#AdoptYourOwnPenguin

Linux Install Party

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Ministry of Silly Walks

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Introduction to Linux

Some information about Linux

- Operating systems based on the Linux kernel[3]
- The Linux kernel is part of the UNIX family
- (Mostly) open source
- Fit for a range of different use cases:
  - Desctop computers
  - Server
  - Smartphones
  - TVs
  - Tablets
  - IoT devices
  - . . .
- Around since the mid-1990s
- Many of the supporting system software and libraries are provided by the GNU project[1]

Advantages of Linux

- Free
- Open source
  - Freedom to run the program for whatever purpose
  - Freedom to redistribute copies of the program
  - Freedom to study the inner workings of the program
  - Freedom to make changes to the program
  - Freedom distribute copies of the modified versions
- A system under your exclusive control
- Multi-purpose
- Extremely costumisable
- Package managers
- Fewer viruses and malware
- . . .

There are some closed source programs. Most distributions give you the option whether or not to use them. Furthermore there are some paid for Linux distributions but they mainly come into play for server operating systems.

The pieces of a Linux operating system

1. **Bootloader**:
   The software managing the boot process of your computer and thus responsible for starting the operating system.
2. **Kernel**:
   The actual Linux. It manages the CPU, the memory and all peripheral devices.
3. **Init system**:
   Bootstraps the user space and controls the daemons. Takes over after the bootloader is done.
4. **Daemons**:
   Background services like printing, sound, or scheduling.
5. **Graphical Server**:
   Renders and displays all graphics.
6. **Desktop environment**:
   The piece the user interacts with. There are a few different environments to choose from (GNOME, KDE, Mate, XFCE, etc.).
7. **Applications**:
   Software that is not included with any of the previous pieces. Can be installed via a package manager or by hand.

Linux distributions

Well known distros:

- Debian
- Ubuntu
- Arch Linux
- Manjaro
- openSuse
- Red Hat
- Fedora
- Kali
- Linux Mint
- . . .

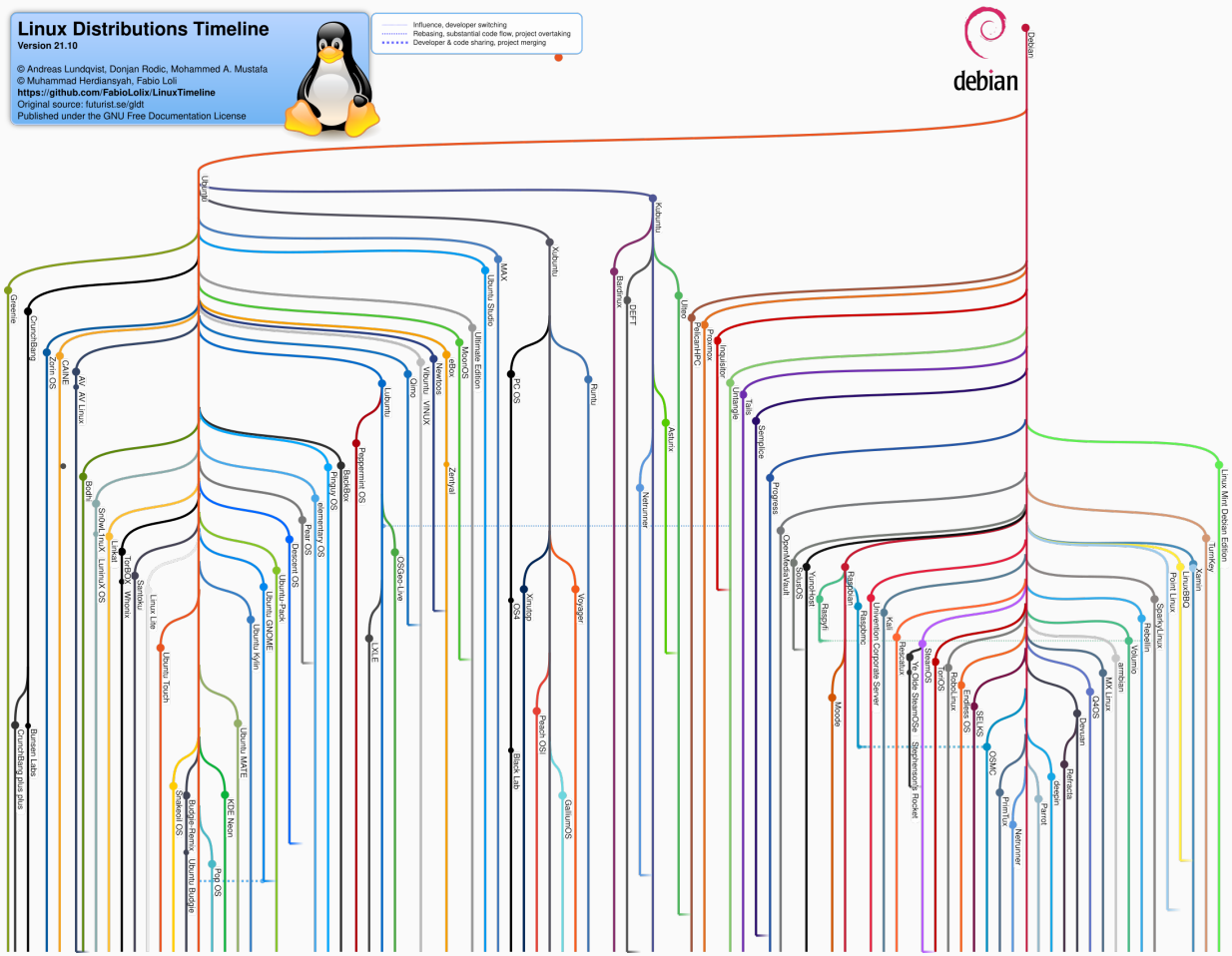


Figure: Excerpt from the Linux distro tree for Debian [2]

See DistroWatch[4] for a comprehensive list of all Linux distributions.

A selection of noteworthy distributions

Debian

- Around since 1993
- Comes with over 50,000 packages
- Supported desktop environments:
  - XFCE
  - GNOME
  - KDE
  - MATE
  - Cinnamon
  - LXDE
  - MATE
- Release cycle
  - A stable version is released every 2 years
  - Each version will receive updates for 3 years
  - Those updates will only contain security updates and fixes
  - After that the version will receive security updates for 2 more years
  - oldoldstable – oldstable – **stable** – testing – unstable – experimental
- Package manager: `dpkg` / `apt`

debian

Ubuntu and Linux Mint

Ubuntu

- Around since 2004
- Derivative of Debian
- Very new-user-friendly
- Default desktop: GNOME
- Packages are based on packages from Debian's unstable branch
- Release cycle
  - New version every 6 months
  - Long-term support version every 2 years
  - LTS version updates for 5 years
- Package manager: `apt`

Linux Mint

- Around since 2006
- Derivative of Ubuntu
- Also very new-user-friendly
- Default desktop: Cinnamon / MATE / Xfce
- Full out-of-the-box multimedia support
- Release cycle same as Ubuntu
- Package manager: *dpkg* / *Flatpak* / `apt`

Arch Linux and Manjaro

Arch Linux

- Around since 2002
- Release cycle:
  - Rolling release model
  - Latest stable versions of most software
  - **stable** – testing – unstable
  - Quick access to new versions of software
- Package manager: `pacman`
- Additional package repository called **A**rch **U**ser **R**epository
- Get the package manager `yay` if you can
- No visual installation!

Manjaro

- Around since 2011
- Derivative of Arch Linux
- Default desktop: Xfce / KDE Plasma / GNOME / Phosh
- Focus on user-friendliness and accessibility
- Still most of the benefits of Arch
- Visual installer
- Uses the same package repositories as Arch
- Package manager: `pacman`

Installing and working with a Linux system

Installing Linux

1. Choose the distro you want to install.
2. Make sure your machine meets the requirements for installation.
3. Download the .iso-file you want.
4. Write the .iso-file to USB-stick.
5. Start your computer an enter the boot loader menu.
6. Boot using the USB-stick as boot medium.
7. Go through all installer steps and wait for the installation to finish.

Well done, you've got yourself a Linux!

Basics of your new Linux system

- If you need superuser permissions to execute a command use

```
> sudo [command]
```

- The log in as the superuser use the command

```
> su
```

- Superuser permissions are needed to use your package manager.
- To get some information about a command use

```
> man [command]
```

Installing and updating software

Debian/Ubuntu/Mint

- Get all new updates

```
> apt update
```

- Install the updates

```
> apt upgrade
```

- Install a package

```
> apt install [package]
```

- Remove a package

```
> apt remove [package]
```

- Search for a package

```
> apt search [package]
```

Arch/Manjaro

- Get and install all updates

```
> pacman -Syu
```

- Install a package

```
> pacman -S [package]
```

- Remove a package

```
> pacman -R [package]
```

- Search for a package

```
> pacman -Ss [package]
```

- Clean cache files

```
> pacman -Scc
```

Troubleshooting

- Keep your calm and search for the origin of your error.
- Use the information you've got to search for solutions with a search engine of your choice.
- Most likely someone else already had the same problem.
- Wikis are a great source for help
  - `https://wiki.ubuntuusers.de/`
  - `https://wiki.archlinux.org/`
- Mailing lists can also contain valuable information.
- Ask people you know with some knowledge of Linux.
- Only clear the cache of your package manager when you're sure everything works. You might need the older versions of packages stored there.
- And don't forget: **Make regular backups!**

References

[1] Free Software Foundation.
Gnu operating system.
https://www.gnu.org/.

[2] J. Klooster.
Distribution graph.
https://github.com/jappeace/distrowatch1graph1svg.

[3] Linux Kernel Organization.
The linux kernel archives.
https://www.kernel.org/.

[4] Unsigned Integer Limited.
Distrowatch.
https://distrowatch.com/.

Flux beamer theme

Flux is a modern style beamer presentation. It is provided as a work in progress version and may suffer from inconsistencies. Sources and complementary information are available at:

`github.com/pvanberg/flux-beamer`

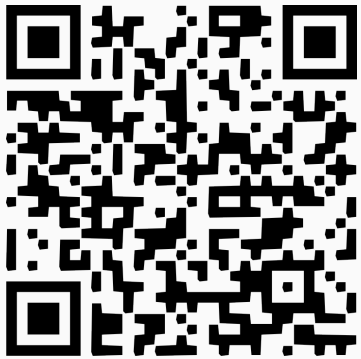
Flux is licensed under GNU General Public License v3.

`http://www.gnu.org/licenses`

Flux is inspired by **Metropolis** theme from Matthias Vogelgesang:

`https://github.com/matze/mtheme`

This presentation



The presentation can be found here:

`https://github.com/christoph-grossmann/AdoptYourOwnPenguin`

This presentation draws inspiration from a presentation by Lea Laux, which you can find here:

`https://github.com/LeaRain/LinuxInstallParty`

Have fun with your new penguin!