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Windows
Microsoft

[Windows 7 Boot Performance â€œ Under 15 Seconds](#)

Unlike Vista SP1 â€œ 30 seconds

A 15-second boot time is the target Microsoft is aiming for with the evolution of Windows 7's startup [performance](#). The software giant in fact spared no resources for the next major iteration of the Windows client, and has an entire team focusing exclusively on the performance associated with the startup process. However the effort is much larger than just a single team, spanning across the entire Windows project and to the Redmond company's hardware and software partners. "Startup can be one of three experiences; boot, resume from sleep, or resume from hibernate. Although resume from sleep is the default, and often 2 to 5 seconds based on common hardware and standard software loads, this post is primarily about boot as that experience has been commented on frequently. For Windows 7, a top goal is to significantly increase the number of systems that experience very good boot times. In the lab, a very good system is one that boots in under 15 seconds," revealed [Michael Fortin](#), Microsoft distinguished engineer and lead of the Fundamentals feature team in the Core Operating System group. "Statistics gathered through the Customer Experience Improvement Program from Windows Vista Service Pack 1 machines indicate that just 35% experience boot times of 30 seconds or less. The remaining 75% boot in as much as 50 seconds. Fortin indicated that there are millions of computers corresponding to the data received by Microsoft. But in this regard, the Redmond company considers that the startup experience delivered to end users, even with Vista SP1, is simply not good enough. "From our perspective, too few systems consistently boot fast enough and we have to do much better. Obviously the systems that are greater than 60 seconds have something we need to dramatically improve—whether these are devices, networking, or software issues. As you can see there are some systems experiencing very long boot times. One of the things we see in the PC space is this variability of performance—variability arises from the variety of choices, and also the variety of quality of components of any given PC experience," Fortin added. "But in the end it's not just Windows, it's also the installed software and the underlying hardware that deliver an impact on the perception of performance, or the lack of it. One major contributor to a reduced level of startup performance is "the off-the-shelf configuration" of OEM computers. Microsoft found that while a pre-configured OEM machine would boot in 45 seconds, the same computer, but featuring a clean install of Windows Vista SP1, would have a boot time of just 23 seconds, which, with additional optimization, could be taken down to just 21 seconds. "As an example Windows 7 effort, we are working very hard on system services. We aim to dramatically reduce them in number, as well as reduce their CPU, disk and memory demands. Our perspective on this is simple; if a service is not absolutely required, it shouldn't be starting and a trigger should exist to handle rare conditions so that the service operates only then," Fortin explained. "Windows 7 will be tweaked with the inclusion of a revamped service trigger mechanism which will manage auto start items more efficiently. On top of this, Microsoft is also optimizing Vista's successor to offer an enhanced parallelism of driver initialization. In this context, individual driver loading times will not take a toll on the startup time. "In terms of reading files from the disk, Windows 7 has improvements in the "prefetching" logic and mechanisms. Prefetching was introduced way back in Windows XP. Since today's disks have differing performance characteristics, the scheduling logic has undergone some changes to keep pace and stay efficient. As an example, we are evaluating the prefetcher on today's solid state storage devices, going so far as to question if is required at all. Ultimately, analysis and performance metrics captured on an individual system will dynamically determine the

extent to which we utilize the prefetcher," Fortin said.