Business

Qingyin Expressway is a 1610 kilometer-long transportation line going across northern China. China made a great amount of investment to construct this national expressway to enhance communication between northwestern inland and eastern seaside areas.

Challenge

- *24x7 non-stop service*
- *Ensure data integrity in vibrations*
- *Real-time information query*

Solution

Infortrend EonStor B12 Series, SFF (Small Form Factor) storage systems

- *Space efficiency: twelve 2.5-inch disk drives in a 1U enclosure, suitable for toll stations with limited space*
- *Reliability: fault-tolerant hardware designs and RAID protection, ensuring high data availability*

Infortrend Storage System Accelerates Tolling on the China Expressway to Ensure Smooth Traffic Flow

Background

Starting from Shandong Qingdao and ending at Ningxia Yinchuan, Qingyin Expressway is a main transportation line going across northern China. This national expressway is mostly used for energy transportation and export. It plays an important role in enhancing resource communication between northwestern inland and eastern seaside areas in China. The installations of automatic tolling systems on the expressway are based on infrared ray technology to transfer data and realize non-stop tolling. They effectively solve the problem of traffic jam around toll stations. It is expected that up to thirty thousand cars and one million people will use the expressway per day. Its contribution to economic development in Shandong can not be overemphasized.

Application Requirements

Evolving Chinese economy, increasing number of cars and the need for real-time data access require Qingyin Expressway Branch of Shandong Hi-Speed Group to set high standards for its storage systems, whether in front-end or back-end applications. Their main storage requirements include:

- 24 x7 online service
- High system reliability: able to ensure data integrity in car vibrations and noises
- High performance: rapid response to data query and able to handle heavy workloads
- Easy management and maintenance of multiple storage systems via a unified platform
- Compatible with dominant operating systems
- Providing necessary capacity in small footprint; able to fit in the toll stations with limited space

Solution

For now, the expressway tolling systems do not require much capacity but demand high availability. When cars pass through, data have to be processed correctly and promptly, or traffic around toll stations may be blocked. Housing 2.5-inch drives, the EonStor B12 Series provides less response time and faster I/O processing. It can fully satisfy the performance need of tolling system data storage.

In the solution, ROSE HA software is used with EonStor RAID systems to improve system availability. Coming with PowerPC750 CPU and two SAS 4x host ports, the EonStor B12S-G1030 storage system delivers 2,400MB/s data path bandwidth to meet performance demands. When more capacity is required, users can largely expand the B12S by connecting it with a maximum of four 1U, 2U or 3U JBODs accommodating SAS drives through the mini SAS expansion port. The flexible scaling can help users save long-term investment. Moreover, the fault-tolerant hardware designs and RAID protection precisely answer the critical application needs for service uptime and data availability. The B12S also allows users to perform easy storage management in various ways.

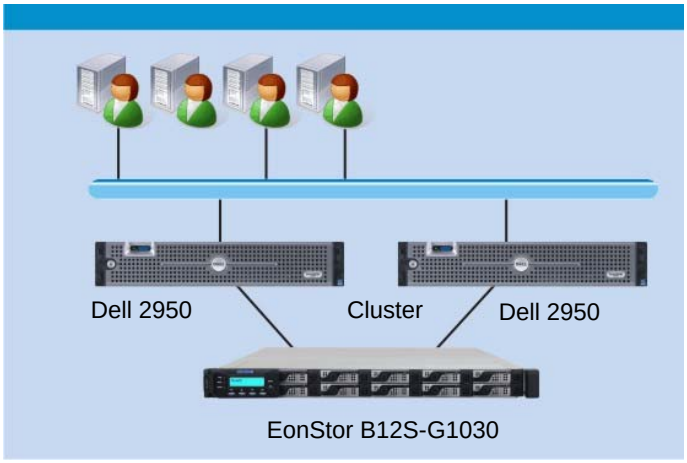
"Ever since the tolling systems started to operate, they have never suffered from any malfunction. Their response speed was much improved and this is very important in ensuring smooth traffic flow. The small form factor B12 storage system is ideal for our toll stations since our working space is quite limited. All workers of the Qingdao toll station, including me, really appreciate the benefits Infortrend storage brings to us."

- Deputy head of the Qingdao toll station

Configuration

Equipped with strong expertise in storage planning and years of deployment experiences, UDSAFE Electronics, Infortrend's leading distributor in China, first analyzed user's needs and deployed a cluster environment with Rose HA software for them. The storage systems UDSAFE chose is EonStor B12S-G1030. The configuration is as below:

- Server: Dell 2950
- Operating System:
- Microsoft Windows Server 2003 Enterprise Edition SP2
- Database: Oracle
- Storage: EonStor B12S-G1030
- Cluster Software: Rose HA



Benefits

EonStor B12S-G1030 fully met storage requirements of the tolling systems on Shandon Qingyin Expressway. The B12S enabled high-speed and reliable data transfer, which satisfied workers of the toll stations and effectively solved the problem of traffic jam around toll stations. It contributed a lot to the smooth traffic flow on the expressway.

When interviewed, the deputy head of the Qingdao toll station said, "Ever since the tolling systems started to operate, they have never suffered from any malfunction. Their response speed was much improved and this is very important in ensuring smooth traffic flow. The small form factor B12 storage system is ideal for our toll stations since our working space is quite limited. All workers of the Qingdao toll station, including me, really appreciate the benefits Infortrend storage brings to us."

About Qingyin Expressway Branch, Shandong Hi-Speed Group

Qingyin Expressway is a 1610 kilometer-long transportation line going across northern China. Starting from Shandong Qingdao and ending at Ningxia Yinchuan, this national expressway is mostly used for energy transportation and export. It plays an important role in enhancing resource communication between northwestern inland and eastern seaside areas in China. The Shandong section of Qingyin Expressway is 419 kilometer-long. It starts from Qingdao and extends into Hebei.

Qingyin Expressway Branch of Shandong Hi-Speed Group has seven departments, respectively responsible for miscellaneous affairs, politics, operation, finance, information management, infrastructure maintenance and property security. It also sets one main-line and four interchange toll stations to manage and protect property, collect operation fees, perform road maintenance and provide service for their responsible road sections. In 2007, a total of 4,030,294 cars passed the Shangdon section and paid 4,148 millions of tolls

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