

Hitachi Unified Computing for the SAP HANA Platform helped Russian Railways to optimize the procedures of scheduling and analytical reporting, increase accuracy of financial indicators computing, and reduce data volume.



## Hitachi Converged Solution Brings Virtualization and Top Performance to Russian Railways

Russian Railways, one of the world's largest railway companies, began its partnership with Hitachi Data Systems in 2008 to manage its increasing data growth. Now, with four data centers, Russian Railways relies on the virtualized environment it built on the converged Hitachi Unified Compute Platform for the SAP HANA Platform solution, which consists of Hitachi enterprise and midrange storage, servers and software.

### About Russian Railways

Russian Railways was created in 2003, as a result of a large-scale reorganization of the Russian railway industry. It is now one of the largest railway companies in the world in terms of amount of cargo and passengers conveyed every year. With more than 85,300 km of operational railroad, Russian Railways employs one million people.

In addition to cargo and passenger transport, Russian Railways' operations include infrastructure services, locomotive pulls, infrastructure site construction and repair of rolling stock. The company also conducts scientific research, designs and enables experimental projects, and offers social support activities. The primary goal

of the company's operations is to meet the demands of the state, legal entities, and private citizens for rail conveyance and other operations and services provided by rail transport.

The management of the company's IT infrastructure is accomplished by several company subdivisions: Central IT Committee, Design and Experimentation System Bureau, Primary Data Center, IT Systems Development and Integration Field Center, and Corporate IT. Russian Railways owns four data centers, located in St. Petersburg, Ekaterinburg, and two in Moscow. The Primary Data Center is Russian Railways' largest IT department, employing about 10,000 people, plus an additional 14 regional computer centers in the Russian federation.



### Russian Railways

INDUSTRY  
Transportation

SOLUTION  
Converged, Data Protection, Enterprise, Virtual Tape Library, Virtualization

HARDWARE  
Hitachi Unified Compute Platform for the SAP HANA Platform with: Virtual Storage Platform, Accelerated Flash, Unified Storage 100, Unified Storage VM, Compute Blade 500 and 2000, and legacy Universal Storage Platform V systems

SOFTWARE  
Hitachi Command Suite with TrueCopy and Data Protection Suite

### Benefits at a Glance

- Improved financial planning and accounting.
- Improved performance and greater efficiency.
- Simplified storage management.
- Reduced backup time.

## SUCCESS STORY

In 2003, Russian Railways took over all business and managerial transportation functions from the abrogated Ministry of Transportation Routes. Part of the railway industry reform, the company was designed to advance the quality of transportation services and investment potential of the rail lines, as well as improve transport efficiency. A major component of this reform was the reorganization of the IT sector in the company.

### Hitachi Answers the Consolidation Challenge

Russian Railways and Hitachi Data Systems (HDS) first began their partnership in 2008. After consolidating management of cargo and passenger flows, Russian Railways planned to unify its business processes: finance, tax reports, accounting, asset management, and enterprise resource planning systems. The company selected HDS for the task, as it was well-regarded in terms of creating and supporting existing IT infrastructure of Russian Railways in comparison with its competitors.

HDS solutions, in addition to their performance, power and reliability, also supported virtualization, allowing administrators to manage isolated resources from one location. At the start of 2009, the first Hitachi enterprise storage systems were installed at the railway transport data centers.

As a result of the successful installation, HDS became a provider of enterprise management system consolidation equipment for the Human Resources, Finance,

Transport Documentation, and Electronic Document Exchange departments. HDS supports critical services, including almost 200,000 SAP solution users. Virtualization technology in Hitachi Virtual Storage Platform (VSP) systems allowed Russian Railways to continue to use previous-generation storage systems, including Hitachi Universal Storage Platform V (USP V).

Data center consolidation at Russian Railways involved 21 high-end storage systems (Hitachi USP V and Hitachi VSP) with a total usable enterprise-level storage capacity of more than 2.5PB.

### The New Challenge: Optimize Storage, Increase Manageability and Fault Tolerance

In 2011, in parallel with the data consolidation project, Russian Railways data centers launched a project for transferring applications vital to the infrastructure and certain regions to a virtual infrastructure. The main goals for virtualizing the processing capacity of the data-processing centers were to optimize performance of the current equipment and increase manageability and fault tolerance.

### The Solution: Multifaceted Hitachi Converged Approach

#### High Performance With Hitachi Compute Blade

The specified standard computer systems were built based on the operational experience and technical requirements

of the Primary Data Center and operated using high-performance Hitachi Compute Blade servers and midlevel Hitachi Unified Storage, as well as legacy Hitachi Modular Storage. In addition to high-performance operational characteristics, the specified type of server equipment physically unites several modular servers into one unified system. This option allowed the company to completely reject the idea of buying rack servers. As a result, Russian Railways' IT Department was able to reduce energy consumption and significantly optimize the quantity of the purchased equipment.

#### Virtual Tape Library Ensures Data Security

Russian Railways' data centers have adopted a multilevel data backup approach. Backup data is stored in Virtual Tape Library Solutions by Hitachi Data Systems, which include servers, a storage system, and supplemental components, such as switchboards, cables and cards. Thus, data is backed up to a data storage system instead of a magnetic tape (as in traditional tape libraries). Virtual Tape Library Solutions offer fast data backup and restore in several threads, which reduces the time spent on these operations by 10-15 times compared to traditional tapes.

Data is stored in the Virtual Tape Library Solutions for four to six weeks, after which it is transferred in one thread to tape libraries for long-term storage. Thus, the solution offers fast restoration of data backed up within the past several days or up to a month. The additional deduplication

“ The online purchasing option has increased the number of Express Automated Ticketing System orders. At the same time, the ratio of 'empty' orders to those that lead to an actual ticket purchase is in the dozens. This forces us to seek ways to improve system performance. At the moment, a pilot project is being implemented based on Hitachi UCP for SAP HANA that offers in-memory analytics. This will help to significantly speed up the process of finding and purchasing tickets for Russian residents. Hitachi UCP for SAP HANA has been chosen as the main solution for this project. ”

*Andrei Pavlovsky  
IT Department Head  
Russian Railways*

option reduces stored data volume by 15-20 times by searching for duplicated, previously saved data, which reduces data storage and maintenance costs. In addition, the solution supports high reliability and increased backup and restore speed compared to traditional tape libraries.

### Converged Hitachi Solution Brings Efficiencies to SAP HANA

Hitachi Unified Compute Platform for the SAP HANA Platform (UCP for SAP HANA) was introduced into the Russian Railways financial department to improve operating performance in managerial accounting.

Why UCP  
for SAP  
HANA?

VIEW

“One of the company’s key goals is to improve its operating performance,” confirms Deputy Head of the Financial Accounting Department of Russian Railways, Aleksandr Biryukov, in a video shot by SAP. “Taking into account the depth and size of the company and the large volumes of information we have to process, our accounting process is rather complex, multidimensional and labor-intensive.”

After the launch of the pilot project for the financial department, system performance proved extraordinary. Query processing time, depending of the type of query, decreased significantly, in certain cases, by several hundred times. Processing time for planning operations by type of activity decreased from 842 to 33 minutes and for planning by territory from 33 to 8 minutes. A monthly cost-allocation analysis, which would take up to three days in the past, now takes 20 minutes. Database access has sped up by 300 times with access time decreasing from 117 sec. to 0.35 sec. The SAP Business Warehouse subsystem performance has increased by five times. The total volume of stored information has decreased by three times. Further, increased computer system performance has made automated systems more accessible for users of the financial subdivisions of Russian Railways, which, in turn, improved the overall quality of financial planning and accounting.

The Executive Board of Russian Railways has set a goal of switching the majority of its analytical services, such as tax and other accounting services, to Hitachi UCP for

SAP HANA. By 2013, Russian Railways had installed several SAP HANA suites to perform a variety of tasks. Both analytical and production services have already switched to this platform. At the moment, the company is focusing on adapting and the future migration of applications from mainframe servers to the SAP HANA platform.

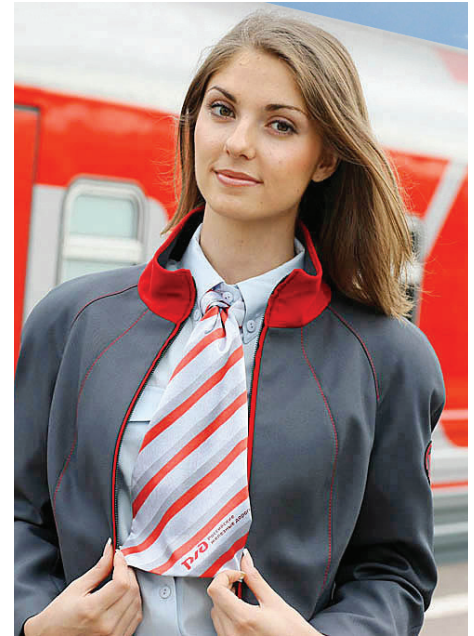
To increase the efficiency of operational task management (freight and passenger transportation, as well as online ticket sales), the company is optimizing and adapting its current mainframe server applications to interface with the SAP HANA platform. This switch will allow the company to move away from expensive infrastructure and on to a more economical Intel platform with a significant increase in performance.

In addition to global strategic tasks and projects, Russian Railways’ business processes involve local tasks for which the company also uses Hitachi equipment. The Russian Railways’ corporate portal needs to be highly reliable and efficient in operation. To satisfy this demand, the company uses high-end Hitachi Unified Storage VM with super-fast Hitachi flash drives.

### The Benefits and a Look Ahead

In the future, the Russian Railways plans to migrate the Express Automated Ticketing System, because this application has exhausted its scaling resources on current equipment and can no longer satisfy the system performance requirements. Hitachi UCP for SAP HANA testing for one node of the Express Automated Ticketing System has proven a success and demonstrated high performance. At the moment, the company is testing a multinode cluster configuration, and by the end of the year, the platform should be at full operational capacity. In addition, five more applications that use mainframe servers will switch to Hitachi UCP for SAP HANA.

The converged UCP for SAP HANA solution was originally selected for corporate data storage and protection for 270,000 active users and over 850,000 employees. The solution helped Russian Railways optimize the procedures of scheduling and analytical reporting, increased accuracy of financial indicators computing, and reduced data volume. With the Hitachi Command Suite console, which is used across all HDS storage, the company improved its overall management.



Additional backup is provided by Hitachi Data Protection Suite in four data centers. This software suite allowed Russian Railways to transition from agent-based licensing with Symantec NetBackup to the backup data volume-based licensing model, with approximately 915TB of consolidated backup data. Further security is provided with the disaster recovery solution implemented by HDS using Hitachi TrueCopy remote synchronous replication across the four main data centers.

According to Head of the Russian Railways IT Department, Andrei Pavlovsky, in the future the company will focus on finding solutions to help improve productivity and use existing resources more efficiently. The data storage system upgrade will be implemented using Hitachi Accelerated Flash. SAP HANA, based on the Hitachi offering, is being considered as the primary solution. “We will be modernizing our infrastructure using new Hitachi Accelerated Flash storage,” explains Pavlovsky. “This will allow us to vastly improve performance while processing large amounts of data, yet utilizing less electricity while occupying the same amount of space as existing data storage systems.”

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