

Linux Basic

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2021/9/22

How long have you been using Linux?

5 years

So you must be good at it?



Missing-semester

[./missing-semester](#) | [lectures](#) | [about](#)

The Missing Semester of Your CS Education

Classes teach you all about advanced topics within CS, from operating systems to machine learning, but there's one critical subject that's rarely covered, and is instead left to students to figure out on their own: proficiency with their tools. We'll teach you how to master the command-line, use a powerful text editor, use fancy features of version control systems, and much more!

Students spend hundreds of hours using these tools over the course of their education (and thousands over their career), so it makes sense to make the experience as fluid and frictionless as possible. Mastering these tools not only enables you to spend less time on figuring out how to bend your tools to your will, but it also lets you solve problems that would previously seem impossibly complex.

Read about the [motivation behind this class](#).

Schedule

- **1/13/20:** [Course overview + the shell](#)
- **1/14/20:** [Shell Tools and Scripting](#)
- **1/15/20:** [Editors \(Vim\)](#)
- **1/16/20:** [Data Wrangling](#)
- **1/21/20:** [Command-line Environment](#)
- **1/22/20:** [Version Control \(Git\)](#)
- **1/23/20:** [Debugging and Profiling](#)
- **1/27/20:** [Metaprogramming](#)
- **1/28/20:** [Security and Cryptography](#)
- **1/29/20:** [Potpourri](#)
- **1/30/20:** [Q&A](#)

前沿计算实践II(2021年春)

课程简介

时间表

轮转报告

分数构成

[回到最新课程](#)

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课程简介

本课程主要配合图灵班大二同学的科研轮转, 每位同学都会在课堂上对三段轮转经历进行报告分享, 相互交流讨论, 同时课程中间穿插对科研基础工具的介绍(助教负责)以及科研讲座(老师安排)。

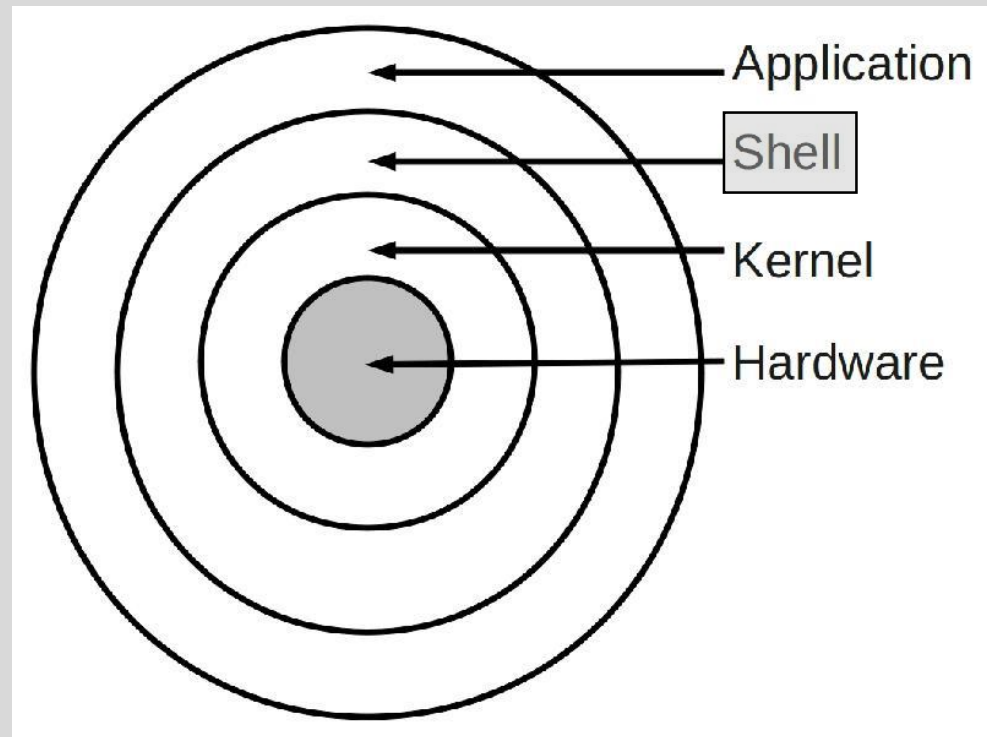
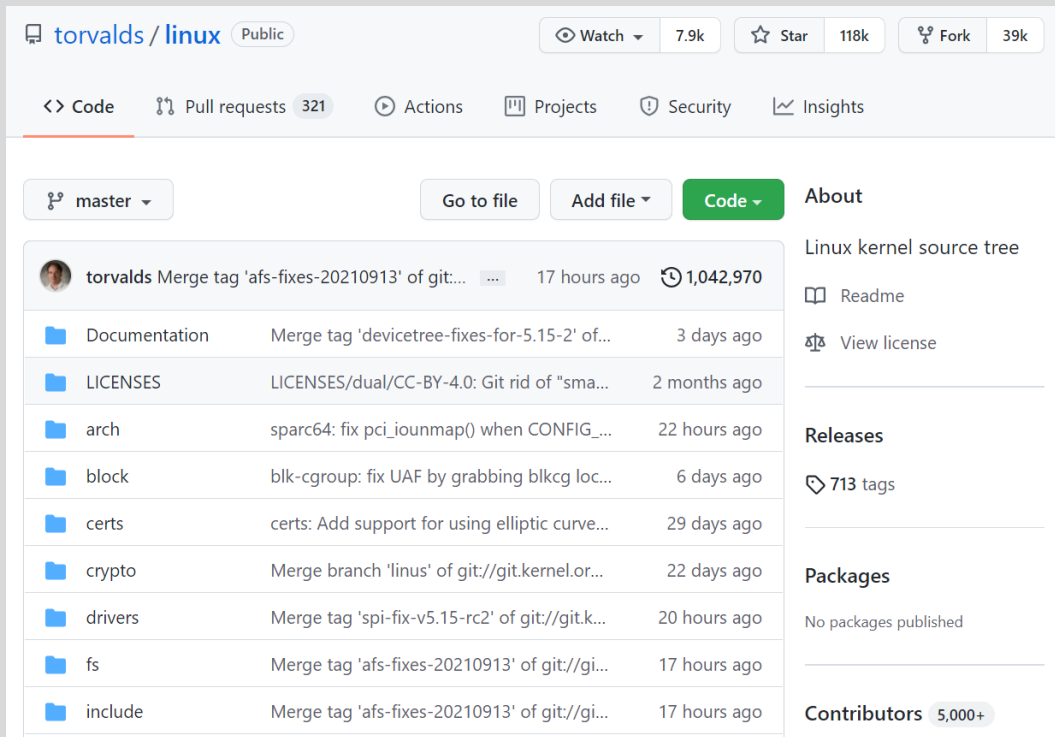
时间表

日期	课程内容	讲座	报告
3-10	课程介绍, 高年级同学分享(Slides)		
3-17	Lecture 1(Linux基础, Note)	孔雨晴老师(Materials)	
3-24	Lecture 2(编辑器, Note)	陈宝权老师	
3-31			第一轮, 第一组(Materials)
4-07			第一轮, 第二组(Materials)
4-14			第一轮, 第三组(Materials)
4-21	Lecture 3(Git&Misc, Note , Slides)	陈宝权老师	
4-28	Lecture 4(Python, Note , Slides)		
5-05			第二轮, 第二组(Materials)
5-12			第二轮, 第三组
5-19			第二轮, 第一组

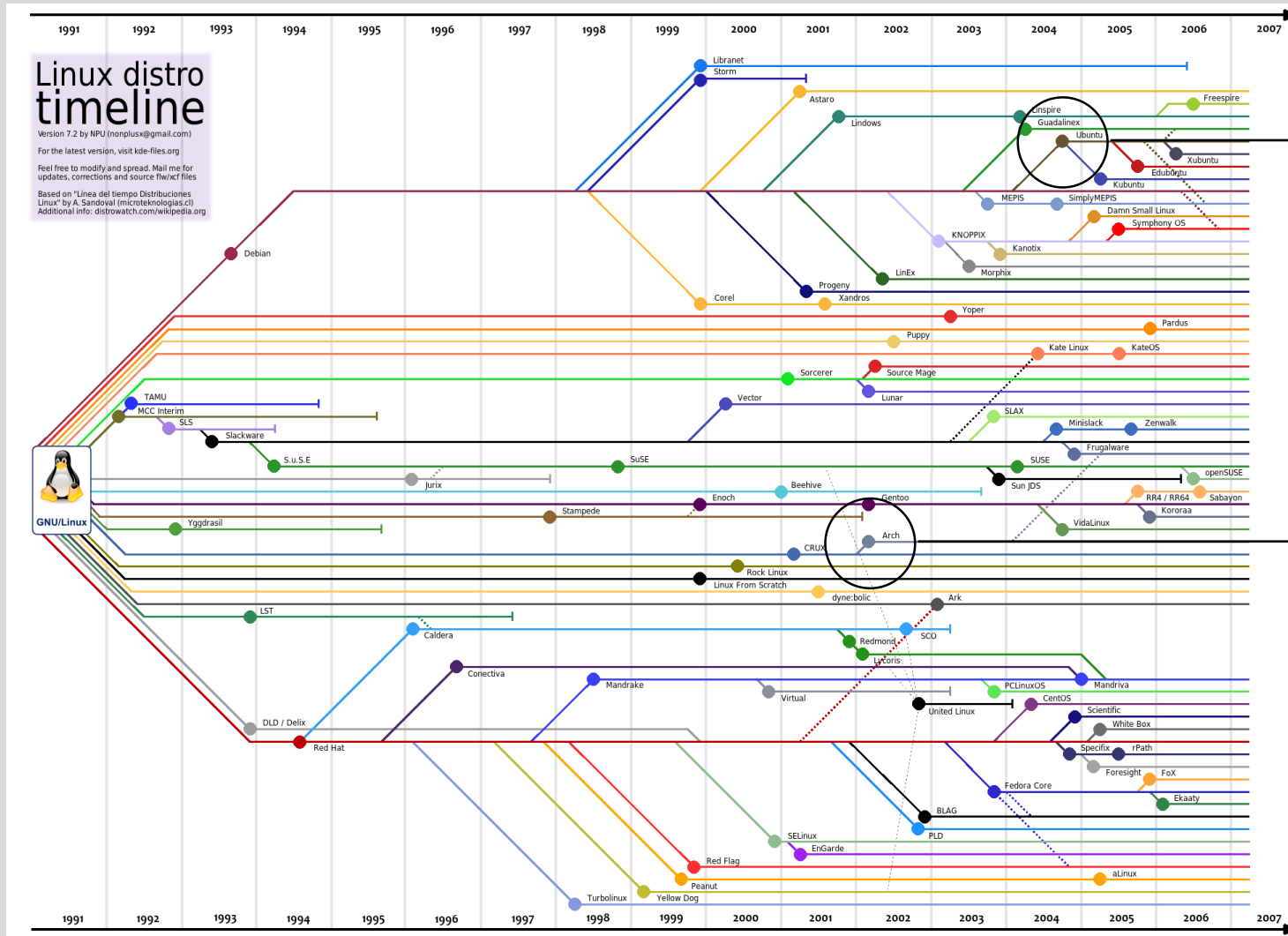
- + Markdown, Latex, Python, VScode, Networking, Cython
- Data wrangling, debugging, profiling, security

What is Linux?

Linux是一群开源的、基于Linux内核的类Unix操作系统集合。



What is Linux?



Windows & MacOS?



- NT内核 (New Technology Kernel)
- 借鉴了UNIX内核
- 命令行:
 - CMD (from DOS, old)
 - PowerShell (from Win10, new)

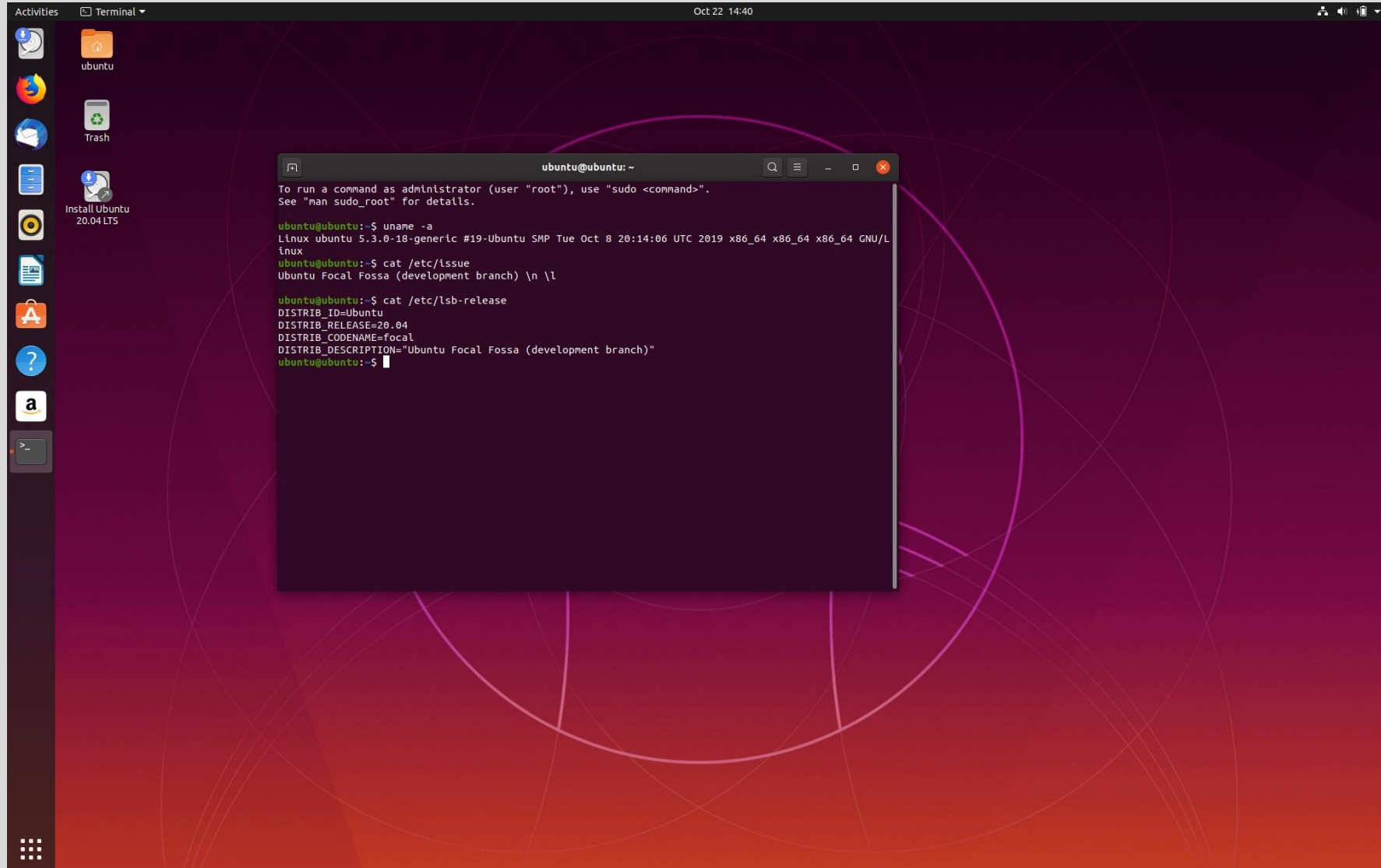


- XNU (for *XNU is Not Unix*)
- Mach内核 + FreeBSD + C++ API
- 命令行与Linux基本相同

How to access Linux?

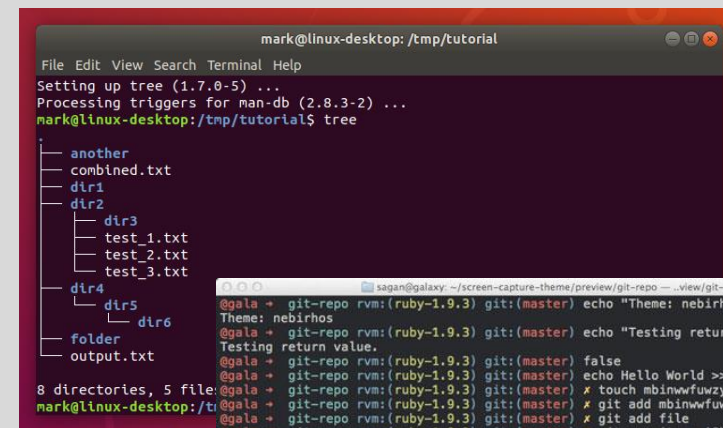
- 制作启动盘 -> U盘启动 -> 覆盖C盘或安装双系统
- 使用虚拟机 (VMware, VirtualBox)
- WSL (Windows Subsystem for Linux)
 - WSL2基本等同于虚拟机
 - 通过XServer或者官方预览版可开启图形界面
- 通过ssh连接服务器(之后介绍)
- 安全起见请选择Ubuntu

Ubuntu

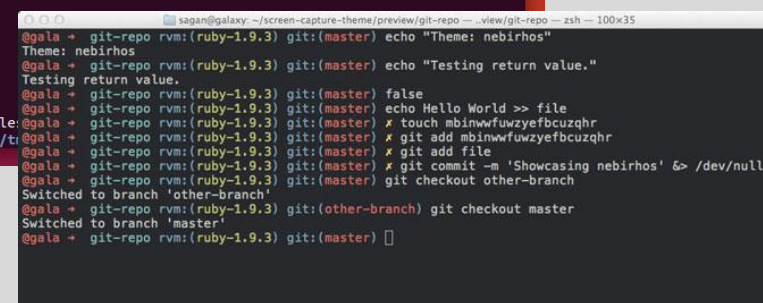


Shell

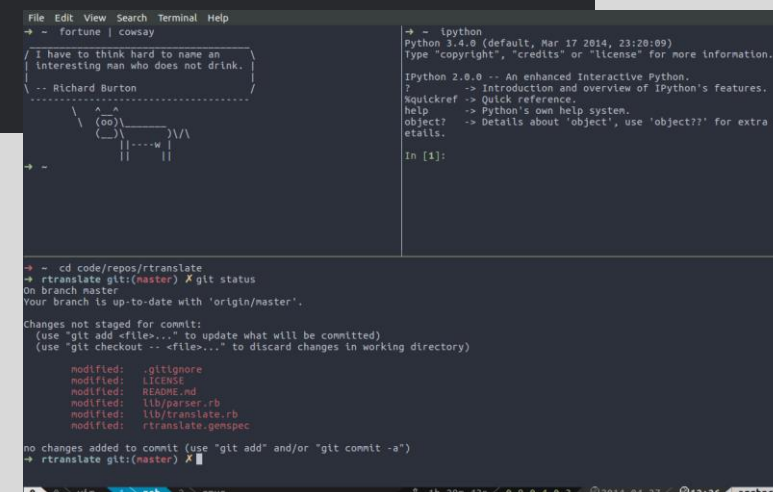
- Bash: Ubuntu默认
- Zsh: Bash的升级版, 拼写检查、路径补全、插件、主题.....
- zsh-autosuggestion: zsh拼写补全插件
- oh-my-zsh: zsh主题插件
- Tmux: 多窗口管理



```
mark@linux-desktop: /tmp/tutorial
File Edit View Search Terminal Help
Setting up tree (1.7.0-5) ...
Processing triggers for man-db (2.8.3-2) ...
mark@linux-desktop: /tmp/tutorial$ tree
.
├── another
├── combined.txt
├── dir1
├── dir2
│   ├── dir3
│   ├── test_1.txt
│   ├── test_2.txt
│   └── test_3.txt
├── dir4
│   └── dir5
├── dir6
├── folder
└── output.txt
8 directories, 5 files
mark@linux-desktop: /tmp/tutorial$
```



```
sagan@galaxy: ~/screen-capture-theme/preview/git-repo -- view/git-repo -- zsh -- 100x35
@gala → git-repo rvm:(ruby-1.9.3) git:(master) echo "Theme: nebirhos"
Theme: nebirhos
@gala → git-repo rvm:(ruby-1.9.3) git:(master) echo "Testing return value."
Testing return value.
@gala → git-repo rvm:(ruby-1.9.3) git:(master) false
@gala → git-repo rvm:(ruby-1.9.3) git:(master) echo Hello World >> file
@gala → git-repo rvm:(ruby-1.9.3) git:(master) x touch mbinwfwuzyefbcuzqhr
@gala → git-repo rvm:(ruby-1.9.3) git:(master) x git add mbinwfwuzyefbcuzqhr
@gala → git-repo rvm:(ruby-1.9.3) git:(master) x git add file
@gala → git-repo rvm:(ruby-1.9.3) git:(master) x git commit -m 'Showcasing nebirhos' && /dev/null
@gala → git-repo rvm:(ruby-1.9.3) git:(master) git checkout other-branch
Switched to branch 'other-branch'
@gala → git-repo rvm:(ruby-1.9.3) git:(other-branch) git checkout master
Switched to branch 'master'
@gala → git-repo rvm:(ruby-1.9.3) git:(master) []
```



```
File Edit View Search Terminal Help
→ - fortune | cowsay
I have to think hard to name an
interesting man who does not drink.
-- Richard Burton
A
((o))
| |
| |---W
| |
+ -

→ - cd code/repos/rtranslate
→ rtranslate git:(master) x git status
On branch master
Your branch is up-to-date with 'origin/master'.

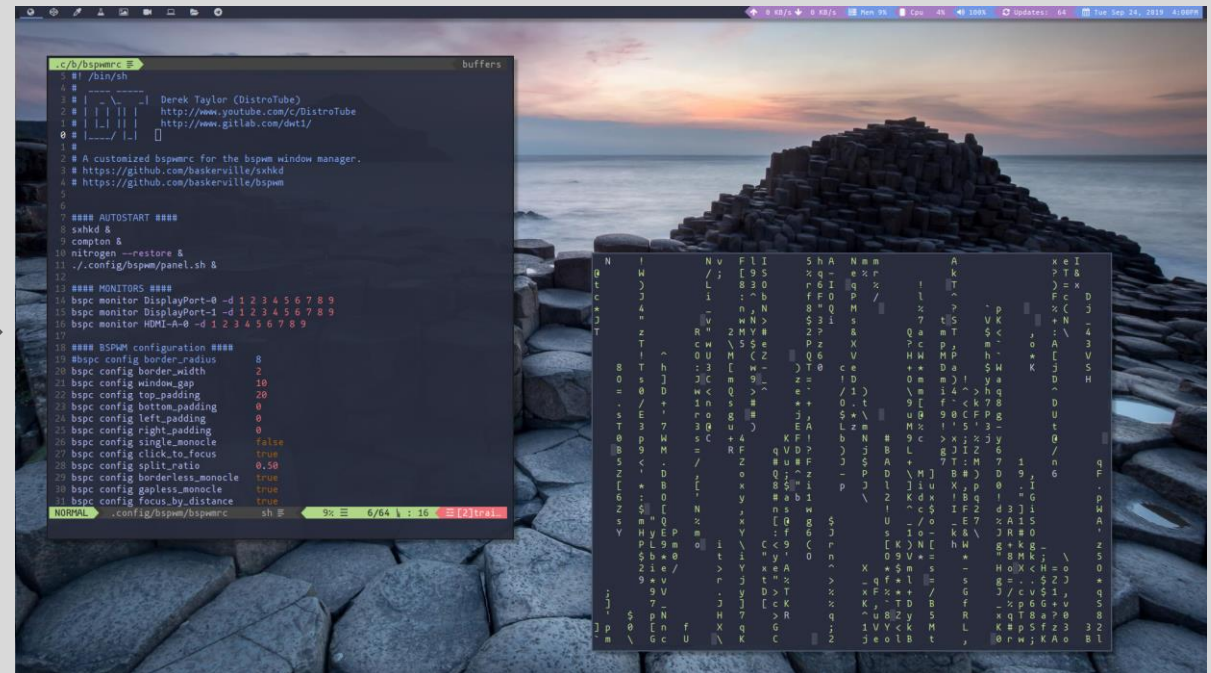
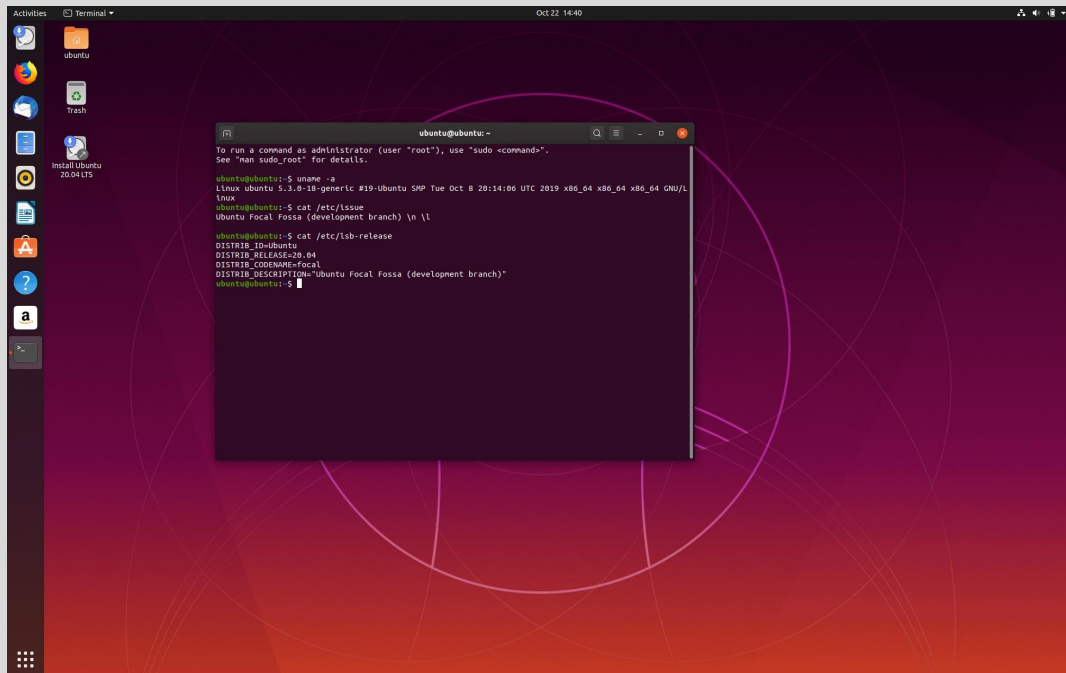
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

    modified:   .gitignore
    modified:   LICENSE
    modified:   README.md
    modified:   lib/parser.rb
    modified:   lib/translate.rb
    modified:   rtranslate.gemspec

no changes added to commit (use "git add" and/or "git commit -a")
→ rtranslate git:(master) x
```


Config your own Linux!

bspwm, i3, polybar, GTK themes...



For Windows

Windows Terminal + oh-my-posh

```
(base) lwruan@DESKTOP-PPG08G4:~$ neofetch
      .-/+00ssssso+/-.
      `:+ssssssssssss++:`
      -+ssssssssssssyyssss+-
      .ossssssssssssssdMMMMNyssso.
      /ssssssssshdmmNNmyNMMMNhsssss/
      +ssssssssshmydMMMMMMNddddyssssss+
      /ssssssssshNMMMyhhyyyhNMMMNhsssss/
      .sssssssdMMMMNhsNMMMdssssss.
      +ssssshhNMMNysssssssssyNMMMyssssss+
      ossyNMMMNyMMhssssssssshmmhssssso
      +ssssshhNMMNysssssssssyNMMMyssssss+
      .sssssssdMMMMNhsNMMMdssssss.
      /ssssssshNMMMyhhyyyhNMMMNhsssss/
      +sssssssdmydMMMMMMNddddyssssss+
      /ssssssssshdmmNNmyNMMMNhsssss/
      .ossssssssssssdMMMMNyssso.
      -+ssssssssssssyyssss+-
      `:+ssssssssssss++:`
      .-/+00ssssso+/-.

lwruan@DESKTOP-PPG08G4
-----
OS: Ubuntu 20.04.1 LTS on Windows 10 x86_64
Kernel: 4.19.128-microsoft-standard
Uptime: 7 mins
Packages: 858 (dpkg)
Shell: bash 5.0.17
```

```
CPU - 3.19/3.19GHz  CPU 12.4% idle: 88.7% ctx-sw: 35K MEM 85.2% SWAP 76.8% LOAD 12-core
CPU [||||| 11.0%] user: 2.6% inter: 23696
MEM [||||| 85.2%] system: 8.4% sw_int: 0
SWAP [||||| 76.6%] syscal: 153516
total: 15.8G total: 47.3G 1 min: 0.00
used: 13.5G used: 36.3G 5 min: 0.00
free: 2.34G free: 11.0G 15 min: 0.00

TASKS 414 (6269 thr), 407 run, 0 slp, 7 oth sorted automatically by memory consumption

NETWORK Rx/s Tx/s
_interface 1 0b 0b
_lt Switch) 0b 0b
_rnet (WSL) 0b 0b
WLAN 11Kb 9Kb

TCP CONNECTIONS
Listen 49 0.0 2.3 650M 369M 16372 DESKTOP-P 44:18 22 64 R 1K 1
Initiated 0 0.5 2.0 525M 326M 20732 None 2h41:48 54 ? R 0 0
Established 55 0.0 1.8 1.89G 297M 11956 None 1:03 10 ? R 0 0
Terminated 0 0.0 1.6 256M 253M 9496 DESKTOP-P 8:40 22 64 R 1K 0
0.0 1.4 316M 233M 13944 DESKTOP-P 4:49 50 32 R 0 0
0.0 1.4 221M 221M 52908 DESKTOP-P 17:18 48 32 R 0 73
0.0 1.3 329M 214M 2580 DESKTOP-P 6:53 40 32 R 0 0
0.0 1.3 313M 206M 32504 DESKTOP-P 29:52 16 64 R 0 0
0.3 1.2 214M 202M 7792 DESKTOP-P 50:10 22 64 R 36K 9K
12.7 1.1 329M 184M 8292 DESKTOP-P 10h32:19 239 32 R 0 0
0.2 1.0 193M 161M 13228 DESKTOP-P 11:01 16 64 R 254 147

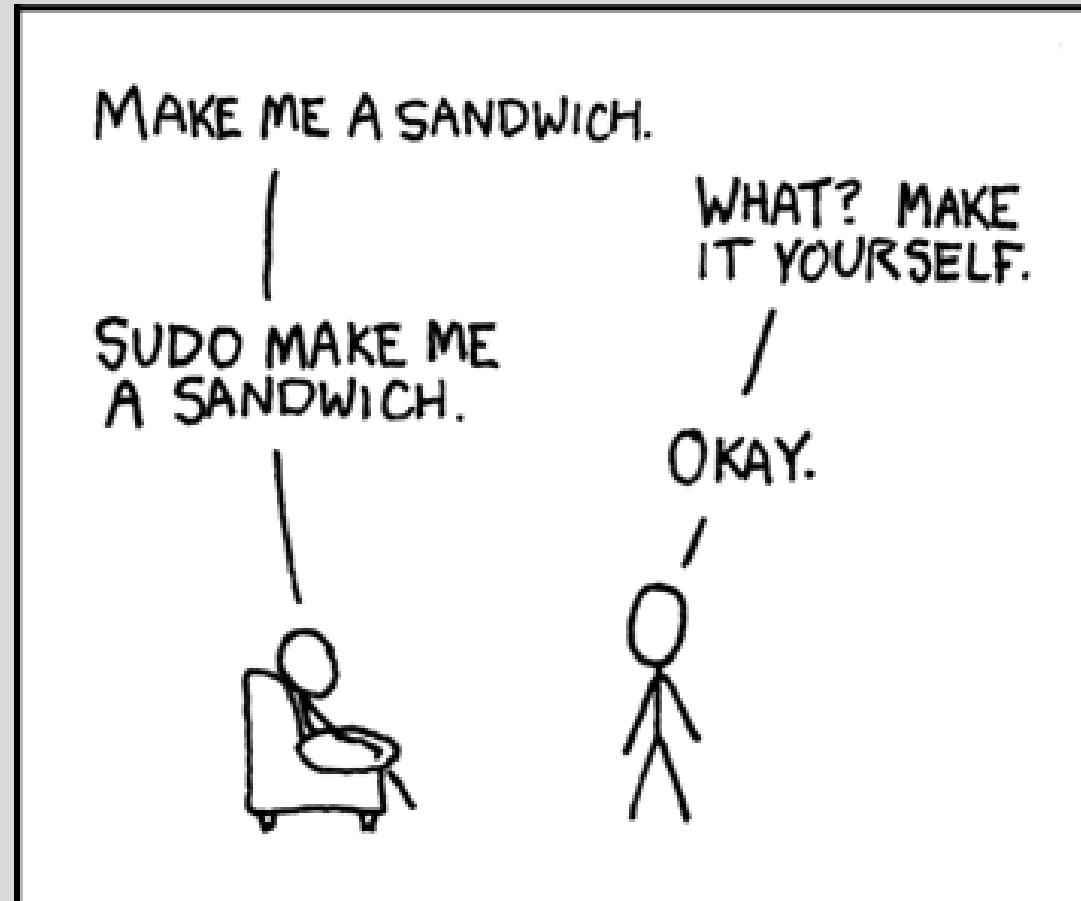
DISK I/O R/s W/s
_calDrive0 144K 117K 0.0 1.3 329M 214M 2580 DESKTOP-P 6:53 40 32 R 0 0
_calDrive1 48K 6K 0.0 1.3 313M 206M 32504 DESKTOP-P 29:52 16 64 R 0 0
_calDrive2 0 0 0.3 1.2 214M 202M 7792 DESKTOP-P 50:10 22 64 R 36K 9K

FILE SYS Used Total
C:\ (C:\) 127G 138G
D:\ (D:\) 359G 1.82T
High swap (paging) usage
2021-09-22 12:24:12 (ongoing) - MEMSWAP (76.8)
2021-09-22 12:24:23 中国标准时间 2021-09-22 12:24:12 (ongoing) - MEM (85.3)
```

Commands

命令	功能	命令	功能
date	显示时间	rm	删除
shutdown -h now	关闭系统	mv	移动、重命名
man	查看帮助文档	cp	复制
cat	显示文件内容	touch	新建文件
cd	切换当前路径	ln	链接
pwd	显示当前路径	find	寻找文件
ls	查看目录中的文件	whereis	寻找命令路径
mkdir	新建目录	passwd	修改密码
neofetch	查看系统	atop	监视系统
less	滚动查看内容	grep	搜索字符串
exa	比ls更好用	tldr	命令提示

Access



Package management

```
~$ sudo apt autoremove apt
```



I used the apt to destroy the apt

Redirect & Pipe



Environment variables



Q&A