

Huawei Creates Highly Reliable Data Center Network for Central Bank of Russia's NPCS

Background

The CBR NPCS went online April 1, 2015, operating as an independent Russian payment system. This system operates within Russia, processing all bank card transactions internally, while offering connections to international payment systems such as VISA, MasterCard, and so on.

The Central Bank of Russia (CBR) is the most influential bank in Eastern Europe, and utilises the largest payment settlement center. Headquartered in Moscow, the CBR earns annual revenues of over 600 billion Russian rubles (USD 8.8 million), and is valued on the market at more than 3,200 billion Russian rubles (nearly USD 46 million).

Operating in line with local federal law, the independent CBR must:

- Formulate national currency strategies
- Establish and maintain a national payment system
- Regulate the financial market
- Protect national currency stability
- Guide development of the financial services industry in Russia

To better fulfill these responsibilities, the bank established a modern National Payment Card System (NPCS) to unify online domestic and international payments and transactions within the Russian Federation.

Challenges

The CBR serves over 100 million consumers, 12,000 payment organisations, and 1,200 banks — totaling more than 10 million transactions and over 400 billion Russian rubles (USD 5.9 million) a day. From 1990 to 2014, the CBR handled financial transactions using the payment systems of multiple companies. Since roughly 95 percent of these transactions were handled by companies outside Russia,



"The NPCS is responsible for financial stability in Russia, and therefore requires high reliability. We want to thank Huawei for successfully delivering data centers in such a short period of time and supporting the rollout of the NPCS. Huawei's professional and experienced performance contributed a lot to this project."

Sergey Bochkarev
Deputy CEO of NPCS

Executive Summary

Industry

Finance

Challenges

CBR's National Payment Card System (NPCS) must accommodate the following long-term requirements:

- Guarantee smooth card and online transactions for up to 100 million customers who spend 400 billion Russian rubles (USD 5.9 million) a day
- Guarantee access security and service isolation for the transactions of 20+ payment systems spread over 400+ banking data centers
- Sustain payment business development of 12,000+ financial institutions and 1,200+ banks over the next 10 years

Solution

- The 1+1 highly available disaster recovery DC design can support business development of NPCS for the next 5 to 10 years.
- The 1:16 VS virtualization capability and support for 4,000 VRFs ensure secure payment and settlement.
- The large L2 TRILL network with over 500 nodes supports on-demand service expansion.
- DCs are connected through EVN, improving reliability of disaster recovery and ensuring rapid migration of service resources.

Benefits

The CBR NPCS has achieved:

- Zero interruption in transactions: A data center network of high reliability ensures nonstop transactions on the NPCS.
- 100% security isolation: The multi-service data center switching core completely isolates the payment business of different systems, guaranteeing financial security.
- Smooth evolution: The elastic network architecture supports smooth business expansion on the NPCS over the next 10 years.

CASE STUDY



risks were high and unpredictable. To manage these risks, the Russian government mandated creation of an NPCS in 2014.

The NPCS processes all transactions for the CBR, including card payments, online payments, cross-border settlements, and cross-bank settlements. The CBR required an advanced data center solution to ensure efficient NPCS operations to deliver highly reliable, secure, and scalable business to clientele and maintain national economic security.

In addition, the NPCS is required to facilitate nationwide transactions of the entire banking industry to all consumers. Any failure could potentially cause severe economic loss and even affect the stability of the national financial system.

To ensure stability, the CBR NPCS required an industry-leading network architecture that is both highly reliable and secure. The NPCS must continue to support current operations while adapting to rapid increases in domestic and international financial transactions. This system now faces the following challenges:

- Reliable Data Center (DC) operations
- A highly reliable switching core network that is free of single-point failures to ensure long-term stability of system operations
- Load balancing to improve the efficiency of network resources
- Connections to more than 20 payment systems such as the VISA, MasterCard, as well as the data centers of more than 400 banking institutions
- Isolating different systems and banks while still facilitating communication between them
- Active/standby data centers in Moscow to provide unified transactions for both domestic and international customers
- Reliable connections between DCs in different geographical locations
- High capacity, reliable and secure data center network with the scalability to support financial Big Data and other innovations on the NPCS over the next 10 years

Solution

The CBR selected Huawei to build the NPCS data center network. Huawei's data center network solution guarantees the reliability of the financial data center at several levels. The data center meets the following technical requirements:

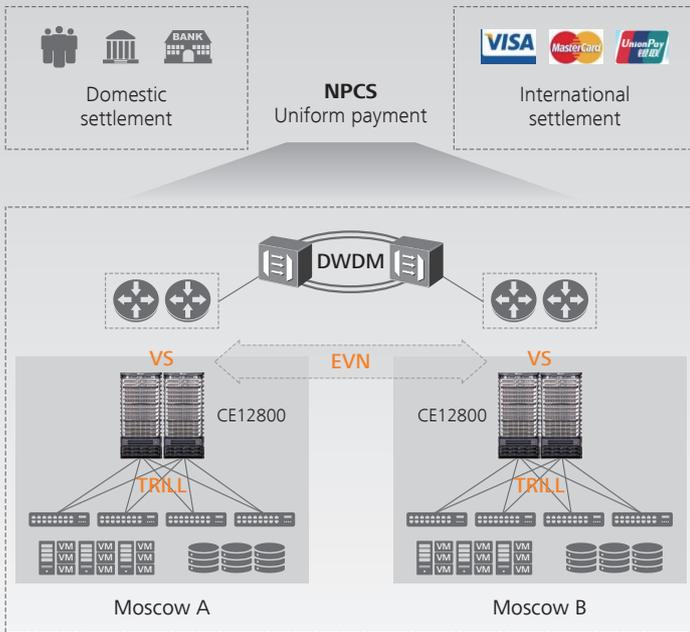
- Huawei CloudEngine (CE) series data center switches offer industrial-grade, "five-nines" (99.999 percent) reliability and In-Service Software Upgrade (ISSU) capability, ensuring the long-term stability of the



network core and non-stop service forwarding. The Huawei solution ensures high network reliability and high link utilisation by deploying a large Layer 2 network over the core layer using Transparent Interconnection of Lots of Links (TRILL). Huawei also provided cross-DC resource collaboration and utilisation by implementing a next-generation Data Center Interconnect (DCI) solution — Ethernet Virtual Network (EVN) across data center sites. The EVN solution provides multiple, redundant processing centers to serve external access sites and financial terminals (including individual consumer terminals), and prevents faults from affecting transactions.

- Huawei CE12800 series switches provide the industry's strongest 1:16 Virtual System (VS) virtualization capability with 4,000 VPN Routing and Forwarding (VRF) instances. The CE12800 utilises the entire network as a large virtual resource pool that can be scheduled on demand, helping customers flexibly build and maintain multiple-service data center networks. Huawei's next-generation "1:N" device virtualisation technology implements access control and security isolation for payment and settlement businesses by deploying different business servers in 4,000 Services while simplifying multiple-service management.
- Elastic scalability: at device, network, and DC levels:
 - Device-level: Supports evolution of four generations of servers (GE/10GE/40GE/100GE) over a 10 year span. Chassis switching capacity of 160 Tbit/s can be upgraded easily to 320 Tbit/s, enabling sustainable development of cloud computing data centers and non-stop service forwarding.
 - Network-level: TRILL improves network resource utilization and enables smooth data center network evolution plus automatic network node discovery and maintenance.
 - DC level: Ensures scalability of payment business; EVN provides access to cross-DC utilization and IT resource sharing.

CASE STUDY



"1+1" active/standby production data centers for NPCCS

High reliability

High security

High scalability

- **CE12800** core switches provide uninterrupted services to ensure network stability.
- Dual-core redundancy design improves system reliability.
- Disaster recovery networks support service backup while improving service reliability.
- **1:16** VS virtualization ensures the highest logical isolation capability.
- A VS can provide **4,000** VPN Routing and Forwarding (VRF) tables to guarantee the **secure isolation** of payment services.
- **High-capacity** core devices support continuous service expansion.
- Large L2 TRILL network resource pool supports **on-demand** network **expansion**.
- Two active/standby data centers become multiple data centers working in redundancy mode.

Benefits

The construction of the NPCCS data center network was completed in 2015. This project will establish a large Layer 2 network that connects two payment centers, facilitating free online service migration and the communication and isolation of different services. In the future, additional disaster recovery data centers will be deployed to ensure business continuity. If active data centers are damaged by disaster, standby data centers in other regions will restore data and services, ensuring uninterrupted financial services.

About Huawei Enterprise Business Group

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For more information, please visit: <http://e.huawei.com>

More Information

For more information about Huawei data center network solutions and the CE12800, please visit: <http://e.huawei.com/en/solutions/technical/sdn/software-defined-data-center-network>

