■ NetApp

Amazon FSx for NetApp ONTAP supports revolutionary animation production of Suzume

新海誠監督 最新作

すずめの戸締まり

行ってきます。

原案乃華
松村北斗

深津絵里
染谷将太
伊藤沙莉
花瀬琴音
花澤香菜

松本白鸚

原作・脚本・監督
新海誠

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suzume-tojimari-movie.jp

CoMix Wave FILMS

Using cloud storage for theatrical animation production.

Makoto Shinkai's latest film, Suzume, was released on November 11, 2022. Set in various parts of Japan, this adventure story shows the growth of the main character. The dramatic and impressive visual depictions that only a director like Makoto Shinkai can accomplish, envelop the viewer with an overwhelming presence. CoMix Wave Films (CWF), which handled everything from creator management to animation production, adopted Amazon FSx for NetApp ONTAP as the main storage environment for support of the innovative animated movie production.

The amount of data required for theatrical animation productions continues to increase, with Suzume reaching approximately 56TB. That's 1.6 times the amount required for Director Shinkai's previous film, Weathering With You. FSx for ONTAP storage was chosen because it met all of the performance, capacity, operation, and cost requirements for the CWF production. Here are some cutting-edge examples of cloud storage utilization in animation production.

> IOPS
> 100x

"The fact that FSx for ONTAP and NetApp FlexCache were able to achieve a user experience comparable to local storage is a great achievement."

Masahide Miyakogawa
System Administration Department, CoMix Wave Films Inc.

Unprecedented main storage in the cloud

On January 17, 2023, 68 days after its release on November 11, 2022, Makoto Shinkai's theatrical animation Suzume reached an audience of more than 9.4 million, earning it a reputation as "the culmination of masterpieces."

CoMix Wave Films focuses on theatrical animation, aiming to create works that have strong author personality and that will continue to appeal to later generations. They break the mold of an animation production company, handling everything from artist management to movie creation and production, theater distribution, package sales, and overseas sales.

Masahide Miyakogawa, System Administration Department, CoMix Wave Films Inc.

Masahide Miyakogawa, who leads their System Administration Department, said, "What is necessary to create a movie that will remain in the hearts of people all over the world? A team where everyone can share their wisdom and give their all. I myself work hard every day as a system administrator toward the goal of achieving system construction, operation, and maintenance that accelerate creativity."

For Suzume, Mr. Miyakogawa required unprecedented main storage in the cloud. "In the previous film, Weathering With You, we used an on-premises storage environment, but as the production progressed, problems such as insufficient capacity and performance became apparent. Although we overcame these by installing multiple storage systems, I greatly regret the fact that data management and operations faced complications. To clear up this issue for Suzume, we went through with discussions with the aim of achieving a single storage environment with flexibly scalable capacity and performance."

Mr. Miyakogawa finally decided on Amazon FSx for NetApp ONTAP, a fully managed shared storage in the AWS Cloud.
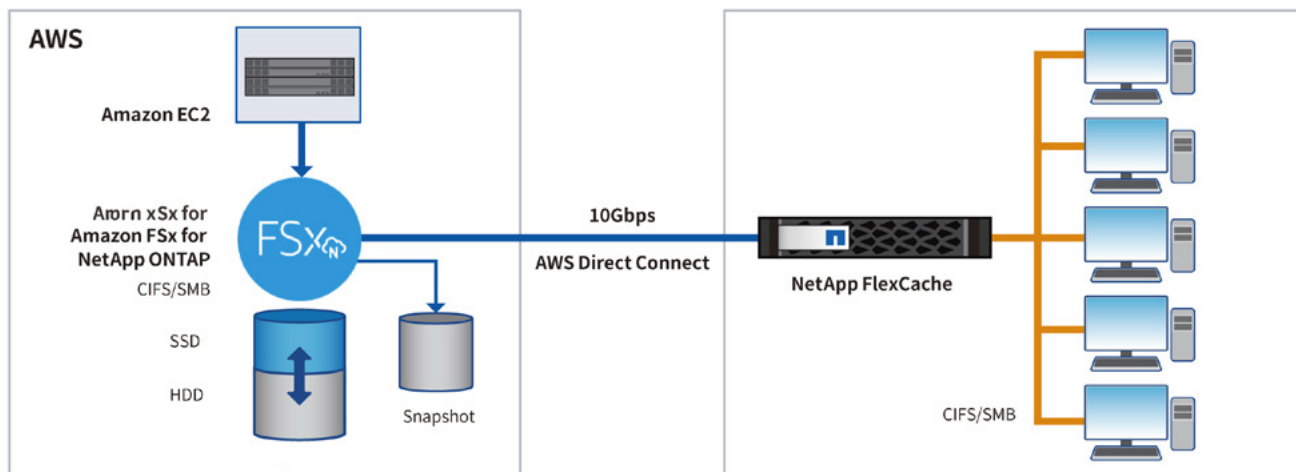
A single storage environment with flexible, scalable capacity, and performance

With cloud storage, capacity and performance can be scaled on demand, with various benefits such as eliminating the need for hardware management and maintenance.

According to Mr. Miyakogawa, "The main storage for support of animation production has an issue in that it is difficult not only to predict the required capacity, but also to estimate the number of concurrent users. I felt that with cloud storage, we could achieve a single storage environment with flexible, scalable capacity and performance."

Animation production, which requires various materials, produces a movie that is a combination of materials such as cels, art background, and 3D CG. The process, called compositing, which assembles all the video materials and creates the movie, requires the highest storage performance.

For Suzume, thousands of large and small files from a few kilobytes to several gigabytes were used to finish a mere 3 seconds of rendering for the final movie during compositing. To store these files during production, folders with dozens of GB were treated as single units and passed between processes.

Mr. Miyakogawa explains, "Film production requires a combination of extraordinary I/O performance and near-instantaneous file transfers. Trying to meet these requirements with our current solution was possible but costs would have increased almost 3 times, so we needed to abandon that idea and find another solution."

NetApp ONTAP® technology resolved the two performance issues that plagued Mr. Miyakogawa. Adopting FSx for ONTAP and NetApp FlexCache® software achieved an excellent user experience, as if they were using local high-speed storage.

Solving performance issues in cloud storage
Amazon FSx for NetApp ONTAP brings the capabilities of NetApp ONTAP to an AWS Native, fully managed storage service. It can, therefore, achieve the same level of data management and data access as on-premises storage with ONTAP and provide other ONTAP functions such as Snapshot™ copies, deduplication and compression, and FabricPool storage tiers.

According to Mr. Miyakogawa, "FSx for ONTAP, which can use the SSD area, immediately demonstrated its power in speeding up the transfer of a huge number of files. IOPS reached 100X compared to our current HDD-based solution, and it is important that we were able to achieve this high performance within our budget. FSx for ONTAP allows tiering from SSDs to the lower cost capacity pool tier, which let us enhance performance and capacity in a balanced manner while keeping costs down. Also, the data migration to FSx for ONTAP was done in the background while production progressed, allowing us to complete the storage migration without stressing the creators."

The CWF production studio and the AWS data center are connected by AWS Direct Connect with a wide bandwidth of 10Gbps. Even so, transferring thousands of files over the physical distance caused latency issues. The FlexCache remote cache technology offered by ONTAP solved this challenge.

Mr. Miyakogawa explained, "Creators were then able to comfortably retrieve huge numbers of files by accessing FlexCache cache volumes installed at CWF's production studio. The FlexCache function synchronizes FSx for ONTAP on AWS and the studio's cache volumes at high speed in the background. Creators being able to concentrate on production as if work is being done locally without thinking about the fact that they are working on cloud storage is a great advantage."

A hybrid cloud storage environment combining FSx for ONTAP and FlexCache was the best choice to meet all of CWF's performance, capacity, operation, and cost requirements.

A user experience comparable to local, no matter where data is stored
CWF actively used AWS resources as the production environment for Suzume such as FSx for ONTAP (described earlier), Amazon EC2 spot instances as rendering servers, and AWS Thinkbox Deadline for managing the render farm.

Mr. Miyakogawa says, "Migrating our main storage to the cloud was a big challenge, but the fact that FSx for ONTAP and NetApp FlexCache provided a user experience comparable to local storage is a great achievement. I believe that this system, which seamlessly links AWS and on premises, can also be applied as a mechanism for using a single storage environment from multiple production sites."

The total amount of data handled by CWF in the production of Suzume was approximately 56TB. That's 1.6 times the amount of data in Director Shinkai's previous film. The number of files similarly increased 1.8 times to 1.69 million, and the number of folders increased 2.2 times, to 900,000.

According to Mr. Miyakogawa, "The ability to scale storage capacity on demand is also a great relief. In October 2022, right at the final stage of production, we ran out of storage capacity, but with FSx for ONTAP, we were able to secure the required capacity in a mere 5 minutes. I realized that this massive sense of speed, which would be unthinkable with on premises, is the true value of the cloud. I also cannot overlook the advantages of being freed from in-house adjustment and installation work related to capacity scaling."

FSx for ONTAP includes all of the features and capabilities of NetApp ONTAP, with management via the AWS Management console or programmatically using the AWS Command Line Interface or API. Backups can be created instantly with Snapshot technology, and dozens of terabytes can be restored in minutes. Because data can be recovered at high speed, FSx for ONTAP is also effective for ransomware countermeasures and disaster recovery..

Mr. Miyakogawa concluded, "With FSx for ONTAP, which has high read/write performance, we have obtained a good response that can withstand nearly 1,000 rendering servers"

"I myself used to be a freelance designer and joined CWF in 2018. Since then, I have worked in Production Assistant of setup and CG, and in 2021 I became the full-time system administrator. So I was an amateur, but I was able to carry out my mission as system administrator for Suzume with the support of NetApp, AWS, and many other partners. I feel a sense of fulfillment in working together as a team that transcends company organizational barriers and running with all our might toward the common goal of contributing to movie production through systems."

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