

# Studying the Z Boson with the ATLAS Detector at the LHC – F91/92 Remote Access Instructions –

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March 5, 2021

## 0 Updates to this document

### March 2021

- The lab course can now also be taken remotely on the server PCs in the [KIP CIP-Pool](#).
- Simplified remote access to the lab course PCs without ssh tunnel.
- Use of ThinLinc instead of X2Go as remote desktop application.

## 1 Introductory remarks on the remote lab course

Since May 2020, we are temporarily offering this lab course to be taken remotely. Instead of working directly in front of the PCs in the lab course building, you will set up a remote connection from your private PC or laptop at home. To establish the remote connection we are using the Linux remote desktop application [ThinLinc](#). To be able to connect remotely to the PCs in the lab course building or in the KIP CIP-Pool, you will need to establish a VPN connection to the [URZ](#) first. For the supervision by the tutors and the discussion amongst students during the remote lab course we are using the [heiCONF](#) web conferencing system.

In contrast to the non-remote lab course in which both students of one group work together in front of the same computer, for the remote lab course each student will have to establish her or his own remote connection. However, joint work is not only allowed but highly recommended. Although each student will connect to a separate PC, the development of only one common coding solution is sufficient. The heiCONF system offers screen sharing which can be used for active cooperation during the remote lab course.

## 2 Web conferencing for supervision and discussion

A heiCONF meeting room is set up for supervision and discussion during the remote lab course. Your tutor will open this meeting room at defined times during the day and she or he will communicate this to you beforehand. During these times you and your partner will work on the lab course, each person remotely from her or his own computer. The tutor will be available for discussions and questions via the web conference. If the daily work time has passed, the meeting will be closed.

The heiCONF meeting url is <https://heiconf.uni-heidelberg.de/wes-fy2-9kn>.

### 3 Establishing the remote connection

Connecting remotely to the lab course PCs requires two steps, which are described in detail in this section. Students who registered for **F91 will use PCs in the lab course building**, while students who registered for **F92 will use PCs in the KIP CIP-Pool**. Students working on PCs in the CIP-Pool will also need to set up the correct environment for the lab course, as described in section 4. As a reminder for the daily work, the quickstart guide below summarizes the steps to open and close the remote connection.

#### Quickstart guide to open the remote connection:

1. Start the VPN connection to the Heidelberg university network.
2. Log into the ThinLinc remote session.

#### Quickstart guide to close the remote connection:

1. Log out of the ThinLinc remote session.
2. Close the VPN connection to the Heidelberg university network.

#### 3.1 Setting up the VPN connection

A virtual private network (VPN) extends a private network across a public network, and allows the user to establish secure access from her or his local network e.g. at home into the private network. The URZ supports the Cisco AnyConnect VPN Client, which students can download for free. Detailed instructions how to download and install the client can be found at <https://www.urz.uni-heidelberg.de/en/vpn>.

#### 3.2 ThinLinc remote connection

ThinLinc is a fast remote desktop system, which allows you to work from home as if you were in front of the remote PC itself. While the server is running on the remote PC, you need to install the client on your local computer. It is available for Linux, Mac and Windows and can be downloaded for free from <https://www.cendio.com/thinlinc/download>.

In order to establish a remote connection to a PC in the lab course building or in the KIP CIP-Pool, first open the VPN connection as described in section 3.1. Recall that this is using your URZ UniID. Then start the ThinLinc client application. Depending for which lab course you registered, F91 or F92, you will be using either the PCs in the lab course building (F91) or the PCs in the CIP-Pool (F92). There are small differences in the ThinLinc configuration, which will be described in the following.

Figure 1 shows the ThinLinc client login window. Please enter here the name of the PC you will connect to, and the corresponding user name and password.

For groups who registered for **F91**, one student fills **fpatlas01.kip.uni-heidelberg.de** as server name, and the other student fills **fpatlas02.kip.uni-heidelberg.de**. As user name and password, you need to use your FP account name and password which was sent to you by email beforehand.

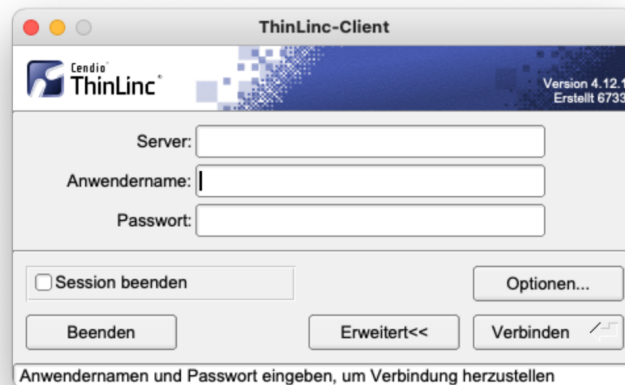
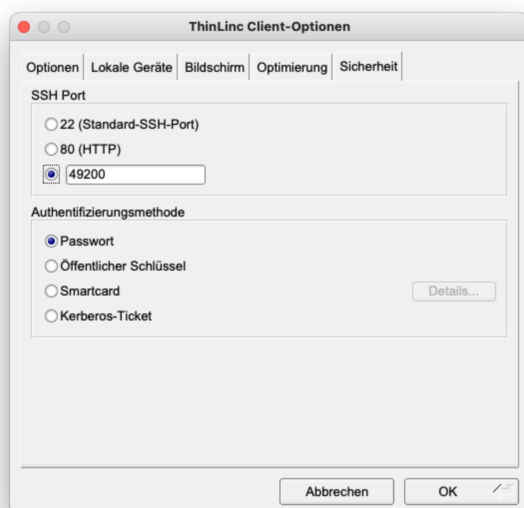


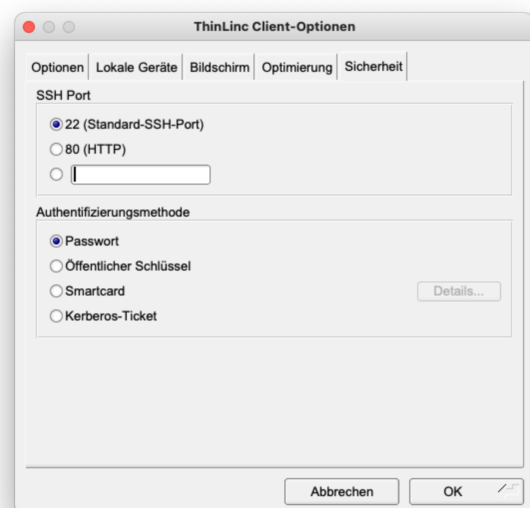
Figure 1: ThinLinc client login window.

For groups who registered for **F92**, one student fills **physik4.kip.uni-heidelberg.de** as server name, and the other student fills **physik5.kip.uni-heidelberg.de**. As user name and password, you need to use your URZ UniID. You will NOT need your FP account name and password.

Before establishing the remote connection, you might need to configure the ssh port setting. Click on the *Options* button which will open the ThinLinc client option window, and select the *Security* tab as shown in Figure 2. Students who registered for **F91** and connect to the lab course PCs need to specify ssh port 49200 as shown in Figure 2(a). Students who registered for **F92** and connect to the CIP-Pool PCs need to select the standard ssh port 22 as shown Figure 2(b). After having set the correct ssh ports, confirm with **OK** and return to the ThinLinc client login window.



(a)



(b)

Figure 2: ThinLinc client option window. Security settings when connecting to the lab course PCs (a) and the CIP-Pool PCs (b).

Press **Connect** to establish the remote connection, which will open the ThinLinc profile selector window as shown in Figure 3. Students who registered for **F91** and connect to the lab course PCs can choose between the Ubuntu and the Xfce desktop. Students who registered for **F92** and connect to the CIP-Pool PCs should select the Xfce desktop.

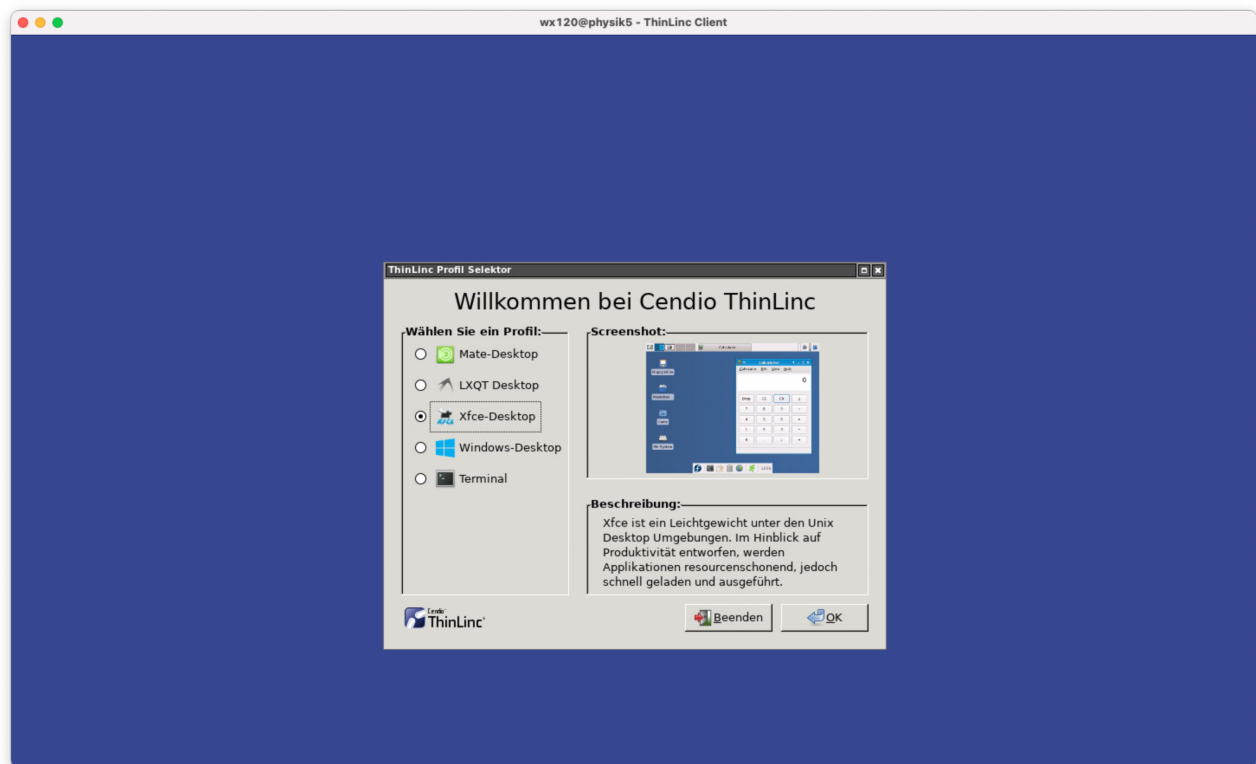


Figure 3: ThinLinc profile selector window when connecting to a PC in the KIP CIP-Pool.

## 4 Special settings when using the KIP CIP-Pool PCs

On the CIP-Pool PCs, the data for the lab course are stored in a different location than described in the main lab course manual. In addition, different versions of ROOT and python are set as default. Therefore students who registered for **F92** and connect to the CIP-Pool PCs will have to adjust their working environment before being able to execute the lab course scripts as described in the main manual.


On the CIP-Pool PCs, the data for this lab course are stored under **/local/fp9192/data** instead of **/fp/data** as for the lab course PCs. Hence, when the main manual refers to **/fp/data**, always use **/local/fp9192/data** instead.

The correct versions of ROOT and python for the lab course can be configured by sourcing a little shell script. To do so, execute following command each time you open a new terminal window. You should see an output as shown in Figure 4.

```
$ source /local/fp9192/data/Setup/.bash_pool
```

To avoid having to execute this command each time a new terminal window is opened, we recommend to put this command into your **.bashrc** file or, preferably, into your **.bash\_aliases** file which are located in your home directory. To do so, open the file with your preferred text editor and insert the

command. Note that while a `.bashrc` file should already exist, it might be that you have to create the `.bash_aliases` for the first time. In case you changed your default shell to something different than `bash`, we assume you know what you are doing and find the corresponding setup scripts yourself.

A terminal window titled ".ssh — wx120@physik4: ~ — connect · ssh wx120@physik4.kip.uni-heidelberg.de — 91x24". The terminal shows the following commands and output:

```
wx120@physik4:~$  
wx120@physik4:~$ source /local/fp9192/data/Setup/.bash_pool  
Setting up FP 91/92 CIP pool environment:  
Setting ROOT version to 6.14.04  
Setting python version to 2.7  
wx120@physik4:~$  
wx120@physik4:~$  
wx120@physik4:~$
```

Figure 4: Setting up the CIP-Pool environment.

## 5 Copying result data

In order to be able to include result plots into your lab course report or seminar talk, you need to copy them to your local computer. We recommend to use the URZ [heiBOX](#) service for this purpose.

heiBOX is a secure file hosting service available for free to all students, offering 10 GB storage space for each student. It can be used to exchange and synchronize files on PCs and mobile devices, providing a similar functionality to commercial cloud storage services such as Dropbox or Google Drive.

To transfer data from the remote PC to your local computer, open a web browser (e.g. firefox) in the ThinLinc session on the remote PC. Use the heiBOX web interface (login via UniID) to upload the data you want to transfer. On your local computer, you can again use the heiBOX web interface to download the data, or install the Seafile client for automatic syncing.

Detailed information as well as links to the heiBOX web interface and client download page are provided at <https://www.urz.uni-heidelberg.de/en/heibox>.