Huawei can quickly respond to customer requirements, and new methods can be quickly employed. For example, the unified maintenance interface of the Huawei E9000 server facilitates O&M and greatly improves the convenience of local device maintenance. In addition, the E9000 server supports reliable operating at 40°C, which enhances our system operating stability, and system shutdown will not occur during air conditioner maintenance for a short period.”

----Information Technical Support Department in China Railway Corporation

About China Railway Corporation

China Railway Corporation, established in March 2013, is a large state-owned enterprise that provides passenger and freight transportation service by using railways. China Railway Corporation provides transportation service in all provinces, autonomous regions, and municipalities in China mainland. The covered railway mileage is 98,000 km, ranked the second around the world.

Challenges

Routine railway transportation organization uses an operation dispatching system to dispatch, organize, and coordinate passenger and freight trains and to ensure transportation safety. To implement hierarchical management and unified command for transportation, China Railway Corporation has set up a dispatching center in the headquarter, dispatching posts in railway administrations, and dispatching offices in railway technical stations.

China Railway Corporation has launched multiple dedicated passenger transportation lines in recent years. The existing passenger railway lines parallel to these dedicated lines are released and provide large freight transportation capacity. These lines work with the existing dedicated freight lines (such as Daqin Railway and Shuohuang railway) to build a dedicated freight network in China. The original operation dispatching system was based on the passenger and freight hybrid transportation mode. As the freight line mileage continuously increases, the operation dispatching system cannot meet the freight demands in planning preparation, operation management, vehicle management, and maintenance management. To ensure transportation safety and improve overall operating efficiency, China Railway Corporation determined to deploy a dedicated freight service operation dispatching system.

"We want to build an efficient freight transportation dispatching system. The system is secure and reliable, and can greatly improve the freight dispatching capability, resolve the problems in management and O&M, and reduce investment costs.” said
Customer Benefits

- Service rollout time is shortened by 70%.
- The O&M cost is reduced by 50% and the TCO is reduced by 30%.
- Smooth upgrades and expansion are supported to maximize the customer's ROI.

Gao Mingxing, the director of Information Technical Support Department in China Railway Corporation.

The operation dispatching system is the central system for the railway transportation organization command. It consists of the operation dispatching management system, train dispatching command/centralized dispatching system, and traction power supply and telecontrol system. As the most important part of the operation dispatching system, the operation dispatching management system manages information sharing and interfaces between the subsystems of the dispatching system and between the operation dispatching system and the existing dispatching system.

During the long-term construction period, the original operation dispatching system involved various switches, servers, and maintenance interfaces, which resulted in heavy workload unexpected human errors of maintenance engineers. In addition, rapidly developed services posed new challenges to the original system; however, the system architecture failed to provide a good scalability for upgrades and capacity expansion, and the services running in the original system cannot be smoothly migrated to a new system. This increases the technical upgrade investment.

"Obviously, the original operation dispatching system faces a big challenge in scalability and maintainability, and performing capacity expansion or upgrades on the existing devices cannot resolve these problems. Therefore, an easy-to-expand and -manage operation dispatching system has become an inevitable choice." said Gao Mingxing, the director of Information Technical Support Department in China Railway Corporation.

After learning about the customer's requirements for manageability and scalability, Huawei interviewed relevant departments and found that the train dispatching work involved multiple departments, used complex rules, and had frequent dynamic changes and real-time requirements. The new system must be highly reliable and secure. In addition, the operation dispatching system needs to frequently exchanges information with the dispatching centers of railway bureaus, the general dispatching center, and neighboring railway dispatching centers. This requires the minimum data transmission delay.

Solution

Information Technical Support Department in China Railway Corporation has communicated with multiple vendors, hoping to work out a cost-effective solution that meets current service requirements.

Huawei rose to the challenge of China Railway Corporation in building a new freight transportation dispatching system and offered the solution using the Huawei E9000 converged architecture blade server. Huawei E9000 blade server converges computing, storage, and network resources, and adopts redundant design for functional components to ensure the secure, reliable running of the operation dispatching system. The “All-in-one” solution perfectly meets the technical requirements of China Railway Corporation and features cost-effectiveness, which
has been approved by China Railway Corporation.

The operation dispatching system must provide reliable services, networks, and computing platforms. To meet these requirements, Huawei solution has the following features:
Adopts fully redundant functional modules and the passive backplane to prevent service breakdown caused by single-point failures.
Uses redundant network devices and isolation of network planes to ensure that the service network, management network, and data network are isolated from each other and operate reliably.
Provides the fault tolerance mechanism to improve the reliability of data storage, and memory security and availability.

China Railway Corporation has demanding requirements on real-time performance. Huawei solution uses the backplane with up to 15.6 Tbit/s switching capacity to ensure high-speed data exchange inside service modules and adopts 10GE switch modules to meet external switching requirements.

To meet the current service platform requirements and future expansion requirements, Huawei solution uses Intel Romley EP-based compute nodes whose performance is improved by 80% compared with the previous-generation computing system. In addition, the processors on the existing compute nodes can be smoothly upgraded to the Intel next-generation Ivy Bridge platform at no costs. Huawei E9000 server architecture also supports the 9000 W heat dissipation capacity and evolution to the 100GE network. The advanced architecture design helps the customer reduce the overall TCO.

To implement unified maintenance, Huawei E9000 server provides the BMC management interface, which allows maintenance personnel to configure, monitor, and manage the chassis, PSUs, fan modules, switch modules, and compute nodes in a centralized manner.

**Customer Benefits**

Huawei E9000 blade server provides a highly reliable and secure service platform for the railway operation dispatching system. China Railway Corporation has gained the following benefits:

- The integrated system greatly shortens the service deployment period, and service rollout time is shortened by 70%.
- Unified O&M management reduces costs by at least 50%.
- The scalable architecture design fully satisfies the system upgrade and capacity expansion requirements driven by the soaring freight services in future years, which reduces the TCO by about 30%.

"Huawei can quickly respond to customer requirements, and new methods can quickly put in place. For example, the unified maintenance interface of the Huawei E9000 server facilitates O&M and greatly improves the convenience of local device maintenance. In addition, the E9000 server supports reliable operating at 40°C, which enhances our system operating stability, and system shutdown will not
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