Format file system:

Các loại file system cơ bản trong Linux

| **File system** | **Creation command** | **Userspace utilities** | [**Archiso**](https://wiki.archlinux.org/index.php/Archiso)[**[1]**](https://git.archlinux.org/archiso.git/tree/configs/releng/packages.both) | **Kernel documentation**[**[2]**](https://www.kernel.org/doc/Documentation/filesystems/) | **Notes** |
| --- | --- | --- | --- | --- | --- |
| [**Btrfs**](https://wiki.archlinux.org/index.php/Btrfs) | [**mkfs.btrfs(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mkfs.btrfs.8) | [**btrfs-progs**](https://www.archlinux.org/packages/?name=btrfs-progs) | Yes | [**btrfs.txt**](https://www.kernel.org/doc/Documentation/filesystems/btrfs.txt) | [**Stability status**](https://btrfs.wiki.kernel.org/index.php/Status) |
| [**VFAT**](https://wiki.archlinux.org/index.php/VFAT) | [**mkfs.vfat(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mkfs.vfat.8) | [**dosfstools**](https://www.archlinux.org/packages/?name=dosfstools) | Yes | [**vfat.txt**](https://www.kernel.org/doc/Documentation/filesystems/vfat.txt) |  |
| [**exFAT**](https://en.wikipedia.org/wiki/exFAT) | [**mkexfatfs(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mkexfatfs.8) | [**exfat-utils**](https://www.archlinux.org/packages/?name=exfat-utils) | Yes | N/A (FUSE-based) |  |
| [**F2FS**](https://wiki.archlinux.org/index.php/F2FS) | [**mkfs.f2fs(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mkfs.f2fs.8) | [**f2fs-tools**](https://www.archlinux.org/packages/?name=f2fs-tools) | Yes | [**f2fs.txt**](https://www.kernel.org/doc/Documentation/filesystems/f2fs.txt) | Flash-based devices |
| [**ext3**](https://wiki.archlinux.org/index.php/Ext3) | [**mke2fs(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mke2fs.8) | [**e2fsprogs**](https://www.archlinux.org/packages/?name=e2fsprogs) | Yes ([**base**](https://www.archlinux.org/groups/x86_64/base/)) | [**ext3.txt**](https://www.kernel.org/doc/Documentation/filesystems/ext3.txt) |  |
| [**ext4**](https://wiki.archlinux.org/index.php/Ext4) | [**mke2fs(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mke2fs.8) | [**e2fsprogs**](https://www.archlinux.org/packages/?name=e2fsprogs) | Yes ([**base**](https://www.archlinux.org/groups/x86_64/base/)) | [**ext4.txt**](https://www.kernel.org/doc/Documentation/filesystems/ext4.txt) |  |
| [**HFS**](https://en.wikipedia.org/wiki/Hierarchical_File_System) | mkfs.hfsplus(8) | [**hfsprogs**](https://aur.archlinux.org/packages/hfsprogs/)AUR | No | [**hfs.txt**](https://www.kernel.org/doc/Documentation/filesystems/hfs.txt) | [**macOS**](https://en.wikipedia.org/wiki/macOS) file system |
| [**JFS**](https://wiki.archlinux.org/index.php/JFS) | [**mkfs.jfs(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mkfs.jfs.8) | [**jfsutils**](https://www.archlinux.org/packages/?name=jfsutils) | Yes ([**base**](https://www.archlinux.org/groups/x86_64/base/)) | [**jfs.txt**](https://www.kernel.org/doc/Documentation/filesystems/jfs.txt) |  |
| [**NILFS2**](https://en.wikipedia.org/wiki/NILFS) | [**mkfs.nilfs2(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mkfs.nilfs2.8) | [**nilfs-utils**](https://www.archlinux.org/packages/?name=nilfs-utils) | Yes | [**nilfs2.txt**](https://www.kernel.org/doc/Documentation/filesystems/nilfs2.txt) |  |
| [**NTFS**](https://wiki.archlinux.org/index.php/NTFS) | [**mkfs.ntfs(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mkfs.ntfs.8) | [**ntfs-3g**](https://www.archlinux.org/packages/?name=ntfs-3g) | Yes | N/A (FUSE-based) | [**Windows**](https://en.wikipedia.org/wiki/Microsoft_Windows) file system |
| [**Reiser4**](https://wiki.archlinux.org/index.php/Reiser4) | mkfs.reiser4(8) | [**reiser4progs**](https://aur.archlinux.org/packages/reiser4progs/)AUR | No |  |  |
| [**ReiserFS**](https://en.wikipedia.org/wiki/ReiserFS) | [**mkfs.reiserfs(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mkfs.reiserfs.8) | [**reiserfsprogs**](https://www.archlinux.org/packages/?name=reiserfsprogs) | Yes ([**base**](https://www.archlinux.org/groups/x86_64/base/)) |  |  |
| [**UDF**](https://wiki.archlinux.org/index.php/UDF) | [**mkfs.udf(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mkfs.udf.8) | [**udftools**](https://www.archlinux.org/packages/?name=udftools) | Optional |  |  |
| [**XFS**](https://wiki.archlinux.org/index.php/XFS) | [**mkfs.xfs(8)**](http://jlk.fjfi.cvut.cz/arch/manpages/man/mkfs.xfs.8) | [**xfsprogs**](https://www.archlinux.org/packages/?name=xfsprogs) | Yes ([**base**](https://www.archlinux.org/groups/x86_64/base/)) | [**xfs.txt**](https://www.kernel.org/doc/Documentation/filesystems/xfs.txt) [**xfs-delayed-logging-design.txt**](https://www.kernel.org/doc/Documentation/filesystems/xfs-delayed-logging-design.txt) [**xfs-self-describing-metadata.txt**](https://www.kernel.org/doc/Documentation/filesystems/xfs-self-describing-metadata.txt) |  |
| [**ZFS**](https://wiki.archlinux.org/index.php/ZFS) |  | [**zfs-linux**](https://aur.archlinux.org/packages/zfs-linux/)AUR | No | N/A ([**OpenZFS**](https://en.wikipedia.org/wiki/OpenZFS) port) |  |

Nhật ký

Tất cả các file system trên trừ ext2, FAT, Btfs, ZFS, đề hỗ trợ chức năng nhật ký, sử dụng journaling. “Journaling” cung cấp chức năng phục hồi lỗi bằng cách logging cách thay đổi trước khi người dùng thay đổi filesystem. Khi hệ thống lỗi hoặc mất điện, 1 số file system sẽ hư hỏng. Logging sẽ backup lại các khu vực đặc biệt đó.

Không phải tất cả loại “journaling” đều giống nhau. Ext3, ext4 cung cấp “data-mode journaling”. Nó sẽ log cả data và metadata, cung như logging thay đổi của metadata. “Data-mode journaling”

In the same vein, Reiser4 offers so-called "transaction models", which include pure journaling (equivalent to ext4's data-mode journaling), pure Copy-on-Write approach (equivalent to btrfs' default) and a combined approach which heuristically alternates between the two former.

Bên cạnh đó, fs cung cấp chế độ chế độ lệnh “ordered-mode journaling”, chỉ trên meta-data. Trong khi tất cả journaling sẽ trả lại trạng thái chính xác của fs sau khi gặp lỗi, “data-mode journaling” sẽ ghi 2 hoạt động: tới journal và disk. Sự đánh đổi giữa tốc độ và độ an toàn sẽ được cân nhắc với mỗi loại file system.

File system được trên 2 hoạt động copy-on-write, như Btfs và ZFS, sẽ không cần tới các journal truyền thống để bảo vệ metadata vì chúng sẽ không cần đề update.

Although Btrfs still has a journal-like log tree, it is only used to speed-up fdatasync/fsync.

FUSE-based file systems

[**Filesystem in Userspace**](https://en.wikipedia.org/wiki/Filesystem_in_Userspace) là kỹ thuật của hệ điều hành Unix, cho phép user không cấp quyền được tạo file system của riêng họ mà không phải chỉnh sửa kernel code. Đây là thành quả đạt được bằng cách chạy file system code trong trạng thái user space, trong khi FUSE kernel modult sẽ cung cấp giao tiếp với kernel interface.

1 số FUSE

* **adbfs-git** — Mount an Android device connected via USB.

[**http://collectskin.com/adbfs/**](http://collectskin.com/adbfs/) || [**adbfs-git**](https://aur.archlinux.org/packages/adbfs-git/)AUR

* [**EncFS**](https://wiki.archlinux.org/index.php/EncFS) — EncFS is a userspace stackable cryptographic file-system.

[**https://vgough.github.io/encfs/**](https://vgough.github.io/encfs/) || [**encfs**](https://www.archlinux.org/packages/?name=encfs)

* **fuseiso** — Mount an ISO as a regular user.

[**http://sourceforge.net/projects/fuseiso/**](http://sourceforge.net/projects/fuseiso/) || [**fuseiso**](https://www.archlinux.org/packages/?name=fuseiso)

* [**gitfs**](https://wiki.archlinux.org/index.php/Gitfs) — gitfs is a FUSE file system that fully integrates with git.

[**https://www.presslabs.com/gitfs/**](https://www.presslabs.com/gitfs/) || [**gitfs**](https://aur.archlinux.org/packages/gitfs/)AUR

* [**gocryptfs**](https://wiki.archlinux.org/index.php/Gocryptfs) — gocryptfs is a userspace stackable cryptographic file-system.

[**https://nuetzlich.net/gocryptfs/**](https://nuetzlich.net/gocryptfs/) || [**gocryptfs**](https://aur.archlinux.org/packages/gocryptfs/)AUR

* [**SSHFS**](https://wiki.archlinux.org/index.php/SSHFS) — SSHFS is a FUSE-based filesystem client for mounting directories over SSH.

[**https://github.com/libfuse/sshfs**](https://github.com/libfuse/sshfs) || [**sshfs**](https://www.archlinux.org/packages/?name=sshfs)

* **vdfuse** — Mounting VirtualBox disk images (VDI/VMDK/VHD).

[**https://github.com/muflone/virtualbox-includes**](https://github.com/muflone/virtualbox-includes) || [**vdfuse**](https://aur.archlinux.org/packages/vdfuse/)AUR

* **xbfuse-git** — Mount an Xbox (360) ISO.

[**http://multimedia.cx/xbfuse/**](http://multimedia.cx/xbfuse/) || [**xbfuse-git**](https://aur.archlinux.org/packages/xbfuse-git/)AUR

* **xmlfs** — Represent an XML file as a directory structure for easy access.

[**https://github.com/halhen/xmlfs**](https://github.com/halhen/xmlfs) || [**xmlfs**](https://aur.archlinux.org/packages/xmlfs/)AUR

Stackable file systems

aufs — Advanced Multi-layered Unification Filesystem, a FUSE based union filesystem, a complete rewrite of Unionfs, was rejected from Linux mainline and instead OverlayFS was merged into the Linux Kernel.

http://aufs.sourceforge.net || aufsAUR

eCryptfs — The Enterprise Cryptographic Filesystem is a package of disk encryption software for Linux. It is implemented as a POSIX-compliant filesystem-level encryption layer, aiming to offer functionality similar to that of GnuPG at the operating system level.

http://ecryptfs.org || ecryptfs-utils

mergerfs — a FUSE based union filesystem.

https://github.com/trapexit/mergerfs || mergerfsAUR

mhddfs — Multi-HDD FUSE filesystem, a FUSE based union filesystem.

http://mhddfs.uvw.ru || mhddfsAUR

overlayfs — OverlayFS is a filesystem service for Linux which implements a union mount for other file systems.

https://www.kernel.org/doc/Documentation/filesystems/overlayfs.txt || linux

Unionfs — Unionfs is a filesystem service for Linux, FreeBSD and NetBSD which implements a union mount for other file systems.

http://unionfs.filesystems.org/ || not packaged? search in AUR

unionfs-fuse — A user space Unionfs implementation.

https://github.com/rpodgorny/unionfs-fuse || unionfs-fuse

Read-only file systems

SquashFS — SquashFS is a compressed read only filesystem. SquashFS compresses files, inodes and directories, and supports block sizes up to 1 MB for greater compression.

http://squashfs.sourceforge.net/ || squashfs-tools

Clustered file systems

Ceph — Unified, distributed storage system designed for excellent performance, reliability and scalability.

https://ceph.com/ || ceph

Glusterfs — Cluster file system capable of scaling to several peta-bytes.

https://www.gluster.org/ || glusterfs

IPFS — A peer-to-peer hypermedia protocol to make the web faster, safer, and more open. IPFS aims replace HTTP and build a better web for all of us. Uses blocks to store parts of a file, each network node stores only content it is interested, provides deduplication, distribution, scalable system limited only by users. (currently in aplha)

https://ipfs.io/ || go-ipfs

MooseFS — MooseFS is a fault tolerant, highly available and high performance scale-out network distributed file system.

https://moosefs.com || moosefs

OpenAFS — Open source implementation of the AFS distributed file system

http://www.openafs.org || openafsAUR

OrangeFS — OrangeFS is a scale-out network file system designed for transparently accessing multi-server-based disk storage, in parallel. Has optimized MPI-IO support for parallel and distributed applications. Simplifies the use of parallel storage not only for Linux clients, but also for Windows, Hadoop, and WebDAV. POSIX-compatible. Part of Linux kernel since version 4.6.

http://www.orangefs.org/ || not packaged? search in AUR

Sheepdog — Distributed object storage system for volume and container services and manages the disks and nodes intelligently.

https://sheepdog.github.io/sheepdog/ || not packaged? search in AUR

Tahoe-LAFS — Tahoe Least-Authority Filesystem is a free and open, secure, decentralized, fault-tolerant, peer-to-peer distributed data store and distributed file system.

https://tahoe-lafs.org/ || tahoe-lafsAUR

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