

workshop 12.9 by 屠鑫明

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- 似乎我忘记考虑到同学不一定能有Linux账户，那可以在未名教学上申请一个 <http://hpc.pku.edu.cn/guide.html>
- Windows的话提前下载
 - xshell 或者 putty
 - xshell要注册一下，就可以下载
 - <http://www.netsarang.com/download/software.html>
 - Filezilla
 - <https://filezilla-project.org/download.php?type=client>

登录Linux

- mac 用户

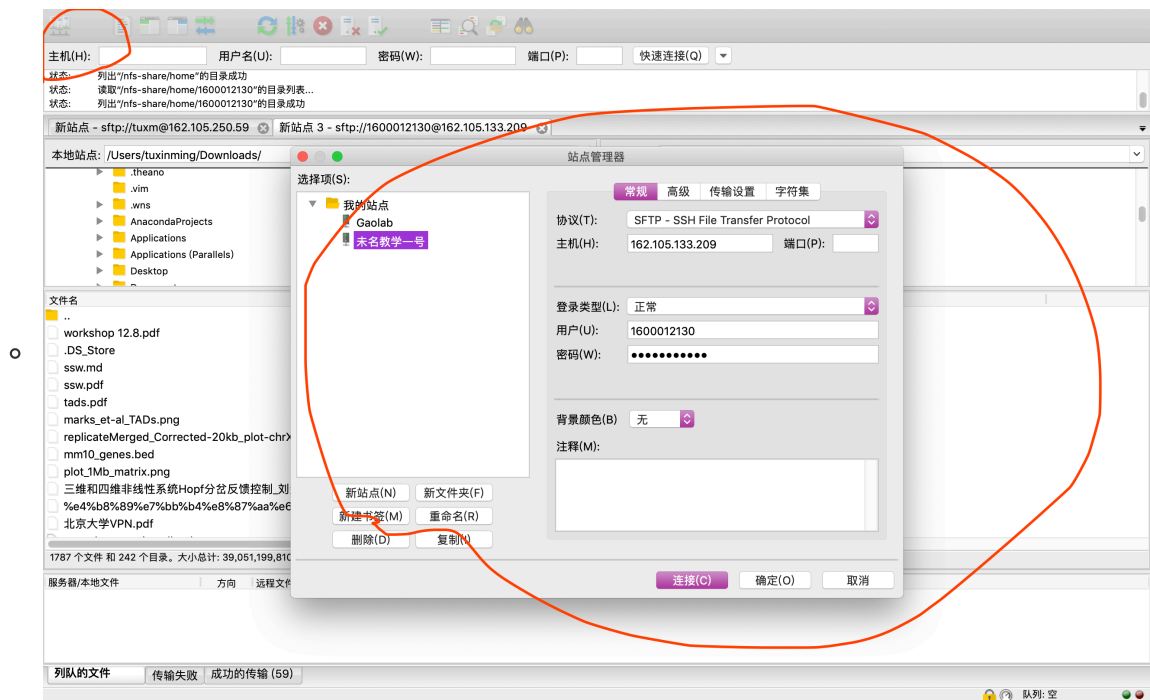
```
ssh 1600012130@162.105.133.209
```

◦

```
Last login: Thu Dec 6 02:11:25 on ttys000
[tuxinmingdeMacBook-Pro-3:~ tuxinming$ ssh 1600012130@162.105.133.209
The authenticity of host '162.105.133.209 (162.105.133.209)' can't be established.
ECDSA key fingerprint is SHA256:DFaguo9IEhUDdFVRJfocBkXKL8AlYCHeUTho0mJNeK8.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '162.105.133.209' (ECDSA) to the list of known hosts.
1600012130@162.105.133.209's password:
Creating directory '/nfs-share/home/1600012130'.
[1600012130@login01 ~]$
```

- windows 用户
 - 下载 Xshell

- Filezilla 图形界面（更容易传文件）



- 先点左上角，然后输入信息
- 链接即可

Linux使用

Linux 基本命令

- 首先介绍 Linux 的最最基本的命令
 - (写在前面) **多用tab键!!!!** 千万要记住!! 因为这样出来的保证是可执行的, 是可以用的!!
 - cheat-sheet (pdf会给大家)

Cheatography Linux Command Line Cheat Sheet by DaveChild

Bash Commands	Is Options	Nano Shortcuts
uname -a Show system and kernel	-a Show all (including hidden)	Files
head -n1 file issue Show distribution	-R Recursive list	Ctrl-R Read file
mount Show mounted filesystems	-r Reverse order	Ctrl-O Save file
date Show system date	-t Sortby last modified	Ctrl-X Close file
uptime Show uptime	-S Sortby file size	Cut and Paste
whoami Show your username	-l Long listing format	ALT-A Start marking text
man command Show manual for command	-l One file per line	CTRL-K Cut marked text or line
	-m Comma-separated output	CTRL-U Paste text
	-Q Quoted output	Navigate File
Bash Shortcuts	Search Files	ALT-/ End of file
CTRL-c Stop current command	grep pattern Search for pattern in files	CTRL-A Beginning of line
CTRL-z Sleep program	grep -i Case insensitive search	CTRL-E End of line
CTRL-a Go to start of line	grep -r Recursive search	CTRL-C Show line number
CTRL-e Go to end of line	grep -v Inverted search	CTRL-_ Go to line number
CTRL-u Cut from start of line	find /dir/ - name name* Find files starting with name in dir	Search File
CTRL-k Cut to end of line	find /dir/ -user name Find files owned by name in dir	CTRL-W Find
CTRL-r Search history	find /dir/ -mmin num Find files modified less than num minutes ago in dir	ALT-W Find next
!! Repeat last command	whereis Find binary / source / manual for command	CTRL-\ Search and replace
!abc Run last command starting with abc	locate file Find file (quick search of system index)	More nano info at:
!abc:p Print last command starting with abc		http://www.nano-editor.org/docs.php
!\$ Last argument of previous command		Screen Shortcuts
!^ All arguments of previous command		screen Start a screen session.
^abc^123 Run previous command, replacing abc with 123		screen -r Resume a screen session.
Bash Variables		screen -l Show your current screen sessions.
env Show environment variables		CTRL-A Activate commands for screen.
echo \$NAME Output value of \$NAME variable		CTRL-A c Create a new instance of terminal.
export NAME=value Set \$NAME to value		CTRL-A n Go to the next instance of terminal.
\$PATH Executable search path		CTRL-A p Go to the previous instance of terminal.
\$HOME Home directory		CTRL-A * Show current instances of terminals.
\$SHELL Current shell		CTRL-A A Rename the current instance of terminal.
	File Operations	
	touch file1 Create file1	
	cat file1 Concatenate files and output file2	
	less file1 View and paginate file1	
	file file1 Get type of file1	
	cp file1 file2 Copy file1 to file2	

- 教程大家可以看这个 <http://blog.genesino.com/2017/06/bash1/> 很简洁!

Linux学习教程

June 08, 2017

○ Reading time ~29 minutes

Linux学习教程

Jump to...

1. 本教程宗旨 (请仔细阅读)
2. 为什么要用Linux系统
3. 如何获取Linux系统
4. 初识Linux系统
5. 我的电脑在哪?
6. 获取可用命令行参数
7. 中文版翻译和中文翻译

- 写的很简洁，如果还要具体了解的话可以找本Linux的书看看（具体的我也不太了解）
- 最最基本的Linux命令
- 查看当前系统版本

```
cat /etc/redhat-release
```

```
[[1600012130@login01 ~]]$ cat /etc/redhat-release
CentOS Linux release 7.4.1708 (Core)
```

#下面都只是最最基本的命令！最最基本的

#查看文件

ls

ls /home/1600012130

ls /home

ls *

#打开目录

cd XXX

#返回上级目录

cd ..

#返回根目录

cd

#解压 (这个里面有些别的具体可以Google 或者看cheat sheet)

gzip -d file.gz

#新建文件

touch newfile

#移动文件

mv file1 ../XX/XX

#删除文件

rm file1

#查看当前磁盘空间

df -h

tmux 使用

tmux 安装

- 首先介绍一下 tmux 的使用
 - 安装 (没有root权限的安装，一般服务器上都是没有root权限的吧)

wget <https://github.com/tmux/tmux/releases/download/2.2/tmux-2.2.tar.gz>

wget <https://github.com/libevent/libevent/releases/download/release-2.0.22-stable/libevent-2.0.22-stable.tar.gz>

wget <ftp://ftp.gnu.org/gnu/ncurses/ncurses-5.9.tar.gz>

```

tar -xvzf libevent-2.0.22-stable.tar.gz
tar -xvzf tmux-2.2.tar.gz
tar -xvzf ncurses-5.0.tar.gz

#####
# libevent #
#####
cd libevent-2.0.22-stable
./configure --prefix=$HOME/local --disable-shared
make
make install
cd ..

#####
# ncurses #
#####

cd ncurses-5.9
./configure --prefix=$HOME/local
make
make install
cd ..

#####
# tmux #
#####
cd tmux-2.2
./configure CFLAGS="-I$HOME/local/include -I$HOME/local/include/ncurses" LDFLAGS="-L$HOME/local/lib -L$HOME/local/include/ncurses -L$HOME/local/include"
CPPFLAGS="-I$HOME/local/include -I$HOME/local/include/ncurses" LDFLAGS="-static -L$HOME/local/include -L$HOME/local/include/ncurses -L$HOME/local/lib" make
cp tmux $HOME/local/bin
cd ..
b
echo "export PATH=$HOME/local/bin/tmux:$PATH" >> ~/.bashrc

```

tmux 命令

- 常见命令
 - 大家可以保存一下这个 Tmux Cheat Sheet & Quick Reference <http://tmuxcheatsheet.com>
-

Sessions	
\$ tmux	\$ tmux ls
\$ tmux new	\$ tmux list-sessions
\$ tmux new-session	Ctrl + b s
: new	Show all sessions
Start a new session	\$ tmux a
\$ tmux new -s mysession	\$ tmux at
: new -s mysession	\$ tmux attach
Start a new session with the name <i>mysession</i>	\$ tmux attach-session
\$ tmux kill-ses -t mysession	Attach to last session
\$ tmux kill-session -t mysession	\$ tmux a -t mysession
kill/delete session <i>mysession</i>	\$ tmux at -t mysession
\$ tmux kill-session -a	\$ tmux attach -t mysession
kill/delete all sessions but the current	\$ tmux attach-session -t mysession
\$ tmux kill-session -a -t mysession	Attach to a session with the name <i>mysession</i>
kill/delete all sessions but <i>mysession</i>	Ctrl + b (

- 剩下的一些就直接百度 tmux 使用就行了

#新建tmux session

tmux new -s <my-session-name>

#查看目前有哪些 session

tmux ls

#连接 session

tmux attach -t <my-session-name>

删除 session

tmux kill-session -t <name-of-my-session>

#session 之间切换

Ctrl-b s

#新建 window

tmux new -s mysession -n mywindow

Ctrl-b c

#新建 Panes

#横的

Ctrl+b "

#竖的

Ctrl+b %

- 配置（代码可以不会写，但是界面一定要骚）

vi ~/.tmux.conf

Send prefix

set-option -g prefix C-a

unbind-key C-a

bind-key C-a send-prefix

```
bind -n M-Down select-pane -D
```

```
bind -n S-Right next-window
```

```
set -g mouse on
```

```
bind-key h split-window -v
```

```
bind-key r source-file ~/.tmux.conf \; display-message "tmux.conf reloaded"
```

:wq!

```
Used while writing file within file system module - sys-  
tem bad file descriptor error fd='10'  
2018-12-02T16:35:43 fasterq-dump.2.9.1 err: join_results  
.print(1,KFileWriteAlt at 6373244654) -- RC(rcResr,rcFl  
eWrWriting,rCStorage,rcExhausted)  
2018-12-02T16:35:43 fasterq-dump.2.9.1 err: storage exhausted while writing file within file system module - sys-  
tem bad file descriptor error fd='10'  
2018-12-02T16:35:43 fasterq-dump.2.9.1 err: storage exhausted while writing file within file system module - sys-  
tem bad file descriptor error fd='20'  
  
tuxmGPU~/project/hic/Rao_data$  
tuxmGPU~/project/hic/Rao_data$  
tuxmGPU~/project/hic/Rao_data$  
tuxmGPU~/project/hic/Rao_data$  
tuxmGPU~/project/hic/Rao_data$ ls -lh  
total 3.0G  
-rw-rw-r-- 1 tuxm tuxm 75K 11/23 22:02 index.html#run  
dwxmxv-x 1 tuxm tuxm 4.0K 11/25 18:47 sample_1  
dwxmxv-x 2 tuxm tuxm 4.0K 11/25 18:46 sample_2  
-rw-rw-r-- 1 tuxm tuxm 1.5G 12/3 00:35 SRR1658577.1.fastq.gz  
asta.qz  
-rw-rw-r-- 1 tuxm tuxm 1.5G 12/3 00:35 SRR1658577.2.fastq.gz  
SRR1658577.2.fastq.gz  
tuxmGPU~/project/hic/Rao_data$  
  
Loading data file...  
Converting bias file...  
Conversion from Hi-C-Pro to Fit-Hi-C format completed  
(hi-c) tuxmGPU~/project/hic/Rao_data  
out$ ls  
boutie_results fithic.fragsmen  
tmappability.qc logs  
config_test_latest.txt fithic.interac  
tionCounts.gz rawdata  
fithic.biases.gz hic_results  
genome_mn10  
hicMatrix  
original_data  
tuxmGPU~/project/hic/Rao_data  
out$  
(hi-c) tuxmGPU~/project/hic/Rao_data  
out$  
(hi-c) tuxmGPU~/project/hic/Rao_data  
out$  
boutie_results config_test_latest.txt  
fithic.biases.gz fithic.FragmentMap  
pability.qc fithic.interactionCounts.  
gz hic_results logs rawdata tmp  
(hi-c) tuxmGPU~/project/hic/Rao_data  
out$  
CPU i 65d 2h 6m | bash 2 | htop 3 | bash
```

Fliezilla 的使用

- 大家先提前下载一下
- <https://filezilla-project.org/download.php?type=client>

vim 简单使用

- cheatsheet (pdf会给大家)

Modes & Controls	Inserting Text	Other
Command Mode ESC (commands preceded by :)	i Insert before cursor	u Undo last change
Insertion Mode Entered on insertion or change	a Append after cursor	J Join lines
Starting VI (command line)	I Insert before line	nJ Join next n lines
vi <filename> Edit filename	A Append after line	. Repeat last command
vi -r <filename> Edit last version of filename after crash	o Add new line after current line	U Undo all changes to line
vi + n <filename> Edit filename at line n	O Add new line before current line	:N Open split screen
vi + <filename> Edit filename at end of file	r Overwrite one character	v Visual mode
vi +/str <filename> Edit filename at first occurrence of str	R Overwrite many characters	ctrl + c Escape insert mode
In insertion mode the following should be preceded by ESC:	:r <file> Reads file and inserts it after this line	
:w Save	p Put after the position or line	
:x Save & Exit	P Put before the position or line	
:q Exit if no changes made	C Rewrite the whole line	
:q! Exit & discard any changes		
	Deleting Text	
Cursor Navigation	x Delete character to right of cursor	
h or ◀ Cursor left	X Delete character to left of cursor	
j or ▼ Cursor down	D Delete the rest of line	
k or ▲ Cursor up	dd or :d Delete current line	
l or ▶ Cursor right	ndw Deletes the next n words	
w Next word	ndb Deletes the previous n words	
W Next blank delimited word	ndd Deletes n lines starting with current	
b Start of word		

#别的不说，先学会退出和修改！

#进入file1

vim file1

#退出

:q!

#保存退出

:wq!

#修改 i 进入 insert 模式

i

#Esc键退出

- 其他的一些操作可以看<http://www.runoob.com/linux/linux-vim.html> 学起来都挺快的

linux 安装软件

安装anaconda

#从清华镜像源下载

```
wget https://repo.continuum.io/archive/Anaconda3-5.3.1-Linux-x86_64.sh
```

```
bash Anaconda3-5.3.1-Linux-x86.sh
```

```
echo "export PATH=/nfs-share/home/1600012130/anaconda3/bin:$PATH" > ~/.bashrc
```

```
source ~/.bashrc
```

#之后一直确认就行，注意最后那个VS没什么装的必要

#安装完毕之后尝试输出帮助文件

```
conda -h
```

```
[[1600012130@login01 ~]$ wget https://repo.continuum.io/archive/Anaconda2-5.3.0-Linux-x86_64.sh
--2018-12-08 16:10:52-- https://repo.continuum.io/archive/Anaconda2-5.3.0-Linux-x86_64.sh
正在断主机 repo.continuum.io (repo.continuum.io)... 104.16.18.10, 104.16.19.10, 2606:4700::6810:120a, ...
正在连接 repo.continuum.io (repo.continuum.io)|104.16.18.10|:443... 已连接。
已发出 HTTP 请求，正在等待响应... 200 OK
长度: 647650387 (618M) [application/x-sh]
正在保存至: "Anaconda2-5.3.0-Linux-x86_64.sh"
51% [=====] 331,045,659 6.44MB/s 剩余 51s
```

- 修改一下下载源从清华下载就方便很多

```
conda config --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgs/free/
conda config --set show_channel_urls yes
```

- conda 使用

#新建环境

```
conda create -n python34 python=3.4 #指定Python 版本
```

#激活环境

```
activate python34 # for Windows
```

```
source activate python34 # for Linux & Mac
```

#退出

```
source deactivate python34
```

#查看现有的环境

```
conda info -e
```

安装scipy

```
conda install scipy
```

查看已经安装的packages

```
conda list
```

查看某个指定环境的已安装包

```
conda list -n python34
```

查找package信息

```
conda search numpy
```

安装package

```
conda install -n python34 numpy
```

如果不用-n指定环境名称，则被安装在当前活跃环境

也可以通过-c指定通过某个channel安装

更新package

```
conda update -n python34 numpy
```

删除package

```
conda remove -n python34 numpy
```

更新python

```
conda update python
```

- 运行软件
- 简单的下载

服务器配置jupyter notebook

```
conda create -n notebook python=3.6
```

```
source activate notebook
```

```
conda install jupyter notebook
```

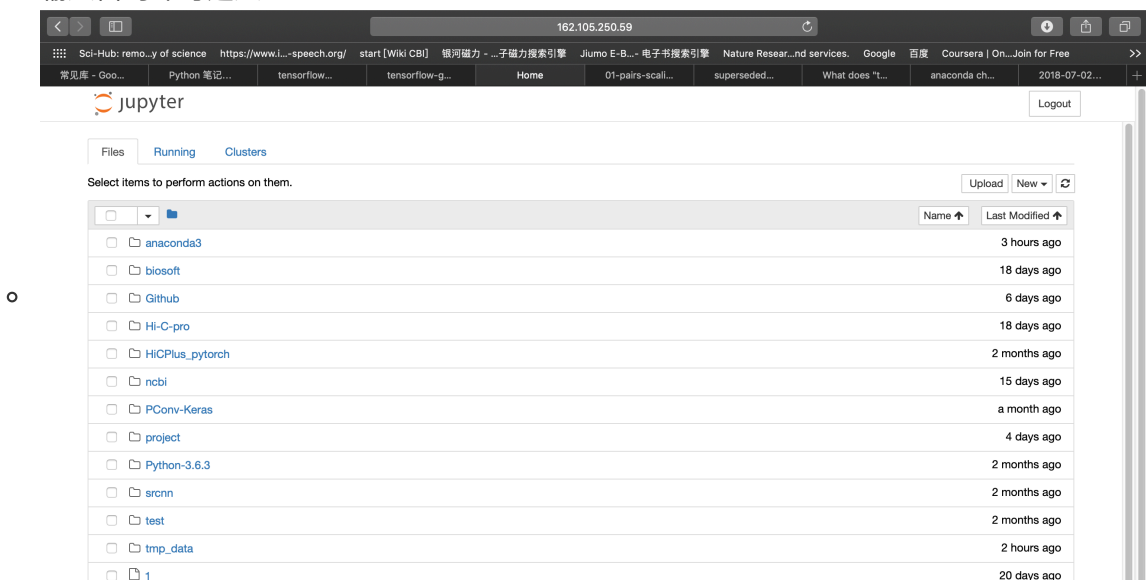
```
jupyter notebook --generate-config
```

```
jupyter notebook password
```

#输入密码即可

```
nohup jupyter notebook --no-browser --port=10XXX --ip=0.0.0.0 &
```

- 这样就能随时用浏览器访问服务器上的jupyter notebook了！
 - 输入密码即可进入



- 之后就可以在浏览器上快乐Python了
- 可以让子玉讲下怎么快乐 R （或者付云天讲一下也行），我记得我找的方法比较诡异（好像出错了）