

# Defragmenting/Optimising Disk Drives

On a brand new disk drive, whole files are stored sequentially in one piece.

If a file is deleted, its space may be taken up by a new file, but if the new file is larger than that space then it is fragmented into two or more pieces on different areas of the disk and the location of these fragments is stored in the *File system* (see below).

Over time the number of fragmented files can be so high that disk access begins to slow down and the drive has to work harder, so reducing its life span.

Disk defragmentation moves all the fragmented files around so that each file comprises a single fragment.

All this is managed by a *file system* on the disk which determines how files are named, stored, and organized on a disk. A file system manages files and folders, and the information needed to locate and access these items by users. There are two main file systems used these days –NTFS (New Technology File System) and the older FAT (File Attribute table). Most hard disks use NTFS. Most SD cards and USB sticks use FAT.

With Windows XP and earlier versions of Windows, we were constantly reminded to regularly defragment our disks.

Windows 7, 8 and 10 will automatically defragment your hard disk weekly, so there is no need to manually defragment disks.

In PCs there are two main types of hard disk used – the spinning disk which has moving parts, and the SSD (Solid State Drive) which has no moving parts. Many computers have both types.

SSDs operate differently to the spinning disk. True defragmentation only occurs on spinning disks. To run this type of defragmenter on an SSD can damage it. ***This is another reason why you should allow Windows to look after your disk drives.***

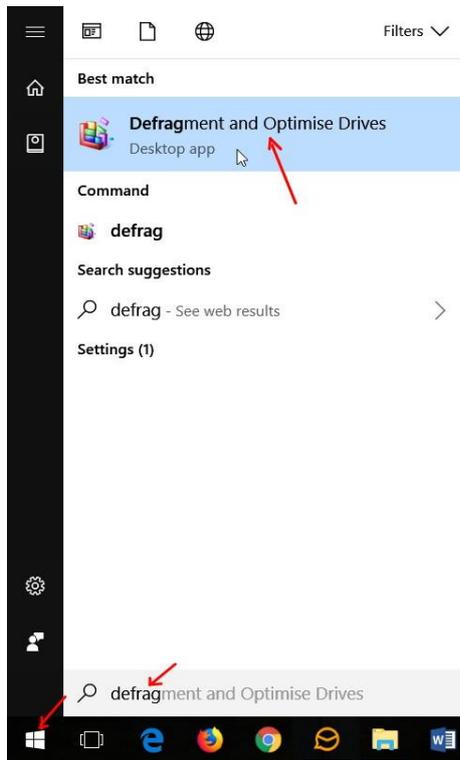
Windows 10 maintains SSDs better than Windows 8 or 7, and is tending to use the term “Optimise” instead of “defragment. With SSDs, the optimising process is very different to that used for spinning disks. The SSD requires the use of “Garbage collection” and “Trim”. See the following site for more detail:

<http://www.thesdreview.com/daily-news/latest-buzz/garbage-collection-and-trim-in-ssds-explained-an-ssd-primer/>

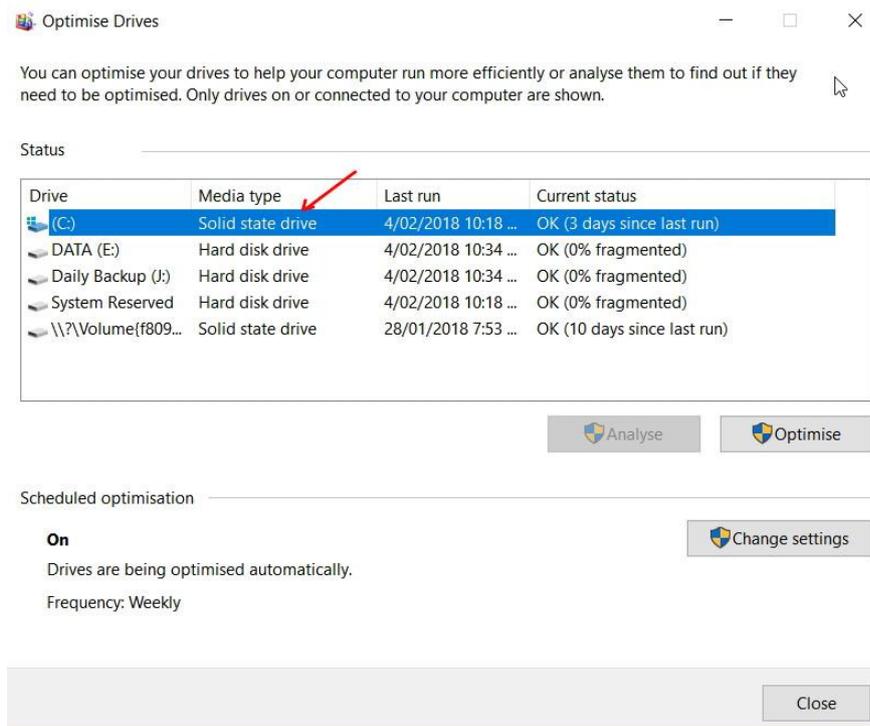
Apart from Windows maintenance of SSDs, SSDs contain their own “Firmware” (a small program stored in the disk unit itself). Many SSDs will do some self maintenance during the time a computer is Sleeping. If you have an SSD, It is a good idea to periodically Sleep your computer for a few hours rather than shutting it down.

# How to tell what sort of disk drives you have

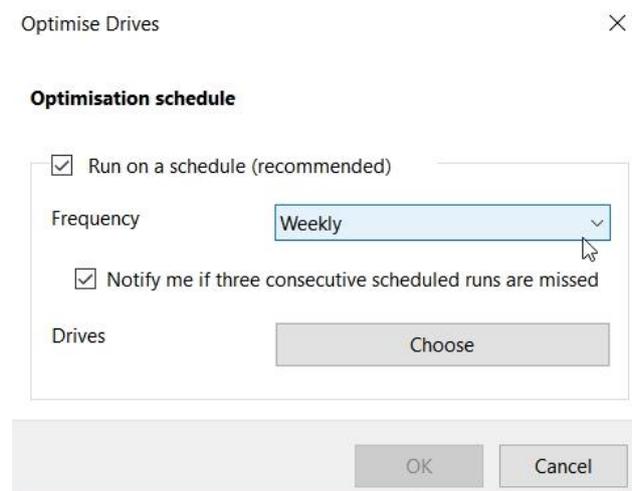
Click the Start button the type “defrag”. Click on Defragment and Optimise drives



The Optimiser windows displays the disk drives on your system and if they are SSD or hard disk. In the following example there is one SSD (C: drive) and two spinning hard disk drives (E:) and (F:) (System reserved and \\?\... Are special partitions of the disks used by Windows)



You can view the settings for the disk optimise – click on *Change settings*



Although you can change the settings for each drive, it is best to leave them at the default settings.