

Vantiv delivers ultra-secure, lightning-speed payment processing

Cutting latency and costs with Smarter Computing best practices from IBM

Overview

The need

Vantiv wanted to preserve its reputation for industry-leading speed and availability in payment processing, while responding to customer demand for encryption to support new payment methods.

The solution

By moving all encryption workload from external appliances to an IBM Crypto Express3 coprocessor deployed in its existing IBM® zEnterprise® 196 environment, the company has cut latency dramatically.

The benefit

Delivers higher processing speeds and helps to address scalability issues, equipping Vantiv for the future. Capitalizing on the built-in security of the zEnterprise platform protects payment data.

Vantiv processes payments for merchants and financial institutions, handling gateway transactions, debit, credit, gift card, electronic benefit transfer (EBT) and authorizations for signature and personal identification number (PIN) based transactions. As the number one processor of PIN debit transactions in the United States, Vantiv has over 400,000 merchant locations, 1,300 financial institutions and drives more than 13,000 automated teller machines (ATMs). Employing 2,500 people worldwide, the company's headquarters are located in Cincinnati, Ohio.

Staying ahead of the competition

One of Vantiv's key selling points is the speed of transaction processing it offers. Tom Kesselring, Vice President for Mainframe and Non-stop Systems at Vantiv, comments: "Vantiv differentiates itself from the competition via a highly specialized processing engine that seamlessly integrates all of the elements of payment processing. This one-stop shop capability is why many of our customers leverage our services. Due to our commitment to this sector, we have been able to leverage the IBM systems to provide one of the fastest and most reliable transaction processing systems in the industry."

To retain its award-winning status as one of the fastest and most reliable payments processors in the US, Vantiv needs to find ways to more efficiently handle growing demands for more complex encryption without compromising on speed or availability. Specifically, the introduction of Europay, MasterCard and Visa technology—based on credit cards with embedded microchips—to the US market would require the generation of more encryption keys.



“The IBM Crypto Express3 coprocessors are very fast—we get an average execution time of less than 50 microseconds, equating to 20,000 transactions per second.”

—Tom Kesselring, Vice President for Mainframe and Non-stop Systems at Vantiv

Previously, Vantiv relied on external hardware security modules (HSM) to handle the encryption and decryption of transactions. As demand for encryption grew, Vantiv began experiencing scalability issues with this model.

Chris Doyle, Manager – Encryption Processes at Vantiv, explains: “Relying on external hardware security modules presented us with several challenges. Because they were limited to a certain number of connections, there was a cap on the processing power and throughput we could achieve. To meet security requirements, the devices need to be locked up in cages, calling for more people to install and manage them, increasing our costs. Eventually, we had 20 devices in place, and it simply didn’t make financial sense to continue installing new ones.”

Achieving faster processing

With the release of IBM Crypto Express3, a coprocessor designed specifically for encryption, Vantiv saw an opportunity to cut latency, enabling even faster processing of big data. With all cryptographic processing handled within the IBM zEnterprise® 196, Vantiv no longer incurs a performance hit from the network latency inherent in sending cryptographic processing to external appliances.

Kesselring says: “The IBM Crypto Express3 coprocessors are extremely fast—we are seeing an average execution time of less than 50 microseconds, equating to 20,000 transactions per second. The encryption component used to be a negative drag on the transaction response time. That just isn’t the case anymore.”

Maximizing security

The IBM Crypto Express3 is based on leading-edge, tamper-sensing and tamper-responding, programmable cryptographic technology, building on the inherent security of the IBM System z platform to help Vantiv generate encryption keys faster than ever before within a protected environment. Doyle comments: “IBM Crypto Express3 comes with

Smarter Computing: The IT Infrastructure of a Smarter Planet

Designed to process large-scale transactional throughput, the IBM zEnterprise offers Vantiv a secure cloud for data that helps the company maintain its status as one of the fastest, most reliable payment processors in the US. Selecting an IBM mainframe solution with advanced, integrated virtualization technology ensures Vantiv can exploit economies of scale to maximize use of resources. Offering cost-effective, non-disruptive scaling options, Vantiv has gained an infrastructure that removes barriers to growth, helping the company make the most of opportunities. With tamper-resistant cryptographic technology, the Crypto Express3 enables Vantiv to process a greater number of encryption keys without a drag on the transaction response time, at a rate of 20,000 transactions per second.

Solution components

Hardware

- IBM® zEnterprise® 196 (z196)

Software

- IBM z/OS®
 - IBM DB2®
 - IBM CICS®
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management tools that offer control and transparency. We are able to view, log and verify all processes, creating an operating environment that stands up to the most rigorous of security and operating requirements.”

Kesselring adds: “The devices are also tamper-resistant—if anyone tried to access them in an unauthorized manner, the contents would automatically be erased, ensuring our customer’s data is always protected.”

Boosting efficiency

By offloading encryption processing to the IBM Crypto Express3 coprocessor, the company has freed up valuable capacity on its general purpose processors that can now be used for other workloads. Bryan Bailey, Vice President of Online Systems, explains: “Because the IBM Crypto Express3 no longer eats up our CPU resources, we can be more efficient with our processing.”

Handling encryption processing within its existing IBM System z environment helps Vantiv drive down the cost-per-transaction, by reducing floor space requirements, cabling and also management time. Doyle says: “If we had continued adding external appliances to our infrastructure we would be dealing with a lot of devices right now, using up lots of valuable data center space. I have talked to other customers that have hundreds and hundreds of external appliances with hundreds of key custodians trying to stay on top of managing them. Choosing the IBM Crypto Express3 allows us to avoid all this.”

Preparing for the future

Vantiv has deployed three IBM Crypto Express3 devices, with the option of up to 16 in each of its IBM z196 mainframes. This provides much-needed headroom to accommodate the rising demand for greater levels of encryption, and also manage seasonal spikes in workload.

Kesselring summarizes: “We believe that with the IBM Crypto Express3 coprocessor, we can easily scale to ten times our current capacity with no impact on encryption processing performance or response times.

The process to install a new coprocessor is fairly straightforward and well-documented, meaning we can simply slot one in and have it up and running within an hour. For our purposes, we have a solution that we can consider pretty much infinitely scalable.”

For more information

To learn more about how IBM can help you transform your business, please contact your IBM sales representative or IBM Business Partner. Visit us at: ibm.com/smartercomputing



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