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What USB drive filesystem works out of the box on Windows, Linux, and OS X?

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What USB drive filesystem works out of the box on Windows, Linux, and OS X so that, when I give a 64GB USB drive to my dad, I don't have to tell him to first type in `sudo apt-get install exfat-fuse exfat-utils ntfs-3g` in the terminal, for example?

filesystems

edited yesterday
 Big Chris
3,859 ● 1 ● 4 ● 17

asked yesterday
 Mihai
361 ● 3 ● 12

2 There really isn't one. Those filesystems that are cross-platform out of the box don't support partitions as large as 64GB. Which means you are going to need to provide the drivers to those filesystems that do support partition size that large. You can't tell your father to type in that command once and be done with it? - [Ramhound](#) yesterday

I think that really depends on which filesystems you selected when you compiled your Linux kernel. Or when your Distribution did it for you, if you went that way. - [Toby Speight](#) yesterday

3 possible duplicate of [Cross-platform file system](#) - [Mihai](#) 20 hours ago

1 What, you didn't already install all those nifty required packages for your dad? :) - [Ángel](#) 19 hours ago

The "most correct" answer changes depending on which versions of each platform in particular you need to support. ExFAT is supported well on modern versions of every OS, but if you need to support XP or Mac OS X Leopard (10.5) or older, or some arbitrarily old versions of Linux it won't work OOB. Otherwise NTFS is your next best bet if FAT32 is too restrictive. - [afrazier](#) 2 hours ago

6 Answers

The FAT series of filesystems tends to be the most widely supported on modern day operating systems. It's a very simple filesystem, and a basic implementation can be written quickly for any platform. **FAT16** is probably the most widely supported variety, followed closely by **FAT32**. For a 64 GB drive, FAT32 would be ideal. As others have mentioned, the catch is that you'd need to use a third party utility to format the partition if you're using Windows because the built-in Windows utility can't create FAT32 partitions larger than 32 GB. **FAT32 is probably your best bet if you can tolerate the initial hassle of formatting the drive.**

exFAT isn't really in the FAT family because it's encumbered by patents. However, it is starting to see more widespread use, particularly on mobile platforms, as it's a standard format for large SD cards. You'll likely find native support for exFAT on any device with an SDXC card reader. As you've noticed, some platforms—or specific versions/distros of platforms—don't ship the drivers by default, either because they're unnecessary on devices without SDXC hardware or the distro chooses to avoid "non-free" software by default. **My recommendation would be to use exFAT if FAT32 is too restrictive, particularly if you'll often be using the drive on Windows.** Yes, you may need to install drivers on some Linux systems, but they are useful drivers that should probably be installed anyway.

Formatting the drive as **UDF** would overcome some of the limitations of FAT32. However, some platforms are likely to present the device to the user as an optical drive, which could be cumbersome. You'd also probably need a third-party utility to format the drive on Windows or Mac. If you go this route, make sure to use plain UDF, rather than VAT or spared. The latter two builds are for certain types of optical media and won't work as expected on a flash drive. **Allegedly, UDF doesn't support files larger than 1GB on Linux** due to a lazy fix for a security vulnerability (CVE-2006-4145)—I haven't verified this. There's also some evidence to indicate that Windows may outright refuse to handle non-optical media formatted as UDF, but I haven't tested this either.

edited 9 hours ago
 JakeGould
14k ● 4 ● 36 ● 53

answered 20 hours ago
 Zenexer
388 ● 1 ● 2 ● 13

1 Also have to note that FAT32 doesn't support files larger than 4G. - [Ruslan](#) 1 hour ago

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I would recommend the FAT32 filesystem.

The **FAT32** filesystem works out of the box on almost all OSes. Most USB flash drives come preformatted as FAT32.

You will have to make 2 partitions on the USB, and they will only be visible on Linux or Mac. This is because FAT32 can only handle 32GB partition sizes at most. In Windows, it will only show the first partition.

FAT can only handle partition sizes of 4GB, so I would not recommend it because as I said Windows will only show the first partition.

NTFS needs additional drivers on Linux and Mac, and you may run into problems with file permissions.

edited 3 hours ago

answered yesterday
 geek1011
617 ● 16

9 +1 for the FAT32 but your answer could do with mentioning the partition size limitation of FAT32 as the OP says he'd like to hand his dad a 64GB disk... FAT32 supports 32GB max partition size if formatted in Windows - [Big Chris](#) yesterday

11 @BigChris FYI, that 32GB limitation is only in Windows' default format tool. Other tools will create larger FAT32 partitions on Windows. - [Martijn Heemels](#) yesterday

3 And Windows will happily read a large FAT32 partition, bigger than 32 gb - [Canadian Luke](#) yesterday

11 Also, the maximum files size for FAT32 is limited to 4GB. - [algiozia](#) yesterday

1 @BigChris A flash drive can have multiple partitions, but Windows will only recognize and read from the first partition. It will refuse to mount, delete, or format the others. This stands as of Windows 10, though the other partitions will show up in diskmgr.msc. Some motherboards can be configured to present flash drives as external hard drives, which circumvents this problem, but can introduce other caveats. - [Zenexer](#) 21 hours ago

UDF is supported by most modern operating systems and does not have the severe limitations of FAT32. See the [compatibility table](#) on Wikipedia.

answered yesterday
 suriv
181 ● 4

1 I've tried using UDF, and ran into issues on all platforms. It's good on paper but isn't mature in the implementation and support. - [JDlugosz](#) 11 hours ago

FAT32 works almost on every device but but Windows only allows FAT32 partition to be 32GB. You need to format it using Linux (eg. gparted) if you want 64GB. Windows will not have any problems with reading/writing from/to that partition.

NTFS would also work but you may encounter problems with file permissions.

edited yesterday

answered yesterday
 rav_kr
69 ● 4

4 There're 3rd party tools to format larger FAT32 partitions in Windows. The 32GB limit is only in the format tool; it'll happily read/write to larger ones. I know I've done it with a 64GB sd card; might've done with a 128 too. (Not sure, and I'm not home to check.) - [Dan Neely](#) yesterday

@rav_kr Macs cannot write to NTFS filesystems out of the box, so FAT32 seems the only option. - [Mihai](#) yesterday

We shouldn't really recommend NTFS for any use. It inherently has stability issues (no journal, no copy-on-write, etc... all the things a modern filesystem has standard). It's not portable, and no device natively can read and write to it. - [SnakeDoc](#) 18 hours ago

1 @SnakeDoc NTFS does have Journaling. COW is a design decision, it's not "modern". NTFS is rock solid. - [Daniel B](#) 10 hours ago

2 @SnakeDoc: NTFS is journaled, not sure where you got the idea that it's not. It also supports ownership, ACLs, hard links, symbolic links, mount points (that aren't drive letters), multiple data streams, transparent compression or encryption, large files, very long file names, and many other features. Copy-on-write is the main "modern" feature it's lacking, and even many Linux filesystems lack it. - [CBHacking](#) 9 hours ago

FAT is the most widely supported partition type. Allows volumes up to 4GB and file size up to 2GB. This is also supported by most devices (like TVs, cars, etc)

FAT32 also works on all the mentioned systems, allows volumes from 512 MB to 2 TB and file size up to 4GB. As mentioned by others Windows XP only allows volumes up to 32GB.

NTFS is only supported by Windows versions based on NT (Windows 2000 or Windows XP and above) and *NIX systems

Source: https://www.microsoft.com/resources/documentation/windows/xp/all/proddocs/en-us/choosing_between_ntfs_fat_and_fat32.msp?mfr=true

I personally creates two partitions on (big enough) USB drives, so I'm sure I'll always have a way to store data if I visit a place.

edited 10 hours ago

answered yesterday
 algiozia
149 ● 4

Also, you can use NFS on *NIX to access NTFS drives. Probably there's something for Mac as well. - [Ismael Miguel](#) yesterday

3 @IsmaelMiguel NFS has nothing to do with NTFS. It is a protocol for accessing files over a network. - [suriv](#) yesterday

I remember using NFS configured to read local NTFS drives. But, my memory may fail since it was around 6-8 years ago. But *NIX usually has NTFS support almost out-of-the-box, on some distributions. - [Ismael Miguel](#) yesterday

To the first question, "What is the most 'cross-platform' high capacity filesystem?": There isn't one, but UDF would be closest if only it was more useful in non-optical formats. Excluding Windows OSes, HFS+ turns out to be pretty useful for moving across the other common platforms, Linux & OSX. (But sadly, not BSD: https://en.wikipedia.org/wiki/Comparison_of_file_systems).

I recently was doing a lot of bulk file transfers (terabytes) between Linux and OSX systems, and UDF or ext2 seemed the natural choices for formatting the 5tb drives I was using for the transfers. Neither was perfectly satisfactory because of differences in partition schemes and/or/poor native driver support. In the end, Linux was better at writing to HFS+ (sans journaling) than OSX was at reading anything else.

To the second question: Why not just format the drive so it works right on your dad's computer?

answered 21 hours ago
 Tarryn
121 ● 3