Micron SSDs Provide the Storage Muscle for SilverDraft’s Supercomputers

About SilverDraft
SilverDraft, the leader in streamlining creative digital media workflow, began with a desire to answer a seemingly simple question: How can technology be used to enhance the work of truly creative people and help them work more efficiently and more freely? The founders knew that supercomputing would be an essential element, but their main driver was to bridge the gap between difficult-to-use, non-purpose-built, standard PC systems and the creative potential of digital artists—knowing that they would have to get the technology out of the way.

According to Amy Gile, SilverDraft founder and CEO, “SilverDraft was founded on a crazy idea: Create an environment where, from pre-production to production, to distribution, we could create truly new experiences using a technology that is more easily approachable.”

The Challenges
Shoot, Wait, Pray
With an ever-increasing amount of computer-generated imaging or CGI (most modern films contain some level of CGI), the director’s job has gotten a lot harder. Historically, the director’s role was filled with starts and stops: Frames would be shot one day, sent off for rendering, and arrive back days or weeks later. With modern CGI, scenes are shot in front of a green screen by actors wearing sensors; and in real time, there’s no way to tell whether the scene looks right. To see the scene as the viewer will see it requires rendering by some kind of rendering farm. The rendering process is very taxing—involving CPU, network, and, most importantly, disks—and there is a high degree of random disk I/O interspersed with sequential I/O. It’s the kind of workload that cripples conventional storage and computing designs. The process can take days or even weeks with traditional, modern computing; and once the director gets the results back, they may not be suitable and may need to be shot again.

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“The level of performance our systems offer is simply not possible without Flash. There’s no way an HDD can keep up. We tested several SSDs and found the Micron SSDs were an ideal fit for us.”

DR. SRINIDHI VARADARAJAN
Co-Founder and Systems Architect, SilverDraft

Potential in Supercomputing
The SilverDraft team looked into existing supercomputing systems and saw the potential for advancing the digital rendering process, but none of the designs fit their requirements. Supercomputing offered the raw horsepower to do the work, but the systems were not well balanced and not easy to deploy and use. The answer seemed clear: The only way to get an effective and affordable supercomputer for digital rendering was to build it themselves.

However, another factor complicating the use of supercomputers was the way that the younger generation interacted with content. When grappling with the fundamental question of what a digital artist needs to create content that enables interaction, they found that regardless of the state of technology, it got in the way of the artists’ creativity.

Cloud Rendering Sounds Good, but...
One relatively new option SilverDraft studied was cloud rendering, where raw camera data is uploaded to a remote, cloud-based rendering farm, rendered, and returned. However, the amount of data being recorded in modern formats is huge, and it has to have a way to get to the rendering farm for processing. For small student projects, cloud rendering is an option; but for anything larger or of higher quality, cloud rendering won’t cut it—the pipes into the cloud are far too small.
The Solution

**Bring the High-Bandwidth, High-Speed Rendering Farm to the Site**

To Gile, the solution was simple—if there isn’t enough bandwidth to quickly render data remotely, bring the rendering on site and render the data as it comes off the cameras, in near real time. The implementation took considerable thought and expertise. According to Gile, “We knew that workflow-tailored supercomputing was the key for us. We wanted to exploit supercomputing technologies, high-bandwidth interconnects, and state-of-the-art SSD storage to enable smooth delivery of time-shifted rendered frames quickly and easily; and we wanted to enhance the creative process by providing near-real-time results.”

To transform this plan into a real platform, Gile reached out to Dr. Srinidhi Varadarajan. He is best known for his pioneering work in designing and building powerful supercomputers using off-the-shelf components—bringing the very best of massive-scale computing within the budgets of a wider audience.

Gile also added, “We’ve proven the technology already. As a test, we rendered three major motion picture-length films—a process that would have taken at least three times as long using conventional techniques.”

**AMY GILE**

Founder and CEO, SilverDraft

“…”

According to Varadarajan, “Amy involved me from the beginning to help with data center design and mobile supercomputer development. We started our first project in 2007 and built our first big machine in late 2009. This system, which was fully operational in early 2010, was the start of our relationship with Micron. We knew we had to build a storage system to hold the vast quantities of data generated by our customers and process it at speeds that would enable near real-time rendering and on-set review. Micron’s SSDs are the heart of that storage system. The end product that resulted is our SilverDraft mobile rendering farm.”

**DR. SRINIDHI VARADARAJAN**

Growing By Going Smaller

When asked what’s next for SilverDraft, Gile said their next key release shrinks the physical size and budget considerations and brings the power of the SilverDraft mobile data center into a more attainable form factor and price point. The concept of empowering a far wider audience is known as SilverDraft’s “Devil and Demon” strategy.

According to Ted Schilowitz, SilverDraft’s president, the smaller strategy is their next major growth segment. “We are catering to a clear trend in the industry.”
The industry is spreading, flattening. No longer do a few companies control all the visual effects work, all the post work, all the finishing work, and all the creative work in movies. It’s becoming controlled and managed by many thousands of companies, typically with 20–50 people. These teams have outgrown what is available with typical desktop computing, but they lack the IT infrastructure to move easily to the next levels. So they struggle until they get to the point where they can hire and build a complete IT infrastructure themselves."

"These are SilverDraft’s Devil and Demon customers,” explains Schiwowitz. For them, we offer powerful, targeted plug-and-play workstations, plus a much better computing package—and we charge much less for it. We then enable them to easily grow by connecting these platforms to a world of very high-end IT supercomputers and save them from having to customize or create something new every time.”

The Demon workstation with Micron’s SSDs installs like any simple PC. Using standard power and sitting nearly anywhere (it’s about the size of a small refrigerator), Demon is easy to install and even easier to own. But this small package drives far greater overall value. The economics are startling, Schiwowitz points out, “With the Demon running Micron’s SSDs, the economic value is clear no matter how it is measured—deployment cost, purpose-built design, higher quality ingredients, reduced cost per rendered frame, or the resultant improvement in creative output. The Demon costs less to buy and you get better components. Better design and better components yield a better computer that literally costs thousands less than a similarly configured standard PC with the upgrades that it would need to reach the performance level of a Demon workstation.”

How Does the Devil and Demon System Work?

The Devil utilizes 56GB Infiniband to allow ultra-fast communication between layers. It is this speed that enables the Devil to perform like a supercomputer.

In a Devil and Demon workspace, each workstation would also connect to the Devil via Infiniband. Workflow for rendering would then operate at the same speeds as the internal architecture of the Devil.

For all major processing tasks, the artist would no longer need to render locally. Instead, submitting a render to the Devil would result in fast turnaround, while enabling the artist to continue working.
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The Devil system using Micron’s SSDs is the “painkiller” for the industry, Schilowitz adds that, “Trying to get the Devil’s level of efficiency out of standard PCs will end up costing more. This is primarily due to the Devil’s high degree of optimization. Standard hardware will cost you more—more to buy, more to optimize, and more to support—and, still, you will never reach the Devil’s performance level. Standard hardware costs more per render and requires far more time. Devil gives you a 10:1 speed advantage in rendering. It’s that simple.”

The Result

A Partnership That Enables Customer Creativity

According to both Gile and Schilowitz, their recent product announcement at NAB 2014 was a resounding success, and customers responded with a high level of interest. According to Gile, “The less (IT work) our customers have to do themselves, the better. They rely on us to make their lives easier, and we enable their creativity. Our products, with the Micron SSDs preinstalled, enable a shift in content generation. Several customers have migrated from providing video content created by others to creating, finishing, and delivering high-quality 4K content every day. Customers like YouTubeNation rely on our platforms to generate new viewer experiences, previously unachievable. Our systems enable this next-generation media.”

Varadarajan agreed. “Our systems combine the most powerful, capable components available into a very easy-to-use, purpose-built platform that enables far greater creativity and efficiency. SilverDraft gets technology out of the way of digital artists while enabling them to work more efficiently. Micron’s SSDs are a key element in these designs.”

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