Using the High-Performance Computing Cluster Through the Lumerical GUI

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Background:

The 2020 and beyond versions of Lumerical come with a python script for connecting to computing clusters through a variety of job managers. This allows for seamless integration into the Lumerical GUI and makes scheduling jobs as easy as pressing the “Run” button in the program. The password protection on the HPC cluster is the main roadblock so this guide will walk you through a method that allows Lumerical to connect to your account. Please note that this process was developed without CHTC help so they might not be able to troubleshoot. Contact Brandon Hacha (hacha[at]wisc.edu) with any problems.

Requirements:

* Lumerical 2020
* PuTTy
* WinSCP
* GlobalProtect VPN (for accessing campus network)
* HPC account

Procedure:

Part 1: Cluster Account Configuration

1. **Log in to the cluster using PuTTy**
2. **Run the command “ssh-keygen” (**without the quotes)
   1. This command creates a pair of security keys that it will save to your cluster account
3. You will be prompted to enter a file name and a password, **press enter through both prompts**
4. **Your key will be displayed and you may exit the window.**
5. Open up WinSCP and log in.
6. When looking at your home directory, press Ctrl+Alt+H to display the hidden files
7. In the .ssh directory, you should see your keys, labeled id\_rsa. The key with the .pub extension is a public key and the other is a private key. **Download the private key and save it somewhere on your computer.**
8. In the .ssh directory, **create a file called “authorized\_keys”**
9. **Open the public key file and copy the contents into the authorized\_keys file,** then save
   1. This should be one line of text beginning with “ssh-rsa AAAA[…]”
10. Exit the session

Part 2: Lumerical Configuration

1. In the Lumerical program folder, navigate to the slurm.py file and save a backup copy of it somewhere on your computer (with a different name)
2. Open the original slurm.py file in your editor of choice
   1. This is typically found in C:\Program Files\Lumerical\v202\scripts\job\_schedulers
3. In the first block of code, make the following changes:
   1. Line 24: Change *USE\_SSH = False* to *USE\_SSH = True*
   2. Line 28: Change *centos* to your username for accessing the cluster (usually NetID)
   3. Line 29: Change *<master-node-ip>* to either of the HPC head nodes (see website for current node URL’s)
   4. Line 30: Change  *expanduser('~/.ssh/<private-key>.pem')* to *expanduser(r”<Private Key Location>”)* 
      1. The private key location is where you saved the file in step 7
4. If you do not want to save your simulation files in your home directory, you can define a path in the *CLUSTER\_CWD=* line
5. Save the file as slurm.py and exit
   1. NOTE: Depending on your admin settings, you might not be able to save this file. If you get a permission error use the save as function and save the file somewhere else. Then copy and paste it into the Lumerical job\_schedulers folder. **The file must be named slurm.py**

Part 3: Lumerical GUI Setup