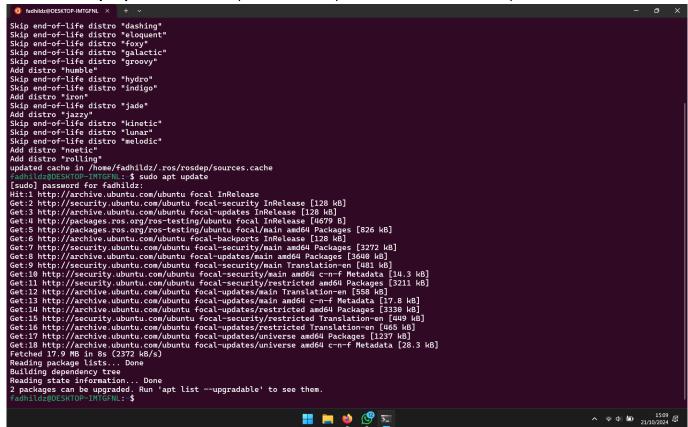Nama : Fadhil Dzikri Aqila
NIM : 1103213136
Kelas : TK-45-G09
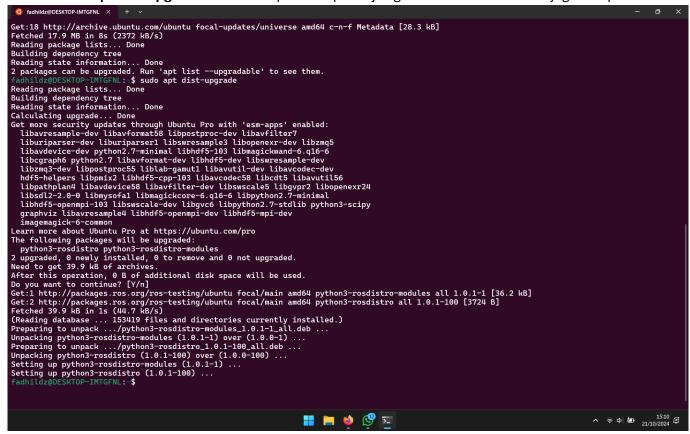
# Getting Started – MoveIt 1 Noetic

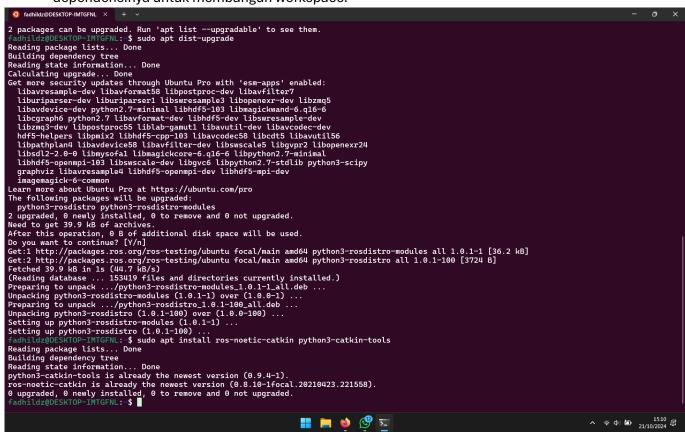1. **rosdep update** untuk memperbarui database dependensi ROS.



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

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



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

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



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

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



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

9. **wstool remove moveit_tutorials** untuk menghapus tutorial MoveIt dari workspace.

```
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$
```
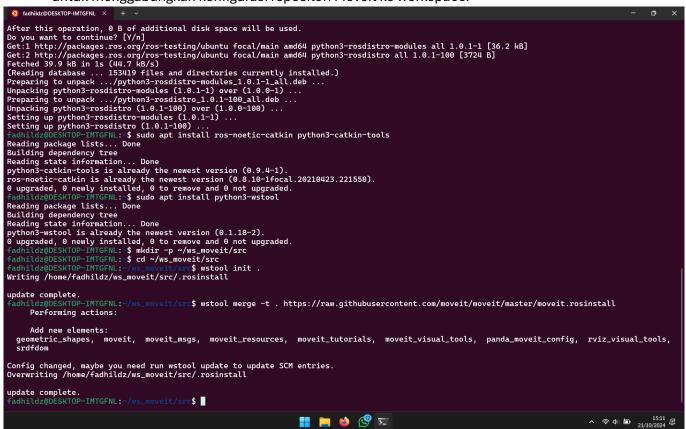
10. **wstool update -t .** untuk memperbarui repositori di workspace.

```
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_shap
es
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](https://github.com/moveit/moveit_tutorials.git) **-b master** dan **Git clone** [https://github.com/moveit/panda_moveit_config.git](https://github.com/moveit/panda_moveit_config.git) **-b noetic-devel** untuk mengkloning repositori tutorial dan konfigurasi panda MoveIt.

```
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_mo
veit_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_t
ools
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-IMTGFNL:~/ws_moveit/src$ cd ~/ws_moveit/src
fadhildz@DESKTOP-IMTGFNL:~/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-IMTGFNL:~/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-IMTGFNL:~/ws_moveit/src$
```

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

```
veit_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_t
ools
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-IMTGFNL:~/ws_moveit/src$ cd ~/ws_moveit/src
fadhildz@DESKTOP-IMTGFNL:~/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-IMTGFNL:~/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-IMTGFNL:~/ws_moveit/src$ cd ~/ws_moveit/src
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$ rosdep install -y --from-paths . --ignore-src --rosdistro noetic
#All required rosdeps installed successfully
fadhildz@DESKTOP-IMTGFNL:~/ws_moveit/src$
```
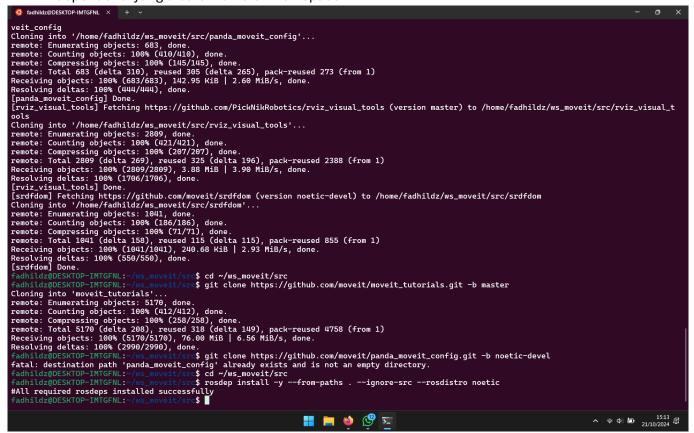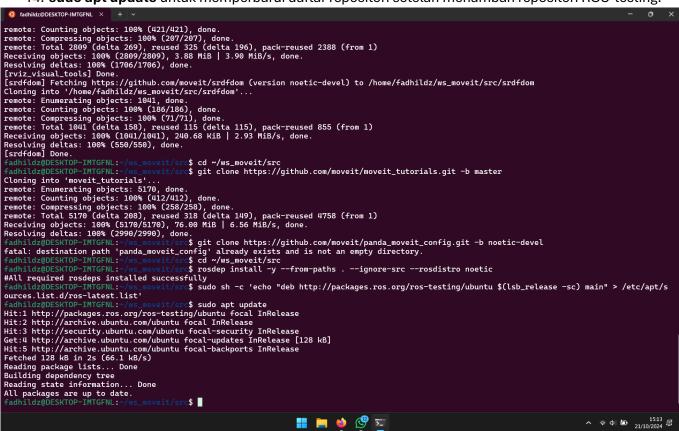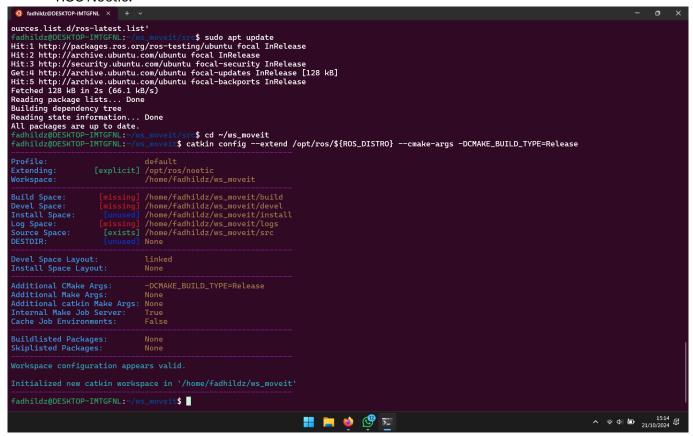
13. **sudo sh -c 'echo "deb http://packages.ros.org/ros-testing/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'** untuk menambahkan repositori ROS-testing ke sources list.
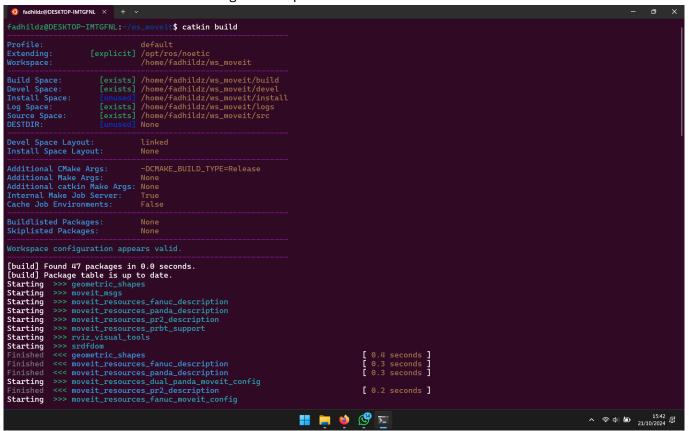


14. **sudo apt update** untuk memperbarui daftar repositori setelah menambah repositori ROS-testing.

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.



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

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$
```