An Overview of Common SolidWorks Performance Issues

Every SolidWorks user wants to do more, faster, with fewer mistakes. Here’s a quick look at the top performance issues SolidWorks users are facing, and some advice on what you can do about them.

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Executive Summary
Speed, system reliability, and design quality are all top of mind for SolidWorks users. It’s natural that you want to get the most from your applications, and adjustments to both your software and hardware can help boost your productivity in a major way. While it’s easy to solve most performance issues with big budgets, there are several things you can do to optimize your system without incurring significant expense. In this paper, I’ll show you a variety of ways to work better, faster, and smarter—and help you determine whether or not a performance gain is worth the cost.

Performance Issue 1: Getting More Done in Less Time
Time to market is important for businesses, and that puts pressure on design engineers to work faster. Fortunately, there are many things you can do to fulfill your need for speed.

Bring Your Software Up to Speed
At the software level, a few simple setting and workflow adjustments can have a significant impact on how fast you work.

For example, check your operating system. If you’re running a 32-bit version, you won’t be able to access as much memory as you would with a 64-bit version.

Another way to free up memory for SolidWorks is to remove unneeded applications that are set to automatically start up when your OS is loaded. Check your Start Menu Folder to see which applications you can remove to free up RAM.

Of course, the most obvious software adjustment you can make is to upgrade to the latest version of SolidWorks. Dassault Systèmes puts out annual SolidWorks updates for a reason, and studies have shown dramatic improvements in performance from one version to the next.

Maximize Your Memory
At the hardware level, memory is one of the easiest and most affordable ways to accelerate SolidWorks. SolidWorks system requirements say that you can work with 1 GB of RAM, but the gain achieved with the recommended 6 GB or higher definitely justifies the extra cost, starting around $100.

With more RAM you can avoid caching data to your hard drive, which generally prevents you from getting anything done. The first clue that this is happening is the sound of your hard drive spinning. Short of adding memory, the only other solution is the time-consuming task of restarting your system.

Defrag Your Hard Drive
Fragmentation can strain your hard disk and slow you down. Use Disk Defragmenter in Windows, either manually or on a set schedule, to help your hard disk work more efficiently.

Upgrade Your Video Capabilities
For the best performance, choose from the latest SolidWorks-certified video cards and drivers. For example, if you’re currently using an FX380 video card, you can achieve a 25% 3D performance gain by upgrading to an NVIDIA Quadro 400.
Make the Move to Multiple Monitors

Microsoft® researchers have demonstrated that using a second monitor can improve your productivity by about 10%—and up to 50% for specific, sometime repetitive tasks like cutting and pasting.

In the study, respondents using multi-screen configurations saw solid gains after just five minutes of training:

- 6% quicker to task
- 7% faster on task
- 10% more production
- 16% faster in production
- 33% fewer errors
- 18% faster in errorless production

These results led to the conclusion that multiple monitors were cost effective where multi-screen tasks represented as little as “15% of total work for the highly competent, 17% for entry-level competence, and 21% for the general work force.”

Having CAD running on the primary display—while viewing specs, related drawings, and even email on a second display—eliminates the need to constantly switch among windows on a single monitor. You can also spread SolidWorks across both monitors if you’re working on very large drawings or complicated assemblies.

A study by Jon Peddie Research estimated that only 1.9% of new systems were equipped with multiple displays, despite a great demand for the configuration. Obstacles to obtaining additional displays included price, available desk/office space, not understanding how to do it, and additional heat, noise, and radiation.

Before you run out and get a second monitor, check to see if your system can handle multiple screens: Most workstations will, but you’re better safe than sorry.

Monitor Quick Tip

If you’re on a limited budget, get one big monitor instead of two smaller ones to increase productivity.

Performance Issue 2: Preventing System Crashes

In addition to speed, system reliability is another major factor to ensure SolidWorks performance.

Use SolidWorks-Certified Drivers

One of the simplest things you can do to make your system more reliable is to only install SolidWorks-certified drivers. You can obtain a list at http://www.solidworks.com/sw/videocardtesting.html.

Avoid System Lockups and BSOD with ECC Memory

Memory errors are the leading cause of system crashes, and have also been shown to make systems more vulnerable to security breaches.
What happens is known as a “bit flip,” which occurs about once a week on typical systems with 4 GB of memory. Radiation within the system causes a memory bit to suddenly change state from 0 to 1 or 1 to 0. If this occurs in an application area, there can be an error in a calculation or the application may crash. If the error occurs in the OS, your whole system could crash or present you with the Blue Screen of Death.

Workstations with Error Correction Code (ECC) memory provide a much more stable computing environment, resulting in fewer computer crashes and better data integrity. Several studies confirm that ECC memory detects and fixes single bit errors and reduces the likelihood of a system crash by 25 times.

A recent Google study showed that 32.2% of all its machines experienced an average of 277 errors per year that were correctable with ECC memory. Just 1.3% of the machines had errors that ECC memory couldn’t correct.

Performance Issue 3: Ensuring Defect-Free Design
Another category of performance issues, which is often overlooked, centers around getting designs ready for production without mistakes. Many designers worry that an unnoticed error could cost a lot to fix, once in production.

Step Up Your Screen Size
Larger monitors can help you design with fewer errors. In addition to easing eye strain, larger monitors make it easier to see design flaws and other problems.

Because of permanent menus and other displayed application items, using a smaller monitor limits your usable modeling area. For about $100 more than a 19-inch model, a 22-inch monitor gives you 32% more work area and a 24-inch monitor can increase your usable workspace by up to 57%. The more you can see the more likely you’ll find mistakes—and the less nervous you’ll be about making them in the first place.

Conclusion
As you can see, there are many variables involved in getting peak performance from SolidWorks. If you break things down into the three larger categories of speed, reliability, and design quality, you’ll have a better sense of what you really need to fix. Start small, and realize that some simple, inexpensive adjustments may be all you need to get your desired performance. If you decide that you really do have to spend a lot more to get the performance you’re after, know that the upfront expense may indeed be justified by the productivity gains you achieve.