

White paper



Registry Optimization: Beyond Registry Cleaning

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The registry is one of the most critical components of your PC. It holds settings needed by software, hardware, and the Windows operating system, and when it becomes cluttered or corrupted, the overall condition of your computer declines. To maximize your PC's performance and stability, the registry should not only be kept clean, but should also be kept organized and at its minimum size.

Keeping the registry in good condition should be a top priority for all PC users—without proper care of the registry, a computer will only get slower and errors will eventually begin to surface. Registry optimization should be done regularly and include the following:

- Clean and repair the registry
- Defragment and compact the registry
- Back up the registry

Why should I optimize the registry?

The registry, vital to your PC's operation, stores configuration settings that the operating system needs to perform all of its operations. Due to the critical role it plays in how Windows operates, errors in the registry have a significantly detrimental effect on performance. When the registry becomes corrupted or disorganized, you can experience slow boot times, sluggish responses from programs, unusual error messages, and frequent lock-ups or crashes.

Conversely, following just a few simple steps to maintain your registry's health can make your PC both faster and more stable and can add years to your computer's life.

How do errors develop in the registry?

When you get a brand-new computer, the registry is clean and organized. But as you use the computer, the registry grows larger and larger, becoming cluttered with invalid data and disordered with fragmented entries. After just **six months to a year** of use, hundreds of registry errors can develop.

How does this happen?

- The primary cause is a design flaw in the registry. The registry is designed to hold data about every program you've ever installed, every driver you've ever used, and every printer, camera, USB drive, and any other gadget you've ever plugged in – even just once. The problem arises in that many of these settings quickly become obsolete, but Windows is still trying to decipher the commands every time you start your PC or open a program.
- Even after cleaning out invalid and obsolete entries, the old registry keys are deleted, but the registry does not get smaller. Rather, the old entries leave gaps and the registry becomes bloated – unnecessarily large and fragmented. And because the registry is loaded into RAM during startup, the bloat also eats up vital system memory.
- Lastly, dangerous files, installed without your knowledge, are often designed to hide themselves inside registry commands.

Signs of an unhealthy registry

6 months–1 year of no maintenance

- Slow boot times and program response times
- Perplexing error messages
- Hidden malicious software in the registry
- Frequent computer lockups and crashes

With regular registry optimization

Only 10–15 minutes every month*

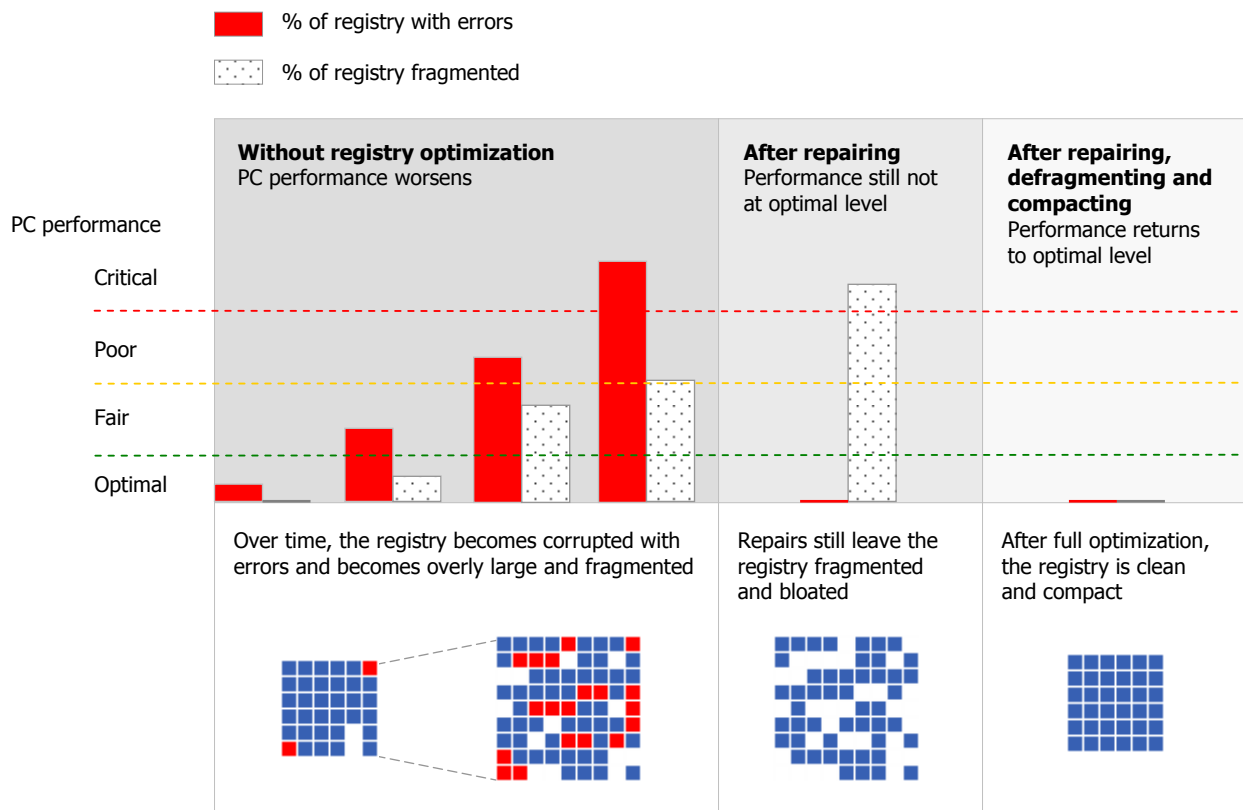
- Boosted efficiency and speed
- Increased stability
- Removal of potentially dangerous programs
- Extension of the healthy life of your PC

* Some PC tune up programs can automate registry repairs either on an as-needed basis or on a scheduled basis. If your software does not include an automated feature, you may wish to run the processes bi-weekly or monthly, depending on how often you install programs and devices. All users should clean and optimize their registry at least every three months.

Illustration of registry degradation and optimization

The following diagram illustrates how:

- The registry degrades over time, with an increasingly detrimental effect on performance
- Both erroneous entries and registry bloat negatively affect processing
- Complete registry optimization – repairing, defragmenting, and compacting – eliminates errors, shrinks the size of the registry, and improves overall performance

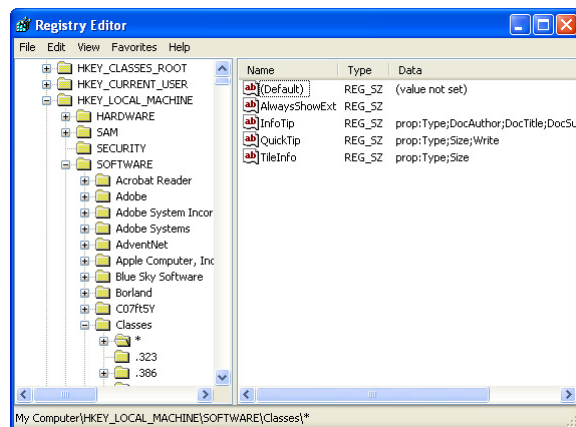


How do I fix the registry? Can I do it myself?

The registry, a set of protected data files saved in various locations on your computer, is both large and complex. To clean and repair the registry, specialized software can locate the values stored in the registry, compare them to the software and hardware that is actually on your computer, and then either correct or remove any erroneous entries.

Windows does provide a tool called *Registry Editor* that allows users to view and modify registry contents manually, without the use of any additional software. But with cryptic names and no descriptive file information, it is not possible for most users to make safe changes with this tool.

While many like to learn about their PCs and software through trial-and-error and experimentation, this is not a safe option with Registry Editor. Registry changes, even just one incorrect registry entry, can cause **irreversible damage to your computer**, including a completely unbootable PC. You should never manually edit the registry unless you know what you are doing. Due to the high risk, even Microsoft recommends using specialized tools to make registry changes, rather than attempting to make manual changes.



Registry Editor. Unlike other Windows tools, Registry Editor does not have a readily accessible interface—it can only be opened from the Run menu. Registry Editor is "hidden" to discourage its use by the casual user; the tool is intended for trained system administrators.

Advanced technical users who feel comfortable making manual registry tweaks and changes will still likely find Registry Editor impractical for large-scale registry repairs and optimizations. The tool is intended for modifying single entries, not for extensive registry maintenance. The registry can easily contain tens of thousands of values—locating all the appropriate keys will be a daunting task and many areas can be overlooked. If you do wish to make manual changes through Registry Editor, be sure to back up the registry first.

Are all registry cleaners the same?

All registry cleaners will detect and clear out some invalid entries. They can differ, however, in how they detect and report errors, in how deeply they search for errors, and in their level of sophistication for repairing errors.

- Many registry cleaners are not designed to clean a corrupted registry; any complicated errors are simply skipped by the program. Conversely, some registry cleaners are overly aggressive and can remove necessary entries, breaking the functionality of your programs.
- Many trial versions either limit the areas of the registry that are searched or they restrict the number of errors that can be repaired. Additionally, they may show an inflated number of errors in order to induce you into purchasing the full version (see below).
- Some registry cleaners artificially inflate the number of errors detected. One technique is to include temporary issues that actually eliminate themselves soon after creation; “repairing” such items has no impact on performance. Another tactic is to take a single problem and divide it into dozens of subparts prior to reporting. This overstatement makes the list of detected problems appear impressively long, but only one repair is actually needed.
- Some registry cleaners are not safely integrated into Windows. Some are known to conflict with commonly used programs (such as Microsoft Word) and some unsafely attempt to defragment or compact the registry *while Windows is running*; software that manipulates the registry in this way at the same time as Windows can result in data loss and an even more corrupted registry.
- Finally, most registry cleaners do just that—clean. To properly optimize the registry, you should also defragment and compact the registry and run regular backups.

How do I choose a registry cleaner?

An internet search on “registry repair” or “registry cleaners” will display a bewildering array of results. How do you know which one to choose?

1. To ensure that modifications to the critical registry are **safe**, use a program from a software maker you trust. Further, verify that the company offers technical support; many companies that create registry cleaners are quite small and do not have any customer support staff.
2. To ensure that registry repairs are **thorough**, use a program that can run complete repairs, rather than a trial version that limits the number of errors it will fix; for trial versions, look for software that offers full functionality during the trial period.
3. To ensure a **comprehensive** approach to registry optimization, use a program that not only cleans and repairs, but also defragments and compacts the registry and allows for registry backups and restorations.
4. To ensure a balance of ease-of-use and user control, use a program **with versatility**; ideally, the software will have different registry scanning/testing levels and will offer both automated and user-driven repairs.

Registry Optimization

Registry optimization should be done regularly and include the following:

- Clean and repair the registry
- Defragment and compact the registry
- Back up the registry

Clean and repair

Normal, everyday PC usage can cause the registry to become filled with errors and obsolete entries. Registry repair tools use code that safely integrates into Windows to make changes to the registry. The software will compare what is in the registry to what is actually on your computer and will then either correct or delete erroneous entries. The cleaning and repair process can also detect and remove dangerous software that may be running without your knowledge.

Defragment and compact

As you make system changes and the registry grows, the registry becomes fragmented and overly large. Defragmenting the registry restructures the data so that Windows can access what it needs faster, while compacting eliminates the bloated and unused space in the registry. The processes work together to speed registry access, improve registry efficiency, and free up vital memory. To prevent the risk of data overwrites and registry corruption, the software must defragment and compact the registry at boot time, before the operating system loads.

Back up

Since the registry is vital to your computer's ability to run correctly, regular backups of the registry are an important safeguard. A full registry backup and restoration function allows you to bring the registry back to a previous state; this is crucial in case you ever need to restore its vital settings.



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