Huawei N8500 Helps CCTV Welcome a Digital Future

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— CCTV

Executive Summary

Industry

Media

Challenges

- Not enough bandwidth to support program packaging and production for 10 HD channels
- Increased access control difficulty due to a large number of projects and users as well as various operating systems
- Need for 24/7 reliability and data security

Solution

- Deployed one N8500 with four NAS nodes and 210 SAS hard disks
- Combined the N8500 and the AD server to support different operating systems and enable directory-based access control
- Combined the N8500 and Symantec NBU backup software for data backup and restoration

Customer Benefits

- Up to 3,600 Mbit/s bandwidth, improving program packaging and production efficiency by 50%+
- Effective access control and reduced information security risks
- Facilitated HDTV broadcasting for the London Olympic Games

Introduction

China Central Television (CCTV) is the largest state television broadcaster in mainland China and also the most influential Chinese media around the world. CCTV has a network of 45 TV channels, with the largest audience share in China. Besides the TV channels targeted for viewers in mainland China, CCTV has also launched a variety of channels for international audiences in multiple languages (including Chinese) via satellites and the Internet.

Challenges

To expand their influence, CCTV sees High Definition (HD) broadcasting as a major development strategy. CCTV plans to use HD technology in all program production and broadcasting platforms in its new office building. When the relocation is completed, ten CCTV channels (CCTV-1, 2, 3, 5, 8, 10, 11, 12, NEWS, and 14) will deliver HD and Standard Definition (SD) programs concurrently. All channels will deliver HD programs by 2014.

Based on CCTV's overall design, the broadcasting system in the new office building will use an "island-based network" architecture, dividing the system into recording, non-linear editing, packaging and production, media asset, and broadcasting subsystems (or islands), with all the subsystems connected through an IP-based network. With this layout, CCTV will be able to produce programs over the network, improving resource sharing and production efficiency.

Among the different islands, the Packaging and Production Island (PPI) is a content production unit, providing an impressive array of services, including graphic design, packaging design, three-dimensional Flash generation, template design, special effects, editing and composing, and coloring. The PPI system is used to produce a wide assortment of high-quality TV programs (such as documentaries, channel publicity, program titles and trailers, and online packaging), which require innovative design and complex computer-generated graphics.

The PPI is a shared production platform that provides program packaging and production services for 10 HD channels in the new office building. Working in online mode, the PPI has more than 70 HD workstations and 64 rendering servers, centrally storing data in the core file storage system.

According to a CCTV expert, *"During the construction of the new program production and broadcasting system, CCTV confronted a variety of challenges, among which storage device selection was our major concern. The core file storage system provides storage services for*

the PPI, so the system performance, manageability, and reliability pose a direct impact on work efficiency, data security, program quality, and timeliness."

Performance

The PPI supports a wide range of projects. To enable quick delivery, the PPI must be highly efficient, which depends on the processing performance of the workstations, network bandwidth, and the core file storage system's read-and-write bandwidth.

Since editing one layer of HD video signals on the workstation requires a bit rate of no less than 100 Mbit/s, the storage system must provide at least 2.2 Gbit/s read-and-write bandwidth to meet packaging and production requirements for 10 HD channels.

Manageability

The PPI is a shared production platform used by a large number of personnel working at different TV channels. To prevent unauthorized access and ensure the smooth operation of various program productions, the core file storage system of the PPI must support directory-based access control. In other words, system administrators can assign role-based access rights to different directories within a project. Only authorized users can access a specific directory.

In addition, the directory-based access control function must work with different operating systems (such as Windows, Linux, and Mac) on different workstations to simplify system management.

Reliability

As a core unit of the PPI, the file storage system provides centralized data storage services for all service platforms on the island. To ensure data security and normal production, the core file storage system must deliver 24/7 reliability.

Solution

CCTV issued a technical tender specifying a series of strict requirements on the performance, manageability, and reliability of the PPI core file storage system. In addition, CCTV specified a Proof of Concept (PoC) test to check whether devices provided by different vendors would meet the requirements.

To meet CCTV's needs, Huawei worked with Beijing Jetsen Technology Co., Ltd. (a leading audio and video solutions provider in China) and participated in CCTV's PoC test with a Huawei OceanStor N8500 clustered Network Attached Storage (NAS) system. With its superb architecture, high performance, stable operation, and flexible manageability, the Huawei N8500 ranked first in the test and won the bidding for the core file storage system.

In this project, Huawei deployed one N8500 with four NAS nodes and 210 Serial Attached SCSI (SAS) hard disks to offer a capacity of 100 TB. The N8500 works with Huawei-provided Symantec NetBackup (NBU) backup software to provide service data backup and restoration.

To enhance performance, the N8500 uses a scale-out storage architecture to ensure the expansion of system throughput capability and reliability. The front-end nodes of the N8500 are clustered to achieve load balancing. A single node offers at least 800 Mbit/s read-and-write bandwidth, and the overall system read-and-write bandwidth expands linearly with the increase of storage nodes.

With the deployment of four NAS nodes, the N8500 provides up to 3,600 Mbit/s read-and-write bandwidth over a10-Gigabit network, which meets CCTV's requirements for

the core file storage system and improves the production efficiency by 50% more than specified in the tender document.

To improve manageability, CCTV deployed one Active Directory (AD) server for the PPI. The AD server allows workstations running Windows, Linux, and Mac to simultaneously access the AD domain, enables directory-based access control, simplifies system management, and reduces information security risks.

To increase reliability, all N8500 components use a redundant design, to protect the system from single points of failure, and a multi-cluster design to ensure normal system operation, even in case of a single point of failure at a front-end node. In addition, the back-end disk arrays provide disk pre-copying capabilities to predict disk faults and transfer data from faulty disks to hot spare disks. This ensures service continuity and meets CCTV's fault-free requirements for the storage system.

Customer Benefits

At the beginning of 2012, Huawei delivered the N8500 core file storage system to CCTV. In May 2012, the CCTV sports channel was the first to use the new production and broadcasting system in HDTV broadcasting for the London Olympic Games.

CCTV commented on Huawei solution as follows, *"We are greatly impressed by the Huawei N8500, which provides CCTV a reliable storage system featuring superb architecture, high performance, and flexible access control. During the 2012 London Olympics, the Huawei N8500 ran stably and played a significant role in HDTV broadcasting of the events."*