

Virtual Lab Setup

This page will guide you through the installation process of the Lab:

1. Install Ubuntu 18.04.3 LTS.

<https://releases.ubuntu.com/18.04/> or

<https://tutorials.ubuntu.com/tutorial/tutorial-create-a-usb-stick-on-ubuntu> or

<https://tutorials.ubuntu.com/tutorial/tutorial-create-a-usb-stick-on-windows>

2. Clone our cpm software repository with:

```
git clone https://github.com/embedded-software-laboratory/cpm_lab software
```

3. Prepare to run our installation script by getting a license.dat-file for the [RTI DDS Connex Service](#) (ask your supervisor if you are a student or get into contact with [RTI](#)). This is not required if you are running the eProxima version (which is not yet present in the master branch).
4. Run our script to install all necessary components. In the *software* folder you have just cloned you find *install.sh*.

todo	full installation	simulation setup only
run	<pre>cd software/ sudo bash install.sh</pre>	<pre>cd software/ sudo bash install.sh --simulation</pre>
What will it install?	Unbuntu packages	Unbuntu packages
	Joystick/ Gamepad	Joystick/ Gamepad
	RTI DDS Connex or eProxima	RTI DDS Connex or eProxima
	RTI ARM or eProxima ARM	
	OpenCV 4.0 for the Indoor Positioning System	
	Basler Pylon 5 for the Indoor Positioning System and lab camera	

Change DDS Domain

If you want to change the DDS Domain later, change the corresponding variable `DDS_DOMAIN` in `/etc/profile.d/rti_connex_dds.sh`.

The following domain IDs are used in the CPM Lab:

Domain ID	Purpose
21	Lab (main computer, NUCs, vehicles)
61-66	Student computers

Change RTI license file

If you want to update your license file, change the file at: `/opt/rti_connex_dds-6.0.0/rti_license.dat`

5. Reboot your PC.

6. **Optional:**

Setup MATLAB. As a student from RWTH, you can do this with a MathWorks account following [these instructions](#).

For RTI DDS: [Download the DDS Support Package for MATLAB](#) and install the toolbox. The native DDS addon that ships with MATLAB versions from 2021a only supports Simulink. If you are going to code in MATLAB, install the corresponding package from the link.

To use MATLAB with eProxima, look [here](#).



Make sure to create a symbolic link to the MATLAB binary during or after the setup!

7. Run the build script.

full setup	only simulation setup
<pre>./build_all.bash</pre>	<pre>./build_all.bash --simulation</pre>

Troubleshooting

- If you have problems during the building process, try starting over again with

```
cd ~/software/  
git pull  
git clean -xdf  
./build_all.bash
```

- If you ever run `build_all.bash` as `root`, you might run into a lot of `permission denied` errors. You need to delete all files and folders that were created and rerun as your usual user.
- If you receive an error like `"dds/someheader.h" not found`, run the command `"rtiddsgen"`, which should build the necessary cpp-files
- If you receive an error regarding timing issues of unittests, run

```
git clean -xdf  
./build_all.bash
```

again. This error occurs often in VM.