



FEDORA WORKSTATION · GNOME · DNF5 · BTRFS

Fedora Handbook

For beginners

Don't fear the terminal. Start with a few commands. This section is for people who just installed Fedora Workstation: what to do after installing, basic terminal commands, desktop shortcuts and where each setting lives.

```
[user@fedora ~]$ sudo dnf upgrade
```

user your username · **fedora** the computer name · **~** the folder you are in (your home folder) · **\$** means a normal user, **#** means root (administrator). Nothing appears on screen while you type a password; that is normal.

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Yellow italic text (like *<package>*) marks the parts you fill in. In the terminal, paste is Ctrl+Shift+V and copy is Ctrl+Shift+C. Commands that start with `sudo` change the system; read what they do before running them.

After installing

After a clean install, going through these in order is a good start. You can do each step on its own.

1 Update the system

Dozens of updates wait on first boot. Restart when they're done.

```
$ sudo dnf upgrade --refresh
```

```
$ sudo reboot
```

2 Enable third-party repositories

Software asks on first launch; if you skipped it, enable them from the terminal. They bring repositories such as Google Chrome, NVIDIA and Steam.

```
$ sudo fedora-third-party enable
```

3 Add the RPM Fusion repositories

For patent and licensing reasons Fedora doesn't ship some packages itself (full ffmpeg, the NVIDIA driver, some Wi-Fi drivers). RPM Fusion fills that gap.

```
$ sudo dnf install https://mirrors.rpmfusion.org/free/fedora/rpmfusion-free-release-$(rpm -E %fedora).noarch.rpm  
https://mirrors.rpmfusion.org/nonfree/fedora/rpmfusion-nonfree-release-$(rpm -E %fedora).noarch.rpm
```

4 Install video and audio codecs

So files like MP4, H.264 and HEVC play without trouble.

```
$ sudo dnf swap ffmpeg-free ffmpeg --alloweraseing
```

```
$ sudo dnf update @multimedia --setopt="install_weak_deps=False" --  
exclude=PackageKit-gstreamer-plugin
```

5 Enable all of Flathub

Most apps such as Spotify, Discord and OBS are on Flathub. Fedora may show a limited list by default.

```
$ flatpak remote-add --if-not-exists flathub  
https://dl.flathub.org/repo/flathub.flatpakrepo
```

6 Update firmware

Manufacturer updates for the BIOS/UEFI, SSD, touchpad and similar devices. Software shows these too.

```
$ fwupdmgr refresh
```

```
$ fwupdmgr get-updates
```

```
$ fwupdmgr update
```

7 Name your computer

The name shown on the network and in the terminal prompt.

```
$ sudo hostnamectl set-hostname <new-name>
```

8 Install Tweaks and Extension Manager

For minimize/maximize buttons, fonts, startup apps and GNOME extensions.

```
$ sudo dnf install gnome-tweaks
```

```
$ flatpak install flathub com.mattjakeman.ExtensionManager
```

9 Set up backups

The Backups (Déjà Dup) app regularly backs up your home folder to an external drive or the cloud.

```
$ sudo dnf install deja-dup
```

Meet the terminal

The terminal is the window where you give the computer commands by typing. On Fedora it's called Ptyxis (Terminal). To open it, press Super, type "terminal" and press Enter.

TIP Linux is case-sensitive: `Documents` and `documents` are different folders. Put names with spaces in quotes: `cd "New Folder"`.

TIP Type part of a name and press **Tab**: the command or file name completes itself. Press it twice to list the options. This habit saves more time than anything else.

```
$ man <command>
```

Opens the manual page for a command. Quit with `q`, search inside with `/word`.

```
$ <command> --help
```

Shows a short help text and the command's options.

```
$ sudo <command>
```

Runs the command with administrator (root) rights. It asks for your own password; nothing shows while you type.

```
$ clear
```

Clears the screen. Shortcut: `Ctrl + L`.

```
$ history
```

Lists the commands you typed before. You can also step back with `↑`.

```
$ which <command>
```

Shows which file a command runs from.

```
$ exit
```

Closes the terminal (or a remote session).

WARNING To stop a running command, press `Ctrl + C`. In the terminal, copy is `Ctrl + Shift + C` and paste is `Ctrl + Shift + V`.

Files and folders

`~` means your home folder (`/home/username`). `.` is the current folder, `..` the one above it.

```
$ pwd
```

Prints the folder you are in.

```
$ ls
```

Lists the files in the current folder.

```
$ ls -la
```

Detailed list including hidden files (size, date, permissions). Names starting with a dot are hidden.

```
$ ls -lh
```

Shows sizes in readable KB/MB/GB.

```
$ cd <folder>
```

Enters a folder. Example: `cd Documents`.

```
$ cd ..
```

Goes up one folder.

```
$ cd
```

On its own, goes back to your home folder.

`cd -` returns to the previous folder.

```
$ mkdir <folder>
```

Creates a folder. For nested folders: `mkdir -p a/b/c`.

```
$ touch <file>
```

Creates an empty file (or updates the date of an existing one).

```
$ cp <source> <target>
```

Copies a file. For folders use `cp -r`.

```
$ mv <source> <target>
```

Moves or renames. Example: `mv old.txt new.txt`.

```
$ rm <file>
```

Deletes a file. It does not go to the trash and cannot be undone.

```
$ rm -r <folder>
```

Deletes a folder and everything in it. Add `-i` to confirm each file.

```
$ gio trash <file>
```

Sends the file to the Trash instead of deleting it, so it can be restored like on the desktop.

```
$ find ~ -name "*.pdf"
```

Finds every file ending in .pdf in your home folder.

```
$ ln -s <target> <link-name>
```

Creates a shortcut (symbolic link) to a file or folder.

WARNING Never run commands from the internet that start with `sudo rm -rf` unless you understand them. They can wipe the system in seconds.

Reading and editing files

A simple editor that runs in the terminal is enough for changing configuration files. Fedora ships nano. If

you prefer a graphical editor, there's Text Editor (gnome-text-editor).

```
$ cat <file>
```

Prints a short file to the screen.

```
$ less <file>
```

Reads a long file page by page. Space: next page, `/` search, `q` quit.

```
$ head -n 20 <file>
```

Shows the first 20 lines.

```
$ tail -n 50 <file>
```

Shows the last 50 lines. `tail -f` follows new lines live.

```
$ nano <file>
```

Opens the file in nano. For system files add sudo: `sudo nano /etc/hosts`.

`Ctrl` + `O`

nano: save (then Enter).

`Ctrl` + `X`

nano: quit. Asks if there are unsaved changes.

`Ctrl` + `W`

nano: search in the file.

`Ctrl` + `K` or `Ctrl` + `U`

nano: cut / paste a line.

```
$ gnome-text-editor <file>
```

Opens the file in the graphical Text Editor.

```
$ xdg-open <file>
```

Opens the file with its default app (PDF, image, folder...). `xdg-open .` opens the current folder in Files.

Installing software: DNF

DNF is Fedora's package manager: it downloads software from the Fedora repositories, installs, updates and removes it. Operations that need administrator rights ask for sudo.

```
$ sudo dnf upgrade --refresh
```

Refreshes repository data and updates the whole system. Once a week is a good habit.

```
$ sudo dnf install <package>
```

Installs software. You can list several: `sudo dnf install vlc gimp`.

```
$ sudo dnf remove <package>
```

Removes software.

```
$ dnf search <word>
```

Searches package names and descriptions.

```
$ dnf info <package>
```

Shows a package's version, size and description.

```
$ dnf list --installed
```

Lists all installed packages. To filter: `dnf list --installed | grep firefox`.

```
$ sudo dnf install ./<file>.rpm
```

Installs a downloaded .rpm file with its dependencies.

```
$ sudo dnf autoremove
```

Cleans up packages that nothing needs anymore.

```
$ dnf check-update
```

Lists pending updates without installing them.

TIP Fedora doesn't install .deb packages (Ubuntu/Debian). If a program only offers a .deb, check Flathub first, then look for an .rpm.

Installing apps: Flatpak and Software

Flatpak apps run isolated from the system and bring their own libraries. For desktop apps this is usually the easiest route. If you prefer a graphical way, the Software app shows DNF and Flatpak together.

Super > Software

Search, install, remove and update in one place. An app's source (Fedora / Flathub) can be chosen at the top right.

```
$ flatpak search <name>
```

Searches Flathub and shows the full app ID (e.g. com.spotify.Client).

```
$ flatpak install flathub <app-id>
```

Installs the app. Example: `flatpak install flathub com.discordapp.Discord`.

```
$ flatpak update
```

Updates all Flatpak apps.

```
$ flatpak list --app
```

Lists installed Flatpak apps.

```
$ flatpak uninstall <app-id>
```

Removes the app. Add `--delete-data` to remove its data too.

```
$ flatpak uninstall --unused
```

Frees space by removing runtimes nothing uses anymore.

```
$ flatpak run <app-id>
```

Starts the app from the terminal; handy for seeing error messages.

TIP To edit Flatpak permissions (file access, camera, etc.) visually, install Flatseal: `flatpak install flathub com.github.tchx84.Flatseal`.

TIP If you downloaded an AppImage, make it executable: `chmod +x App.AppImage`, then `./App.AppImage`. If it doesn't start you may need `sudo dnf install fuse-libs`.

System information and resources

The equivalent of Windows Task Manager is the System Monitor app. The same information is available in the terminal.

```
$ cat /etc/os-release
```

Shows the Fedora version.

```
$ hostnamectl
```

Computer name, operating system, kernel and hardware summary.

```
$ uname -r
```

Version of the running Linux kernel.

```
$ df -h
```

Shows how much free space is left on each disk.

```
$ du -sh *
```

Space used by each file and folder in the current folder.

```
$ free -h
```

RAM and swap usage.

```
$ top
```

Live process list. Quit with `q`. For a nicer one: `sudo dnf install htop` or `bttop`.

```
$ lscpu
```

Processor information.

```
$ lspci
```

Lists PCI devices such as the graphics and network cards.

```
$ lsusb
```

Lists connected USB devices.

```
$ pkill <program-name>
```

Closes a frozen program by name. Example: `pkill firefox`.

```
$ kill -9 <PID>
```

Force-kills a process by number (PID). `top` or `pgrep firefox` gives you the PID.

[Settings](#) > [System](#) > [About](#)

Version, processor, RAM and disk information in the graphical interface.

Shut down, restart, sessions

You can also use the system menu at the top right; the terminal equivalents are:

```
$ systemctl poweroff
```

Shuts the computer down.

```
$ systemctl reboot
```

Restarts.

```
$ systemctl suspend
```

Puts it to sleep (suspend).

```
$ gnome-session-quit --logout
```

Logs out.

[Super](#) + [L](#)

Locks the screen.

[Ctrl](#) + [Alt](#) + [Delete](#)

Opens the log out / power off dialog.

GNOME desktop shortcuts

Super is the Windows key on your keyboard. GNOME is designed to be used largely from the keyboard.

Super	Activities overview: open windows, workspaces and search. Start typing right away to find apps, files and settings.
Super + A	List of all apps.
Super + 1 ... Super + 9	Opens or switches to the 1st ... 9th app in the dash.
Alt + Tab	Switch between apps. Super+Tab does the same.
Alt + `	Switch between windows of the same app (the key above Tab).
Super + ↑ or Super + ↓	Maximize / restore the window.
Super + ← or Super + →	Snap the window to the left / right half of the screen.
Super + H	Hide (minimize) the window.
Alt + F4	Close the window. In most apps Ctrl+Q quits the app.
Super + Page Up or Super + Page Down	Go to the previous / next workspace.
Super + Shift + Page Up or Super + Shift + Page Down	Move the window to the previous / next workspace.
Super + Shift + ← or Super + Shift + →	Move the window to the other monitor.
Super + V	Notification list and calendar.

Super + **S**

Quick settings menu (Wi-Fi, sound, brightness, power mode).

Super + **Space**

Switch keyboard layouts.

Print Screen

Screenshot tool: area, window or full screen; picture or video.

Shift + **Print Screen**

Takes a full-screen screenshot immediately. Saved to Pictures > Screenshots.

Alt + **Print Screen**

Takes a screenshot of the active window.

Ctrl + **Alt** + **Shift** + **R**

Starts / stops screen recording. Saved to Videos > Screencasts.

Alt + **F2**

Run a command dialog. Example: type `gnome-text-editor` and press Enter.

Super + **L**

Lock the screen.

TIP Ctrl+Alt+T for a terminal isn't set up by default on Fedora. To add it, see the custom shortcut step in "Where is that setting?".

Terminal and Bash shortcuts

The first group belongs to the Ptyxis terminal window, the second to the command line itself (Bash).

Ctrl + **Shift** + **T**

New tab.

Ctrl + **Shift** + **N**

New window.

Ctrl + **Shift** + **W**

Close tab.

Ctrl + **Page Up** or **Ctrl** + **Page Down**

Switch between tabs.

Ctrl + Shift + C or Ctrl + Shift + V	Copy / paste.
Ctrl + + or Ctrl + -	Bigger / smaller text. Ctrl+0 resets.
Ctrl + Shift + F	Search the terminal output.
F11	Full screen.
Tab	Complete a command or file name. Twice: list the options.
↑ or ↓	Previous / next command.
Ctrl + R	Search history: finds an old command as you type. Ctrl+R again goes further back, Enter runs it.
Ctrl + C	Stop the running command or cancel the line you typed.
Ctrl + D	Log out (same as exit on an empty line).
Ctrl + L	Clear the screen.
Ctrl + A or Ctrl + E	Move to the start / end of the line.
Ctrl + U or Ctrl + K	Delete from the cursor to the start / end of the line.
Ctrl + W	Delete the word before the cursor.
Alt + B or Alt + F	Move back / forward one word.
Ctrl + Z	Pause the running command and send it to the background. fg brings it back.

!!

Repeats the last command. Common use:
`sudo !!` reruns the last command with sudo.

Files (Nautilus) shortcuts

Fedora's file manager is the Files app.

Ctrl + **H**

Show / hide hidden files.

Ctrl + **L**

Type a path into the address bar (e.g. /etc).

F2

Rename. With several files selected, batch rename opens.

Ctrl + **Shift** + **N**

New folder.

Delete or **Shift** + **Delete**

Move to Trash / delete permanently.

Ctrl + **F**

Search in the folder.

Alt + **↑**

Go up to the parent folder.

Alt + **←** or **Alt** + **→**

Back / forward.

Ctrl + **T**

New tab.

Ctrl + **1** or **Ctrl** + **2**

List / grid view.

Ctrl + **I**

Properties of the selected item.

Space

Quick preview of the selected file (needs the sushi package: `sudo dnf install sushi`).

TIP The right-click menu includes "Open in Terminal" by default. To add a folder to the sidebar, right-click it > Add to Bookmarks, or press Ctrl+D.

Where is that setting?

Almost everything is in the Settings app. The quickest way in: press Super and type the setting's name (e.g. "display", "sound", "bluetooth"). The search opens the right page directly.

Settings > Wi-Fi	Connect to wireless networks, forget saved ones, share with a QR code (menu at top right).
Settings > Network	Wired connection, adding a VPN, proxy.
Settings > Bluetooth	Pair headphones, mice, phones.
Settings > Displays	Resolution, refresh rate, scaling (125%, 150%...), multi-monitor layout, Night Light.
Settings > Sound	Output/input device, volume levels, per-app volume, alert sounds.
Settings > Power	Power mode (Power Saver / Balanced / Performance), screen blank timeout, automatic suspend, battery percentage.
Settings > Multitasking	Hot corner, number of workspaces, edge tiling.
Settings > Appearance	Light/dark style, accent color, wallpaper.
Settings > Apps	App permissions, notifications and storage; Default Apps (browser, mail, music, video).
Settings > Notifications	Do Not Disturb, lock screen notifications, per-app notifications.
Settings > Search	Which apps show results in the Activities search, and which folders are searched.
Settings > Online Accounts	Add Google, Microsoft or Nextcloud accounts; Drive/OneDrive appear in Files.

Settings > Mouse & Touchpad

Pointer speed, tap to click, natural scrolling, two-finger right click.

Settings > Keyboard

Input sources, Compose key, View and Customize Shortcuts.

Settings > Keyboard >
View and Customize Shortcuts >
Custom Shortcuts

Add your own shortcut. Example: Name "Terminal", Command `ptyxis --new-window`, Shortcut Ctrl+Alt+T.

Settings > Printers

Add printers; network printers are usually found automatically.

Settings > Accessibility

Large text, zoom, screen reader, sticky keys, cursor size.

Settings > Privacy & Security

Screen lock delay, location services, file history and automatic trash emptying, camera/microphone.

Settings > Sharing

Computer name, file sharing, media sharing.

Settings > System > Region & Language

Interface language, date/number/currency formats.

Settings > System > Date & Time

Time zone, automatic time, 24-hour format.

Settings > System > Users

New users, passwords, administrator rights, automatic login.

Settings > System > Remote Desktop

Connect to this desktop from another computer over RDP.

Settings > System > Secure Shell

Turn the SSH server on/off (to connect from another computer with a terminal).

Tweaks > Windows Titlebars

Bring back the minimize / maximize buttons.

Tweaks > Fonts

Interface, document and monospace fonts; font scaling.

Tweaks > Startup Applications

Apps that start automatically when you log in.

Disks app

Format disks, create partitions, SMART health data, write disk images.

Look and feel, GNOME extensions

GNOME ships minimal; you add what you miss with extensions. Search and install them with one click in Extension Manager.

```
$ flatpak install flathub  
com.mattjakeman.ExtensionManager
```

Extension Manager: search, install and configure extensions.

TIP Popular extensions: **Dash to Dock** (always-visible dock), **AppIndicator and KStatusNotifierItem Support** (tray icons for apps like Discord and Steam), **Blur my Shell** (blurred panel), **Clipboard Indicator** (clipboard history), **Caffeine** (keeps the screen on).

```
$ gsettings set  
org.gnome.desktop.wm.preferences button-  
layout 'appmenu:minimize,maximize,close'
```

Adds minimize and maximize buttons without Tweaks.

```
$ gsettings set org.gnome.desktop.interface  
show-battery-percentage true
```

Shows the battery percentage in the top bar.

```
$ gnome-extensions list --enabled
```

Lists enabled extensions.

WARNING After a big GNOME update some extensions may stop working for a while. If the desktop acts strangely, try disabling extensions first.

USB drives and disks

USB drives appear in the Files sidebar and are mounted under `/run/media/username/`. Click the  icon next to it before unplugging.

```
$ lsblk
```

Shows all disks and partitions as a tree (sda, nvme0n1, etc.).

```
$ lsblk -f
```

Also shows each partition's file system (ext4, btrfs, ntfs, exfat) and label.

```
$ udisksctl mount -b /dev/<sdb1>
```

Mounts a partition without sudo.

```
$ udisksctl unmount -b /dev/<sdb1>
```

Unmounts it safely.

Disks > select the device > ⋮ >
Format Disk

Wipes the USB drive. To use it on both Windows and Linux, create an exFAT partition.

TIP Fedora Media Writer makes Linux install USBs: `sudo dnf install mediawriter`.

WARNING When writing a disk with `dd` in the terminal, picking the wrong target (`/dev/sdX`) erases that whole disk. Check twice with `lsblk` first.

Common problems

The situations beginners most often get stuck on, and the first thing to try.

TIP Nothing appears while typing a password. That's normal. Keep typing and press Enter.

TIP "command not found". The command isn't installed. Fedora often suggests which package to install; if not, find it with `dnf provides */command-name`.

TIP "user is not in the sudoers file". Your user isn't an administrator. With an admin account, make it "Administrator" in Settings > System > Users, or run `sudo usermod -aG wheel username`.

TIP MP4 / H.264 video won't play, or video in the browser is broken. Do the RPM Fusion and codec steps in "After installing".

```
$ systemctl --user restart pipewire  
wireplumber
```

If sound suddenly stops, restarts the sound system without logging out.

TIP Wi-Fi doesn't show up at all. Identify the card with `lspci | grep -i network`. Broadcom cards need `sudo dnf install broadcom-wl` after adding RPM Fusion.

TIP An update stopped halfway or says it's "locked". Software may be updating in the background. Wait a few minutes, or close the app and try again.

TIP An app froze. GNOME usually asks "not responding, force quit?". If it doesn't, run `kill app` in a terminal (xkill doesn't work on Wayland).

TIP The whole desktop froze. Switch to a text console with `Ctrl+Alt+F3`, log in with your user name and password, and run `sudo systemctl restart gdm`. Open work will be lost.

TIP The system won't boot after an update. Pick the previous kernel in the GRUB menu at startup. If the menu doesn't show, hold `Esc` or `Shift` while booting.

Glossary

Words you'll often see in forums and documentation.

Terminal / shell	The terminal is the window you type in; the shell is the program that interprets the commands. Fedora's default shell is Bash.
root	The all-powerful administrator account. Instead of using it directly, you get temporary rights with <code>sudo</code> .
sudo	Means "run this command as administrator".
Package	The installable form of a program. On Fedora the format is RPM.
Repository	A server packages are downloaded from. Fedora, RPM Fusion and COPR are repositories.
DNF	Fedora's command-line package manager.

Flatpak / Flathub	A distribution-independent, sandboxed app format / its main app store.
Dependency	Other packages a program needs to run. DNF installs them for you.
Kernel	The core of the operating system that talks to the hardware. Fedora updates it often.
GNOME	Fedora Workstation's desktop environment.
Wayland	The display server. It replaced the old X11; Fedora GNOME uses Wayland only.
SELinux	A security layer that limits what programs can access. Don't turn it off.
Btrfs	Fedora's default file system. Supports compression and snapshots.
Directory / path	A directory is a folder. A path is a file's address: <code>/home/user/Documents/note.txt</code> .
<code>/etc</code>, <code>/usr</code>, <code>/var</code>, <code>/home</code>	System settings / programs / changing data and logs / user folders.

Commands are written for current Fedora Workstation releases (DNF5, GNOME, Ptyxis terminal). Menu names follow the English interface. Commands that start with `sudo` change the system; read what they do before running them.