LinuxDays

Unleash the Power of Linux

Purpose of this course

- Get overview of common Linux tasks
- Learn what Linux is very good at!

. . . and you get to love your system!

Basics

Stuff you can already do

Automatic updating and shutdown

```
$ sudo su
root's password:
$ zypper ref && zypper -n up && poweroff
```

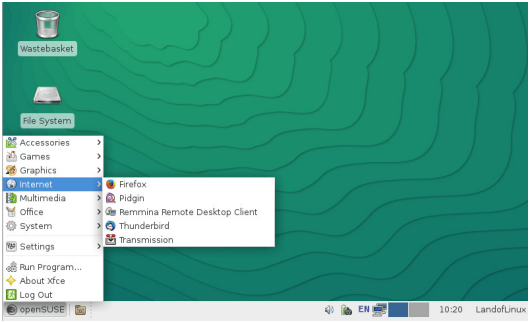
- `sudo su`: Become root
- `zypper ref`: Update repository
- `zypper -n up`: Install upgrades
- `-n` stands for `no confirmation`
- `A && B`: Execute B if A completed successfully

Replace anything!

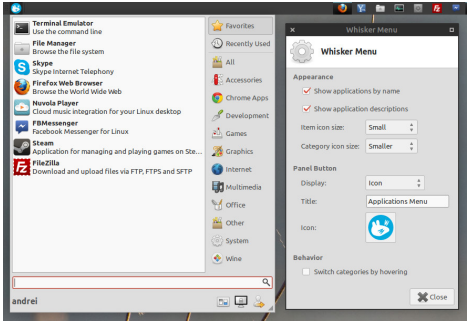
Start menus

- xfce, kupfer, whisker, rofi

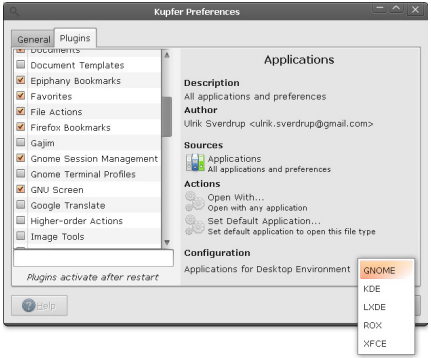
Start menus: XFCE default



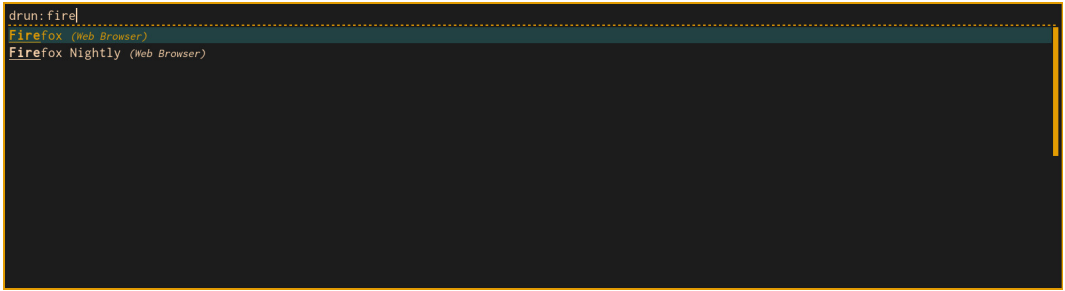
Start menus: Whiskermenu



Start menus: Kupfer



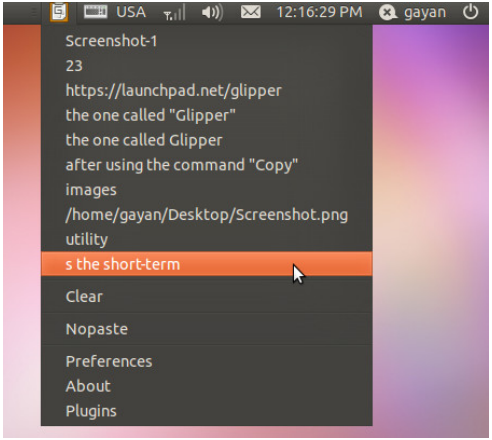
Start menus: Rofi



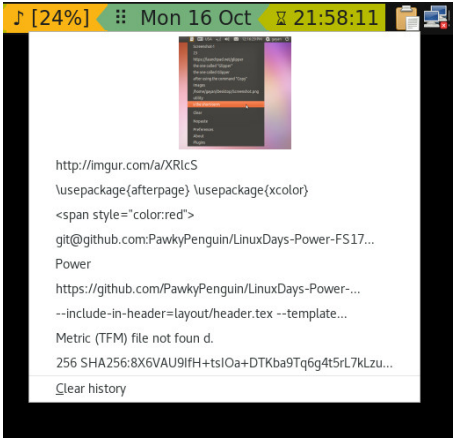
Clipboards

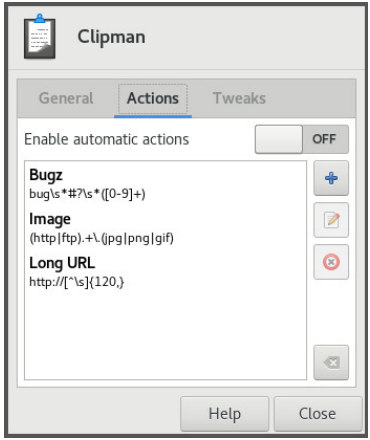
- glipper, copyq, xfce4-clipman

Glipper



Xfce4-Clipman



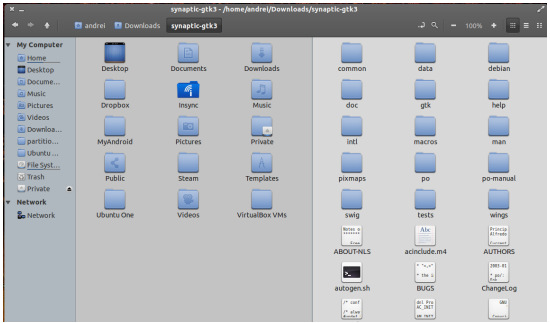


File Managers

- nemo, spacefm, ranger

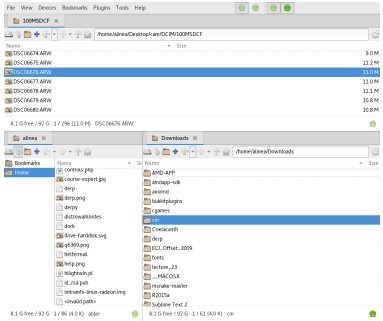
File Managers: Nemo

- Typical graphical file manager



File Managers: SpaceFM

- Graphical manager with a lot of features



File Managers: Ranger

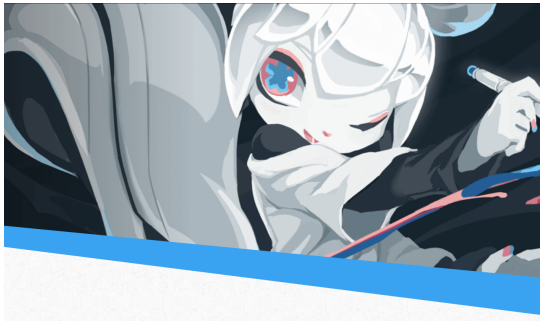
- Completely commandline based
- Even supports pictures

Drawing

- GIMP
- Krita
- Inkspace (for vector graphics)

Krita

- Digital painting and animation
- FOSS



Advanced

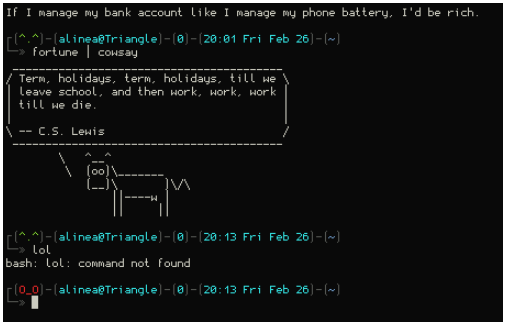
Doable after some reading

Shells

- bash, fish, zsh
- Tmux

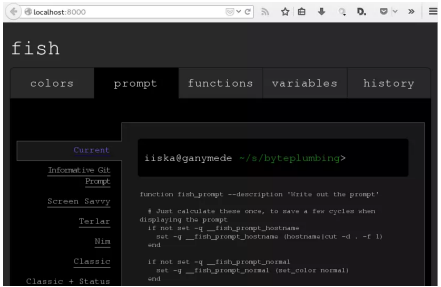
Shells: Bash

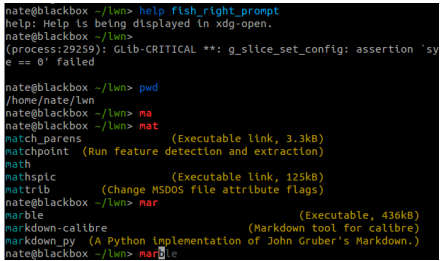
- Standard shell on many distributions
- Configure using `.bashrc`



Shells: Fish

- Friendly interactive shell
- Configure in webbrowser
- Autocompletion shows while typing





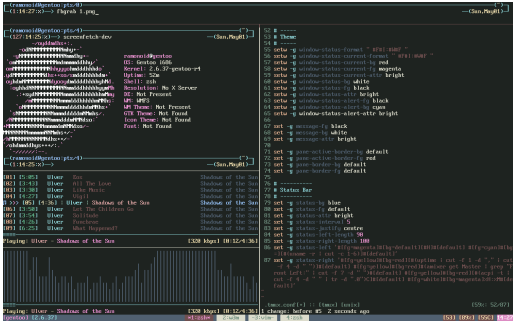
Shells: Zsh

- Nowadays, most advanced shell
- Plugins and themes with “oh-my-zsh”
- Incredibly configurable

```
~ > sources > packages  master
~ > sources > packages  master  tar
A  -- append to an archive
c  -- create a new archive
f  -- specify archive file or device
t  -- list archive contents
u  -- update archive
v  -- verbose output
x  -- extract files from an archive
~ > sources > packages  master  git commit -m"Import IDs (aka keys) from XML into Proceedings and InProceedings"
bck-i-search: com_
```

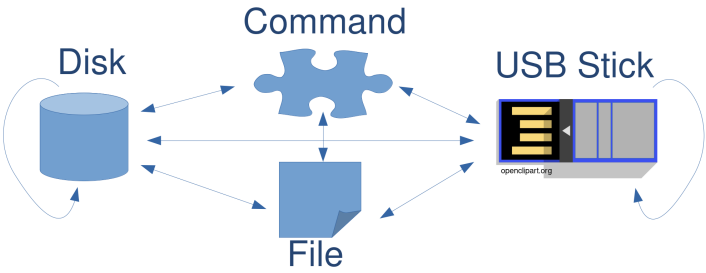
Tmux

- Tmux is not a shell
- . . . but a container for shells
- Provides shell “sessions”



dd

- Bitwise copy: Create exact copies on low level
- Can pipe to commands, e.g. `pbzip2`



dd

- `if=` and `of=` for input and output file
- `bs=4M` for faster copy

dd

- `sudo dd if=openSUSE.iso of=/dev/sdb bs=4M`

  Input file is openSUSE image
  Output file is /dev/sdb (a USB stick)

pbzip2

- `pbzip2` is like zip, but multicore
- Can be used with `dd`

dd and pbzip2

- Copy and compress `/dev/sda1` partition to `archive.img.pbzip`:

```
sudo dd if=/dev/sda1 | pbzip2 > archive.img.pbzip
```

How to backup?

- With `rsync`
- Can backup onto an external harddrive, NAS, Internet...

What to backup

- User files: `/home/user`
- System files: `/etc`, `/opt`, `/boot`, `/var`, `/root`, `/usr`

VPN using openconnect (Demo)

- Install openconnect: `sudo zypper in NetworkManager-openconnect`
- Click on icon -> VPN Connections -> Configure VPN
- Add new connection with openconnect

mpv

- Mediaplayer
- Controlled by keyboard
- Can run in console

youtube-dl

- Download YouTube videos
- `youtube-dl -x <URL>` to download audio only
- `youtube-dl "youtube.com/watch?v=dQw4w9WgXcQ"`

mpv + youtube-dl

- `mpv <URL>` plays YouTube video!

ffmpeg

- Easily convert between video formats:
  ```
  ffmpeg -i input.avi out.mp3
  ```

Merge PDFs

- `pdfunite [SOURCES] [DEST]`

  For example: `pdfunite intro.pdf appendix.pdf out.pdf`

  For example: `pdfunite course*.pdf out.pdf`

Separate PDFs

- Separate a whole book into pages:
  ```
  pdfseparate book.pdf page%d.pdf
  ```
- Extract one page:
  ```
  pdfseparate -f 5 -l 5 book.pdf page.pdf
  ```

Search PDFs

- `pdfgrep` for searching through content of PDFs
- `pdfgrep "NSA"~/Documents/infsec/*.pdf`

Power consumption

- `powertop`
  - See exact information
  - Tune parameters
  - Calibrate battery
- `cpupower`
  - See what cpu is doing
  - See frequencies etc.

Recover lost data

- `photorec`
  - Works on broken filesystems
  - Recovers videos, documents...
  - ~300 file families supportede
- `dd_rescue`
  - Copies data (like dd)
  - Automatically skips unreadable blocks(!)
  - Pulls data from almost dead harddisk

xrandr

- Control display size etc.
- Put projector on auto-resolution:
  - `xrandr --output VGA-0 --auto`
  - `xrandr --output VGA-0 --auto --left-of LVDS`

feh

- Set a random wallpaper:
  ```
  feh --bg-fill --randomize ~/Images
  ```

ssh

- Encrypted connection to remote machine
  - `ssh [USERNAME]@[HOSTNAME]`
  - `ssh nils@192.168.1.1`

scp

- Copy files (securely)

rsync (again)

- `rsync -avh Downloads/ nils@192.168.1.1:media`

Cronjobs

- Schedule jobs, e.g. daily, weekly...
- Command: `crontab`

Look at logs

- Under `/var/log`

Break

- Back in 5 minutes.
- Get the slides:
  `https://github.com/PawkyPenguin/LinuxDays-Power-HS17`

Expert

Concepts needing some experience

Development

- Very tight integration on commandline
- Easy access to software
  - Through package manager
  - Through github

Easy programming in...

- Java
- C, C++
- Ruby
- Python
- Haskell
- ...

Github

- Incredibly big repository
- Community-driven
- Download software with `git clone <URL>`

Write a webserver

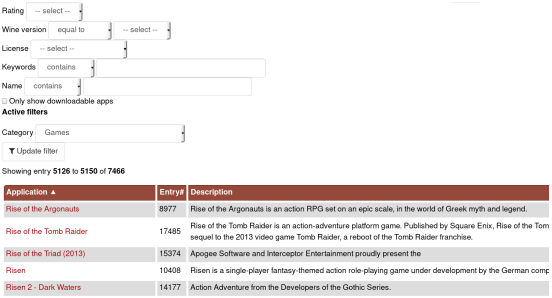
- Activate HTTP server with `systemctl enable httpd`

Gaming

- Steam is nearing ~25% Linux support
- WINE

WINE

- “Emulator” for Windows
- Not only for games
- Works well for most programs
- WineHQ: Giant database keeping track of what works



WINE

- Better support for Windows games than Windows itself![1]

[1] For older games

Gaming outlook

- Valve still actively pushing Linux
- Vulkan (cross-platform API) supported by big game engines
  - Unreal Engine
  - CryEngine
  - Unity

Becoming a power user

(ง`ω´)ง━☆ﾟ.*･｡ﾟ

A **power user** or **experienced user** is a computer user who uses advanced features of computer hardware,[1][2][3] operating systems,[4] programs,[5][6] or web sites[7] which are not used by the average user.

Start

- Identify important Bash commands
- Skim their manuals

Building Knowledge

- Get broad knowledge
- Create your own problems
- Look at examples (open source!)

Building Efficiency

- Learn a lifetime editor
  - Vim
  - Emacs
  - Atom
- Takes a month or two
- . . . but huge payoff

- Identify problem
- Open Vim
- Program some zsh

Communities

- `reddit.com/r/linux`
- `unix.stackexchange.com`
- Various forums
- And us :)

Summary

- You've seen various usecases of Linux
- Hopefully you're willing to use the command line
  - Hopefully it's still scary

Questions?

Coming up

- Bash workshop:
  - October 23 | 17:15-19:00 | ETH HG D 3.2
  - or: October 25 | 17:15-19:00 | ETH HG D 3.2
- Spotlight course: Introduction to Vim
  - October 26 | 17:15-19:00 | ETH HG D 3.2

Questions?

- Is anything still unclear?
- **Ask now!**
  (or come to front in a minute)

Where to find these Slides

- Find the slides here:
  `https://github.com/PawkyPenguin/LinuxDays-Power-HS17`
- Slides by Nils Leuzinger, licensed under CC BY-SA 4.0
- Slide template by Christian Horea, licensed under CC BY-SA 3.0