Running Jupyter Notebook on ENGR Server

CS519

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1 Set SSH Tunnel to Run Jupyter on ENGR Server

If you want to use Jupyter notebook but don't have it installed locally, you need to use SSH tunnel to access Jupyter service on the server. (So far, Jupyter notebook only works on `flip1`, and the administrator is working on other servers to fix the problems. Or you can use TA's conda environment to launch Jupyter notebook on `flip2` and `flip3` as described in Section 2).

1.1 log in the ENGR server

On Unix and Mac machines, open a terminal and run the following command line to log in the server.

```
$ ssh <username>@access.engr.oregonstate.edu
```

To log in a specific server (e.g. `flip1`), use the command line:

```
$ ssh <username>@flip1.engr.oregonstate.edu
```

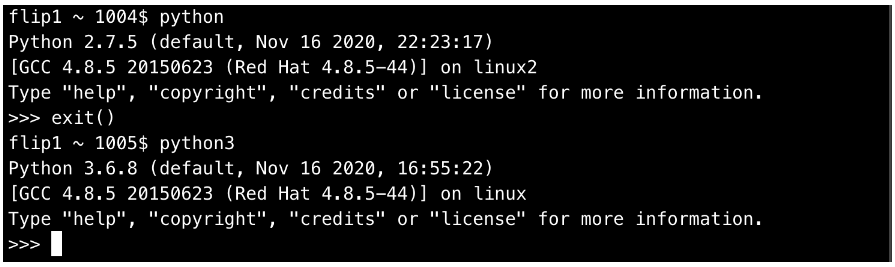
If you are already on a flip server (e.g. `flip2`) and you want to hop on `flip1`:

```
flip2 ~ 1000$ ssh flip1
```

Windows users can use PuTTY to access the server. Please check and follow steps in this link:
`https://it.engineering.oregonstate.edu/accessing-unix-server-using-putty-ssh`

1.2 launch Jupyter notebook on the server

Python2 on the server doesn't work well when importing some packages, so we recommend Python3 when you work on the server. And you should specify `python3` for Python3, the default `python` is Python2.



```
flip1 ~ 1004$ python
Python 2.7.5 (default, Nov 16 2020, 22:23:17)
[GCC 4.8.5 20150623 (Red Hat 4.8.5-44)] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>> exit()
flip1 ~ 1005$ python3
Python 3.6.8 (default, Nov 16 2020, 16:55:22)
[GCC 4.8.5 20150623 (Red Hat 4.8.5-44)] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> 
```

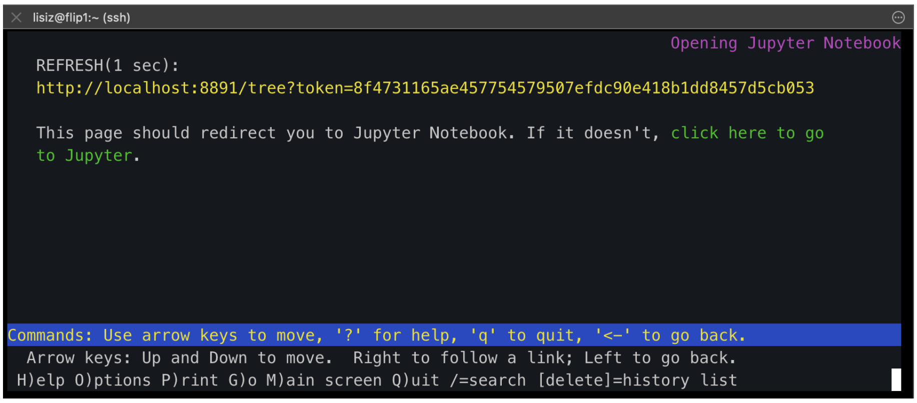
To launch the Jupyter notebook with Python3, run the command line:

```
flip1 ~ 1000$ /usr/local/bin/jupyter notebook
```

Or use TA's conda environment with Python3:

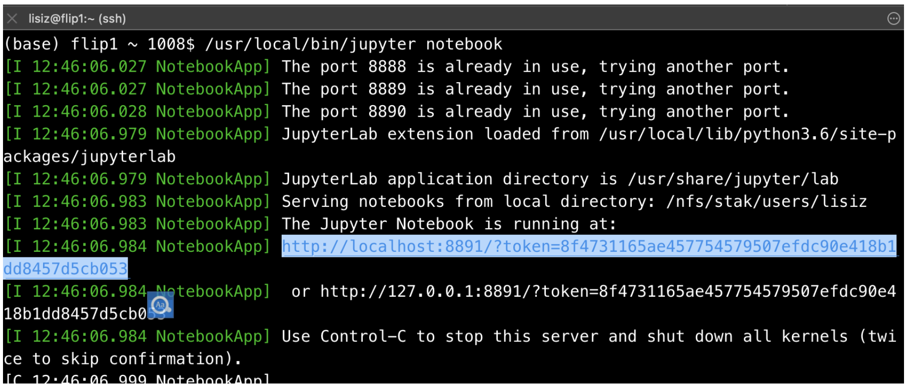
```
flip1 ~ 1000$ /nfs/stak/users/lisiz/miniconda3/bin/jupyter notebook
```

The server may open a new page:



```
lisiz@flip1:~ (ssh)
                                                           Opening Jupyter Notebook
  REFRESH(1 sec):
  http://localhost:8891/tree?token=8f4731165ae457754579507efdc90e418b1dd8457d5cb053

  This page should redirect you to Jupyter Notebook. If it doesn't, click here to go
  to Jupyter.









Commands: Use arrow keys to move, '?' for help, 'q' to quit, '<-' to go back.
  Arrow keys: Up and Down to move.  Right to follow a link; Left to go back.
 H)elp O)ptions P)rint G)o M)ain screen Q)uit /=search [delete]=history list
```

Type q and y to quit this page.



```
lisiz@flip1:~ (ssh)
(base) flip1 ~ 1008$ /usr/local/bin/jupyter notebook
[I 12:46:06.027 NotebookApp] The port 8888 is already in use, trying another port.
[I 12:46:06.027 NotebookApp] The port 8889 is already in use, trying another port.
[I 12:46:06.028 NotebookApp] The port 8890 is already in use, trying another port.
[I 12:46:06.979 NotebookApp] JupyterLab extension loaded from /usr/local/lib/python3.6/site-p
ackages/jupyterlab
[I 12:46:06.979 NotebookApp] JupyterLab application directory is /usr/share/jupyter/lab
[I 12:46:06.983 NotebookApp] Serving notebooks from local directory: /nfs/stak/users/lisiz
[I 12:46:06.983 NotebookApp] The Jupyter Notebook is running at:
[I 12:46:06.984 NotebookApp] http://localhost:8891/?token=8f4731165ae457754579507efdc90e418b1
dd8457d5cb053
[I 12:46:06.984 NotebookApp]  or http://127.0.0.1:8891/?token=8f4731165ae457754579507efdc90e4
18b1dd8457d5cb0
[I 12:46:06.984 NotebookApp] Use Control-C to stop this server and shut down all kernels (twi
ce to skip confirmation).
[C 12:46:06.999 NotebookApp]
```

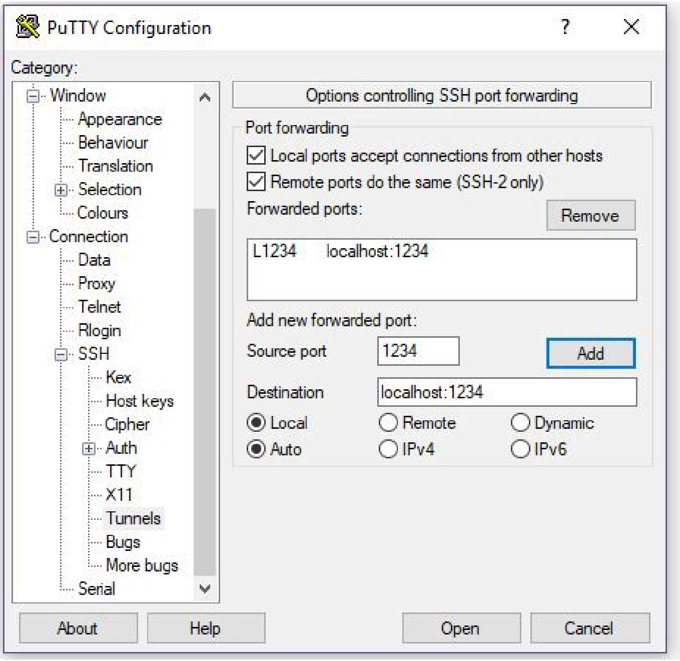
Copy the the highlighted URL and notice the port (four digits after **localhost:** in the URL). In this case, the port is 8891. The port number will be automatically assigned. Next use the specific port to build a SSH tunnel on your local machine.

1.3 build the SSH tunnel

On Unix or Mac machines, start up a local terminal and run:

```
$ ssh -N -L localhost:8891:localhost:8891 <username>@flip1.engr.oregonstate.edu
```

Replace the port (8891) in the command line when the server assigns a different port for the Jupyter notebook. You won't get any feedback but you will be connected.
Windows users can use PuTTY to start the SSH tunnel. You can do it as follows and note that replace the port number (1234) with the correct one:



Options controlling SSH port forwarding

Port forwarding

☑ Local ports accept connections from other hosts

☑ Remote ports do the same (SSH-2 only)

Forwarded ports:

L1234 localhost:1234

Add new forwarded port:

Source port: 1234

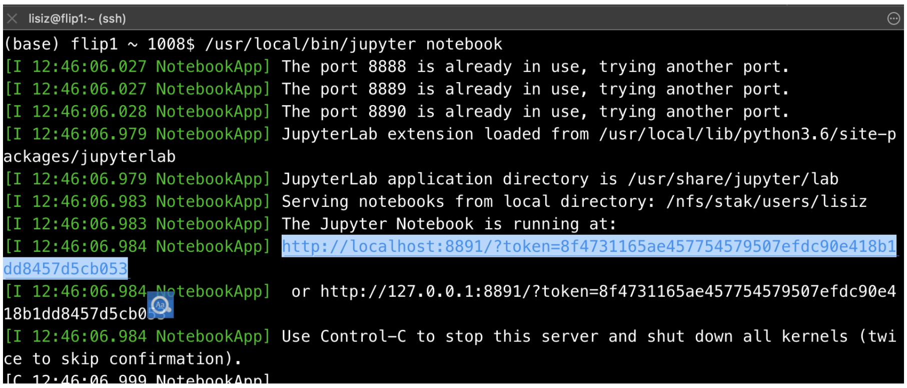
Destination: localhost:1234

● Local ○ Remote ○ Dynamic

● Auto ○ IPv4 ○ IPv6

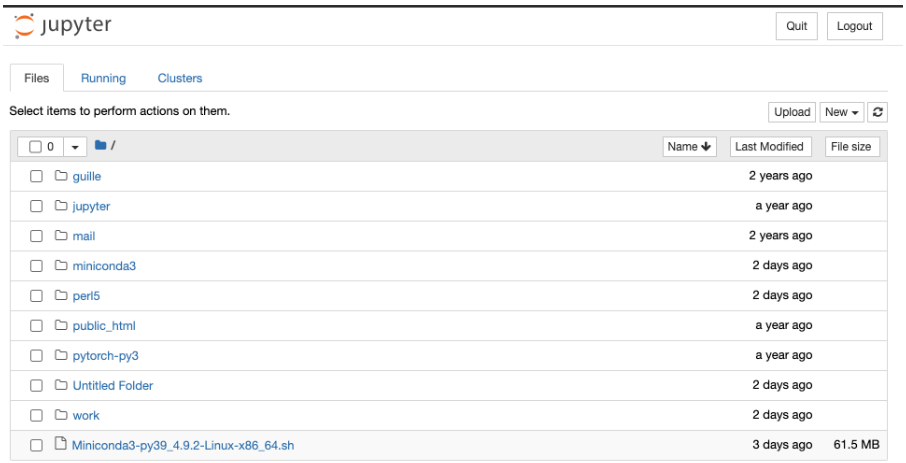
1.4 open the Jupyter notebook link

Open the browser and paste the URL generated after you launch the Jupyter notebook on the server:



```
(base) flip1 ~ 1008$ /usr/local/bin/jupyter notebook
[I 12:46:06.027 NotebookApp] The port 8888 is already in use, trying another port.
[I 12:46:06.027 NotebookApp] The port 8889 is already in use, trying another port.
[I 12:46:06.028 NotebookApp] The port 8890 is already in use, trying another port.
[I 12:46:06.979 NotebookApp] JupyterLab extension loaded from /usr/local/lib/python3.6/site-p
ackages/jupyterlab
[I 12:46:06.979 NotebookApp] JupyterLab application directory is /usr/share/jupyter/lab
[I 12:46:06.983 NotebookApp] Serving notebooks from local directory: /nfs/stak/users/lisiz
[I 12:46:06.983 NotebookApp] The Jupyter Notebook is running at:
[I 12:46:06.984 NotebookApp] http://localhost:8891/?token=8f4731165ae457754579507efdc90e418b1
dd8457d5cb053
[I 12:46:06.984 NotebookApp]  or http://127.0.0.1:8891/?token=8f4731165ae457754579507efdc90e4
18b1dd8457d5cb053
[I 12:46:06.984 NotebookApp] Use Control-C to stop this server and shut down all kernels (twi
ce to skip confirmation).
[C 12:46:06.999 NotebookApp]
```

If you can see the page like this following figure, you open the Jupyter notebook successfully! 🎉👍



Select items to perform actions on them.

	Name	Last Modified	File size
□	guille	2 years ago	
□	jupyter	a year ago	
□	mail	2 years ago	
□	miniconda3	2 days ago	
□	perl5	2 days ago	
□	public_html	a year ago	
□	pytorch-py3	a year ago	
□	Untitled Folder	2 days ago	
□	work	2 days ago	
□	Miniconda3-py39_4.9.2-Linux-x86_64.sh	3 days ago	61.5 MB

1.5 close the Jupyter notebook and release the ports

Keep in mind that first use **Control-C** to stop the SSH tunnel you build in step **1.3**, then use **Control-C** to stop the Juypter service on the server and shut down all kernels (twice to skip confirmation) otherwise the ports won't be released successfully.

2 Use TA's environment (optional)

If you find that the environment that comes with the server is not working well 😕, or you want to use a higher version of Python. You can choose to use the TA's conda environment by `export` the path of TA's environment into your own `PATH`:

```
flip3 ~ 994$ export PATH=/nfs/stak/users/lisiz/miniconda3/bin:$PATH
```

Then your default command will use TA's environment directly.

```
flip3 ~ 995$ which python
/nfs/stak/users/lisiz/miniconda3/bin/python
flip3 ~ 996$ which jupyter
/nfs/stak/users/lisiz/miniconda3/bin/jupyter
flip3 ~ 997$ python
Python 3.9.1 (default, Dec 11 2020, 14:32:07)
[GCC 7.3.0] :: Anaconda, Inc. on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import numpy as np
>>> import pandas as pd
>>>
```