Korean Educational Broadcasting System (EBS) uses HP StorageWorks X9000 to serve 30,000 simultaneous users

"When this solution was first introduced, no one imagined there would be such a significant increase in the number of simultaneous users. If we had not incorporated the HP X9000 solution, it would have been difficult to provide the speed and stable service that we do today." Chang Sun-Kwon, IT infrastructure team manager, Korean Education Broadcasting Service

Objective

Korean Educational Broadcasting System (EBS) needed a new storage solution to cope with a significant increase in downloads of its online tests.

Approach

It implemented the HP StorageWorks X9000 Network Storage system, G/W model.

IT improvements

- Easy maintenance of a file system up to 16 Petabyte (PB).
- Disaster recovery functions are provided as part of the package with no additional IT investment required.
- EBS can increase storage capacity and performance without service interruption and without being dependent on storage vendors.

Business benefits

- Lectures in high definition video can be provided without replacing the storage equipment, thus protecting the existing IT investment.
- The system provides a high quality education service for Korea while reducing private education expenses for parents.
- It enables 30,000 concurrent users to log on to watch Video on Demand (VoD).
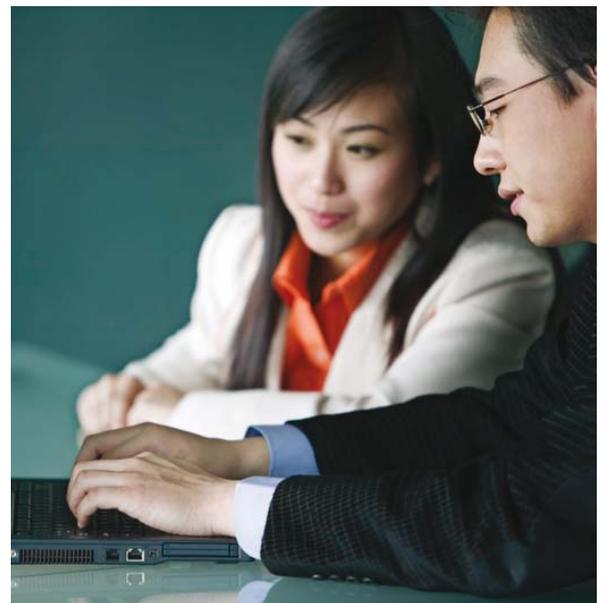
The Korea Educational Broadcasting System (EBS) was founded in 1951 when Korea Broadcasting, which used to broadcast 15 minutes of daily radio lessons to teachers, broadened its territory by airing a TV school and established a TV and radio channel specialising in education. In 2000, EBS started Internet broadcasting and now offers its online educational aptitude test prep lectures through a dedicated website.

The aptitude test prep lectures started as a way to reduce private education expenses and strengthen public education. To achieve this cost cutting, the Korean government announced in 2010 that 70 per cent of the educational aptitude tests would come from the online lectures of EBS, a public service broadcaster.

Significant increase in demand

After this announcement, a record of one million people downloaded free videos from the EBS website over a two-day period. These hits represented a 134.3 per cent increase compared to the previous week. On one single day, there were nearly 12,000 simultaneous users, which was six times the normal average amount. A week later, the lectures were simultaneously used by a record of 25,000 people.

To cope with this increase, EBS needed to deliver an efficient streaming and downloading service. Spikes in access occur almost daily from 10pm to 1am when graduating high school students come home. Students who stream online video lectures can review any parts they do not understand, which can further overload the server or storage. Therefore, the storage capacity for the EBS online lecture system needed to be 1.5 times greater than that of any other Input/Output (I/O).

To popularise the online lectures, EBS increased the quality of the content by securing 52 famous instructors. Moreover, in order to provide a seamless video flow, EBS introduced a system that could accommodate 30,000 simultaneous users without storage extension.

Instead of Direct Attached Storage (DAS), EBS changed its storage environment to Storage Area Network (SAN) and Network Attached Storage (NAS) in order to provide a continuous service to more simultaneous

"After the Korean government's announcement, there were over 25,000 simultaneous VoD users, and this kind of daily traffic is unprecedented among broadcasting companies throughout the world. Just implementing the HP X9000 G/W with the existing EBS storage system was sufficient to provide high definition video lectures to users." Chang Sun-Kwon, IT infrastructure team manager, Korean Education Broadcasting Service

users. In the past, EBS' online lectures had been offered only in a low definition format of 300KB, but this was improved by the addition of 600KB and a high definition format of 1MB. Excluding remote regions, most areas watch the high definition 1MB online lectures and this service is very stable with very few buffering issues.

Currently, EBS' online lecture site is designed to have 3,000 simultaneous visitors using the 1MB format and 30,000 simultaneous people using the 600KB format.

Generally, companies providing Video on Demand (VoD) use the DAS format but leading VoD providers prefer to add external storage close to the data server because it is simpler and more cost effective. However,

the storage device needs to be able to cope with any increase in data, which can be costly and lowers the effectiveness of the server. In addition, if the server is down, the storage device cannot be accessed because the DAS format is directly attached to the server. Therefore, it was not the best solution for EBS, which provides thousands of users with a streaming service requiring massive storage.

To solve this problem, EBS introduced the HP StorageWorks X9000 G/W Network Storage System designed specifically to help users manage data explosions.

Investment protected

Manager Chang Sun-Kwon said: "Having received bids from four vendors, we performed benchmark testing on the final two products. At that time, one of the vendors invited me to visit his company's site, but after seeing the system go down when thousands of simultaneous users logged on to the site, we decided to go with HP.

"The HP StorageWorks X9000 solution was able to provide a seamless streaming service to a large number of individual users, whereas the other products were not able to do this. EBS needed a solution that provided a stable service and HP StorageWorks X9000 Solution was the only product that could accommodate our needs."

The HP StorageWorks X9000 solution allows EBS to protect its existing IT investment while improving the service. Through data tiering, this solution can efficiently use existing storage. As video volume increases, storage space, needs to be expanded, and without increasing storage space the HP StorageWorks X9000 can support the service simply by expanding the G/W.

It has a simple storage and file system that can efficiently be managed. In a single file system, it can support up to 16 Petabyte (PB) and create a multi-file system that can manage an Exabyte of storage capacity. Utilising the characteristics of Scale Out NAS and adding the X9000 is enough to respond to an increase in service demand.

It is essential when expanding storage capacity that current storage is not compromised and performance standards are maintained, and the HP X9000 can be used with a wide range of hardware. In addition, EBS does not have to pay an additional cost because disaster recovery, data tiering and rebalancing are provided in the package.

Easily expanded

"The gateway can be expanded very quickly and easily. Contacting an on-call engineer can result in the work being carried out within a day. The difficult task is to gather expert engineers in areas of network, storage, and security, but if they can be brought together, users can definitely experience an improvement in online speed within one day," says Chang Sun-Kwon.

Currently, online broadcasting is the main EBS service but there are plans to make mobile lectures available through the iPhone. Chang Sun-Kwon explains: "if the mobile mid-tier solution is integrated with the current VoD architecture, then the service can be provided by slightly expanding the current system."

The numbers of users can increase even further with the smart phone, so system expansion is required. Delivering video online requires 600KB to 1MB but 200KB is enough for smart phone users so a new service format will be needed. Currently, EBS has established a Strategic Information Plan, which details

the company's intention to combine all the EBS sites. If this were to happen, the service will either be co-managed or automatically run, and a portion will be directly operated. Currently, IDC is operated in Seocho-dong, Seoul and Ilsan, Gyeonggido, and EBS plans to expand it to new areas.

"There are several advantages in using this HP solution but the major ones are performance and stability," adds Chang Sun-Kwon. "Furthermore, it protects the existing IT investment. Currently, all companies are concerned with reducing costs. A wise IT solution is to utilise the existing IT system by implementing a new solution to enhance performance. HP StorageWorks X9000 G/W Model allows us to use effective storage support and enables the efficient flow in storage expansion through data tiering. The solution enables us to improve our service without having to purchase additional expensive storage equipment."

EBS Internet Educational Aptitude Test Prep Lecture System Structure
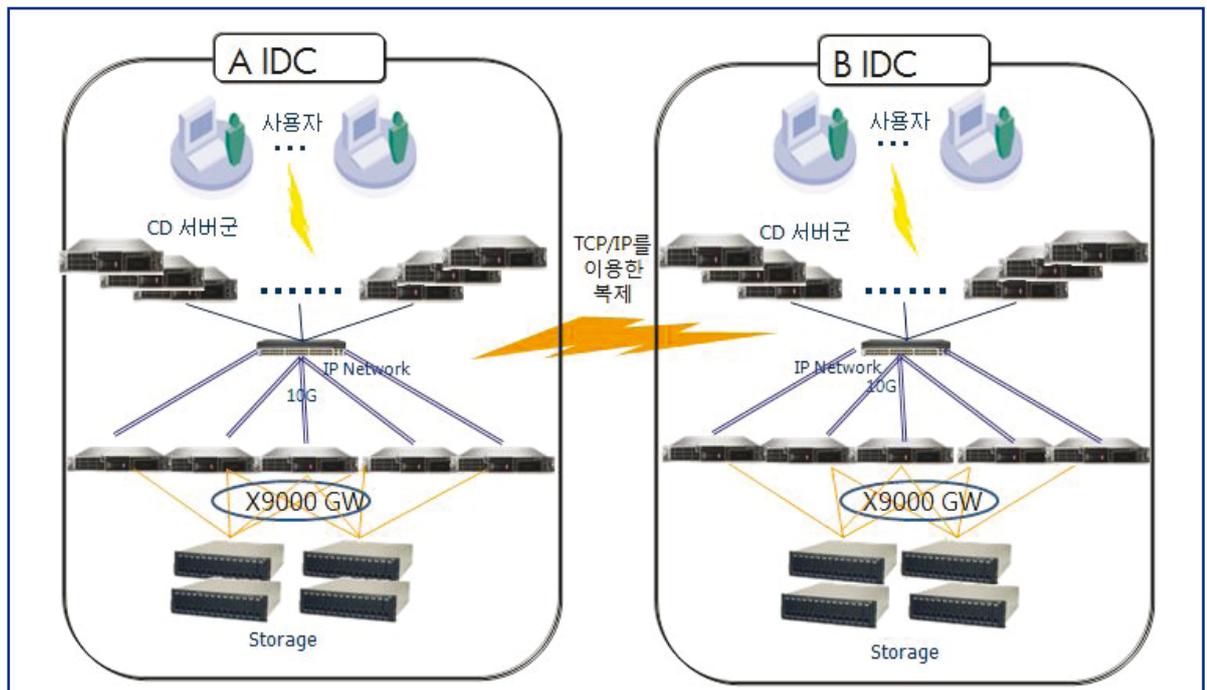
Interview

"This solution generates greater satisfaction from teenagers who highly value internet speed."

Chang Sun-Kwon, IT infrastructure team manager, Korean Education Broadcasting Service

Q. What will be the biggest change after introducing HP StorageWorks X9000 G/W Network Storage System?

A. When this solution was first introduced, no one imagined there would be nearly 25,000 simultaneous users. Although there had been a constant increase in users, a significant increase only occurred recently. If we had not anticipated this kind of increase last year and incorporated the X9000 solution it would have been difficult to provide the speedy and stable service that we do today. After the introduction, there was not too much of a striking difference but without it, customer satisfaction would have diminished. Regardless of the quality of the educational test prep lecture content, if speed-conscious teenagers, who are studying for exams, were hugely dissatisfied, they would have dismissed it.

Q. Why was HP chosen?

A. We reviewed products from vendors other than HP. HP StorageWorks X9000 solution was able to provide a seamless streaming service to a large number of individual users, whereas the other products were not able to do this. EBS needed a solution that provided a stable service and the HP StorageWorks X9000 solution was the only product that could accommodate our needs.

Q. What is the main advantage of HP StorageWorks X9000 G/W Model?

A. There are several but the major ones are performance and stability. Furthermore, it protects the existing IT investment. Currently, all companies are concerned with reducing costs. A wise IT investment is not investing a lot of money to obtain a huge effect but utilising the existing IT system by implementing a new solution to enhance performance. In that respect, through an integral user interface, HP StorageWorks X9000 G/W Model allows us to use effective storage support and through data tiering, allows for efficient flow in storage expansion. The solution enables us to improve our service without having to purchase additional expensive storage equipment.

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