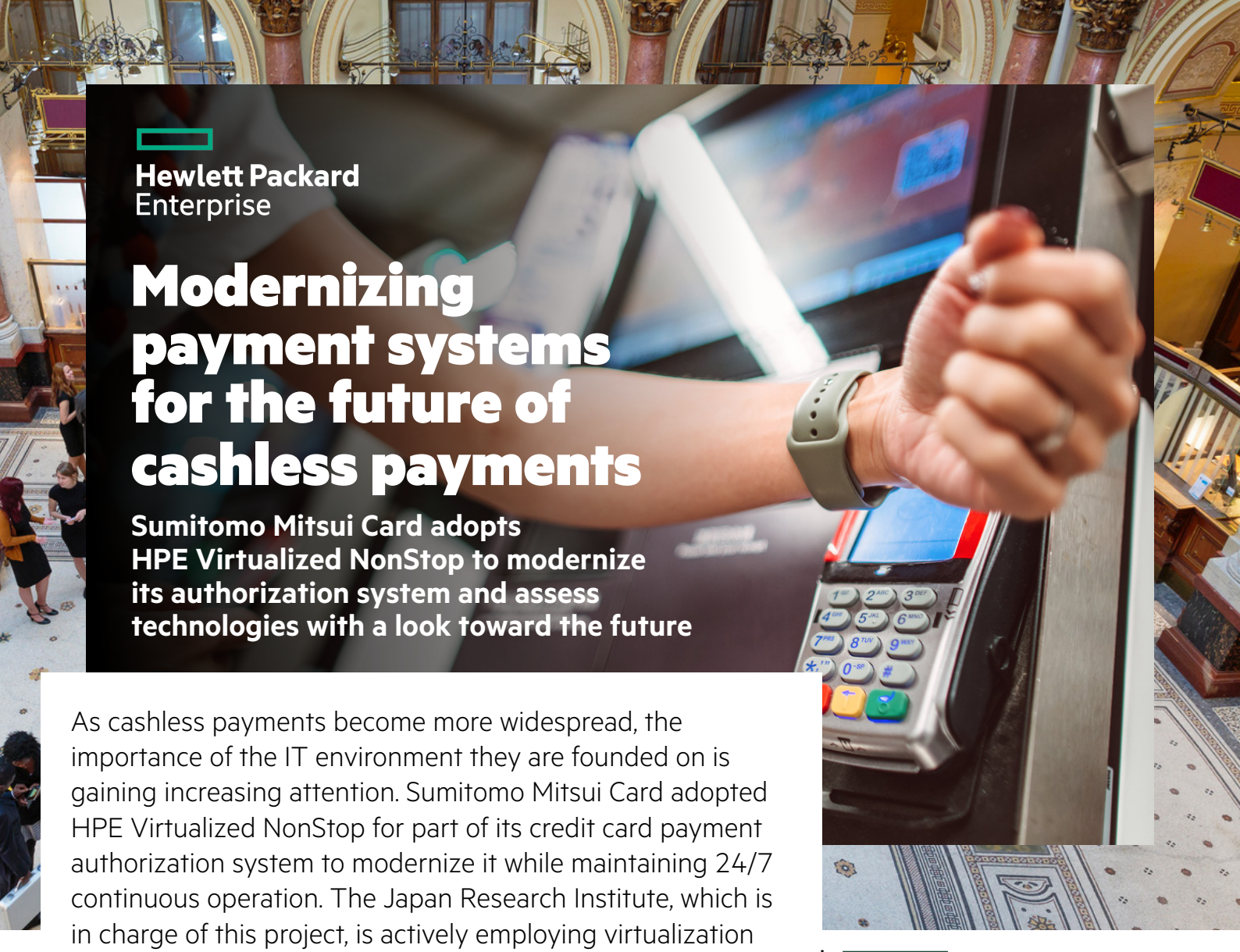


Hewlett Packard Enterprise

Modernizing payment systems for the future of cashless payments

Sumitomo Mitsui Card adopts HPE Virtualized NonStop to modernize its authorization system and assess technologies with a look toward the future

As cashless payments become more widespread, the importance of the IT environment they are founded on is gaining increasing attention. Sumitomo Mitsui Card adopted HPE Virtualized NonStop for part of its credit card payment authorization system to modernize it while maintaining 24/7 continuous operation. The Japan Research Institute, which is in charge of this project, is actively employing virtualization and open technologies to build an IT infrastructure that can meet future needs.

A fault-tolerant platform enabling a flexible, open IT environment

Sumitomo Mitsui Card is widely known as Japan's pioneering issuer of Visa credit cards, which boasts an overwhelming share in the global market. In FY 2020, the company's card membership reached 49.86 million, and its yearly transaction volume surpassed 20 trillion yen by a sizable margin. This staggering business growth, one of the most outstanding among all members of the Sumitomo Mitsui Financial Group, is founded on the company's staunch commitment to provide safe, reliable, and convenient payment services to its customers.

The Japan Research Institute (JRI) has long served as the IT solution expert for the Sumitomo Mitsui Financial Group and works with member companies, including Sumitomo Mitsui Card, to develop and manage their Line of Business systems.

"As card transaction volumes soar, so do the processing volumes of core payment systems," explains Yoshiyasu Kitauji, Deputy Director of the Card Core System Division's Card Payment System department, "Our mission is to provide system services that guarantee a smooth experience every time a customer uses a Sumitomo Mitsui card. These services must be able to deliver continuous 24/7 operation and ensure that online payment transactions are completed with millisecond latency."

SMBC 三井住友カード

日本総研 The Japan Research Institute, Limited

Industry: IT | **Country:** Japan

Vision

Modernizing authorization system for Sumitomo Mitsui Card

Strategy

Actively make use of latest technologies while maintaining 24/7 non-stop operation

Outcomes

- Virtualized gateway system using HPE Virtualized NonStop
- Replaced communication methods, development languages, and other main technologies with open technologies, while continuing un-interrupted operation
- Verified technologies for flexibly responding to changes in payment transactions
- Furthered goal of system modernization while minimizing risks and costs

Authorization systems require the highest levels of availability, reliability, and real-time processing abilities. The HPE NonStop server has long supported such systems.

"Authorization systems form part of the credit card payment system," says Kitauji, "Ever since we adopted the NonStop II (then of Tandem Computers) in 1983, we've continued to use HPE NonStop servers over multiple generations. HPE NonStop servers enable systems that don't stop and don't need to be stopped, even for maintenance or updates."

HPE NonStop servers deliver 100% availability through their unique HPE NonStop process pair technology. They also provide linear scalability, both in terms of performance and capacity, and are equipped with excellent features not found in other systems, such as the fault tolerant database HPE NonStop SQL. In 2019, Kitauji and his team adopted the HPE Integrity NonStop NB-series server as the core server of their authorization system. Also in 2019, they launched a project for verifying and deploying HPE Virtualized NonStop, equipped with virtualization technologies.

A new beginning: HPE Virtualized NonStop

The HPE NonStop server is equipped with the HPE NonStop process pair technology, which duplicates process running on redundant hardware. This technology allows transactions to continue when a failure occurs, without having to restart the system. HPE Virtualized NonStop (vNS) implements the HPE NonStop process pair technology in VMware vSphere® virtual server environments running on standard x86 servers with Intel® Xeon® processors. If a problem occurs in the primary process, the backup process takes over immediately to deliver 100% availability.

"We spent a lot of time debating how we should evolve our credit card payment system, while allowing it to continue to fulfill its role as an enabler for social and digital change." explains Takashi Okonogi, Deputy Director of the Card Payment System department, who is also the project manager, "And the plan that we ultimately decided on was to conduct a 'modernization trial' that incorporates industry standard technologies, including virtualization."

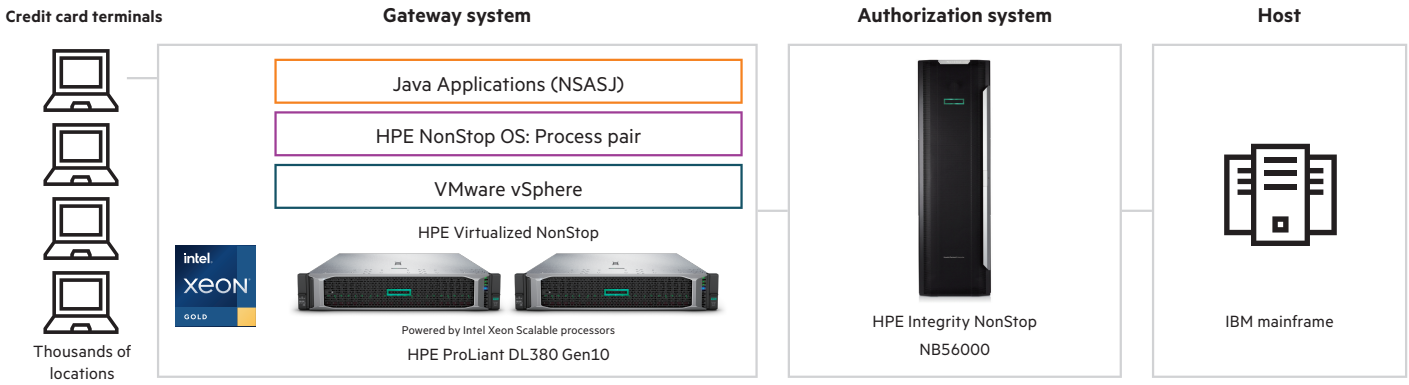
To this end, the team decided to revamp its gateway system, which connects credit card terminals with authorization systems and hosts. The primary goal was to replace its dedicated servers, legacy communication procedures, less commonly used development languages, and applications with industry standard technologies.

"When a customer loses their credit card, taking steps to deactivate that card is a matter of critical urgency," Okonogi explains, "The thousands of credit card terminals installed in locations across the country are used around the clock to respond to a wide range of customer inquiries and requests. The old gateway system ran on a commercial UNIX® system. Our goal is to replace this system with Virtualized NonStop, plus industry standard technologies."

In early 2020, Okonogi and his colleagues built a development/testing environment powered by HPE vNS and HPE NonStop Application Server for Java (NSASJ), which they use for developing Java-based applications. Using NSASJ, they can easily implement the Java Platform and a Java Enterprise Edition (Java EE) environment on an HPE NonStop server. JavaScript Object Notation (JSON) was selected for data exchange.

"By employing HPE Virtualized NonStop for our live environment, we also wanted to assess how practical it was to run a software-based NonStop system on x86 servers,

> "HPE Virtualized NonStop, which enables NonStop systems using software stacks, has many advantages for us."
>
> – **Yoshiyasu Kitauji,** Deputy Director of Card Payment System, Card Core System Division, the Japan Research Institute, Limited



and how effective server virtualization technologies could be in responding to changes in payment transaction," Kitauji explains, "The idea is to determine which technologies can be useful to us, with an eye to the future of payment systems, for which 24/7 continuous operation is a must."

The advantages of creating an HPE NonStop system using software stacks

Several features will be consolidated to the new gateway system, including gateway features and protocol exchange for host communication. The key points of this project put forth by the project team, led by Kitauji and Okonogi, are as follows.

1. Building a Java-based system on HPE Virtualized NonStop running on x86 servers
2. Transitioning from the SNA protocol to JSON-based messaging and REST API based communication
3. Replacing the system without modifying back-end applications
4. Assessing vNS, with a focus on how it can optimize future authorization system architectures

"HPE Virtualized NonStop, which enables NonStop systems using software stacks, has many advantages for us," Kitauji notes, "By separating hardware and software, the problems that arise from the differences in their life cycles can be resolved. If we can prove that a NonStop system can be successfully run on x86 servers housed in standard racks, it would pave the way for such services to be run on Sumitomo Mitsui Financial Group's common platform system as well."

The SNA protocol, which has been used for communication with back-end hosts, will be replaced with REST API and JSON. This, says Kitauji, will enable the HPE NonStop system to work in coordination with a range of different systems, both internal and external, via REST API.

"With its ability to update and modernize systems while protecting existing assets, HPE Virtualized NonStop is sure to be a strong candidate in future projects as well."

– **Takashi Okonogi**, Deputy Director of Card Payment System, Card Core System Division, the Japan Research Institute, Limited

"Windows PC UIs for credit card terminals can be brushed up for better usability, without making any changes to the back-end systems that support credit-related work," he explains, "There's plenty of engineer resources available for Java application development, allowing us to easily accommodate large-scale development requirements. HPE Virtualized NonStop lets us take advantage of the strong points of both the latest technologies and of the traditional system. With its ability to update and modernize systems while protecting existing assets, it's sure to be a strong candidate in future projects as well."

Blazing the trail for the future of authorization systems

As of 2019, when the project team first started considering HPE vNS as an option, there were no cases, as far as they knew, anywhere in the world of it being used for credit card payment systems. This was the first time that it would be applied for such a system in Japan, an enterprising attempt to incorporate new technologies for the future of authority systems. Before the project kicked off, Okonogi traveled to the United States to talk to the HPE NonStop development team, and returned even more convinced that HPE Virtualized NonStop was the right way to go.

"Because the HPE NonStop server has such a long history, some people at our company thought it was a legacy system," says Okonogi, "Through my conversations with HPE's development team, I learned that the HPE NonStop server was steadily evolving, adopting highly practical industry standard technologies like virtualization and Java. I reported to my colleagues at JRI that the HPE NonStop server was a system that can be used in modern ways, and that it would empower us with the ability to integrate the latest technologies with legacy systems."

The spread of NFC and other contactless payment methods is driving the growth of small credit card payments. This further expansion of cashless payments is posing new challenges to Sumitomo Mitsui Card's authorization system. How can it respond to changing business requirements while continuing to fulfill its mission as a social infrastructure system? How can it accommodate the ever-growing transaction volume while keeping costs down? Kitauji believes that the answers to these questions lie in HPE solutions as well.

"What's appealing about HPE GreenLake is that it offers monthly and consumption-based pricing, plus it works well with virtualization technologies," he says, "It allows us to scale server resources up or down according to transaction volume, and pay only for as much as we use. This should have significant cost benefits."

Japan's Ministry of Economy, Trade and Industry launched the "Cashless Vision" campaign, which set a goal to increase the rate of cashless payments to 40% by 2025. At the center of this effort are credit card services like Sumitomo Mitsui Card, which continue to evolve.

"One of our major goals in adopting HPE Virtualized NonStop for our gateway system is to determine how effective it can be in a live critical system," Kitauji says, "If the new system can operate 24/7 and deliver the expected performance levels, it would allow us to widen the scope of its application. I'm confident that the modern NonStop systems have great potential, and that HPE and the HPE NonStop servers will support our mission, now and in the future."

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HPE.com/info/NonStop

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- HPE ProLiant DL380 Gen10
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- HPE Virtualized NonStop
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