

Linux?

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What's a Linux?

Operating systems

- Software that manages hardware and provides an interface for using a computer
 - Desktop: Windows, macOS, Linux-based
 - Mobile: Android (Linux), Apple iOS
 - Server/router: Linux-based, BSD-based, Cisco IOS
 - Many embedded computers have custom operating systems

Kernel and userspace

- Kernel: manages hardware
 - Virtual memory, scheduling, I/O, sometimes device drivers and filesystems
 - Has the highest privilege
- Userspace: OS software outside the kernel
 - Sometimes device drivers and filesystems
 - System daemons
 - Command-line shell
 - Graphical shell (desktop, taskbar, program launcher, etc.)
 - User programs
- In many OSes (not Linux!) these are tightly coupled

- Free and open source *kernel* started in 1991 by Linus Torvalds
- Used in billions of devices of every conceivable kind
 - Servers, desktops, mobile phones, TVs, game consoles, cars, airplanes, refrigerators, automatic cow milkers, etc.
- For desktop/server use, usually install a Linux *distribution*
 - Linux kernel bundled with userspace programs

How do I Linux?

What distribution?

- Many popular beginner-friendly distributions
 - Linux Mint, Pop OS, Fedora
- Of these, Fedora seems the most popular among RITluggers

Dual booting?

- Installing two operating systems (eg. Windows and Linux) on one computer
- Great if you need Windows-only software, out of scope for this talk

Preparing for installation

- Unless you're dual-booting, **YOU WILL LOSE ALL DATA ON YOUR DRIVE.**
- Even if you are dual-booting, things can go wrong, so
- **MAKE A BACKUP**

Preparing for installation

- Download the ISO installer for the distro you've chosen
 - <https://fedoraproject.org/kde/download/>
- Use Rufus (<https://rufus.ie/en/>) to create a bootable flash drive
 - This will **erase the contents of the flash drive**
- Reboot your computer and use the BIOS to boot from the flash drive
 - Process depends on your laptop/motherboard manufacturer
 - Might also need to disable secure boot/other BIOS settings

- Step through the installer and fill out each field appropriately
- Live demo time!

Should I Linux?

Some software is not available for Linux, but there are often good alternatives

- Adobe >:(
 - GIMP, Krita, Inkscape, Kdenlive, DaVinci Resolve
- CAD software (SolidWorks, AnyDesk, etc)
 - FreeCAD, Blender?
- Microsoft Office
 - LibreOffice, Google Docs, online version of Office

Should I Linux?

- Some games generally work very well
 - Most indie games, Minecraft, anything by Valve, older Windows games, emulated console games
 - Steam games: check <https://www.protondb.com/>
- Others are much trickier/do not work
 - Games with invasive anti-cheat
 - VR seems hit-and-miss

After installation

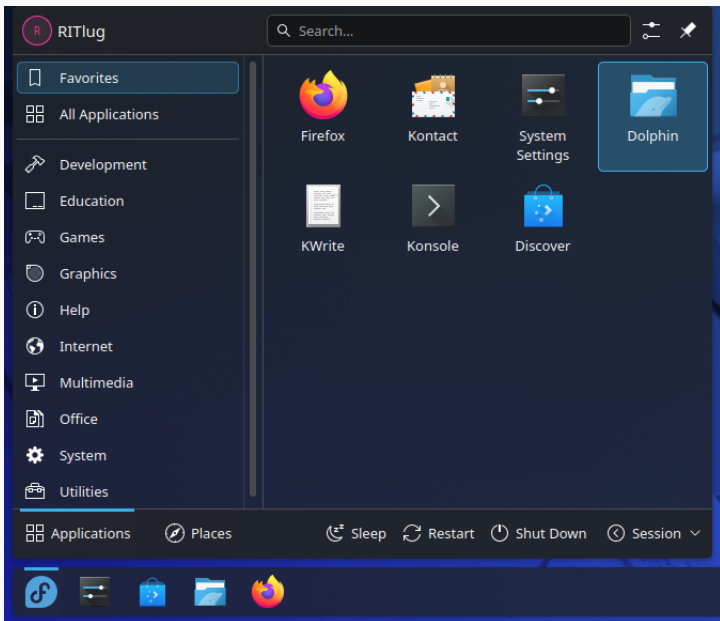
- Remove the flash drive and restart your computer

Using Linux

Fedora KDE

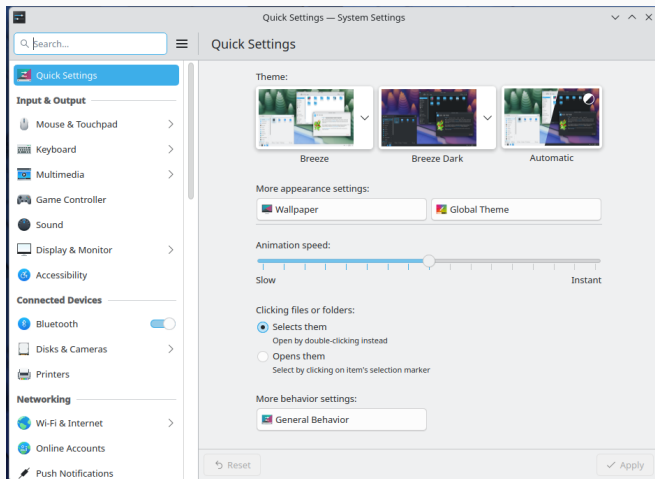


Fedora KDE

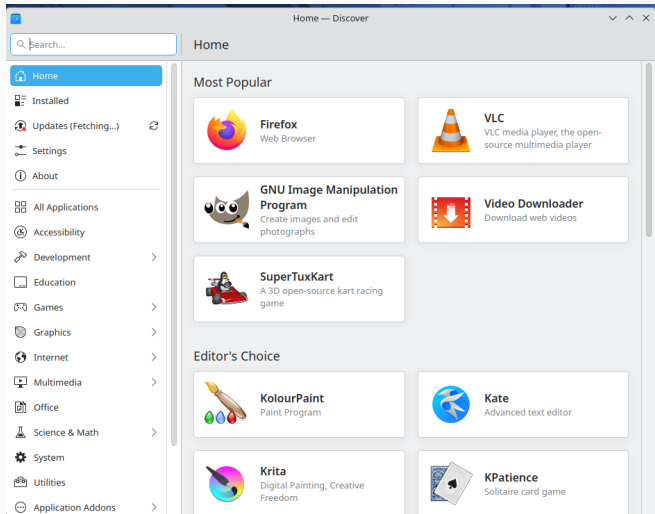


- A bit tricky. See <https://wiki.ritlug.com/eduroam/>
- Most Linux distros use NetworkManager

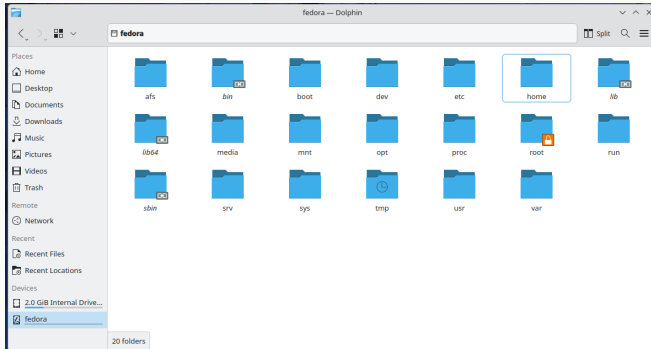
System settings



Installing software



File manager



The filesystem

- "Everything is a file"
- Path separator is /
- All drives mounted into a single file system
- Your home directory is `/home/(username)`

Using the terminal

Why?

- Lots of programs (eg. compilers, build systems, git) are designed for the terminal first
- Work on remote systems (over ssh) that don't have a GUI
- Many find it faster and easier than GUI tools after some practice

- Command-line shell: runs in a terminal, executes the commands you type
- Most commands are just regular programs
- Other commands are *builtins* – part of the shell
- Syntax: **command** **arg1** **arg2** ... (space-separated)
- Quote an argument if it contains spaces or special characters

- `echo`: print some text to the output
 - `echo 'Hello, world!'`

Working directory

- The base directory for relative paths
- `pwd`: print working directory
- `cd /some/other/place`: change directory
- `ls`: list files

Flags

- Every program handles its own arguments
 - Many do it in a very similar way (Unix-like)
- Flags can change the behavior of a command
 - Short flag: `ls -a`
 - Long flag: `ls --all`
 - Flag with option: `ls --sort=time` or `ls --sort time`
- `--help` or `-h` usually prints help information
- **man**: read the manual page for a command

Some more commands

- **cat** concatenate files, often used for just printing one
- **mv**: move a file or directory
- **cp**: copy a file or directory
- **rm**: delete a file or directory (no trash bin!)
- **nano**: simple text editor