

Jupyter-Lab and VNC Manual

- **If you are physically present at the ESAT student-PC classroom:**
 1. You can simply launch Jupyter-lab by typing in the command-line console `jupyter-lab`. Do not forget to `source setup.sh` beforehand.
 2. Then simply click on the link provided by the console output which will be like `http://127.0.0.1:8888/Lab?token=c83c9159fe4f...`
 3. A browser should pop up showing the Jupyter-lab GUI.
- **If you are working remotely with the ESAT student-PC:**
 1. We need to forward the jupyter link to your local machine via the ssh tunneling.
 2. The basic structure of this port forwarding is `Local-Port <-> ESAT-Jump-Server-Port <-> student-PC-port`.
 3. In order to avoid congestion, each user has a unique port “reserved” in the ESAT IT infrastructure.
 - Firstly, `ssh username@ssh.esat.kuleuven.be` (your username should be your student r-ID) to “helium”, the ESAT Jump Server.
 - Use command `id -u | head -c5` to get the output. It is a “unique” 5-digit number which you can use as the port number.
 - Note down that number. We refer to it using `YOUR#` in the next steps.
 - Then type `exit` to terminate this connection.
 4. With `YOUR#` we can start to set up the port forwarding:
 - Pick a port number you like for the Jupyter-lab. (By default, Jupyter launches from 8888. We will use 8899 as an example here.)
 - Firstly, log in to the jump server **helium**, this time with `ssh -L 8899:localhost:<YOUR#> username@ssh.esat.kuleuven.be`
 - Secondly, log in to one student pc via helium, with `ssh -L <YOUR#>:localhost:8899 pc-klas*-*` (e.g. `pc-klas2-2`)
 - Now you are on the student pc. Do the normal environment preparation with `source setup.sh`.
 - Finally, you can launch jupyter lab remotely: `jupyter-lab --no-browser --port 8899`
 - Because of the port forwarding and the same port number we set, you can click on the output link like `http://127.0.0.1:8899/Lab?token=68c7fe58f62e...` to get the jupyter webpage opened on your local browser.

- **This method is also useful for VNC graphical interface forwarding.**
 1. Keep in mind each port is **dedicated** to each process. If you want to forward Jupyter and VNC at the same time. You need to use 2 Port numbers, e.g. `YOUR#` and `YOUR#+1`.
 2. VNC launches from port `5901` instead of the 8888 for Jupyter.
 3. Hence the command chain should be like:
 - Normally ssh into the student pc and start VNC with `vncserver`
 - You will get a number identifying your vnc process id
`... pc-klas2-2.esat.kuleuven.be:1`
 - If it is `1`, then the real port is $5900+1=5901$.
 - Then forwarding it to your local machine:
`ssh -L 5901:localhost:<YOUR#+1> username@ssh.esat.kuleuven.be`
`ssh -L <YOUR#+1>:localhost:5901 pc-klas*-*` (e.g. `pc-klas2-2`)
 - Locally, use software such as VNCViewer to start the connection.

