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Case study

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BIBLIOTECA NACIONAL DE ESPAÑA

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# THE NATIONAL LIBRARY TRUSTS HPE WITH THE FUTURE OF ITS DIGITAL CATALOG

## The institution is revamping its storage systems using HPE and Scality solutions

**Industry**
Cultural

**Objective**
Expand the storage system to meet the National Library's management and digital documentation needs.

**Approach**
Installation of a Scality SDS solution running on HPE Apollo 4510 storage nodes and HPE Aruba 5950 infrastructure.

**IT matters**
- High scale-out storage capacity.
- Greater versatility with object storage functionalities.
- Ease in addressing capacity increases.

**Business matters**
- Improvements in data management and digitized media.
- Integrating IT management with the rest of the NLS's infrastructure.
- The solution maintains independence from the hardware with which it is being integrated.

**The National Library of Spain does not just embody an important cultural heritage on paper, but also has an enormous catalog of books and works that have been digitized to ensure their preservation and improve accessibility to them. To continue growing, it needs to have a solution that allows it to easily manage a large amount of information.**

**"The HPE solution has yielded performance improvements, cost savings, and management integration with the rest of our technology infrastructure. In turn it has allowed us to improve process documentation as well as specific aspects of our activity."**

– Fernando Camps, Chief of Information Technology Services for the National Library

The history of the National Library of Spain (NLS) begins in 1711, when King Philip V approves the plan presented by his confessor Pedro Robinet and Melchor de Macanaz to create a Royal Library. The stated goal, in line with the first generation of "enlightened" Spaniards, was to "renew historical scholarship and shed light on the true origins of the Spanish nation and monarchy."

Opened to the public on 1 March 1712 next to the Royal Alcázar of Madrid, the institution would change locations various times in the 19th century until it opened its doors on 16 March 1896 in its final location on Paseo de Recoletos in the capital. Since then, it has been receiving and preserving copies of all the books published in Spain. Moreover, it has a priceless collection of incunables, manuscripts, prints, drawings, photographs, sound recordings, and musical scores.

## CHALLENGE

In 2008, with an eye to disseminating Spanish cultural heritage while ensuring it is protected and safeguarded, an ambitious program of catalog digitization was launched by making more than 10,000 works available to users electronically. Since then the institution's digital collections have continued to grow exponentially, which has translated into increasing investments in ICT that are needed to securely manage the enormous volume of stored information.

In this respect, Fernando Camps, Chief of Information Technology Services for the National Library of Spain, underscores the importance that ICT plays nowadays in this institution: "one of the main functions of this department is to digitally preserve our whole cultural heritage, which must be available to citizens, researchers, and other entities that collaborate with NLS."

The problem the library confronts is that, as works continue to be digitized, the storage and management needs also increase. Thus, Fernando Camps explains that, until quite recently, "the data resided in proprietary data storage systems subject to model and feature changes on the part of the hardware manufacturer. The tremendous annual increase in data forced continuous and expensive system enhancements and migrations."

To break free from this cycle, the National Library wanted to implement a file storage solution that would achieve three goals: manage large amounts of data in millions of files, easily and dynamically perform enhancements without being constrained by the hardware platform, and protect files and data in the event of a complete or partial system crash. To accomplish this, the institution's ICT department managers contacted HPE, which, together with Datek—a partner specializing in its technology area—proposed designing a solution that would meet all the needs.

**"The HPE Apollo 4510 servers are particularly suitable for work in IT infrastructures where there is a need for storage capacity in excess of two petabytes. This is exactly what the National Library needs."**

– Jorge Esteban, account manager at Datek

## SOLUTION

As Javier Díez, HPE account manager for NLS, notes, the National Library found itself in the same situation as many other institutions and organizations that are forced to work with enormous amounts of information. Companies discover, after reviewing various metrics like cost of storage per TB or the ease of managing and retrieving data, the traditional storage approach cannot meet their requirements. When you are dealing with petabytes of data both cost and the complexities of management "become a challenge that is difficult to overcome."

In the face of this challenge, the proposal from HPE and Datek involves "a Scality SDS solution on an HPE Aruba 5950 ring at 40 GB/s and six HPE Apollo 4510 storage nodes with a net capacity of 3 petabytes," Jorge Esteban, Datek account manager, explains. "The goal is clear: improve data management, make enhancing capacity easy, so the solution is independent of the hardware and it does so ensuring security and integrity," he stresses.

As Datek explains, one of the advantages of Scality is that, as NLS is requesting, it is independent of the hardware into which is it integrated, providing a solution for storage that is determined by software capable of handling multiple petabytes with no problem. Beyond that, it is able to work with the main protocols for files (NFS, SMB, Linux® FUSE) and objects (AWS S3, REST).

In this case, the software layer it incorporates is designed to create a scaled storage system, deployed as a distributed system on six HPE Apollo 4510 servers, that can grow as the National Library requires more storage capacity in the future.

Furthermore, Scality uses a peer-to-peer architecture that uniquely distributes both the stored data and the associated metadata across the different nodes, in order to eliminate the bottlenecks that commonly occur in current distributed systems. These bottlenecks can impact the central metadata repository and the database itself.

At the same time, it has a range of intelligent services that improve access and data management. To that end it provides a system abstraction layer that includes a higher level of scalable access services (connection processes installed directly on the storage servers) that offer specific protocols for the different applications.

As Jorge Esteban points out, no doubts arise when betting on the Apollo servers: "The HPE Apollo 4510 servers are particularly suitable for work in IT infrastructures where there is a need for storage capacity in excess of two petabytes," he notes.

The Apollo 4510 server is based on an Intel® Xeon® Scalable architecture with up to 26 cores and memory speeds of up to 2933 MT/s. When it comes to managing the huge storage capacities that an institution like the National Library of Spain requires, Apollo stands out by being able to offer up to 60 x 16 TB of SAS and SATA storage at 7,200 rpm that reach a maximum gross capacity of 960 TB per server.

Javier Díez emphasizes that "HPE Apollo 4510 is a market leader in density-optimized data storage due to co-located processing power for handling all the types of workloads a modern business might have. By using a combination of HDDs and SSDs, customers can create a system with almost 1 petabyte of storage per server."

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## OVERVIEW

**Solution**
Installation of a storage solution determined by software capable of handling multiple petabytes of information and able to be expanded in the future, regardless of the hardware used.

**Hardware**
- HPE Apollo 4510
- HPE Aruba

**Software**
- Scality RING

On the communications infrastructure side of things, Datek says that HPE Aruba 5950 switches stand out for their 40 GB/s speeds with ultra-low latency (around one microsecond for every 100GbE), which makes them the ideal equipment to use in virtualized environments since they also have great ability to scale up because of their modular design.

With all these ingredients, Datek initiated the migration from an earlier solution in a process that presented a high degree of complexity. Thus, Jorge Esteban confirms that "part of the difficulty had to do with the huge volume of information that had to be migrated. Moreover, various solution processes and protocols had to be personalized to adapt them to what the client's applications needed. The client's technical team was 100% involved in the project, which contributed significantly to its successful implementation."

## BENEFITS

As Fernando Camps notes, with regards to managing the current digital catalog and future data growth, the launch of this new solution has yielded immediate benefits in terms of performance and capability. He emphasizes that "the HPE solution has added versatility, with object storage functionalities that we can tap into to keep growing." And the thing is, keeping in mind the features of the current infrastructure, all NLS would have to do is add new nodes.

In addition, the institution's ICT highlights the good work on the part of the integrator, "who has succeeded in installing a solution transparently, in such a way that we can keep working with the same processes with no disruption." Beyond the improvements in performance and cost savings, the solution "has allowed for management to be merged with the rest of our technology infrastructure," which besides digital catalog management, involves offering ICT services for the day-to-day functioning of the Library itself or managing the archive of the various digital publications that are also stored.

Fernando Camps concludes, "The change has enabled improved documentation of processes such that future digitalization and archiving tasks gain agility and efficiency, allowing us to offer a better service to the citizens."

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