DataCore vFilO lets users locate files across multiple NAS systems with a single search

In our testing, the solution also automatically moved files to better utilize storage resources

Network-attached storage (NAS) can provide straightforward file storage for an organization. Most users are comfortable performing basic file tasks navigating across a small number of folder and file hierarchies, known as file shares, on one NAS system. IT administrators are also comfortable with NAS technologies, but certain pitfalls tend to arise in environments that use this kind of storage.

When an organization outgrows their NAS capacity, they can either replace it or keep it in service and add a new system. Upgrading to a new system can improve performance, security, and data privacy, but can be expensive and require end users to adjust to a new set of folder and file hierarchies. For these reasons, many organizations accumulate a variety of NAS systems over the years.

With file shares across disparate NAS systems, administrators must monitor capacity on each of them. If some systems are almost full while others have plenty of space, it's tempting to move files, but doing so can break links to files that end users have embedded in their documents. Maintaining multiple NAS systems also requires users to search one hierarchy after another when they are trying to locate a file.

DataCore™ vFilO™, a software solution that virtualizes file and object storage, can help with these challenges. We tested it and found that it let users access files the same way they always have and allowed them to conduct a single search to locate files across multiple NAS systems. It also automatically moved files to make the best use of existing storage capacity, which help organizations delay the purchase of new hardware.

A global namespace

DataCore vFilO takes the file shares it controls across an organization's NAS systems and creates a unified way to view all of them, known as a namespace. This lets users locate a file with a single search rather than having to search each file share individually. Behind the scenes, vFilO migrates files from one volume to another to make efficient use of storage capacity, but the file and folder hierarchy remains intact. Document links to file shares work consistently even when the physical locations of the files change.

DataCore vFilO provides a full set of data placement policies intended to let admins set the availability, performance, cost, and location preferences for users' data while preserving the file and folder hierarchy on which users depend.

DataCore vFilO can also move inactive data to low-cost object storage automatically by policy, freeing space and load on existing NAS systems, and possibly delaying the need to purchase new NAS systems.

An overview of our testing

Once we set up the DataCore vFilO environment, we tested its ability to automatically move files between volumes without changing the way that file structures appear to users. We also tested its ability to let users locate files across multiple NAS systems with a single search.

Our test environment included one NAS system and two file servers, which we filled to varying degrees with files of a variety of types and sizes, and three mid-range dual-socket servers, on which we installed the DataCore vFilO software.

We also included a cloud volume in our testing to show the cloud offload capabilities of vFilO. We created an object bucket in Amazon Web Services (AWS) S3, then provided the access credentials for this bucket in the vFilO console.

We present the complete configuration details of our servers and NAS systems in the science behind this report.

How vFilO works: Assimilation

After setting up our file servers and installing the DataCore vFilO software on three additional servers, we "assimilated" the file shares from the three file servers into the DataCore vFilO system. DataCore uses the concept of assimilation to describe the process of traversing the tree of each file share and gathering metadata about every file. DataCore vFilO can assimilate a variety of types of NAS systems, including several commonly used filers, NFS on Linux or Windows, and SMB on Windows. This assimilation process creates a new globally searchable namespace, which can be read-only or read-write, and can run all vFilO services. DataCore vFilO customers can find more information on this process in the "Assimilation" chapter of the DataCore vFilO Configuration Guide.

What we learned in our testing

Testing the vFilO Data Mobility features

DataCore vFilO Data Mobility moves files between volumes based on rules—mobility percentages and objectives—that the IT administrator sets up.

Say the administrator wants Volume A to always keep 25 percent of its capacity open. They would then set the mobility percentage for that volume to 75 percent. Before the used space on Volume A exceeds that

percentage, vFilO automatically seeks other volumes whose current usage is below their mobility percentage, and migrates some of the files from Share A to the other volumes.

vFilO has a rich set of objectives that administrators can apply to entire shares and individual files. Examples include "exclude from object-volumes," "place on object-volumes," "optimize for capacity," "place on <volume-name>," "place in <volume-group>," "availability-5-nines," and several others. Administrators can also create custom rules based on the activity level of the file or folder, the time elapsed since last access of the file or folder, and many other conditions.

We applied some data placement objectives so that vFilO would automatically migrate files to achieve a more optimal balance of capacity and performance while maintaining the original file and folder hierarchy. We set mobility percentages ranging from 75 percent to 95 percent. We also specified that some files and folders could migrate to the cloud.

In Figure 1, we zoom in on the Volume list screen at two points, before vFiIO moved the files in response to the mobility settings and objectives we put in place and after. The purple arrows show how capacity changed from "before" to "after." Note that after we assimilated the original volumes, we created two new volumes to provide additional capacity for storage. These two new volumes appear at the bottom of the "after" screenshot.
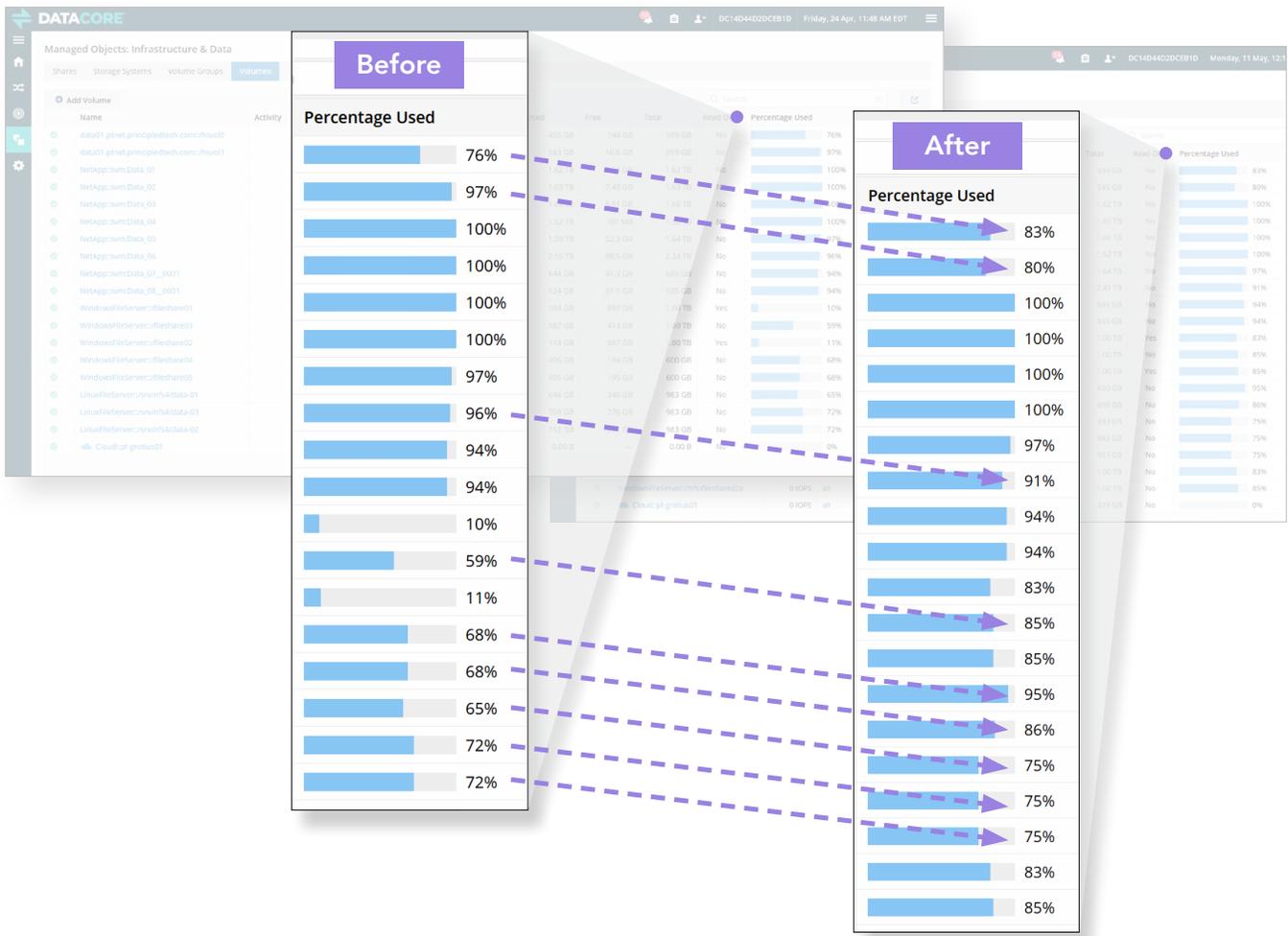
Figure 1: Local volume usage before and after DataCore vFilO automatically moved files in response to mobility percentages and data placement objectives. Source: Principled Technologies

In Figure 2, we again zoom in on the Volume list screen before and after vFiIO moved the files in response to our mobility settings and objectives, this time focusing on usage of the cloud volume. In the "before" screenshot, the cloud volume contained no files, while in the "after" screenshot, vFiIO has moved 329 GB of files to the cloud volume.
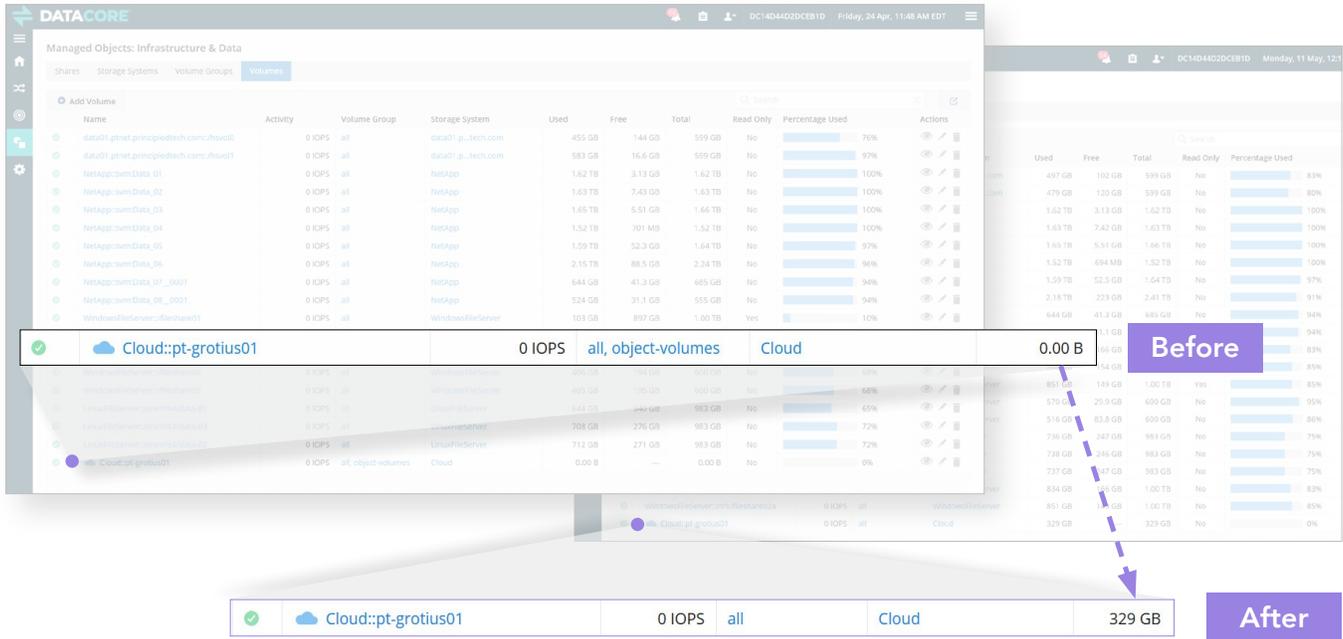
Figure 2: Cloud volume usage before and after DataCore vFiIO automatically moved files in response to mobility percentages and data placement objectives. Source: Principled Technologies

When vFilO moves a file to a new location, you can find its back-end storage volume by looking at the Storage volume column. Clicking the specific storage volume provides details about the resource (see Figure 3).

Figure 3: DataCore vFilO Volume Properties screen. Source: Principled Technologies

After completing the assimilation process and some data migration, we can view the storage systems' information from the vFilO console, which shows the name and type of each storage system as well as its capacity information (see Figure 4).
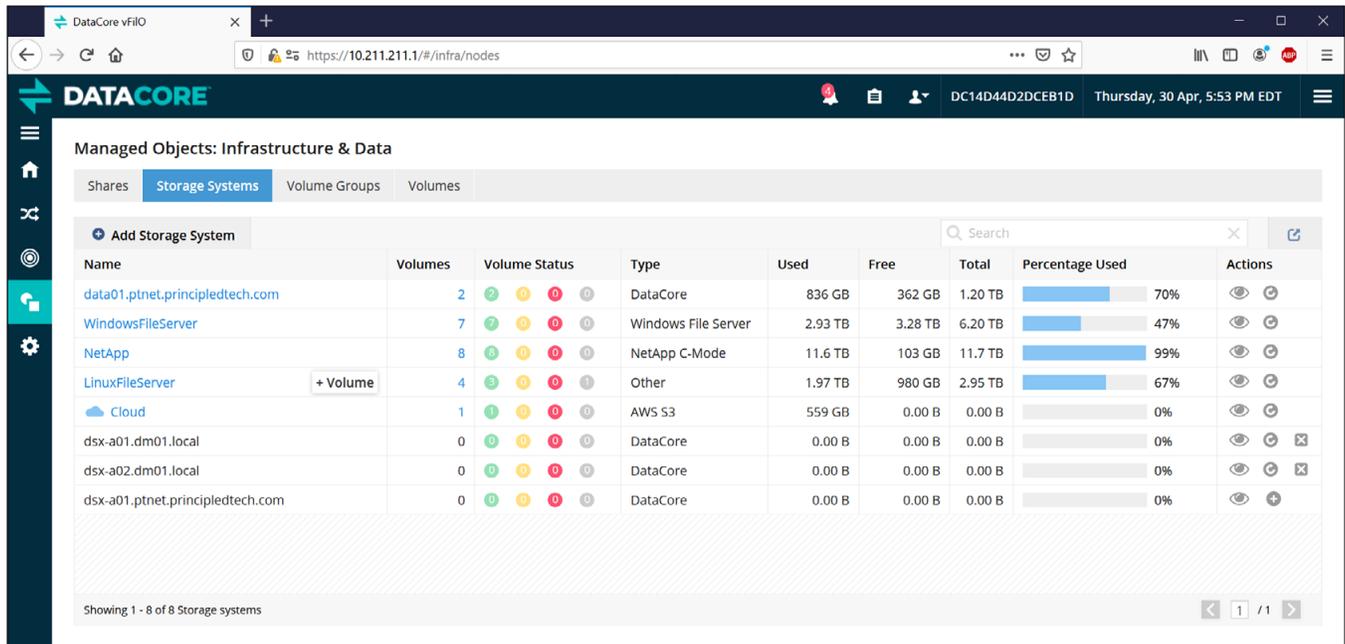
Figure 4: vFilO view of the storage systems. Source: Principled Technologies

Testing moving files to the cloud

To enable automatic data migration to the cloud, we created a custom "Objective" that would migrate all MP4 files older than one year to the cloud (see Figure 5). Any MP4 file newer than one year would follow the default objectives. This was a relatively simple custom objective, and we could have added more criteria to this objective.
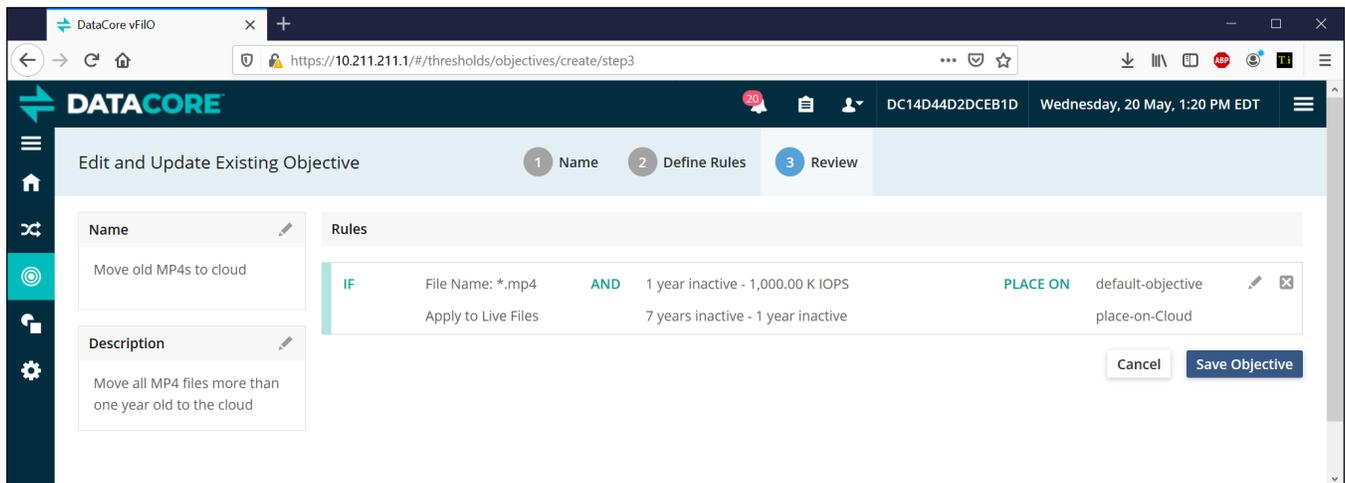
Figure 5: Creating a custom objective. Source: Principled Technologies

Client view

After we assimilated all the file servers into vFilO, we mounted the "main" vFilO file share that we created previously onto our application server. Once we did so, all of the file shares from all of the file servers were visible and accessible (see Figure 6). We mounted this "main" share using NFS.
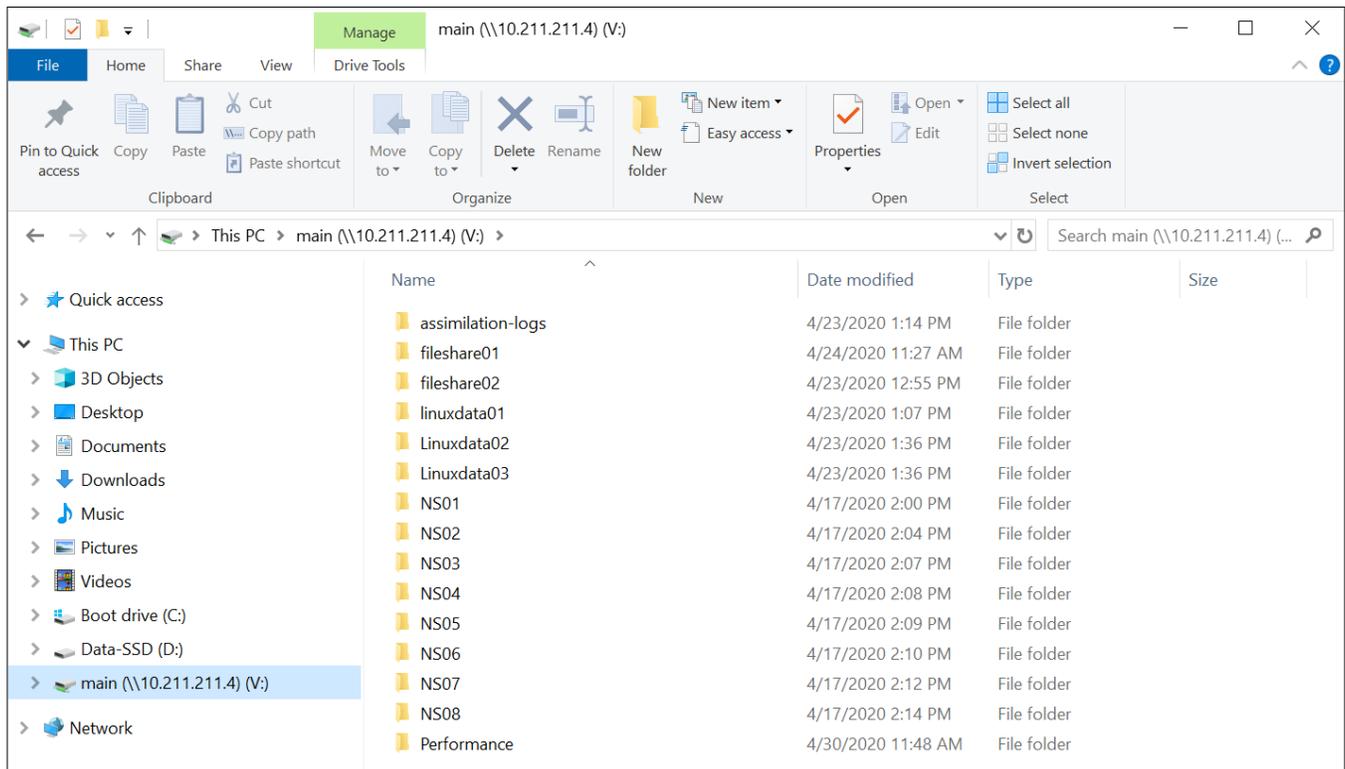
Figure 6: Client view of all the folders presented by vFilO. Source: Principled Technologies

Search once rather than repeatedly

One of the benefits of a global namespace is that all the previously scattered file shares are visible to end users as though they were in one file structure. As a result, one can issue a single search command for a filename and vFilO will search the entire namespace of all the file shares for the desired file. Without vFiIO, a user would have to conduct a separate search for each of the original file shares. Furthermore, once they found a file, they would not know whether it was the most recent version. As part of our testing, we successfully validated that vFilO global namespace search was fully functional.

Conclusion

Organizations that use multiple NAS systems for file storage face a number of inconveniences that DataCore vFilO can minimize. By providing a single, global namespace, vFilO makes it easier for users to find the files they are looking for. IT administrators can also benefit from vFilO policies that automatically migrate files to the appropriate local or cloud storage and consolidate multiple older file servers, and the company can potentially reduce costs by avoiding or delaying the purchase of new storage hardware. In our tests, vFiIO moved files and made them accessible to users in the way its documentation claims.

Read the science behind this report at http://facts.pt/nagxt0w ▶

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This project was commissioned by DataCore.