

Re: Reformat Sd-Card?

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- *From:* "Werner Ruotsalainen [MS MVP – Mobile Devices]" <here@xxxxxxxxx>
 - *Date:* Wed, 22 Mar 2006 10:12:51 +0100
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Get some better engineers.

Agreed :)

An SD card's memory has a limited number of times that it can be used and rewritten. To get around this limitation the card uses different areas of its memory at different times, greatly extending the life of the memory cycles to the point that it is quite practical. But it is not always a contiguous block.

That's not really correct. There is no such 'magic' in the flash controller. It just makes sure it maps out the useless bits (in general, in 4–8 bytes at once); still, the operating over the microcontroller system doesn't see anything of this. That is, logically, this results in no additional fragmentation resulting in the need of, for example, adding new FAT entries – logically.

BTW, even EEPROM's have a very good life expectancy. The next excerpt (p.77) is from the "Smart Card Handbook" from John Wiley and Sons, one of my favourite Smart Card handbook:

"EEPROM is one of the few types of semiconductor memory having a limited number of access cycles. It can be read any number of times, but it can be programmed only a limited

number of times. The reason for this limitation can be found in its semiconductor structure.

The life expectancy of an EEPROM depends strongly on the nature, thickness and quality

of the tunnel-oxide layer between the floating gate and the substrate. Since this layer must

be produced very early in the fabrication process, it is exposed to strong

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thermal stresses in

subsequent fabrication steps. This may cause damage to the oxide layer, which in turn affects

the useful life of the EEPROM cell. During fabrication, and every time the cell is written,

the tunnel-oxide layer absorbs electrons that are not subsequently released. These 'trapped'

electrons are located close to the channel between the source and the drain, and once they

reach a certain number they have a stronger effect on the threshold potential than the charge

stored in the floating gate. When this happens, the EEPROM cell has reached the end of its

useful life. Although it can still be written, the charge on the floating gate has only a minimal

effect on the characteristics of the channel between the source and the drain, so the threshold

potential always remains the same. The number of possible write/erase cycles varies greatly,

depending on structural details. Typical values range from 100,000 to 1,000,000 cycles over the

entire range of operating temperature and voltage. At room temperature and using an optimum

supply voltage, values that are 10 to 50 times greater can be achieved.

When an EEPROM cell is approaching the end of its life, its data retention time decreases.

The retention time can range from hours to minutes or even seconds. The more exhausted the

EEPROM becomes, i.e., the more electrons that have been absorbed by the tunnel oxide layer,

the shorter is the retention time."

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As for defragging a SD card, that is not required, nor would I recommend it.

Nor would I. Simply moving the files off the card (and probably formatting – but that's, in general, not needed) and, then, moving the files back to the card will suffice. Again, I recommend my articles on this subject – I've explained all this stuff in depth there.

After all, the card is managing itself quite well, and rearranging the memory locations used will probably not result in a contiguous block in any means – that is, if the card is doing as it is supposed to and utilizing all available memory location evenly.

Again – this is at the physical level, not at the OS level. The microcontroller does rearrange SOME stuff (when some cells become dead), but the OS doesn't see anything of this. Furthermore, the microcontroller does NOT arrange fragmented files to be unfragmented – its only task is, rearrangement-wise, is mapping out the bad bits. That is, there *will* be fragmentation.

BTW, I've done quite a lot of work with SmartCards (even programmed them).

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Werner Ruotsalainen – Microsoft MVP – Windows – Mobile Devices
Please see my blog at <http://www.pocketpcmag.com/blogs/index.php?blog=3> – you will definitely like it.

"xTenn" <xTennRemoveThisPart@xxxxxxx> wrote in message
[news:O\\$Ut1OTTGHA.196@xxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:O$Ut1OTTGHA.196@xxxxxxxxxxxxxxxxxxxxxxxxxxxx)

"Dr. O'Woodard" <DrWoodardOnDS@xxxxxxxxxxx> wrote in message
news:kis022lnrp528a8pa84ktb7mi6jp712h6o@xxxxxxxxxxx

On Tue, 21 Mar 2006 13:01:27 -0600, "Clinton Fitch {MVP-Mobile Devices}" <management@xxxxxxxxxxxxxxxxxxxxxxxxxxxx> wrote:

I disagree.

Just because it is solid state does not mean that it does not fragment.

Fragmentation has more to do with the OS than the physical platform.

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Regards,

The engineers tell me the files can't be fragmented. That every time you save to a solid state card like SD the the entire contents of every file is re-written to the card in contiguous form. This from engineers I know who worked at HP.

Get some better engineers. An SD card's memory has a limited number of times that it can be used and rewritten. To get around this limitation the card uses different areas of its memory at different times, greatly extending the life of the memory cycles to the point that it is quite practical. But it is not always a contiguous block.

As for defragging a SD card, that is not required, nor would I recommend it. After all, the card is managing itself quite well, and rearranging the memory locations used will probalby not result in a contiguous block in any means – that is, if the card is doing as it is supposed to and utilizyng all available memory location evenly.