BRINGING AGILITY TO THE GAMING INDUSTRY

Revolutionizing Game Development with NVIDIA Virtual GPUs

VIRTUAL GPUs (vGPUs) DELIVER THE HIGH-DEFINITION GRAPHICS PROCESSING REQUIRED FOR GAME DEVELOPMENT.

AT A GLANCE

User Profile

Company name: Square Enix Co., Ltd.

Industry: Gaming

Location: Japan, Global

Established: October 1, 2008

Head office: Shinjuku Eastside Square 6-27-30 Shinjuku, Shinjuku-ku, Tokyo, 160-8430 Japan

Representative Director: Yosuke Matsuda

Capital: 1.5 billion yen (as of March 31, 2019)

Overview

Square Enix Co., Ltd., is a leading provider continuously releasing creative and innovative content and services in the entertainment field. Major works include the *Dragon Quest* series (cumulative shipments and downloads of more than 82 million), the *Final Fantasy* series (more than 154 million), the *Tomb Raider* series (more than 78 million), and the *Space Invaders* series.
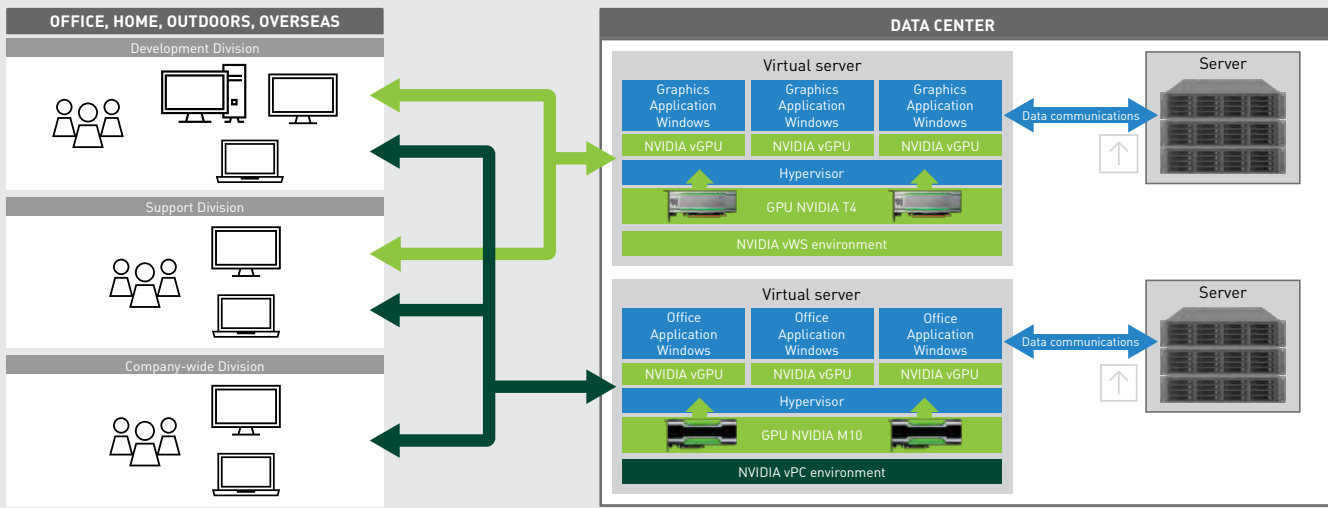
www.jp.square-enix.com

SQUARE ENIX

SQUARE ENIX's corporate philosophy is to "Provide superb 'stories,' bringing happiness to people around the world." The company aims to create high-quality content and services that deliver the finest entertainment to customers. To that end, they've focused on the innovation and creativity of employees and have been developing a collaborative and competitive corporate culture. The company seeks to anticipate changes in the environment so they can respond flexibly and sensitively. As part of this effort, the Service Desk Group in the Information Systems Division, which provides SQUARE ENIX's IT infrastructure and development environment, has been promoting the construction of GPU-accelerated virtual desktop infrastructure (VDI) since 2018 to create a virtualization platform that can accommodate approximately 2,000 users.

CHALLENGE

SQUARE ENIX created a location-agnostic development environment for game development.

To deliver high-quality gaming entertainment, creative professionals, such as programmers, designers, producers, and creative support staff, are all involved in a single project. To ensure that employees could perform their tasks smoothly, the Service Desk Group of the Information Systems Department provided PCs for each employee, including production PCs and a development environment for their programmers. A couple of years ago, the Information Systems Department was given an important mission. Yoshifumi Yamada, technical specialist and an assistant manager of the group, recalled, "There was talk in the spring of 2018 that we should consider remote work, including development work. To address the challenges of expanding offices and skilled employees who would like to work flexibly for nursing care or child care, we

| OFFICE, HOME, OUTDOORS, OVERSEAS | DATA CENTER |

Diagram labels:

OFFICE, HOME, OUTDOORS, OVERSEAS
- Development Division
- Support Division
- Company-wide Division

DATA CENTER

Virtual server
- Graphics Application Windows / NVIDIA vGPU
- Graphics Application Windows / NVIDIA vGPU
- Graphics Application Windows / NVIDIA vGPU
- Hypervisor
- GPU NVIDIA T4
- NVIDIA vWS environment

Server — Data communications

Virtual server
- Office Application Windows / NVIDIA vGPU
- Office Application Windows / NVIDIA vGPU
- Office Application Windows / NVIDIA vGPU
- Hypervisor
- GPU NVIDIA M10
- NVIDIA vPC environment

Server — Data communications

SOFTWARE

Hypervisor & Client:
VMware ESXi and Horizon

Graphics Acceleration:
NVIDIA RTX™ Virtual Workstation (vWS) and NVIDIA Virtual PC (vPC)

Key Applications:
Autodesk Maya, Autodesk 3ds Max, Adobe® Premiere® Pro, Adobe After Effects®, Epic Games Unreal Engine

HARDWARE

Server: Dell PowerEdge R740

GPU: NVIDIA T4, M10

needed to consider a remote work environment that would enable us to do creative work, such as development and design, at home."

While the group researched the feasibility of remote work, unlike companies that focus on general business operations, SQUARE ENIX faced a major challenge in terms of the production of graphics-rich entertainment. "How can we remotely implement the high-performance graphics environment that developers and designers use? We were interested in the virtual GPU solution that NVIDIA had already released that was using vGPU software to virtually partition the GPU hardware on the server, sharing it across multiple virtual machines and cost-effectively utilizing the GPU. We knew that the CAD and BIM markets were increasingly using NVIDIA vGPU-accelerated virtual desktops, according to our research, but we didn't know if we could build a GPU-accelerated VDI environment that could withstand the demands of game development," Yamada explained.

To overcome this challenge, the group implemented a game development project to validate the performance of the production environment with NVIDIA vGPU technology.

SOLUTION

NVIDIA vGPU technology supports game operations, from development to production.

The team deployed a proof of concept (POC) environment powered by the NVIDIA vGPU solution, which was utilized alongside the existing equipment used by the development team for actual

Yoshifumi Yamada, Assistant Manager, Technical Specialist, and VDI Team Leader, Service Desk Group, Information Systems Department

"The team supporting the game development and the associated staff were able to work well in the NVIDIA vGPU environment, so we decided to deploy it to the production environment."

— Yoshifumi Yamada

Sho Wakamatsu, VDI Team Sub-Leader, Service Desk Group, Information Systems Department

Hitoshi Koshiga, VDI Team, Service Desk Group, Information Systems Department

production. As for the results, Yamada said, "High-definition graphics was a challenge for 100 percent reproduction in a virtualized environment. However, the team supporting the game development and the associated staff were able to work well in the NVIDIA vGPU-accelerated VDI environment, so we decided to deploy it to the production environment."

"The Service Desk Group has deployed NVIDIA vGPUs in previous virtual environments. So, we employed the Dell EMC PowerEdge R740 server as the GPU-accelerated VDI foundation due to its configuration flexibility with NVIDIA GPUs. The environment consists of Dell PowerEdge R740 servers with 84 NVIDIA T4 Tensor Core GPUs and 28 NVIDIA M10 GPUs. We have created a virtual environment that can run up to 1,110 NVIDIA RTX Virtual Workstations and up to 800 NVIDIA Virtual PCs for related operations for game development and development support workstations."

Hitoshi Koshiga, who is in charge of operations and has been involved in the implementation, said, "The NVIDIA vGPU solution was used for many years and is very hypervisor-friendly. It has graphics drivers that can be used in virtual environments like PCs and workstations, which are a great support for users. And even with a new OS, applications, and hypervisor versions, they will be supported with a virtual GPU in a short period of time. I am very grateful."

Sho Wakamatsu of the Group explained the breakdown of the resources allocated to the end users. "At this point, about 1,000 people are using it. About 60 percent of our users are running on NVIDIA M10 GPUs, and 40 percent of our users are running on T4 GPUs. We are now going to increase our awareness of NVIDIA vGPU internally as a way to accelerate game development, support, and operations."

CONCLUSION

The company will continue to pursue virtualization of its production teams with RTX 8000.

Yamada said, "We have been considering the NVIDIA vGPU environment as one of the tools for remote working for the last two years, but the coronavirus pandemic has led us to allow a number of employees to work remotely. I think that our early efforts with NVIDIA vGPU have resulted in a successful outcome. Also, the data storage location is important for remote work. GPU-accelerated VDI enables you to consolidate the data and the virtual machines in the data center, and it transfers only the screen images you want to work with, thereby reducing the network load while ensuring performance and security. It also benefits from faster file access because file servers and production systems can be used over high-speed networks in the data center."

Koshiga said, "The Service Desk Group provides several patterns of virtual machine templates, depending on the system resources required for the operations, such as frame buffer size, CPU, memory, and disk of the NVIDIA vGPU. We are committed to making sure that these are optimally assigned to the users' tasks and projects. The ability to change system resources after deployment is a unique benefit of a virtual environment. It is much more convenient than having a physical PC like before."

Wakamatsu also said, "We often use dozens of PCs in testing game development, so the team that supports development is very pleased to have a DirectX game development validation environment in place.
In fact, I was contacted by several departments the other day that they had a sudden need for GPU-accelerated VDI, and I was able to quickly prepare and provide the environment for about 50 virtual PCs."

As of summer 2020, the NVIDIA vGPU solution is gradually being deployed. Regarding the outlook for the future, Yamada said, "We are facing the spread of coronavirus and feel that we need to create a new work style that is different from the previous one. If GPU-accelerated VDI is established, employees can more easily work remotely from anywhere. The company also plans to leverage the RT and Tensor Core technology, which is only available from NVIDIA, and leverage underutilized NVIDIA vGPU resources for deep learning and other workloads. We will also continue to validate the vGPU environment with the RTX 8000, which has a larger VRAM capacity and excellent ray tracing and AI processing in order to meet the demands of our development teams and designers."

For more information about NVIDIA virtual GPU technology, visit
www.nvidia.com/virtualgpu