

Founded in 1899, <u>NEC Corporation</u> has supported and transformed Japan and global businesses for over 120 years, providing diverse solutions ranging from social infrastructure to public and private enterprises to space development.

Industry

Technology

Strategic priorities

Cloud Infrastructure

VMware footprint

- VMware® Cloud™ on AWS
- VMware HCX®

NEC Performs Accelerated, Seamless Migration to the Cloud

With over 300 systems and 400 virtual machines straining its onpremises private cloud, NEC Corporation (NEC) performed an accelerated cloud migration using VMware Cloud on AWS. The solution preserved existing architecture and minimized the impact on users and promises to significantly reduce operational expenses. Moving to the cloud cut migration costs by 91 percent and reduced operational expenses by 19 percent over the previous on-premises infrastructure. NEC plans to apply valuable insights gained from this project to future cloud migrations and to offer these solutions to customers facing similar challenges.

Paving the road for transformation

NEC provides a diverse set of technology solutions, ranging from 5G to AI to DX design. As part of its corporate purpose—"Orchestrating a brighter world: NEC creates social values of safety, security, fairness and efficiency to promote a more sustainable world where everyone has the chance to reach their full potential"—the promotion of digital transformation (DX) forms the core of the company's mid-term business plan 2025.

"The strong partnership and smooth communication between VMware and NEC executives, execution leads, and project members drove a swift, largescale cloud migration. I strongly believe the insights we gained directly through our "Client Zero" approach where we ourselves are the initial client—will be applicable to many other organizations as we support customers' digital transformation journeys and create greater value in our interconnected society."



Mr. Hiroshi Kodama Managing Director Corporate IT and Digital Division, Corporate EVP, CIO, CISO NEC Corporation "DX is not merely changing conventional IT. It is an allencompassing initiative that transforms a company's vision, culture, and business processes. At NEC, we aim to circulate the knowledge and expertise gained through driving our DX to our customers and society at large," says Mr. Toshihiko Nakata, senior director, Management Systems Department, Corporate IT and Digital Division, NEC.



Mr. Toshihiko Nakata Senior Director Management Systems Department, Corporate IT and Digital Division NEC Corporation

Seeking a fast, affordable, and secure transition to the cloud

NEC organizes its DX activities into three areas: "DX for within the company", "DX for customers", and "DX for society".

"DX for within the company" is a crucial initiative serving as the foundation for NEC to benefit from its transformation and share its insights with customers. The company focuses this initiative on three main pillars: "DX of Work Style" to maximize employee potential and improve job satisfaction; "DX of Core Business" to optimize business processes and promote data-driven management; and "DX of Operations" to achieve efficiency and sophistication in IT operations.

NEC seeks transformation through three essential factors in each DX: "Experience" to enhance the digital experience of employees, "DATA Platform" to centralize and utilize various internal data effectively, and "IT Modernization" to improve the efficiency and sophistication of all systems, thereby driving value creation proactively. To build the advanced IT infrastructure required to support these initiatives, NEC adopted a multi-cloud solution. "We had to consider how we could migrate approximately 1,000 existing internal systems to the cloud as quickly and as low cost as possible," said Mr. Susumu Kajino, senior professional, Management Systems Department, Corporate IT and Digital Division, NEC.



Mr. Susumu Kajino Senior Professional Management Systems Department, Corporate IT and Digital Division NEC Corporation

NEC used on-premises private clouds to supply IT resources for group companies and departments that needed to build systems. The company needed to migrate these systems—built on VMware vSphere—to the public cloud.

"Moving systems to the cloud can require modifying the architecture for a cloud native environment," says Mr. Kajino. "Doing so for all systems would net massive labor and costs. In many cases, it is more effective to migrate existing systems to the cloud without significant architectural changes, quickly and at low cost, and then prepare for subsequent phases."

To implement a large-scale move to the cloud rapidly and smoothly—at low cost—NEC chose VMware Cloud on AWS, a secure, fully managed cloud service offered by VMware on AWS EC2 bare metal instances.

Precision-planned migration with minimal user impact

In September 2022, NEC began two months of desktop research and one month of Proof-of-Concept (PoC) of VMware Cloud on AWS, and by January 2023, the company was ready to begin phase one, the threemonth migration of 400 VMs. "Through prior validation, we anticipated that we could build a production environment on VMware Cloud on AWS. But honestly, we were concerned whether we could complete the migration of so many virtual machines," says Mr. Satoshi Omori, professional, Infrastructure and Architecture Group, Management Systems Department, Corporate IT and Digital Division, NEC.



Mr. Satoshi Omori Professional Infrastructure and Architecture Group, Management Systems Department, Corporate IT and Digital Division NEC Corporation

With extensive support from VMware—including lectures, workshops, and technical support—NEC prepared for the migration. During the PoC, the company validated several migration methods and carefully planned the process. Two key requirements were essential: minimizing the impact of cloud migration on end users and reducing the time and costs as much as possible.

Seamless IP address migration minimized the impact on end users. When IP addresses on the system side remain the same before and after migration, the on-premises environment can be migrated to the cloud without modifying applications or environments on the user side. NEC used VMware HCX to implement L2 Network Extension—necessary to consider network latency—but PoC proved in advance that latency was minimal.

While sequentially migrating virtual machines to VMware Cloud on AWS, NEC used VMware HCX to prevent network traffic for virtual machine migration from consuming bandwidth used for regular business operations. The Mobility Optimization Network (MON) function also reduced unnecessary traffic between the on-premises environment and the cloud. Prior verification confirmed that system downtime during migration could be kept to within an hour or less per VM, speeding the scheduling process. "The strong partnership and smooth communication between VMware and NEC executives, execution leads, and project members drove a swift, large scale, cloud migration," says Mr. Hiroshi Kodama, managing director, Corporate IT and Digital Division, Corporate EVP, CIO, CISO, NEC. "I strongly believe the insights we gained directly through our "Client Zero" approach—where we are ourselves the initial client—will be applicable to many other organizations as we support customers' digital transformation journeys and create greater value in our interconnected society."

Shaping the future in the cloud

In only 70 days, NEC completed the migration of 301 systems and 424 virtual machines used by headquarters and all 21 group companies to VMware Cloud on AWS, achieving the company's initial goal.

And there were no complaints about network or system troubles during or after the migration, which had been a concern. Mr. Shunsuke Ichimura, who was the point-ofcontact for internal users and responsible for explaining the scope of the migration project, says, "In this project, there were users who were not enthusiastic about the migration due to concerns about its impact on their operations. To gain their trust and understanding, we carefully explained the measures we implemented to minimize user impact, such as preparing for rollback. And now, we have heard that processing time has improved compared to before due to the high performance of VMware Cloud on AWS instances."



Mr. Shunsuke Ichimura Professional Desktop Services Group, DX Development Center for Work Styles, Corporate IT and Digital Division NEC Corporation

NEC estimates that migrating to the cloud with VMware Cloud on AWS reduced migration costs by 91 percent. The company anticipates the fully managed VMware Cloud on AWS implementation to reduce operational costs by 19 percent over traditional on-premises models. Since the migration, the company has reduced usage fees for its private cloud, aiming to return those savings to users.

NEC plans to use insights gained from this initial cloud migration phase in future endeavors, including the cloud migration of its internal systems that will soon face end-of-life, and in its DX offerings, to support customers facing similar issues.

"We recognize VMware is a leader with top industry technology and experience in the field of virtualization technology," says Mr. Kajino. "For operating management and cost optimization in the multi-cloud environment, many companies will adopt in the future, we plan to use VMware Aria, and we have started verification on cost optimization. We expect these peripheral solutions will be useful not only for VMware Cloud but also for optimizing the management of increasingly complex multi-cloud environments."



