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Shells!

```
jeff@jrtechs-laptop: ~  
-----  
< Welcome to RITlug! >  
-----  
      \  /)/  
     \ (o.o)  
      \ ( />  
     --/  _\  //  
    '~( '~ )//  
     _\  '}/  
    "--~(/
```

Wed 25 Sep - 11:01 ~
@jeff

Bash



History of the Bash Shell



- Bourne Again Shell
 - Replacement for Bourne Shell (sh)
-

Bourne Shell (sh)

- Created in 1979 by Stephen Bourne at Bell Labs
 - Default shell for Unix version 7
 - Replacement for the Thompson Shell
 - First unix shell
 - Used as an interactive command interpreter, it was also intended as a scripting language
-

...So why Bourne Again?

- FSF considered a free shell so strategic for a GNU system, so they funded it themselves
 - SH had licensing issues
 - Supports command completion, brace expansion, command history
-

What does it look like?

```
[tim@dell-fedora ~]$
```

```
[u@h \W]\$
```

- \$PS1: variable stores bash prompt
 - \$PS2: stores continuation prompt
 - \$PS3: prompt used by `select` in shell scripts
 - \$PS4: Used by `set -x` for debugging
-

Common Bash Commands

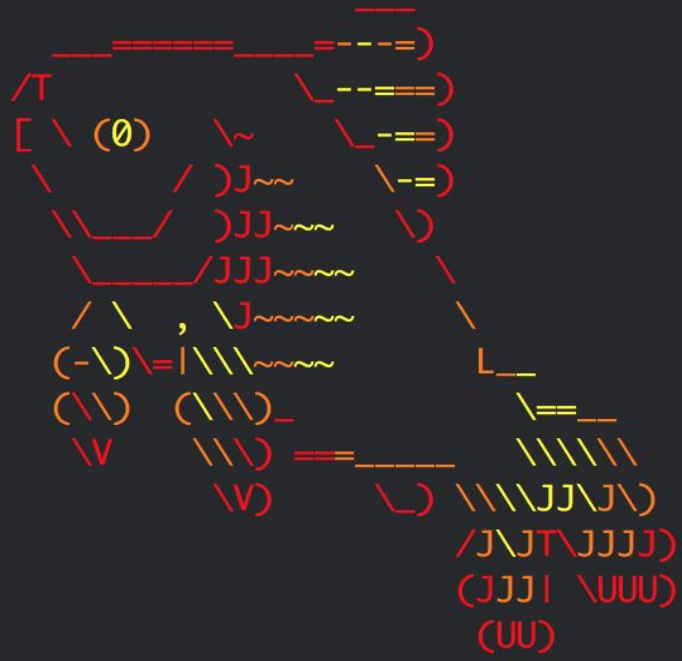
- `cd`
 - Change directory
 - `pwd`
 - Print working directory
 - `kill <process>`
 - Kill/stop a specific running process
 - `echo <foo>`
 - Print foo to screen
-

Cool Bash

- Bashrc, bash_history
 - Bash aliases
 - Alias open="xdg-open"
 - Loops
 - for file in directory/*; do echo \$file; done
 - Environment variables
 - See currently set variables with `env`
-

Fish







What is Fish?

- Fish = Friendly Interactive SHell
 - Written by Axel Liljencrantz in 2005
 - Fish is considered an “exotic shell”, meaning that its syntax is not derived from the Bourne shell (ksh, bash, zsh) or derived from the C shell (csh, tcsh)
 - Makes your shell experience not necessarily easier, but friendlier, more productive, and more approachable
-

```
fish /home/dupeman99
File Edit View Search Terminal Help
dupeman99@dupeman99-Lenovo-Y520-151KBM:~$ fish
Welcome to fish, the friendly interactive shell
dupeman99@dupeman99-Lenovo-Y520-151KBM ~> !
lsping (Executable, 95kB) logilab-pytest (Executable, 133B)
l2test (Executable, 112kB) login (Executable, 51kB)
la loginctl (Executable, 50kB)
laptop-detect (Executable, 3.7kB) lvmame (Executable, 30kB)
last (Executable, 42kB) lvsolve (Executable, 10kB)
lastb (Executable link, 42kB) logrotate (Executable, 74kB)
lastlog (Executable, 18kB) logsave (Executable, 10kB)
lavadecode (Executable, 17kB) loimpress (Executable, 62B)
lef (Executable, 7.6kB) lomath (Executable, 59B)
lconvert (Executable link, 42kB) look (Executable, 10kB)
ld (Executable link, 1.7MB) lorder (Executable, 2.8kB)
ld.bfd (Executable link, 1.7MB) lsetup (Executable, 82kB)
ld.gold (Executable link, 3.0MB) loweb (Executable, 58B)
ldattach (Executable, 30kB) lowmfts-3g (Executable, 106kB)
ldconfig (Executable, 307B) lowriter (Executable, 61B)
ldconfig.real (Executable, 1001kB) lo (Executable, 17kB)
ldd (Executable, 5.3kB) lsolve (Executable, 49kB)
ldfdtoppm (Executable, 9.9kB) lsadmin (Executable, 20kB)
lefty (Executable, 293kB) lsc (Executable, 10kB)
less (Executable, 166kB) lshinfo (Executable, 13kB)
lessecho (Executable link, 10kB) lsmove (Executable, 10.8kB)
lessfile (Executable link, 8.4kB) lsoptions (Executable, 14kB)
lesskey (Executable link, 19kB) lsq (Executable, 10kB)
lesspipe (Executable link, 8.4kB) lsrr (Executable, 13kB)
lesyrag (Executable, 90kB) lsrm (Executable, 10.8kB)
libgvc6-config-update (Executable, 10.8kB) lstat (Executable, 30kB)
libnetcfg (Executable, 15kB) lrelease (Executable link, 42kB)
libpng-config (Executable link, 2.4kB) ls (Executable, 10kB)
libpng16-config (Executable, 2.4kB) lsattr (Executable, 10kB)
libreoffice (Executable link, 5.9kB) lsbl release (Executable, 3.6kB)
libtoolize (Executable, 120kB) lsblk (Executable, 82kB)
libwacom-list-local-devices (Executable, 10kB) lsblk (Executable, 70kB)
lightdm (Executable, 266kB) lsdiff (Executable link, 47kB)
lightdm-session (Executable, 2.9kB) lshw (Executable, 670kB)
lightdm-settings (Executable, 463B) lsinitramfs (Executable, 625B)
linguist (Executable link, 42kB) lsipc (Executable, 70kB)
link (Executable, 30kB) lslocks (Executable, 34kB)
linkicc (Executable, 22kB) lslogins (Executable, 62kB)
linter (Executable link, 10kB) lsman (Executable, 42kB)
linter-info (Executable link, 10kB) lsmod (Executable link, 146kB)
linter-lab-tool (Executable link, 10kB) lsns (Executable, 38kB)
linux-boot-prober (Executable, 1.5kB) lsop (Executable, 159kB)
linux-check-removal (Executable, 4.0kB) lspci (Executable, 79kB)
linux-update-symlinks (Executable, 6.2kB) lspncsia (Executable link, 18kB)
linux-version (Executable, 2.0kB) lspngopt (Executable, 1.1kB)
linux32 (Executable link, 10kB) lsusb (Executable, 114kB)
linux64 (Executable link, 10kB) lstrace (Executable, 325kB)
lispoptgm (Executable, 9.9kB) lsa5.3 (Executable, 226kB)
listres (Executable, 10kB) lsuc5.3 (Executable, 142kB)
ll (Executable, 66kB) lsuit (Executable, 48kB)
ln (Executable, 66kB) lsupdate (Executable link, 42kB)
lneoat (Executable, 1.5kB) lsnp-download (Executable, 10kB)
lnstat (Executable, 22kB) lsnp-dump (Executable, 2.6kB)
loadkeys (Executable, 206kB) lsnp-error (Executable, 2.4kB)
loadunimap (Executable, 26kB) lsnp-request (Executable, 15kB)
```

Cool stuff with Fish

- Out of the box components by default
- Default syntax highlighting
- Remarkably configurable
 - Oh My Fish
 - Use your Vim color configuration!
- Aliases & Abbreviations
 - alias gs="git status"
 - abbr gs "git status"
- Command/Argument autocompletion



So what is the difference?

- Fish has unique syntax
 - Bash-like, but not
- No more `fi` or `esac`!
- POSIX compliant... sorta... kinda... maybe... depends...
- Fish tries to be different
 - Command interpretation
 - System resource usage
 - Shell friendliness and learning curve
 - Designed for productivity

```
1. /Users/demo (fish)
demo > function detect_os
  switch (uname)
    case Linux
      echo Hi Tux!
    case Darwin
      echo Hi Hexley!
    case FreeBSD NetBSD DragonFly
      echo Hi Beastie!
    case '*'
      echo Hi, stranger!
  end
end
demo > detect_os
Hi Hexley!
demo >
```

ZSH



What is ZSH



Z shell

- Written by Paul Falstad in 1990 while attending Princeton University.
 - The name came from a Professor Zhong Shao since his username was zsh.
 - ZSH is an interactive unix shell that is an extension of Bash with many improvements.
 - ZSH Config file is in the home directory called `.zshrc`
-



Z shell

Why is ZSH Cool

- Lots of syntactic sugar to make your terminal use easier.
 - Automatic cd if you type name of directory
 - Recursive path expansion
 - Spell correction and approximate completion if you hit tab
 - Plugin and theme support
-

Oh-My-Zsh



- Open source framework for managing Zsh configurations
 - Has 250+ extensions
 - Has 125+ themes
 - Auto updates!
-

Installing Oh-My-Zsh

[Oh My ZSH](#) has a fancy install script you can run if you trust scripts from the internet.

```
sh -c "$(wget  
https://raw.githubusercontent.com/robbyrussell/oh-my-zsh/master/tools/install.sh -O -)"
```



Some of my favorite Oh-my-zsh themes:

bira

```
jeff@zion /mnt/Jeff-Work/Programming/javascript/JrtechsV2
└─$ cd NodeJSBlog
admin          includes          package.json     run
blog           jrtechs.service photography      server.js
blogContent    LICENSE          previewer.js    sitemap.txt
CODE_OF_CONDUCT.md node_modules     README.md       sites
jeff@zion /mnt/Jeff-Work/Programming/javascript/JrtechsV2/NodeJSBlog <master* >
└─$
```

rkj-repos

```
[jeff jrtechs-laptop] - [~] - [2019-09-25 06:07:00]
└─[0] <> cd dot_files
./ .bashrc .git/ .ideavimrc README.md .zshrc
../ fixSSHfilePermissions.sh .gitconfig install.sh .vimrc
[jeff jrtechs-laptop] - [~/dot_files] - [2019-09-25 06:07:13]
└─[0] <git:(master 9a610e6) > cat .zshrc
./ .bashrc .gitconfig .vimrc
../ .git/ .ideavimrc .zshrc
```

Favorite Shells Continued

[Agnosterzak](#):

- Custom Oh-my-zsh theme based on powerline vim plugin and agnoster theme

```
♥ 85% Wed 25 Sep - 18:00 ~
@jeff cd dot_files
./ .bashrc .git/ .ideavimrc README.md .zshrc
../ fixSSHfilePermissions.sh .gitconfig install.sh .vimrc

♥ 85% Wed 25 Sep - 18:01 ~/dot_files | origin Ω master ✓
@jeff cat .zshrc
./ .bashrc .gitconfig .vimrc
../ .git/ .ideavimrc .zshrc
```

Plugins

```
36 # Which plugins would you like to load?
37 # Standard plugins can be found in ~/.oh-my-zsh/plugins/*
38 # Custom plugins may be added to ~/.oh-my-zsh/custom/plugins/
39 # Example format: plugins=(rails git textmate ruby lighthouse)
40 # Add wisely, as too many plugins slow down shell startup.
41 plugins=(
42     git
43     history-substring-search
44     z
45     extract
46 )
```

Bash Aliases Still and custom commands Works in ZSH!

```
55 # general bash aliases
56 alias ls="ls -abp --color=auto"
57 alias nano="vim"
58 alias ..="cd .."
59 alias size="echo du -sh && du -sh"
60
61
62 # Bash Manager Things
63 alias roosay="python3 /home/jeff/scripts/bash_manager/src/roosay.py"
64 alias ss="python3 /home/jeff/scripts/bash_manager/src/ssh_manager.py"
65 alias ssh_manager="python3 /home/jeff/scripts/bash_manager/src/ssh_manager.py"
66 alias mm="python3 /home/jeff/scripts/bash_manager/src/mount_ssh_drive.py"
67 alias ssh-mount="python3 /home/jeff/scripts/bash_manager/src/mount_ssh_drive.py"
68 alias quote="python3 /home/jeff/scripts/bash_manager/src/quote.py"
```

More customizations for .bashrc

```
# auto ls when you change directories
function cd {
    builtin cd "$@" && ls
}
```

```
# displays quote when terminal opens
quote
```

Workshop: Pimp your shell

Help each other customize your Linux shells and send a screenshot to Jeffery over Slack. We will vote on the most decked out shell at the end of the meeting



Submissions

```

~
> wd teleirc

~/Documents/RITLug/teleirc initial_irc*
> gst
On branch initial_irc
Your branch is up to date with 'origin/initial_irc'.

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
       modified:   internal/irc.go

Untracked files:
  (use "git add <file>..." to include in what will be committed)
       go.sum

no changes added to commit (use "git add" and/or "git commit -a")

~/Documents/RITLug/teleirc initial_irc*
> 

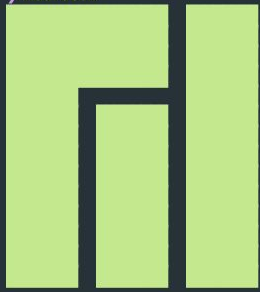
```


```

~
> neofetch

zedjones@zedjones-laptop
-----
OS: Manjaro Linux x86_64
Host: 20L7002AUS ThinkPad T480s
Kernel: 4.19.69-1-MANJARO
Uptime: 6 days, 2 hours, 32 mins
Packages: 1368 (pacman)
Shell: zsh 5.7.1
Resolution: 1920x1080
WM: i3
Theme: vimix-dark-beryl [GTK2/3]
Icons: Papyrus-Adapta-Nokto-Maia [GTK2/3]
Terminal: alacritty
CPU: Intel i5-8250U (8) @ 3.400GHz
GPU: Intel UHD Graphics 620
Memory: 3113MiB / 7733MiB


```

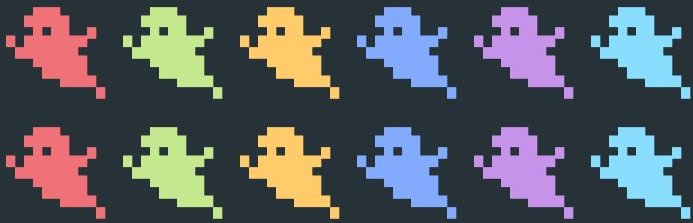




```

~
> ./ghosts


```



```

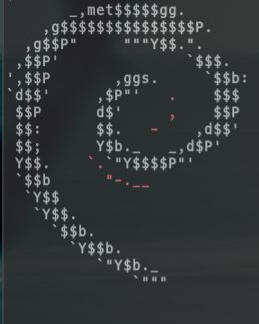
~
> 

```

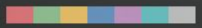
```
2019-09-27 17:55:27-04:00 starting nvm lazy-loader
2019-09-27 17:55:27-04:00 found at least one node installation in nvm dir
2019-09-27 17:55:27-04:00 found node globals: nvm node create-react-app html2react livedown npm npx
```

```
elliott@mckinnon:~
```

```
$ neofetch && colortest && cowsay hello world
```

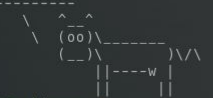


```
elliott@mckinnon
-----
OS: Debian GNU/Linux buster/sid x86_64
Host: 20HD000VUS ThinkPad T470
Kernel: 4.19.0-2-amd64
Uptime: 1 day, 8 hours, 16 mins
Packages: 3176 (dpkg), 41 (flatpak), 9 (snap)
Shell: bash 5.0.2
Resolution: 1920x1080
DE: lightdm-xsession
WM: LG3D
Theme: Adwaita [GTK2/3]
Icons: hicolor [GTK2/3]
Terminal: x-terminal-emul
CPU: Intel i5-7300U (4) @ 3.500GHz
GPU: Intel HD Graphics 620
Memory: 8005MiB / 15794MiB
```



| | 40m | 41m | 42m | 43m | 44m | 45m | 46m | 47m |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|
| m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 1m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 30m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 1;30m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 31m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 1;31m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 32m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 1;32m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 33m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 1;33m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 34m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 1;34m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 35m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 1;35m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 36m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 1;36m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 37m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |
| 1;37m | gYw | gYw | gYw | gYw | gYw | gYw | gYw | gYw |

```
< hello world >
```



```
elliott@mckinnon:~
$
```

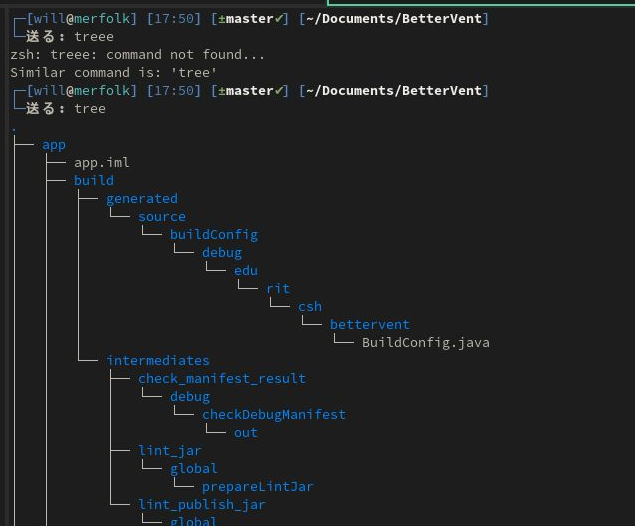
```
[will@merfolk] [17:50] [~]
送る: screenfetch
/;-----;\
:-----:
:-----/shhOhBmp---i\
/-----omMMMMNNMMMD ---:
:-----sMMMMNNMMNP ---:
:-----:MMMdP-----\
:-----:MMMd-----:
:-----:MMMd-----:
:-----oMMMMMMMMMMhho -----:
:---.shhhMMMMhhy+-----/
:-----:MMMd-----:
:-----/hMMMy-----:
:---:dMNdhdhdMMNo-----:
:---:sdNMMMMds:-----:
:-----://:-----:
:-----://:
```

```
will@merfolk
OS: Fedora 30 Thirty
Kernel: x86_64 Linux 5.2.16-200.fc30.x86_64
Uptime: 23h 1m
Packages: 2012
Shell: zsh 5.7.1
Resolution: 1920x1080
WM: i3
GTK Theme: Nord-Black-Frost [GTK2/3]
Icon Theme: Adwaita
Font: Sans 10
CPU: Intel Core i7-5600U @ 4x 3.2GHz [45.0°C]
GPU: Mesa DRI Intel(R) HD Graphics 5500 (Broadwell GT2)
RAM: 1318MiB / 11705MiB
```

```
[will@merfolk] [17:52] [~]
送る: [ ]
```

```
[will@merfolk] [17:52] [master] [~/Documents/dotfiles]
送る: ls -la
total 32
drwxr-xr-x. 8 will will 4096 Sep 26 16:40 .
drwxr-xr-x. 10 will will 4096 Sep 27 01:28 ..
drwxr-xr-x. 9 will will 4096 Sep 26 16:40 eladrin
drwxr-xr-x. 4 will will 4096 Sep 26 16:40 fairy
drwxr-xr-x. 8 will will 4096 Sep 27 17:52 git
drwxr-xr-x. 8 will will 4096 Sep 26 16:40 old
drwxr-xr-x. 10 will will 4096 Sep 26 16:40 pegasus
drwxr-xr-x. 5 will will 4096 Sep 26 16:40 treant
```

```
[will@merfolk] [17:52] [master] [~/Documents/dotfiles]
送る: [ ]
```

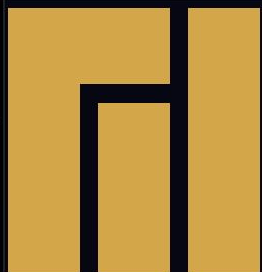


```
1 [ ] 3.3% Tasks: 98, 382 thr; 1 running
2 [ ] 2.0% Load average: 0.07 0.26 0.35
3 [ ] 3.3% Uptime: 23:03:43
4 [ ] 3.3%
```

```
Mem[|||||] 1.25G/11.4G
Swap[|||||] 0K/5.78G
```

| PID | USER | PRI | NI | VIRT | RES | SHR | S | CPU% | MEM% | TIME+ | Command |
|-------|------|-----|----|-------|-------|-------|---|------|------|---------|------------------|
| 16340 | will | 20 | 0 | 736M | 53516 | 34120 | S | 3.3 | 0.4 | 0:04.61 | /usr/libexec/gno |
| 12527 | will | 20 | 0 | 337M | 77240 | 55696 | S | 2.6 | 0.6 | 0:41.65 | /usr/libexec/Xor |
| 12580 | will | 20 | 0 | 337M | 77240 | 55696 | S | 1.3 | 0.6 | 0:03.82 | /usr/libexec/Xor |
| 18109 | will | 20 | 0 | 2487M | 66188 | 48192 | S | 1.3 | 0.6 | 0:00.23 | /usr/lib64/firef |
| 17608 | will | 20 | 0 | 220M | 4656 | 3444 | R | 0.7 | 0.0 | 0:01.24 | htop |
| 13179 | will | 20 | 0 | 2663M | 175M | 102M | S | 0.7 | 1.5 | 0:01.37 | /usr/lib64/firef |
| 13168 | will | 20 | 0 | 2663M | 175M | 102M | S | 0.0 | 1.5 | 0:26.18 | /usr/lib64/firef |
| 12844 | will | 20 | 0 | 2944M | 335M | 142M | S | 0.0 | 2.9 | 0:56.01 | /usr/lib64/firef |
| 1055 | root | 20 | 0 | 121M | 68920 | 65888 | S | 0.0 | 0.6 | 0:13.56 | /usr/lib/systemd |
| 12731 | will | 20 | 0 | 156M | 6844 | 6208 | S | 0.0 | 0.1 | 0:00.63 | /usr/libexec/at- |
| 12583 | will | 20 | 0 | 233M | 13004 | 11272 | S | 0.0 | 0.1 | 0:01.58 | i3 -a --restart |
| 16621 | will | 20 | 0 | 691M | 11120 | 9720 | S | 0.0 | 0.1 | 0:01.02 | polybar win1l |
| 16634 | will | 20 | 0 | 691M | 11120 | 9720 | S | 0.0 | 0.1 | 0:00.67 | polybar win1l |
| 15108 | root | 20 | 0 | 246M | 29916 | 8392 | S | 0.0 | 0.2 | 0:02.32 | /usr/libexec/sss |
| 1463 | root | 20 | 0 | 351M | 27096 | 25200 | S | 0.0 | 0.2 | 0:01.04 | /usr/bin/abrt-du |
| 12998 | will | 20 | 0 | 26.7G | 224M | 84944 | S | 0.0 | 1.9 | 0:00.04 | /usr/lib64/firef |
| 13175 | will | 20 | 0 | 2663M | 175M | 102M | S | 0.0 | 1.5 | 0:00.42 | /usr/lib64/firef |
| 1 | root | 20 | 0 | 167M | 14824 | 9584 | S | 0.0 | 0.1 | 0:19.49 | /usr/lib/systemd |

F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice F8Nice F9Kill F10Quit



jaski@manjaro

OS: Manjaro Linux x86_64

Host: 427637U ThinkPad W520

Kernel: 4.19.69-1-MANJARO

Uptime: 39 mins

Packages: 1289 (pacman)

Shell: bash 5.0.9

Resolution: 1920x1080

WM: dwm

Theme: Adwaita-dark [GTK2/3]

Icons: ePapyrus [GTK2/3]

Terminal: st

Terminal Font: Fira Mono

CPU: Intel i7-2720QM (8) @ 3.300GHz

GPU: NVIDIA Quadro 1000M

Memory: 696MiB / 7929MiB

