As a branch of China Unicom in Liaoning, Liaoning Unicom boasts of the most advanced and widespread fixed networks and Internet in the province. It provides the most widely used technical pattern across the globe, the most mature commercial 3G network, and the most abundant communication offerings in the province. To support these activities plus the province’s new “Drivers’ Training and Examination System,” the company opted to build a cloud storage pool. It selected a solution based on Hitachi Unified Storage VM to support a value-added services cloud platform.

Liaoning Unicom offers various communication services and turkey information service solutions. It provides such offerings as fixed communication, mobile communication, data communication, IT and consulting services for the public as well as enterprise and government customers across the province. Liaoning Unicom is the only telecom carrier that can provide both fixed and mobile communications services, province-wide.

Liaoning Unicom serves more than 28 million users: 15 million are mobile phone users, 5 million are broadband users and more than 8 million are fixed telephone users. Liaoning Unicom offers 4 portfolios, which amount to more than 1,000 communication offerings. The options include WO 3G, WO Family, WO Business, and WO Pie for 4 groups, respectively: individuals, families, business users and teenagers. With its 3-D, multichannel and full-service system, Liaoning Unicom provides high quality and professional information services to users across the province.

**The Challenge**

Liaoning Unicom is responsible for building the “Drivers’ Training and Examination System” across the province. The project requires GPS information, driver record information (from smart card), audio and video information, fingerprint identification, and automatic shooting devices. It identifies trainees’ ID information and monitors the mileage and driving course.

**Benefits at a Glance**

- Improved customer service levels.
- Reduced capex by 50%.
- Support for massive and concurrent file processing.

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**HUS VM from HDS is an ideal option for us as it is a disk array product that integrates manageability, virtualization, high performance, and high reliability. We are greatly satisfied with the products and services from HDS.**
During the training, the GPS system in the coach car records the photo, training hours and mileage information and uploads it to the server in data center. When trainees apply for the exam, the vehicle administration office can further confirm the identity of the examinee. In addition, the system can automatically check whether a trainee has completed his or her required training hours and mileage, thus discerning whether the trainee is qualified. The remote monitoring system can monitor the running, interior training, status and actual road tests of all the training vehicles in driving schools across the province. During an actual exam, the system gives judgment throughout an exam. The examiner does not intervene with the examination appraisal on-site any longer, but supervises the exam visually at the remote appraisal center.

To support the Drivers’ Training and Examination System as well as a value-added services platform, Liaoning Unicom opted to build a cloud storage pool based on Hitachi Unified Storage VM.

The Solution: Cloud Storage From HDS

The cloud storage pool is one of the most vital part of the value-added services cloud platform of Liaoning Unicom. Committed to building a storage pool that is sound and sustainable, Hitachi customized the storage solution with the following objectives:

Storage Virtualization

By integrating storage systems from different vendors into a storage pool, Hitachi unified the management of both internal and external storage resources with Hitachi Unified Storage VM (HUS VM). The solution unifies resource allocation: It allocates appropriate resources based on the performance requirements of applications. From the application perspective, the function of internal resources is the same as that of external resources. Data exchanged between internal and external storage resources is carried out through the data replication and migration of the storage system.

Dynamic Provisioning

Hitachi Dynamic Provisioning software helps Liaoning Unicom to reduce capital expenditure (capex) and storage management expenses. The “on-demand” allocation means that the company can allocate more storage capacity than the actual physical storage capacity. The system won’t break down even when the users add physical storage. Dynamic Provisioning advantages include:

- Reduce initial costs, allowing the company to purchase only necessary physical disk capacity at the beginning.
- Reduce the management expense and time required for changing the storage system or host configuration.
**Dynamic Tiering**

With Hitachi Dynamic Tiering (HDT) software, the company can choose various disks [including solid-state disk (SSD), serial-attached SCSI (SAS), SATA and external disks] for the cloud platform in the future. That flexibility can help improve the cost-performance of storage devices.

With Dynamic Tiering, data in the host volume can be stored at several tiers of a single storage pool. There are 3 tiers in 1 pool. HDT determines how to use the tiers based on the frequency of data access. HDT:

- Reduces capex by providing a variety of disks in 1 storage platform.
- Migrates data to the most appropriate disk automatically, based on the frequency of access. Dynamic tiering allows migration of the most frequently accessed data to the fastest disks (such as SSD) and less frequently accessed data to the slower disks (such as SATA), which improves the overall storage efficiency.

**The Benefits**

During the communication and the planning for the cloud project with Liaoning Unicom, HDS presented well-designed storage solutions based on superior storage products, as well as powerful technical support and project implementation capabilities. HDS proposed the most mature solution with optimal performance and reliability, and presented numerous successful use cases for core business in the telecommunication industry. As a high-end storage product, HUS VM offers sophisticated architecture and superior performance, scalability and reliability. Additionally, HDS can solve technical problems fundamentally as the designer and original vendor, to ensure the quality of technical service. For this reason, users can get the best technical response as soon as possible and the company can obtain the most professional and intensive support for storage technologies.

With the cloud storage platform, Liaoning Unicom has successfully built the storage infrastructure for the value-added services cloud platform, paving the path to e-government as well as application and software services. The solution:

- Improves customer service levels through better performance and higher efficiency provided by HUS VM (2x the performance of comparable storage systems).
- Reduces capex by 50% through integrating the existing storage systems into 1 shared storage pool, the cloud storage platform.
- Processes files in a high-performance and parallel manner, which can be expanded in linear way, thus supporting massive and concurrent file processing for multiple services.
- Provides unified storage architecture to support the cloud. The architecture offers ultra-high scalability, stability, intelligent tiering and long-term planning, to meet the storage requirements in the future.

In addition to the driver training and examination services, more e-government services will be going live in the future. Therefore, it will be necessary to further expand the cloud platform. With the HUS VM solution in place, Liaoning Unicom’s cloud storage platform stands ready to support future expansion, manageability, efficiency and security needs.