

Re: Shutdown my Laptop? Why should I?

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 - *Date:* Fri, 04 Aug 2006 01:54:01 -0500
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"Jack Nguy" <Jack@xxxxxxxxxxxx> writes:

Another thing to keep in mind is the spinning of the harddrive. A harddrive doesn't have infinite lifespan and laptop harddrives are not designed for 24/7 spinning.

Jack

On 7/12/06, David R. Litwin <presently42@xxxxxxxx> wrote:

I have a year old Toshiba Intel Mobil P4 laptop using Sid. I recently downloaded two large files via BitTorrent. As I wanted to have them as quickly as I could, I decided to leave my laptop on until they were fully downloaded, rebooting only for upgrades. I noticed no real difference in performance (maybe Azureus was hogging a bit more memory after a few days).

The question is this: Why should I ever turn off my laptop on a normal occasion (normal being every-day, standard, stationary usage)? If I don't want it on, I can suspend it in some way: Waking-up is faster than

The situation is not simple.

All electronic devices have a limited lifetime; some manufacturers publish "mean time between failure" (MTBF) figures, which are derived statistically. But disk drives have a particular limitation, namely, the number of starts. The last time I saw a specification sheet, the rated number of starts for a laptop drive was on the order of ten thousand to a hundred thousand, but nowhere near a million. So a laptop in which the drive constantly is being powered down to save the battery is likely to fail sooner than a drive which is kept spinning continuously.

Continuous operation is not mechanically harmful to a drive, unless you consider bearing wear. Ball bearings eventually fail, but in a drive bearing failure typically is due to contamination, rather than to

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loading. And the newer drives have "fluid film" (i.e., sleeve) bearings rather than ball bearings; these theoretically have infinite life, if there is no contamination of the lubricant.

Whenever a drive stops turning, the lubricant film is lost, with the result that metal-to-metal rubbing contact occurs during stopping and during subsequent startup; this contact is a source of contamination.

The head of the drive normally flies (in the aerodynamic sense) above the spinning media; there is no contact with the media while the drive is spinning. But as the drive stops turning, the supporting air film is lost, and the head contacts and rubs against the media; this rubbing contact is a source of contamination. And upon startup, the head rubs against the media until the disk is spinning fast enough for the head to fly; this also is a source of contamination. Because of this rubbing, drives have a "parking zone" or "landing zone" to which the head is moved upon power-down. Early drives had a "park" command; modern drives park automatically. The landing zone is outside the region used for data storage.

Finally, whenever a drive is dropped or bumped, the head typically impacts against the media and dislodges microscopic particles; this also is a source of contamination.

The head flies at a height above the media which is about equal to the diameter of a particle of cigarette smoke. In a photomicrograph, a particle of cigarette smoke looks like a jagged boulder; if it wedges between the head and the disk, it can gouge media from the surface of the disk.

So, within the enclosure of a drive, there are several sources of contamination. The contamination can cause media damage and bearing failure. Contamination is less likely to be generated in a drive which is kept running continuously.

While continuous operation is better for the drive, it can shorten the life of electronic components in the laptop, including the electronics of the drive; this is because the interior of a laptop typically is significantly hotter than the interior of a desktop machine. The elevated temperature is a consequence of the fact that power is required to circulate cooling air, and the circulation of air is noisy. In a laptop, power must be conserved, and noise must be minimized; so a laptop cooling of necessity is a compromise. But the life of components such as transistors (and thus, integrated circuits) and electrolytic capacitors is shortened, sometimes dramatically, by elevated temperature.

So it generally is best to use a laptop in the service for which a laptop was designed. But if you keep the machine in a cool room, it may run for years in continuous service.

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RLH

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