HITACHI
Inspire the Next

“The Hitachi archival software makes our hardware clusters appear as a single archive. That means we don’t have to manage different applications with separate interfaces … which greatly expedites the way we’re able to monitor and access content.”

Curt Tilmes
Computer Scientist
NASA

NASA

INDUSTRY	Government
SOLUTIONS	File and Content Services **Software** — Hitachi Content Platform (Hitachi Content Archiver software only)

NASA Protects Atmospheric Data Assets with Highly Reliable Hitachi Content Archiver Software

NASA uses sophisticated instruments mounted on Earth-observing satellites to capture and disseminate data related to the planet's environmental conditions. To better protect vital information and guarantee infinite on-demand data retrieval, one NASA program implemented Hitachi Content Platform technology to create a long-term active archive solution. The solution's unifying Hitachi Content Archiver software supports extensive scalability, consolidates views and expedites retrievals for 70TB of data across heterogeneous server clusters, an amount that is continuing to grow.

The sophisticated instruments that NASA employs on Earth-observing satellites help the agency to better understand global environmental conditions that affect the long-term health of our planet. Data captured by these orbiting satellites is transmitted to NASA scientists to process, analyze and compile into usable information that is subsequently disseminated to scientists across the world. It is also transmitted to the National Oceanic and Atmospheric Administration (NOAA), the European Centre for Medium-Range Weather Forecasts and the US Environmental Protection Agency (EPA). Because of the need to develop an environmental data baseline for future generations of Earth scientists, the ability to archive and access these digital data sets hundreds of years from now is perhaps as critical as the data itself.

On-demand Data Retrieval Needs

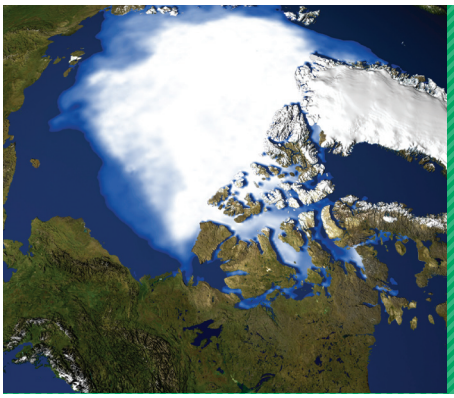
The Ozone Monitoring Instrument (OMI) is an observation tool provided by the Netherlands aboard NASA's Aura satellite, which was launched into space on a Delta II rocket in 2004 to measure the atmospheric gases and radiation that influence the Earth's ozone layer and air quality. When the project was inaugurated, one of the goals was to provide on-demand data retrieval capabilities, indefinitely. Existing satellite programs relied on robotically controlled tape storage to house critical data. The tape systems did not offer advanced technologies to support active digital archive management or guarantee accessibility of data with future hardware upgrades.

"The data we extract from the satellite is considered a national asset so it's extremely important to safeguard. A hundred years from now, someone is going to want the raw data or a processed file. We need to ensure that it will be not only possible but also easy. Having an archival platform that prevents vendor lock-in and goes the distance is crucial to achieving that goal," says Curt Tilmes, OMI computer scientist at NASA.

Disk-based Archive Solution

NASA satellite data was being housed in a two-tiered storage environment that allocated frequently requested files to a disk-based cache and less frequently accessed files to a jukebox tape system. Whenever a scientist needed information stored on tape, robotic mechanisms searched for the intended tape, inserted the correct tape into a reader to be copied, and then sent the files to scientists. Depending on the volume of projects in queue, requests could take hours to fulfill.

With hundreds of clustered Dell servers and multiple software management interfaces, the existing storage configuration was also time consuming and complex. OMI was forecast to generate 50GB of data storage per day, putting further strain on current resources.



"Hardware and technology changes are inevitable, but with the Hitachi platform, we are able to manage our data with no additional backup tasks, no load balance requirements and no forklift worries – no matter what."

Ben Kobler
Computer Scientist
NASA

"Information that is difficult or slow to acquire has consequences to research so we wanted to find an archival technology that would automate and accelerate search and retrieval queries, keep everything on disk and still be easy to use," Tilmes says.

While several archive solutions were considered, OMI was able to benefit from an ongoing research project elsewhere at NASA that had already evaluated Hitachi Content Archiver software. "We'd successfully piloted the archival application a few years ago as part of the NASA Small Business Innovation Research program. Applying the same solution to OMI means unifying existing clusters with one software interface, one set of management tools and one highly scalable archive," explains Ben Kobler, a computer scientist at NASA who was involved in the originating pilot research.

Hitachi Content Platform for Online Reliability

OMI installed the Hitachi Content Archiver software on existing Dell hardware for immediate integration across the storage infrastructure. Hitachi uses standard protocols and metadata indexes to also facilitate seamless interoperability with future upgrades to hardware, software, data and encryption formats.

"Hardware and technology changes are inevitable, but with the Hitachi platform, we are able to manage our data with no additional backup tasks, no load balance requirements and no forklift worries — no matter what," says Kobler.

With RAID-6 to generate two sets of parity data, the Hitachi solution also supplies protection against double disk drive failure so data is always secure. Further, the Hitachi solution provides an online repository to preserve and actively manage digital content as objects so that data remains authentic and instantly accessible. The need for separate islands of archives to store different types of content is eliminated because the Hitachi repository manages structured, semi-structured and non-structured data. With sophisticated metadata management software, automated monitoring and an easy-to-use browser interface, Hitachi Content Archiver software allows integrated and simplified searching, retrieval and indexing for rapid access to archived data.

"The Hitachi archival software makes our hardware clusters appear as a single archive. That means we don't have to manage different applications with separate interfaces. We use one archive to consolidate all those different views and manage applications in one central place, which greatly expedites the way we're able to monitor and access content," explains Tilmes.

Ease of Managing a Highly Scalable Active Archive

Upon implementation, OMI was able to transmit directly to the Hitachi application and begin capturing and securing data. Already, the OMI is storing 70TB of active archive data.

"The scalability of our Hitachi archive is nearly limitless. We can grow vertically with more data, horizontally to support additional applications; we can grow this archive as big as we need it. For data that's supposed to live forever, it's nice to know we don't have to worry about needing additional archives in the future," says Kobler.

The bulk of the data on the archive is OMI files, but it will also be used for test data by the National Polar-orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project, another vital program that monitors global environmental conditions.

"The biggest benefit of the Hitachi archive is knowing that we give it data and it gives the data back when and how we need it. But the fact that it is so easy to manage is a really great value to the organization because scientists can stay focused on the health of our planet," concludes Tilmes.

Hitachi Data Systems Corporation

Corporate Headquarters
750 Central Expressway
Santa Clara, California 95050-2627 USA
www.hds.com

Regional Contact Information
Americas: +1 408 970 1000 or info@hds.com
Europe, Middle East and Africa: +44 (0) 1753 618000 or info.emea@hds.com
Asia Pacific: +852 3189 7900 or hds.marketing.apac@hds.com

Hitachi is a registered trademark of Hitachi, Ltd., and/or its affiliates in the United States and other countries. Hitachi Data Systems is a registered trademark and service mark of Hitachi, Ltd., in the United States and other countries.

All other trademarks, service marks and company names in this document or website are properties of their respective owners.

Notice: This document is for informational purposes only, and does not set forth any warranty, expressed or implied, concerning any equipment or service offered or to be offered by Hitachi Data Systems Corporation.

© Hitachi Data Systems Corporation 2010. All Rights Reserved. SS-074-B DG Novemberr 2010