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Week 1 : ROS2 Installation Documentation

```
neverwh3re@neverwh3re-virtual-machine: ~  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
neverwh3re@neverwh3re-virtual-machine:~$ locale  
LANG=en_US.UTF-8  
LANGUAGE=en_US:  
LC_CTYPE="en_US.UTF-8"  
LC_NUMERIC=id_ID.UTF-8  
LC_TIME=id_ID.UTF-8  
LC_COLLATE="en_US.UTF-8"  
LC_MONETARY=id_ID.UTF-8  
LC_MESSAGES="en_US.UTF-8"  
LC_PAPER=id_ID.UTF-8  
LC_NAME=id_ID.UTF-8  
LC_ADDRESS=id_ID.UTF-8  
LC_TELEPHONE=id_ID.UTF-8  
LC_MEASUREMENT=id_ID.UTF-8  
LC_IDENTIFICATION=id_ID.UTF-8  
LC_ALL=  
neverwh3re@neverwh3re-virtual-machine:~$ sudo apt update && sudo apt install locales  
[sudo] password for neverwh3re:  
Hit:1 http://id.archive.ubuntu.com/ubuntu jammy InRelease  
Get:2 http://id.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]  
Hit:3 http://id.archive.ubuntu.com/ubuntu jammy-backports InRelease  
Get:4 http://id.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [41,6 kB]  
Get:5 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]  
Fetched 271 kB in 10s (27,1 kB/s)  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
97 packages can be upgraded. Run 'apt list --upgradable' to see them.  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
locales is already the newest version (2.35-0ubuntu3.4).  
locales set to manually installed.  
0 upgraded, 0 newly installed, 0 to remove and 97 not upgraded.  
neverwh3re@neverwh3re-virtual-machine:~$ sudo locale-gen en_US en_US.UTF-8  
Generating locales (this might take a while)...  
  en_US.ISO-8859-1... done  
  en_US.UTF-8... done  
Generation complete.  
neverwh3re@neverwh3re-virtual-machine:~$ sudo update-locale LC_ALL=en_US.UTF-8 LANG=en_US.UTF-8  
neverwh3re@neverwh3re-virtual-machine:~$ export LANG=en_US.UTF-8  
neverwh3re@neverwh3re-virtual-machine:~$ locale
```

1. Pertama, saya memastikan terlebih dahulu locale support utf_8 dengan menjalankan command seperti di atas.

- ```
neverwh3re@neverwh3re-virtual-machine:~$ sudo apt install software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
software-properties-common is already the newest version (0.99.22.7).
software-properties-common set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 97 not upgraded.
neverwh3re@neverwh3re-virtual-machine:~$ sudo add-apt-repository universe
Adding component(s) 'universe' to all repositories.
Press [ENTER] to continue or Ctrl-C to cancel.
Hit:1 http://id.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://id.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://id.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Reading package lists... Done
neverwh3re@neverwh3re-virtual-machine:~$ sudo apt update && sudo apt install curl -y
Hit:1 http://id.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://id.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://id.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
96 packages can be upgraded. Run 'apt list --upgradable' to see them.
```
- 2.
- ```
neverwh3re@neverwh3re-virtual-machine:~$ sudo curl -sSL https://raw.githubusercontent.com/ros/rosdistro/master/ros.key -o /usr/share/keyrings/ros-archive-keyring.gpg
neverwh3re@neverwh3re-virtual-machine:~$ echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/share/keyrings/ros-archive-keyring.gpg] http://packages.ros.org/ros2/ubuntu $(. /etc/os-release && echo $UBUNTU_CODENAME) main" | sudo tee /etc/apt/sources.list.d/ros2.list > /dev/null
neverwh3re@neverwh3re-virtual-machine:~$ sudo apt update
Hit:1 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:2 http://id.archive.ubuntu.com/ubuntu jammy InRelease
Hit:3 http://id.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:4 http://id.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:5 http://packages.ros.org/ros2/ubuntu jammy InRelease [4,682 B]
Get:6 http://packages.ros.org/ros2/ubuntu jammy/main amd64 Packages [1,394 kB]
Fetched 1,398 kB in 12s (120 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
96 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

Kedua, saya men-setup Sources ROS2 apt Repository pada sistem supaya instalasi ROS2 berjalan dengan lancar. Saya menginstall curl terlebih dahulu agar command untuk mengakses suatu website menggunakan curl dapat berjalan sehingga dapat memasukkan ROS2 GPG key dan menambahkan repository pada list dari Sources. Lalu agar mensinkronisasikan repository dengan repository caches saya menjalankan command apt update dan upgrade. Terlampir dokumentasi seperti diatas

- ```
Processing triggers for initramfs-tools (0.140ubuntu13.4) ...
update-initramfs: Generating /boot/initrd.img-6.2.0-36-generic
Processing triggers for libc-bin (2.35-0ubuntu3.4) ...
neverwh3re@neverwh3re-virtual-machine:~$ sudo apt install ros-humble-desktop
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
```
- 3.
- Ketiga, saya menginstall ROS2 dengan versi Humble dengan command seperti diatas

- ```
Setting up ros-humble-desktop (0.10.0-1jammy.20230920.00) ...
Processing triggers for libc-bin (2.35-0ubuntu3.4) ...
neverwh3re@neverwh3re-virtual-machine:~$ ros2
ros2: command not found
neverwh3re@neverwh3re-virtual-machine:~$
```
- 4.

Keempat, saya memvalidasi apakah ROS2 sudah terinstall atau belum, namun dikarenakan belum mengatur environment, sehingga ROS2 belum terinstall secara penuh

5.

```
neverwh3re@neverwh3re-virtual-machine:~$ ros2
ros2: command not found
neverwh3re@neverwh3re-virtual-machine:~$ source /opt/ros/humble/setup.bash
neverwh3re@neverwh3re-virtual-machine:~$
```

Ke-5. Saya mensetting source dengan syntax seperti di atas untuk mengatur environment

```
neverwh3re@neverwh3re-virtual-machine:~$ source /opt/ros/humble/setup.bash
neverwh3re@neverwh3re-virtual-machine:~$ ros2
usage: ros2 [-h] [--use-python-default-buffering]
           Call 'ros2 <command> -h' for more detailed usage. ...

ros2 is an extensible command-line tool for ROS 2.

options:
  -h, --help                show this help message and exit
  --use-python-default-buffering
                           Do not force line buffering in stdout and instead use the python default
                           buffering, which might be affected by PYTHONUNBUFFERED/-u and depends on
                           whatever stdout is interactive or not

Commands:
  action                    Various action related sub-commands
  bag                       Various rosbag related sub-commands
  component                 Various component related sub-commands
  daemon                   Various daemon related sub-commands
  doctor                   Check ROS setup and other potential issues
  interface                Show information about ROS interfaces
  launch                   Run a launch file
  lifecycle                 Various lifecycle related sub-commands
  multicast                 Various multicast related sub-commands
  node                     Various node related sub-commands
  param                    Various param related sub-commands
  pkg                      Various package related sub-commands
  run                      Run a package specific executable
  security                  Various security related sub-commands
  service                  Various service related sub-commands
  topic                    Various topic related sub-commands
  wtf                      Use 'wtf' as alias to 'doctor'

Call 'ros2 <command> -h' for more detailed usage.
neverwh3re@neverwh3re-virtual-machine:~$
```

6.

Lalu dapat dilihat saat menjalankan command ros2, output akan berbeda dengan sebelumnya, menandakan bahwa ROS2 sudah terinstall secara penuh