FuseFX Renders 1,000 Frames in One Hour Using AWS Thinkbox Deadline

FuseFX achieves unlimited CGI render-farm scale by seamlessly adding cloud render nodes with AWS Thinkbox Deadline. FuseFX uses its proprietary content-creation pipeline to build visual effects for episodic television, feature films, commercials, and virtual-reality productions. The company is using Thinkbox Deadline to manage and administer CGI render nodes built using Amazon Machine Image templates and Amazon EC2 Spot Instances.

Over the course of just two episodes of the Amazon Video web television series *The Tick*, the visual effects (VFX) team at FuseFX delivered almost 300 shots of the Tick's sidekick, Arthur, swooping, soaring, and battling in his articulated wing suit. That shot list was in addition to the show's usual vehicle collisions, fireballs, and clouds of smoke; buildings smashed to bits; dozens of sequences in which actors were replaced or blended with digital doubles; and, of course, scenes with a talking dog.

The technical artistry that goes into work like this is no problem for a powerhouse studio like FuseFX, which uses its proprietary content-creation pipeline to build spectacular visual effects for episodic television, feature films, commercials, and virtual-reality productions like *American Horror Story*, Marvel's *Agents of S.H.I.E.L.D.*, *Preacher*, and *Turn: Washington's Spies*.

What can create problems, though, is lack of compute power—specifically, finding enough nodes for the compute-hungry process of rendering computer-generated imagery (CGI).

"Rendering is a critical component of the visual-effects process," says Jason Fotter, chief technology officer and partner at FuseFX. "Building your own render farm is expensive and requires a significant commitment to physical infrastructure. You have to consider finite resources like space, power, and cooling. And, no matter how large you build it, there will still be times when it becomes overloaded with jobs, slows you down, and puts you at risk of not being able to deliver a project on time."

Powering Unlimited Render Farms with the AWS Cloud

FuseFX is growing quickly in terms of company size and the scope of its creative ambitions. One of Fotter's responsibilities is ensuring that the capacity of the FuseFX content-creation pipeline grows right along with the rest of the company. That's why the advent of managed rendering in the Amazon Web Services (AWS) Cloud was so exciting to him. "The AWS Cloud is a source of unlimited computing power," says Fotter. "The ability to expand rendering nodes quickly, affordably, and essentially infinitely, is a game-changer for our industry."

Already at the heart of the company's pipeline was Thinkbox Deadline—an administration and compute management toolkit for render farms that avoids the need for a centralized node-management application by using a highly scalable database and basic file-sharing protocols to manage render nodes. Fotter turned to the creators of Deadline, Thinkbox

Completes 1,000-frame render job in as little as 1 hour.

Company: FuseFX
Industry: Media & Entertainment
Country: United States
Employees: 300
Website: fusefx.com

About FuseFX

FuseFX uses its proprietary content-creation pipeline to build visual effects for episodic television, feature films, commercials, and virtual-reality productions. Founded in 2006, the company operates studios in Los Angeles, New York City, and Vancouver, BC.

Benefits

- Accesses 300 cloud render nodes for the cost of 80 on-premises nodes
- Completes 1,000-frame render jobs in as little as 1 hour
- Uses templates to ensure cloud nodes are identical to on-premises nodes

AWS Services Used

- Amazon Elastic Compute Cloud (Amazon EC2)
- Amazon EC2 Spot Instances
- Amazon Machine Images (AMI)
- AWS Thinkbox Deadline

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> Jason Fotter, CTO and Partner, FuseFX

Software, for help adding cloud capabilities. (Thinkbox was acquired by AWS in March 2017.) Working with Thinkbox, FuseFX took advantage of the AWS Portal in Thinkbox Deadline to augment its on-premises render nodes with Amazon Elastic Compute Cloud (Amazon EC2) Spot Instances.

“In the new architecture, Thinkbox Deadline has connectivity into our AWS account, so it can spin up instances on demand and then terminate them when they aren't needed, so we don't have to keep paying for them,” says Fotter. He explains that, with pay-as-you-go pricing on AWS and usage-based licensing for Thinkbox Deadline in the Thinkbox Marketplace, FuseFX pays only for resources when it's actually using them.

Because the FuseFX pipeline relies on customized software components, the ability to use Amazon Machine Image (AMI) templates to create and launch identically customized Amazon EC2 templates is crucial. “We never install software 'as is,' and so our pipeline is fairly complicated," says Fotter. "We have to be able to ensure the integrity of all software installed on our network, or we will just end up wasting time with failed processes and bad frames. Amazon Machine Image templates make it easy to spin up Amazon EC2 render nodes that are identical to our local render nodes."

Delivering with AWS Thinkbox Deadline

For FuseFX, the value of AWS scalability and pay-as-you-go pricing is especially apparent in its work on episodic projects with highly variable effects demands. To create eye-popping action sequences in *The Tick,* for example, FuseFX used Autodesk 3ds Max 3D modeling and rendering software with the Chaos Group V-Ray plugin, relying on AWS Thinkbox Deadline to manage and administer on-premises render resources for lighter workloads. When processing needs, or delivery expectations exceed the capacity of the company’s on-premises render farm, the solution seamlessly adds Amazon EC2 instances as needed. Because of the elasticity of Amazon EC2, FuseFX can scale up its number of cloud render nodes almost infinitely.

One result of this new approach to rendering is significant time savings. "If you have 10 hours for a job, you can use 100 nodes to render 1,000 frames," says Fotter. "But if you only have 1 hour, you can call up an extra 900 Amazon EC2 Spot Instances with a few mouse clicks and still deliver that 1,000-frame render job on time."

The resulting agility is crucial for the projects FuseFX specializes in. "AWS Thinkbox Deadline gives us a nice safety net when dealing with the crazy schedules that we have when working in television," says Fotter.

That kind of safety net is valuable enough that many studios and agencies might pay extra for it, but the new solution enables FuseFX to access all this additional computing power at a fraction of what on-premises resources would cost. “For the same price as renting 80 local render nodes, I can spin up 300 Amazon EC2 nodes almost instantly,” says Fotter.

Now that FuseFX has firsthand experience of the robustness and flexibility of AWS, the studio plans to transfer more of its infrastructure to the cloud. “When you start working with technology this way, your imagination begins to run wild,” says Fotter. “The cloud has huge potential for the whole post-production field, not just for visual effects. It’s going to be used more and more as companies adapt, and solutions like Thinkbox Deadline are invaluable in making that transition as painless as it can possibly be.”

Learn more about AWS Thinkbox Deadline.