Virtual Lab Setup

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

1. Install [Ubuntu 18.04](#).
2. Create the folder '~/dev' and open it in a terminal:

```
cd ~
mkdir dev
cd dev
```

3. Clone the CPM Lab software repository:

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

4. Prepare to run our installation script by getting a license.dat-file for the [RTI DDS Connext Service](#) (ask your supervisor if you are a student or get into contact with [RTI](#)). This is not required if you are running the eProsima version (which is not yet present in the master branch).
5. 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	```cd software/``` ```sudo bash install.sh```	```cd software/``` ```sudo bash install.sh --simulation```
What will it install?	Unbuntu packages	Unbuntu packages
	[Joystick/ Gamepad](#)	[Joystick/ Gamepad](#)
	[RTI DDS Connext](#) or eProsima	[RTI DDS Connext](#) or eProsima
	RTI ARM or eProsima 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_connext_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_connext_dds-6.0.0/rti_license.dat*

6. Reboot your PC.
7. **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 eProsima, look here.](#)

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

⚠️

8. Run the build script.

full setup	only simulation setup
`./build_all.bash`	`./build_all.bash --simulation`

ⓘ **Troubleshooting**

- If you
    - encounter unexpected errors
    - have problems during the building process
    - receive an error regarding timing issues of unittests

  make sure that the software is up to date and built correctly with

```
cd ~/dev/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