

# Install instructions ROS NOETIC - EN

Robot operating system (ROS) is a framework and ecosystem of robotic software packages for control and simulation of mobile and industrial robots. The most current version which is stable Noetic works on Ubuntu 20, which is a prerequisite for the ROS.

**Warning: Before installation of Ubuntu 20, please make a backup of all of your data on your PC.**

Before the installation you have to decide whether to install a virtual machine, dual-boot or a clean installation of the OS. Since the simulation with Gazebo is going to be computationally demanding a moderately powerful PC is required. At least a lower-end processor with 8GB of RAM and 2GB of GPU RAM. For a virtual machine to run smoothly you have to at least double those specifications.

## Installation of ROS Noetic on Ubuntu 20

We will show a shortened guide without in detail instructions, but those can be found at: <http://wiki.ros.org/noetic/Installation/Ubuntu>

### Installation

Run the commands in the console which will do the following:

1. allowing of ROS packages
2. setting of key into OS for downloading packages from ROS repositories
3. check whether all OS packages are up-to-date
4. installation of “full-desktop” ROS
5. adding of script, which after running of the console sets system variables for ROS

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

```
sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-key
C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
```

```
sudo apt update
```

```
sudo apt install ros-noetic-desktop-full
```

```
echo "source /opt/ros/noetic/setup.bash" >> ~/.bashrc
source ~/.bashrc
```

### Initialization of workspace

All source code and binaries which we will create will be located in one folder called workspace of the environment. We will name it “catkin\_ws” to prevent any naming issues. Run the following commands in console:

1. Creation of a folder for the workspace, run it from “home” location (initial location):

```
mkdir -p ~/catkin_ws/src
```

## 2. Change to the workspace

```
cd ~/catkin_ws/
```

3. Initialization of the workspace - running of compilation (with the following command we will always compile the source code)

```
catkin_make
```

4. Setting of script which will on startup of the console set system variables for our workspace

```
echo $ROS_PACKAGE_PATH  
/home/youruser/catkin_ws/src:/opt/ros/noetic/share
```

5. Now, everything is read for creation of a first ROS package or downloading of source code from repositories. Source code of packages should be put into location ~/catkin\_ws/src/

In detail explanation:

<http://wiki.ros.org/ROS/Tutorials/InstallingandConfiguringROSEnvironment>

## Installation on Ubuntu 20 in virtual machine

In a first place it is necessary to use for virtualization VMware, kt. alone can support enough virtual GPU memory. After creation of VM, increase GPU memory in settings to the maximum available amount.

Ideally install vmware workstation 16 player

<https://kb.vmware.com/s/article/2053864>

### Setting of GPU memory:

VmUbuntu > settings > hardware > display > accelerate 3D graphics, graphics memory (set maximum)

It is possible that there will be a problem with running gazebo and the following error will show up in the console:

VMware: vmw\_ioctl\_command error Invalid argument.

If that happens the solution is to disable some of the advanced features of the GPU driver by running the following:

One time solution: export SVGA\_VGPU10=0

Permanent solution: echo ""export SVGA\_VGPU10=0"" >> ~/.profile"