

Re: FileCopy overwrites the existing file

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- *From:* "anton bassov" <soviet_bloke@xxxxxxxxxxx>
 - *Date:* 5 Dec 2006 12:05:36 -0800
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To understand it you'll need to go much lower level than most computer scientists do, ie below NAND gates and ask yourself what really binary 0 and 1 is. On electronic level 0s and 1s are determined by measuring voltage. When you overwrite former 0 by 0 and former 1 by 0 you'll get different voltage measurements (same with overwriting by 1). Of course both of these will be read as logical 0 (1) by the hardware. But now you can already imagine that a specially tuned hardware will be able to distinguish between those, thus recover the former value.

Exactly – this is what speculation about the possibility of recovering overwritten data is based upon. From the logical standpoint, the task in itself is **THEORETICALLY** feasible – no one argues about it. However, AFAIK, in practice no one has yet demonstrated how to do it in more or less reliable way. This is the reason why no data recovery company gives you 100% guarantee of success – if data has been actually overwritten, there is a very good chance that it is gone forever.....

Anton Bassov

Grzegorz Wróbel wrote:

anton bassov wrote:

if you refer US Department of Defence they, depends on how documents are classified recommends up to 7 times rewriting with random data (if I remember well).

Three times is the actual standard. Indeed, there was a **SUGGESTION**

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that overwriting data up to 7 times may be needed, but, again, this is just a speculation.

Concerning classification, AFAIK, top-secret data is still destroyed only by disk incineration.....

I recall reading some newer document stating 3-times overwrite is required for documents classified as CONFIDENTIAL and 7-times write for documents classified as SECRET. I can't find it on my hardrive though ;)

Recovering overwritten data is NOT a speculation, it can be done and any good software recovering company will do it without problems if the data was overwritten only once (we're talking about magnetic data storage disk here).

AFAIK, they deal only with such things as disaster (i.e mechanical or electrical damage to the disk) recovery, formatted disks, accidentally deleted files, etc, and still they never guarantee that absolutely all data will be recovered – when it comes to recovering data that has been actually overwritten, they are out of luck (unless they are able to find a copy of it somewhere on the disk, which happens quite often).....

I wrote a data destruction utility some time ago. I was quite confident that one-pass overwrite will be enough if you chose a good random number generator (large seed and enormous period). I realized much later I was wrong, because not only choosing good pseudo-random number generator is critical, but multiple overwrite as well. To understand it you'll need to go much lower level than most computer scientists do, ie below NAND gates and ask yourself what really binary 0 and 1 is. On electronic level 0s and 1s are determined by measuring voltage. When you overwrite former 0 by 0 and former 1 by 0 you'll get different voltage measurements (same with overwriting by 1). Of course both of these will be read as logical 0 (1) by the hardware. But now you can already imagine that a specially tuned hardware will be able to distinguish between those, thus recover the former value.

What is worse you can't tell how much times you should really overwrite the data to make it unrecoverable, since whether it will be recoverable or not depends on given hardrive characteristic. That is why (or at least one of the reasons), what I believe, documents classified as TOP-SECRET are not to be destroy this way.

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Grzegorz Wróbel

<http://www.4neurons.com/>

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