

Remote Backup of Medical Data for Disaster Recovery with HYDRAsTOR Kurashiki Central Hospital



Overview

Kurashiki Central Hospital is a hospital with over 1,000 beds in Okayama prefecture, Japan. The hospital had been backing up data onto Linear Tape-Open (LTO) tapes. Master tapes were stored in the hospital building and replicas were stored in an associate hospital located in the same city. However, tape-based backup management and operation was laborious and moving the replica tapes to the associate hospital risked them being stolen or lost in transit. In addition, the backup frequency was only once per week, introducing the risk of losing the latest data when disaster strikes. To resolve these issues, Kurashiki Central Hospital transitioned from tape-based backup to disk-based backup using NEC HYDRAsTOR disk-based inline deduplication storage. The hospital was able to achieve fast backup and replication to a robust data center over WAN, maximizing the efficiency of backup management and operation as well as ensuring business continuity through disaster recovery.

Customer

- Kurashiki Central Hospital

Industry

- Medical – Hospital in Okayama, Japan

Challenges

- Storage capacity consumption – backup data growth
- Backup management – inefficient tape management
- Data security – risk of lost or stolen tapes during transport
- Backup frequency – limited to one backup per week

Solution

- NEC's HYDRAsTOR backup solution
 - Fast disk-based backup with inline data deduplication
 - Advanced erasure-coded data resiliency
 - WAN-optimized replication with in-flight encryption
 - Integrated management and monitoring

Results

- Reduced storage capacity consumption by 83%
- Completed backups daily instead of weekly
- Eliminated risk of lost or stolen tapes with WAN-optimized replication
- Simplified backup management with disk-based storage

Challenges

Kurashiki Central Hospital had been storing important medical data including health records and accounting data onto LTO tapes for backup. The hospital was only able to complete one full backup per week, from which a master and a replica tape copy was created. The master tape was stored in the server room of the hospital building, and the replica tape was carried to the associate hospital located in the same city. However, Toshiyuki Fujikawa, a manager in the IT system group, acknowledged that there were several problems using tape-based backup. "We needed to back up data during business hours because the emergency room is open 24x365. Originally, the backup window started at midnight and ended by 8 am to avoid peak hours. However, the backup could no longer complete by 8 am due to the ongoing growth of health record data. To complete backup jobs by 8 am, we needed to start them before midnight and prioritize the data to be backed up. In addition, we needed to change tape cartridges manually and address backup failures due to media errors." Backup data included images and movies and was increasing on a daily basis, making it no longer efficient to continue to back up using tape. Keizo Ogasahara, an executive director, noted the backup frequency.

Kurashiki Central Hospital

“We needed to back up medical data on a daily basis to be able to restore up-to-date data at any time. We have 3,000 patient visits every day, and generate or update a total of 15,000 patient health records every week. With a backup frequency of once per week, we would lose many patient records which were created or updated within the latest week if a disaster were to occur.”

In addition, there was also the security risk of lost or stolen tapes. A shuttle bus carried a locked box containing the cartridges between Kurashiki Central Hospital and its associate hospital. The transporting of tapes exposed sensitive patient data to potential loss from theft.

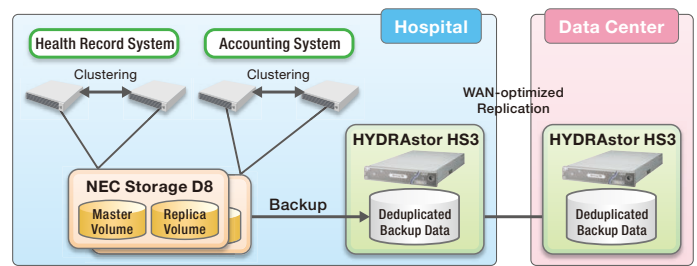
Solution

Kurashiki Central Hospital started business continuity planning, evaluating new backup solutions to back up electronic health records on a daily basis and to replicate the data to a robust data center for disaster recovery. Ogasahara noted, “Data retention at our associate hospital was insufficient for business continuity during disaster recovery. We concluded that a more secure data center would be the best place to protect data.” Great importance is placed on data availability and reliability at data centers. “Data centers are housed in buildings equipped with seismic-isolation systems and private power generators”, said Fujikawa. “Storing important data at a data center is the safest option.”

NEC offered data backup to a remote data center using the HYDRAsstor inline deduplication storage system. Kurashiki Central Hospital project members had several discussions and decided to adopt NEC’s remote backup solution. The determining factors were storage capacity optimization, data protection with advanced erasure-coded resiliency, and secure remote replication to the data center. The system was installed in May 2011.

The new backup system at Kurashiki Central Hospital incorporates three components. The first component is an NEC Storage D8 system which synchronizes the replica volume to the master volume within the storage system. The second component is a HYDRAsstor system located at the hospital, backing up the replica volume from the NEC Storage D8 system onto the HYDRAsstor system. The third component replicates the backup data from the primary HYDRAsstor system to another HYDRAsstor system in a remote data center. By leveraging deduplicated replication, the HYDRAsstor system at the hospital transmits only unique, compressed, encrypted data chunks to the HYDRAsstor system at the remote data center over the network, ensuring security and efficiency during data transport.

HYDRAsstor DataRedux inline deduplication technology eliminates redundant data across all incoming data streams and reduces storage consumption by 95% or more. By reducing the physical storage capacity requirements of Kurashiki Center Hospital, which sees data increases of 10TB to 20TB per year, HYDRAsstor maximizes performance while still being comparable in cost to tape-based



backup. For data retention and disaster recovery at the remote data center, HYDRAsstor RepliGrid enables WAN-optimized replication between HYDRAsstor systems. By transmitting only unique data chunks and reference metadata to the remote HYDRAsstor system, HYDRAsstor significantly reduces network bandwidth requirements and exchanges information with the remote HYDRAsstor system via asynchronous replication. In-flight encryption secures transmitted data between HYDRAsstor systems, guarding it from unauthorized access. In addition, HYDRAsstor protects data across the entire system with Distributed Resilient Data (DRD) erasure-coded resiliency, delivering greater failure tolerance and faster rebuild times than traditional RAID with lower capacity and processing overhead.

Results

Using the new backup system, Kurashiki Central Hospital was able to achieve secure remote backup. Ogasahara highlighted the significance of remote backup. “Remote backup of health records protects us against data loss during a disaster and enables us to provide continuous medical services at all times. With HYDRAsstor, we were able to build an efficient backup system to maximize business continuity.”

Fujikawa also noted that backup management and operation is easy to use and virtually hands-free. “Before adopting the new backup system, we needed to change tape cartridges, manage historical records, and prioritize the data to be backed up. We also needed to create replicas to retain at the associate hospital. Currently, we just need to look at the console every morning to check that all backup jobs were completed successfully. The NEC HYDRAsstor backup solution runs without any intervention.”

The new backup system at Kurashiki Central Hospital does not require any special operations and automatically completes remote backup as scheduled within the backup window. While tape backup came with the risk of lost or stolen tape cartridges, the new backup system improves data security with in-flight encrypted data replication over the network.

Kurashiki Central Hospital is now planning to back up data from other systems to HYDRAsstor as well. Says Ogasahara, “We look forward to NEC taking the initiative and anticipating customer and industry demands to deliver more advanced, efficient, and integrated IT technology solutions in the future.”