1. Introduction to JupyterLab

JupyterLab is an interactive development environment and the next generation product of Jupyter Notebook. It integrates more functions, supports plug-in extensions, and can be run and operated through web pages. It is simple, convenient, and powerful, making it a very worthwhile code editing tool.

2. Switch to root user

The installation of jupyterab requires the use of a root user, while the root user of the official Jetson Nano system needs to set a password before using the root account.

Note: The password set for root here must be remembered, preferably consistent with the user's password, so that it is not easy to forget. Once forgotten, the consequences can be serious.

2.1 Enter the following command to set the password for root, and then enter the same password twice to confirm.

sudo passwd

```
jetson@jetson-desktop:~$ sudo passwd
New password:
Retype new password:
passwd: password updated successfully
```

2.2 Switch to root user

sudo su

```
jetson@jetson-desktop:~$ sudo su
[sudo] jetson 的密码:
root@jetson-desktop:/home/jetson#
```

From the above figure, it can be seen that the user has been switched to root. And the $symbol before the editing command has changed to a # symbol.

3. Installing JupyterLab

3.1 Install ffi library

apt-get install libffi-dev

```
root@jetson-desktop:/home/jetson# apt-get install libffi-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
```

3.2 Install jupyter (the installation process may be interrupted due to network issues and an error message may appear. Please run again)

pip3 install -i https://pypi.tuna.tsinghua.edu.cn/simple jupyter

```
root@jetson-desktop:/home/jetson# pip3 install -i https://pypi.tuna.tsinghua.edu
.cn/simple jupyter
Collecting jupyter
```

3.3 Install jupyter lab

pip3 install -i https://pypi.tuna.tsinghua.edu.cn/simple jupyterlab

```
root@jetson-desktop:/home/jetson# pip3 install -i https://pypi.tuna.tsinghua.edu
.cn/simple jupyterlab
Collecting jupyterlab
```

4.Switch back to regular users after installation is complete.

su jetson

```
root@jetson-desktop:/home/jetson# su jetson
jetson@jetson-desktop:~$
```

4. Set up LAN to access Jupyter Lab

4.1 If you want it to run on other devices in the same LAN, you need to follow the following process

4.2 Create a configuration file, and after creation, the detailed location of the file will be output. Please remember this location.

jupyter notebook --generate-config

```
jetson@jetson-desktop:~$ jupyter notebook --generate-config
Writing default config to: /home/dofbot/.jupyter/jupyter_notebook_config.py
jetson@jetson-desktop:~$ ls ~/.jupyter/
jupyter_notebook_config.json  jupyter_notebook_config.py  lab  migrated
```

4.3 Modify the configuration file

nano ~/.jupyter/jupyter_notebook_config.py

Just paste the following code in and place it at the top.

```
c.NotebookApp.ip = '0.0.0.0'
c.NotebookApp.allow_remote_access=True
c.NotebookApp.open_browser = False
c.NotebookApp.port = 8888
```

```
  GNU nano 2.9.3   /home/jetson/.jupyter/jupyter_notebook_config.py

# Configuration file for jupyter-notebook.
c.NotebookApp.ip = '0.0.0.0'
c.NotebookApp.allow_remote_access=True
c.NotebookApp.open_browser = False
c.NotebookApp.port = 8888
```

After writing, press the shortcut key to exit

Save: Ctrl+S

Exit: Ctrl+X

4.4 Change the password, the system will require you to enter the password twice (note: when entering the password, pressing the character on the keyboard will not display anything, which is a normal phenomenon. Continue to enter and press Enter)

jupyter notebook password

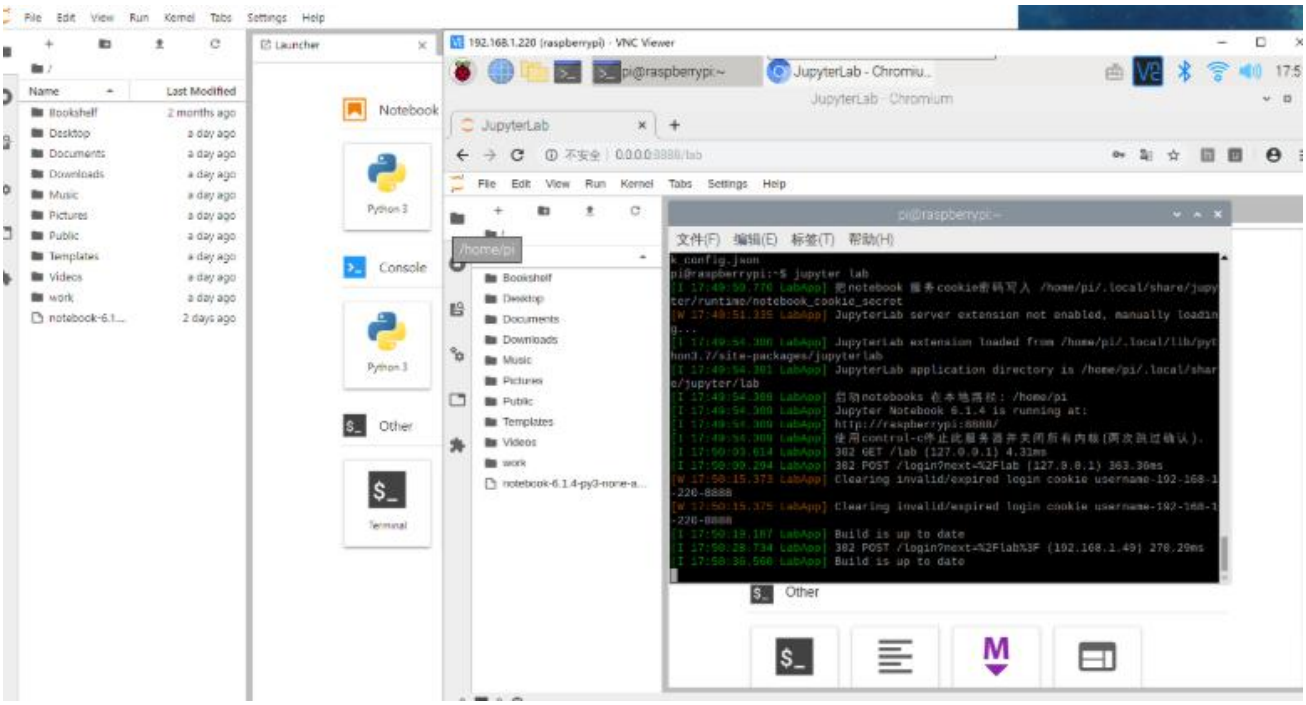
```
pi@raspberrypi:~/.jupyter $ jupyter notebook password
/usr/local/lib/python3.7/dist-packages/jupyter_client/channels.py:17: VisibleDep
recationWarning: zmq.eventloop.minitornado is deprecated in pyzmq 14.0 and will
be removed.
    Install tornado itself to use zmq with the tornado IOLoop.

  from .session import Session
Enter password:
Verify password:
[NotebookPasswordApp] Wrote hashed password to /home/pi/.jupyter/jupyter_noteboo
k_config.json
pi@raspberrypi:~/.jupyter $
```

4.Test

jupyter lab

Can be accessed locally on Raspberry Pi http://127.0.0.1:8888 Alternatively, by accessing http://<your ip address>: 8888 from a machine on the local area network and entering the password you set, you can operate your raspberry pie on the webpage.
Exit jupyterab: Press Ctrl+C twice on the terminal where jupyterab was just opened to exit jupyterab.

For example:
If the address of Raspberry Pi is 192.168.1.91, then machines in the local area network should access it http://192.168.1.91:8888
As shown below.



5. Solution for running code to automatically close Kext

If there is a situation where any code running after installing JupyterLab becomes invalid and Kext automatically closes. And there is Import Error: cannot import name 'create'_ Prompt_ The error in 'application' is due to the high version of the prompt toolkit, which requires reinstalling the lower version.

Let's take a look at the current version, the target version is 1.0.5:

pip3 list | grep prompt

It was found that the installed version is 3.0.18, so it needs to be reinstalled.

pip3 install --upgrade prompt-toolkit==1.0.5

6. Configuring the Jupyter Lab for startup and self startup

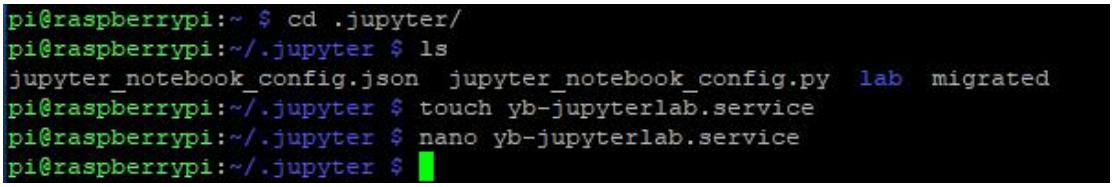
After the installation is completed, under normal circumstances, every time you use JupyterLab, you need to enter the command to start JupyterLab. For convenience, we have configured a bootstrap program.

The operation is as follows:

6.1 Create a startup service

cd .jupyter/

touch yb-jupyterlab.service



6.2 Copy the code to this file, save and exit.

nano yb-jupyterlab.service

```
[Unit]
Description=jupyter lab start service
After=multi-user.target

[Service]
Type=idle
User=jetson
ExecStart=/bin/sh -c "jupyter lab"
WorkingDirectory=/home/jetson

[Install]
WantedBy=multi-user.target
```

After writing, press the shortcut key to exit

Save: **Ctrl+S**

Exit: **Ctrl + X**

6.3 Copy the file to the startup service

sudo cp yb-jupyterlab.service /etc/systemd/system/

Check if the file was successfully copied.

ls /etc/systemd/system

```
pi@raspberrypi:~/.jupyter $ sudo cp yb-jupyterlab.service /etc/systemd/system/
pi@raspberrypi:~/.jupyter $ ls /etc/systemd/system
asplashscreen.service                   halt.target.wants
autologin@.service                      multi-user.target.wants
bluetooth.target.wants                  network-online.target.wants
dbus-fi.wl.wpa_supplicantl.service      poweroff.target.wants
dbus-org.bluez.service                  printer.target.wants
dbus-org.freedesktop.Avahi.service      rc-local.service.d
dbus-org.freedesktop.timesyncl.service  reboot.target.wants
default.target                          remote-fs.target.wants
dhcpcd5.service                         sockets.target.wants
dhcpcd.service.d                        sshd.service
display-manager.service                 sysinit.target.wants
getty.target.wants                      syslog.service
getty@ttyl.service.d                    timers.target.wants
graphical.target.wants                  yb-jupyterlab.service
pi@raspberrypi:~/.jupyter $
```

6.4 Update startup service

sudo systemctl daemon-reload

6.5 Enable startup of jupyterab

sudo systemctl enable yb-jupyterlab.service

```
pi@raspberrypi:~/.jupyter $ sudo systemctl daemon-reload
pi@raspberrypi:~/.jupyter $ sudo systemctl enable yb-jupyterlab.service
Created symlink /etc/systemd/system/multi-user.target.wants/yb-jupyterlab.servic
e → /etc/systemd/system/yb-jupyterlab.service.
pi@raspberrypi:~/.jupyter $
```

6.6 Restart Raspberry Pi

sudo reboot

Attempting to access locally http://127.0.0.1:888

perhaps

Machine access in the local area network http://"your IP address": 8888, such as:

http://192.168.1.220:8888

If the access is normal, then the Jupyter Lab environment has been successfully built!