S
oftware updates from Autodesk inevitably place more demands on your computer’s hardware. Year after year, these updates ratchet up the requirements, asking more from computers that are themselves getting faster each year. So an update to the Autodesk suite might also involve a corresponding update of your computer’s hardware.

Configuring a computer can be overwhelming. Even for something as simple as a hard drive, there is a multitude of speeds, sizes, manufacturers, and prices to consider. The seemingly endless array of options makes it hard to understand the tradeoffs in selecting an individual component. This choice becomes even more vexing when you have to consider how the performance of any single component will interact with other components and, ultimately, how they collectively interact with the software. To help make this configuration process easier, we have assembled some general rules of thumb for configuring hardware components to run Revit, as well as some solutions that guarantee every component interacts smoothly and error free. We’ll begin by looking at the four major parts of a computer: RAM, storage, processor, and graphics.

**RAM**

RAM is Revit’s oxygen. If Revit runs out of RAM, it slows to a suffocated crawl and performance drops almost vertically. Therefore, it is critical to keep Revit stocked with enough RAM to avoid this performance cliff. As a general rule, Revit requires 20 times the RAM of the loaded Revit (RVT) project file. So a 200MB RVT file requires at least 4GB of RAM to open. Add to this the RAM needed to run the operating system and to keep other applications like a web browser open. To be safe, a second core generally only use one core to its full capacity, while a second core is the cost, which is still significantly more expensive on a per-gigabyte basis. One solution is to use two drives: a solid state drive (SSD) plus a standard hard disk drive (HDD). This is especially critical when working with point-cloud data or when saving and opening large Revit files.

Benchmarks demonstrate that solid state drives complete these tasks two to three times faster. The major downside to solid state drives is the cost, which is still significantly more expensive on a per-gigabyte basis. One solution is to use two drives: a solid state drive containing the operating system, Revit, virtual memory, and your active files; and a regular hard disk drive with an archive of lesser used files. Whether you use this dual drive setup or just purchase one large solid state drive, the investment is generally worthwhile since it is perhaps the single most noticeable change you can make to a computer.

**PROCESSOR**

For the most part, Revit only utilizes a single processing core at a time. This is a major consideration when selecting a processor since multi-core chips are not used to their full capacity by Revit. Even if Revit is given an eight core multiprocessor chip, it will generally only use one core to its full capacity, while a second core will work with the operating system and input/output requests. This leaves the other six cores idling largely unoccupied. For this reason, Revit’s current performance is largely determined by the speed of the chip rather than the number of cores.

There are, however, a number of tasks Revit will execute on multiple cores, including printing, joining walls, loading files and elements, using a point-cloud overlay, opening and changing views, rendering, and ray tracing. A full list of these tasks can be found at [http://wikihelp.autodesk.com/rvt/en/Community/Tips-and-Tricks/Performance/Multithreaded-Processes_in_Revit](http://wikihelp.autodesk.com/rvt/en/Community/Tips-and-Tricks/Performance/Multithreaded-Processes_in_Revit). Note that Revit’s rendering engine now operates in a separate process; therefore, it can access RAM beyond that defined by the paging size.

**GRAPHICS**

The GPU produces what you see in real time on screen. To produce on-screen graphics, Revit generally requires a low to mid-range GPU—although you should increase the performance if you are working with large models or models with lots of environmental effects. In Revit, this includes realistic mode, ambient occlusion, surface transparency, and anti-aliasing. To get the most from your GPU, make sure hardware acceleration is turned on in Revit.

The biggest concern in selecting a GPU is ensuring compatibility between Revit and the GPU. Revit can be somewhat temperamental with regards to GPU performance if you are working with large models or models with lots of environmental effects. In Revit, this includes realistic mode, ambient occlusion, surface transparency, and anti-aliasing. To achieve optimum performance, one way of ensuring this cohesion is to purchase a workstation that has been certified to run Revit. HP works closely with Autodesk to ensure HP Z Workstations with Intel® Xeon® and Intel® Core™ processors run Revit and other Autodesk software flawlessly. A list of recommended workstations can be found at [http://www8.hp.com/us/en/campaigns/workstations/performance-advisor.html](http://www8.hp.com/us/en/campaigns/workstations/performance-advisor.html).

Another way to ensure all components in a computer are reaching their optimum performance is to make sure the workstation, operating system, and settings are set up properly for Revit. This might include installing the latest certified drivers, as well as making performance tweaks to the BIOS and operating system. While these tweaks normally require expert knowledge, HP Performance Advisor can optimize settings for Revit automatically. Additional information about HP Performance Advisor is available at [http://www8.hp.com/us/en/campaigns/workstations/performance-advisor.html](http://www8.hp.com/us/en/campaigns/workstations/performance-advisor.html).

**STORAGE**

The hard drive is typically the biggest bottleneck when booting, starting applications, and opening and saving files. Solid state drives perform all of these tasks noticeably faster when compared to standard hard disk drives. This is especially critical when working with point-cloud data or when saving and opening large Revit files. Benchmarks demonstrate that solid state drives complete these tasks two to three times faster. The major downside to solid state drives is the cost, which is still significantly more expensive on a per-gigabyte basis. One solution is to use two drives: a solid state drive containing the operating system, Revit, virtual memory, and your active files; and a regular hard disk drive with an archive of lesser used files. Whether you use this dual drive setup or just purchase one large solid state drive, the investment is generally worthwhile since it is perhaps the single most noticeable change you can make to a computer.

**ABOUT HP**

HP helps you stay ahead of the curve with professional and desktop workstations designed for large and complex datasets, dispersed teams, and tight deadlines. HP Z Workstations with Intel® Xeon® processors deliver the innovation, high performance, expandability, and extreme reliability you need to deliver your 3D CAD projects in less time. For more information, visit the HP Workstations and Autodesk page on the HP website (hp.com/go/autodeskmanufacturing).

**ABOUT CASE**

CASE exists where building and technology intersect. We combine our experience as architects, engineers, project managers, software developers, and educators with a passion for technology to improve the way buildings are designed, realized, and operated. CASE is a building information modeling (BIM) and integrated-practice consultancy. We provide strategic advising to building design professionals, contractors, and owners seeking to supplant traditional project delivery methods through technology-driven process innovation.

**Making sure everything works**

The GPU is not the only component that can suffer from incompatibility. The RAM, storage, processor, and motherboard must all work together cohesively in order to achieve optimum performance. One way of ensuring this cohesion is to purchase a workstation that has been certified to run Revit. HP works closely with Autodesk to ensure HP Z Workstations with Intel® Xeon® and Intel® Core™ processors run Revit and other Autodesk software flawlessly. A list of recommended workstations can be found at [http://www8.hp.com/us/en/campaigns/workstations/performance-advisor.html](http://www8.hp.com/us/en/campaigns/workstations/performance-advisor.html).