P1 Technologies
Boots in the Cloud

aws partner network

Challenge

Without a scalable system, the ability to burst into AWS for additional compute capacity was out of reach. Failing to address this challenge would put production deadlines at serious risk.

Permanent on-premises compute resources for a highly variable rendering workload would not be cost-effective

The AWS Portal Saas rendering solutions offered a faster set-up process, but were more expensive, less flexible, and not integrated into the existing pipeline.

Skydance Animation taps P1 Technologies to deliver burst rendering in AWS

Skydance are creating an animation studio where wildly entertaining stories will captivate audiences of all ages around the world. Their deeply creative artists want to tell bold, original stories that touch people's hearts. Focusing on short form and full-length animated features, they brought to life the Annie award-nominated short film Blush and the upcoming films Luck and Spellbound.

To create these films, Skydance operates a large on-premises render farm. They knew it wasn't enough to handle the peak demands of their most recent release, Luck. They wanted to be able to ramp up their rendering capacity at a moment's notice. They decided that the ability to render faster shouldn't be bound by technical constraints or resource limitations. The only limiting factor should be cost. With a cost-effective and scalable system, going faster would become a simple business decision.

Tough Luck

AWS Thinkbox's render management software, Deadline, was selected as a natural fit to these needs. Not only could Deadline seamlessly orchestrate on-premises and cloud render queues and offer very attractive licensing terms, but Deadline's AWS Portal Server also could serve as a transparent bridge to move render assets into and out of the AWS cloud as needed. It also natively integrated with the AWS Spot Fleet offerings to deliver pre-built render server images and large-scale rendering capabilities at significantly reduced rates.

During testing, Skydance discovered that the scale of their render use exceeded the limits that AWS Portal was designed to support. In order to meet the demands of production, they had to replace Portal and two primary features it provided, auto-scaling and asset transfer to the cloud. Most importantly, the solution had to scale.

Turn your Luck around

The first step in supporting the cloud rendering process was to provide a stable, high performance home for the data needed during the render process. Using a cloud-based NAS solution from the AWS Marketplace, deployed using CloudFormation, we were able to provision storage of any size and throughput, on demand.

The asset transfer system design leveraged the Deadline queuing software and the existing render pipeline to create a set of data management jobs to bookend the render process. The orchestration system identified required assets, render parameters, and expected render outputs produced by the pipeline to create a series of linked jobs in Deadline. As these jobs executed, the prerequisite data was moved into the AWS cloud, rendered, and the output images were returned to on-premises storage for review and use.

Since the data movement was tightly coupled to the render job using it, and executed in the Deadline queue, the data movement process was able to be scaled horizontally by provisioning additional on-demand EC2 data movement instances and placing them in the appropriate Deadline worker groups.Job speed was determined by bandwidth availability between on-premises and cloud networks. AWS Direct Connect was provisioned to ensure a fast and reliable data flow.

The auto-scaling challenge was solved with Deadline's Spot Fleet plug-in and a set of Spot Fleet management tools that were developed to identify and terminate idle workers using data obtained from the Deadline and EC2 APIs. Newly created instances were moved into the correct Deadline pools and groups based EC2 instance tags and interrupted spot instances were cleanly removed from the Deadline worker database.

Together, Skydance Animation and P1 Technologies built a creative, cost-effective, and scalable solution in the Cloud to help bring a story to life.

Solution

P1 Technologies collaborated with Skydance's pipeline engineering and infrastructure teams to:

- Build a reliable and scalable asset transfer system
- Leverage EC2 Spot instances to significantly reduce costs
- Build a set of Spot Fleet management tools to ensure maximum efficiency

Conclusion

From the outset, Skydance Animation had a vision for rendering. Technical challenges and resource limitations shouldn't impact their decision to increase render power and reduce production times. It should be influenced by one simple factor, cost. With this solution, they were able to realize this vision.

Results and Benefits

Scale

Render fleets that scale to thousands of instances running multiple concurrent jobs.

Efficiency

Data and compute lifecycle features ensure that unneeded data and instances are removed in a timely and reliable manner.

Cost

Reduce costs by enabling rapid movement of instances between render pools to meet changing priorities in near real-time..

P1 Technologies

P1 Technologies is an innovative consulting team of enterprise architects with deep cloud expertise. Our mission is to provide unsurpassed value to our clients through the alignment of their business goals and technical solutions.

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