

## CASE STUDY

### Intel® Xeon® Processor E7 Product Family

Financial Services

Mission-Critical Computing

High-Performance Computing

Virtualization



# High-speed data center boosts credit card service

The National Credit Card Center of the R.O.C. adopts an Intel® Xeon® processor E7 product family-based platform to build a top-notch data processing center that boasts high speed, stability and easy maintenance



Established in 1979, the National Credit Card Center of the R.O.C., Taiwan (NCCC) handles credit card processing, domestic liquidation, and collection of bill payments, as well as bonus calculation and card-related services. With its innovative and professional services, NCCC promotes diverse and convenient financial flows, enhances the quality of life for consumers, and stimulates the development of the economy as a whole.

## CHALLENGES

- **Timely, reliable data exchange.** Complete verification of information and authorization process within the required period while ensuring data transfer process efficiency.
- **Meet business request demands.** Ensure high performance and a stable computing system to handle an enormous volume of business requests on tight deadlines.
- **Meet data processing demands.** Make use of best-performing CPUs with sufficient power to meet the demands of processing massive amounts of financial information in future operations.

## SOLUTIONS

- **Deploy data processing servers based on Intel® Xeon® processor E7 product family.** Use the excellent performance of the Intel Xeon processor E7 product family to allow real-time credit card transaction data to be processed in a timely way and ensure that the data transfer process is effort-free.
- **Utilize VMware vSphere\*.** Provide a virtual environment that is enhanced and adequate for handling massive amounts of data.
- **Deploy high-performing CPU.** Use the Intel Xeon processor E7 product family to maintain stable service for current and future processing requirements with the high-reliability architecture of the data processing system's CPU.

## IMPACT

- **Achieved efficient computing power.** Using an Intel Xeon processor E7 product family-based platform for the data processing system has ensured a fast, secure and convenient payment process.
- **High performance and stable computing system.** Serviced enormous volumes of business requests with a high-performance system designed to handle heavy workloads.
- **Stable, fast, and easy-to-maintain CPUs.** Harnessing the power of the Intel Xeon processor E7 product family for the CPUs avoided system shutdowns, ensuring service stability.

# Deploying servers based on the Intel® Xeon® processor E7 Family and VMware vSphere enhances the virtual system performance of the data processing system, handling massive amounts of data for NCCC



“Intel® Xeon® processor E7 product family’s excellent performance allows real-time credit card transaction data to be processed in a timely way, ensuring a smooth flow and positive overall experience for consumers.”

*Wang Xiaohui  
Senior Assistant Manager, Information  
Service Department  
National Credit Card Center of R.O.C.*

## Timely, reliable data exchange and efficient computing power

Using credit cards to purchase goods is a routine part of consumers’ spending habits. From the time the card info is input to the completion of the transaction, a lot of information needs to be compared and processed. The processing of credit card information requires a third-party organization such as the NCCC to quickly verify relevant information and complete the authorization while ensuring that the data transfer process is error-free and secure. This requires implementing high-level security solutions such as those from HP and Trend. All these guidelines help ensure the payment process is fast, secure, and convenient.

Wang Xiaohui, senior assistant manager of the Information Services Department at NCCC, pointed out that, as Taiwan’s largest credit card processing business, the NCCC mainly relies on a high-performance and stable computing system to service its enormous volume of business requests, which also have stringent requirements for timeliness.

“For the NCCC, the main work is data processing and exchange. Hence, there are high demands on the performance of the server hardware, mainly because a high-performance system can handle a relatively heavier workload. For our huge trading volume, which can be up to several million transactions per day, saving manpower, time, and management costs is of paramount importance,” explained Wang.

One of the key factors affecting the data processing system’s server performance is the CPU. The CPU is also one of the main components of the

computer’s hardware specifications. When the NCCC purchases new servers, the CPU is a critically assessed item. Predetermined applications are directly installed in the device to benchmark all devices based on actual data, and the best-performing model is selected to ensure there is sufficient power to meet the demands of processing massive amount of financial information in future operations. Meanwhile, during the testing process, the stability of the system’s operation must also be verified. To do this, the NCCC has established a real device testing standard operating procedure for new server purchases to find the most suitable server.

## Stable, fast, easy-to-maintain CPUs for data processing system

Based on test results, the Intel Xeon processor E7 product family-based server has the most satisfactory overall performance data, meeting one of NCCC’s most important procurement specifications. The center’s current servers are also mostly based on the Intel Xeon processor E7 product family. The processor’s excellent performance allows real-time credit card transaction data to be processed quickly, thus ensuring a smooth flow and positive overall experience for consumers.

Due to the nature of the information processed by the NCCC, and although it is not a bank or similar legal entity, its information systems must comply with the strict regulations of the Financial Services Commission to ensure that it meets stability and reliability requirements. The foundation of a system’s stability and reliability depends on the quality of its central processor. To ensure it could meet this

requirement, NCCC ran a 24/7 test of its trading system using the Intel Xeon processor E7 product family. Compared to its old trading system, based on a different processor, the new system has never had any failure that caused the system to shut down, regardless of long hours and intensive computing environments—even when they are due to be replaced. The high-reliability architecture of NCCC's data processing system using the Intel Xeon processor E7 product family has been a key factor in maintaining stable service.

Wang believes that the quality and stability of the hardware can also be discerned from the marketplace. Commercially available, mainstream IT products usually use mature technology and have a certain level of quality. Moreover, thanks to the equipment's wide availability in the marketplace, the purchase process can be short. For instance, the open Intel® architecture deliver a good reputation for high stability and performance.

"Mainstream products also reflect the current global trend of IT development," said Wang. "Using mainstream products is following the trend. Not only can we provide services to meet today's needs, but it's also easy to get follow-up maintenance resources and technical personnel, which lower our maintenance costs."

### High-performance processors reduce the overall cost of the virtual environment

With more and more diverse credit card services, NCCC has started bank trading-related businesses, such as the National Travel Card system, in addition to its existing card data processing business.

With the increasing variety of services comes the demand for more powerful computing resources. If the data exceeds NCCC's computation power, the company must quickly expand its resources. If it uses the same open platform, it can avoid conflicts such as application incompatibility or lack of support from driver applications, enjoying seamless integration with upper-layer operation services.

Different businesses have different resource needs. For instance, some Web services use less than 10 percent of the CPU, while some credit card processing systems require several CPUs to effectively deal with demand. NCCC wanted to minimize CPU usage without compromising performance and ensure that it was using system resources to their full potential. To do this, NCCC adopted VMware vSphere. Intel and VMware have signed a technical cooperation contract and specially developed instruction-level virtualization technology for NCCC, ensuring virtual system performance is adequate to handle its massive amounts of data.

### Lessons learned

- A high-performance and stable computing system ensures that high-volume business transactions can be serviced efficiently.
- A high-performance CPU provides enough power to meet the demands of processing massive amounts of financial information in future operations.
- Intel Xeon processor E7 Family-based servers have the most satisfactory overall performance data to meet NCCC's needs.
- The open architecture CPU has led the market for a long time and continues to deliver a good reputation for high stability and performance.
- VMware vSphere enhances virtual system performance, ensuring adequate handling of massive amounts of data.

Wang explained that the CPU's excellent performance in the virtual environment means it can run more virtual machines. Using VMware vSphere, a single physical CPU can execute more virtual machines, improving performance for processing credit card information by 50 percent. With a consolidation ratio of 1:6, or one CPU for six virtual machines, using a virtual environment allowed NCCC to handle and analyze huge amounts of data in the database. This enabled NCCC to lower its virtual platform licensing costs and gain in its return on investment.

With the computing power of the Intel Xeon processor E7 product family, NCCC's IT department has been able to produce excellent reports for management. This not only gives the staff a sense of accomplishment, it also lets management appreciate the IT department even more.

Most importantly, the NCCC achieved its important goals: high stability and fewer system errors as well as high efficiency and quick service processing speed.

As mobile devices become increasingly convenient and smartphones become a more common mode of consumer payment, NCCC is also actively developing a mobile payment system. When the relevant legal regulation system is completed, NCCC will work with banks to launch the new payment method to make everyone's payment process more convenient.

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