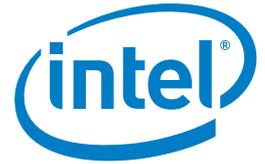


CASE STUDY

Intel® Solid-State Drives

Performance: Data-Intensive Computing



Delivering extreme entertainment with Intel® Solid-State Drives

Intel® Solid-State Drives help Digital Extremes increase the efficiency of game development and maximize innovation

Co-creators of the immensely popular Unreal* series of video games and current producers of several AAA game titles, Digital Extremes is among the most successful game development studios in the world. Sustaining that success requires not only a constant stream of creativity but also an extreme focus on internal efficiency. To speed up key production tasks, the company recently replaced traditional hard disk drives with Intel® Solid-State Drives in several workstations. By accelerating source-code build times up to 46 percent and increasing the speed of other production processes more than 100 percent, the new drives enable development teams to experiment with more creative possibilities while still meeting tight deadlines.



“Our game designers might want to try a new game mode, new behavior, or another idea....Using Intel SSDs, our teams can make a change and produce a fresh build in just minutes.”

– Glen Miner,
Senior Engine Architect,
Digital Extremes

CHALLENGE

- **Increase process efficiency.** Maintain a competitive edge by increasing the efficiency of numerous production tasks, from completing new source-code builds to encoding content for multiple game platforms.

SOLUTION

- **Intel® Solid-State Drives.** Digital Extremes replaced traditional serial ATA (SATA) hard disk drives with Intel® X25-M Mainstream SATA Solid-State Drives (SSDs) in workstations used by programmers and artists.

IMPACT

- **Faster builds, increased innovation.** The Intel SSD solution helped accelerate source-code build times by up to 46 percent, enabling development teams to rapidly incorporate testing feedback and giving them time to explore additional creative ideas without increasing costs.
- **Rapid ROI.** By saving time with key processes, Digital Extremes could recoup the cost of each drive within a month.
- **Improved productivity.** Intel SSDs help to boost worker productivity by enabling artists to load editing applications and move between game layers more than five times faster than before.
- **Accelerated production.** With the installation of Intel SSDs, Digital Extremes dramatically reduced the time to encode content, optimize placement of content on DVDs, and build disc images, helping to ensure on-time delivery of innovative games.

In the competitive game development industry, producing innovative games is not enough to ensure success. “At Digital Extremes, we are committed to delivering exciting, high-quality games as efficiently as possible,” says Glen Miner, senior engine architect at Digital Extremes. “Game publishers often choose to work with us because we can produce games faster, more cost-effectively than other studios.”

Achieving high levels of operational efficiency requires constant effort. “Transforming 1 million lines of content and 50 GB worth of source code into a finished game can involve a number of time-consuming processes,” says Miner. “We are continuously looking for ways to accelerate those tasks. By speeding up source-code builds, the

encoding of content into optimal formats for each target platform, and the creation of disc images, we can free up time for more creative activities.”

Enhancing operational efficiency also has a direct impact on the bottom line. “Today, all game developers are scrutinizing their budgets and resources,” says Peter Alau, vice president of business development at Digital Extremes. “By implementing superior hardware and improving development practices, we can save one very expensive nonrecoverable resource—time. And time savings add up. If we can save a programmer a few minutes each time source code is compiled, we can save thousands of dollars every year and help to ensure profitability.”

Intel® Solid-State Drives Facilitate Creative Exploration

Digital Extremes refreshes workstations with Intel® Solid-State Drives

The Digital Extremes team saw an opportunity to speed up several processes by replacing traditional hard disk drives with solid-state drives in workstations. The team selected Intel® Solid-State Drives (SSDs) for their outstanding performance. "As we learned more about Intel SSDs and then evaluated them in-house, it was clear to us that they delivered superior performance to other technologies in the marketplace," says Miner.

The Intel® SSD Optimizer, part of the Intel® SSD Toolbox, helps sustain that performance with support for the "Trim" feature of the ATA Data Set Management Command. The Trim feature works with the operating system to recover drive capacity as soon as the user deletes files. "We wanted to maximize performance without having to run additional utilities that could interrupt our workflow," says Miner. "Support for the Trim command helps ensure that the drive will perform optimally all the time."

Digital Extremes chose Intel® X25-M Mainstream SATA SSDs with 160 GB capacity. The company installed them initially in the workstations used for source-code builds, which in the past used SATA hard disk drives of varying speeds and capacities. Typical workstations are equipped with Intel® Core™ i7 vPro™ processors and NVIDIA GeForce* graphics cards, and run the Microsoft Windows Vista* operating system.

Intel drives help accelerate source-code build times up to 46 percent

Replacing traditional hard disk drives with Intel SSDs has helped dramatically accelerate source-code build times for Microsoft Windows*, Microsoft Xbox 360*, and Sony PlayStation* 3 (PS3) environments. "With Intel SSDs, we can complete a Microsoft Windows build 46 percent faster than before," says Miner. "Xbox and PS3 build times are 41 and 22 percent faster."

Completing builds faster facilitates innovation. "Our game designers might want to try a new game mode, new behavior, or another idea," says Miner. "Every change requires a new iteration of the build. Using Intel SSDs, our teams can make a change and produce a fresh build in just minutes. Ultimately, we can produce better games without taking more time or spending more money."

Digital Extremes speeds up some processes by more than 250 percent

The new Intel SSDs are helping to reduce the time for a range of additional production tasks. For example, encoding and transcoding content for each target game platform is now 74 percent faster, while building the final DVD images is 111 percent faster. The new drives also help speed up the process of locating the optimal placement of content on the DVD to enhance game performance. That process is now 251 percent faster. "The Intel SSDs help us prepare content for distribution much faster than before, so we can be sure we meet all of our deadlines," says Miner.

The new drives help speed up content creation as well. "Creative inspiration can be fleeting," says Alau. "If it takes more than 30 seconds for someone to launch an editing

SPOTLIGHT ON DIGITAL EXTREMES

Founded in 1993, Digital Extremes today ranks among the world's top game development studios. The company has worked on popular titles—including the Unreal* series—that have sold more than 12 million units worldwide across the PC, Sony PlayStation* 2, Microsoft Xbox*, and Sega Dreamcast* platforms. More recently, Digital Extremes has teamed up with 2K Games to deliver versions of BioShock* for PlayStation 3 and multiplayer formats. Digital Extremes has been licensing its Evolution Engine (used in the creation of Dark Sector*) for PlayStation 3, Xbox 360, and PC platforms to top-tier developers since 2009. The company is currently working on several new titles.

application or load a game level to experiment, they can lose their creative spark. By helping to load applications and capabilities more than five times faster than before, Intel SSDs keep our artists in the zone."

Intel SSDs help keep Digital Extremes lean and efficient

The Digital Extremes team plans to continue the deployment of Intel SSDs across the enterprise to realize the benefits with additional production tasks. "When you have a streamlined process, you can do more with less," says Alau. "The Intel SSDs enable us to continue to produce exciting, innovative games with fewer people in much less time than other studios—and that helps us keep our competitive edge."

Performance: Data-Intensive Computing. Support the most demanding business data processing, and computationally intense graphics.

Find the Intel® Solid-State Drive solution that is right for your business. Contact your Intel representative or visit www.intel.com/go/ssd for product information.

To learn more about other Intel business solutions, please visit the Reference Room at www.intel.com/references.



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