



## Get through the migration maze with less downtime with help from Dell Data Migration Services

For many organizations, the infrastructure that supports IT functions doesn't resemble a well-planned city, but rather an intricate, disordered maze. As your business has grown, so too have the computing possibilities that new technologies make possible. Linking disparate servers to facilitate growth has so far kept open the path between employee and customer transactions.

When your IT team takes stock of your legacy server and storage environment and decides it's time to move that data onto a modern Dell™ PowerStore™ storage solution, they have options. Is it best to complete the migration manually, or employ Dell Data Migration Services to handle it?

Depending on the size of your environment, the experience level of your IT team, and your goals during and after migration, you may need the help that a professional service can provide. Here's our experience: We had a Principled Technologies administrator migrate file and block data from a four-server Red Hat Enterprise Linux® environment with HPE 3PAR storage onto a Dell PowerStore array manually and then used Data Migration Services to complete the same task. In our example file migration, using Dell Data Migration Services resulted in just 5 minutes of total downtime, because data was still accessible during the move. In comparison, the manual approach our administrator took resulted in 17 hours of downtime. Migrating block data resulted in 1 hour of downtime using the manual approach, with no downtime using Dell Data Migration Services. Additionally, Dell Data Migration Services provided a more thorough planning approach to data migration, which could mean a smoother migration experience for admins and less disruption for users accessing that data.

Dell Data Migration Services **reduced downtime by 99.5%** vs. our manual approach

Comprehensive planning and assisted execution with Dell Data Migration Services could result in **less business disruption**

Preserve and transfer file permissions with your data to **streamline data access**

## 💡 Using Data Migration Services

If you're moving to Dell storage, engaging Dell Data Migration Services provides a proven approach to migrate aging infrastructure and update your data center.

Data Migration Services allows customers to move traditional block, file, virtual, and object data on premises or to the Dell APEX cloud. According to Dell, Data Migration Services aims to minimize both administrator effort and user downtime, offers post-migration verification, and streamlines migrations using proven tools and procedures.<sup>1</sup>

We completed a block and file data migration using Data Migration Services, moving from a disparate Linux environment with a 3PAR array to a new Dell PowerStore array (see Figure 1). The four bare-metal servers in our tests—a database server, a web server, an email server, and a file client—ran different Linux builds to represent a disparate legacy environment built over time. We also completed the same migration process manually and compared our experiences with both migration methods.

## 🔧 Our manual migration

Administrators have different levels of experience, specialties, and preferences when it comes to the tools they use to manage and migrate infrastructure. As such, there are plenty of different choices you might make when migrating data manually.

For our manual migration test, we chose an on-staff administrator with average IT data center experience but limited storage migration experience, and presented them with the legacy 3PAR environment and the new PowerStore array as migration target. Because the environment was small, we assigned a less experienced administrator. Larger environments would be more likely to have a more experienced administrator, though the challenges they face might also be greater. We recorded the time and steps the administrator took to move the file and block data (12.9 TB total) to present one example of how the process could differ from using Dell Data Migration Services.

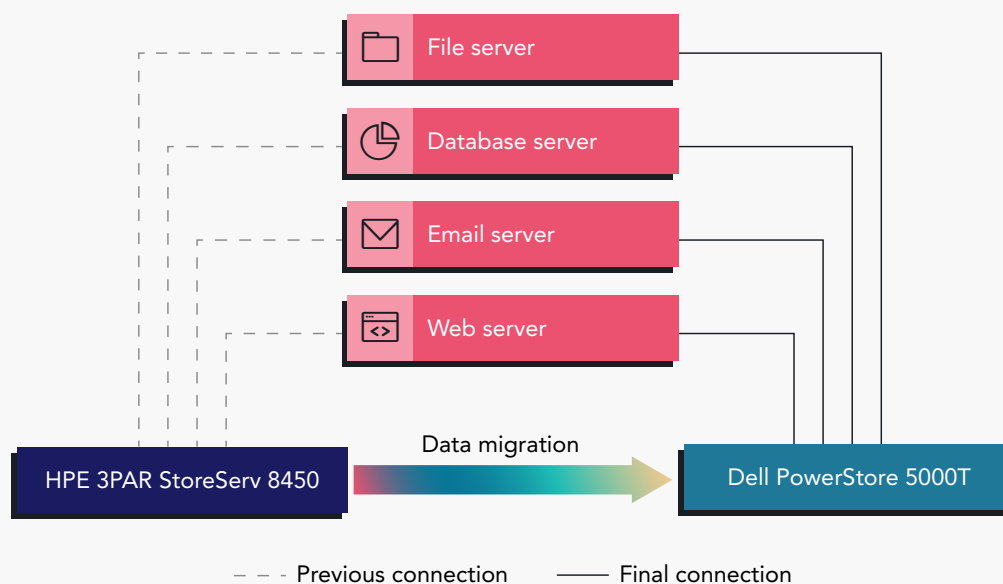


Figure 1: The example migration we completed, moving a disparate Linux environment on 3PAR storage to a PowerStore array. Source: Principled Technologies.



## The takeaway from our experience: Up to 99.5% reduction in downtime with Dell Data Migration Services

While the overall time to complete the file migration was longer from start to finish using Dell Data Migration Services (42 hours vs. 17 hours), the downtime we experienced when using Dell Data Migration Services was just a fraction of the downtime experienced in the manual approach. Data Migration Services runs incremental copies for data changes throughout the migration process so that all systems would be accessible to users during all but 5 minutes of those 42 hours, meaning business could go on as usual. Admins could easily schedule that short downtime window during off-hours to avoid disruption to business processes. By transferring data over a longer period, Dell Data Migration Services also limits the effect the migration has on I/O or bandwidth for users accessing data. In contrast, the 17 hours of manual migration time means 17 hours of infrastructure downtime, which is over two business days where business processes would grind to a halt.

Migrating block storage data told a similar story. Using the manual approach to migrate block storage data resulted in 1 hour and 2 minutes of downtime, while using Dell Data Migration Services resulted in no downtime at all for end users.

### Plus...

Using Data Migration Services preserved and transferred all file permissions without further admin intervention. In a manual migration, a more experienced admin may have invested the extra time to migrate permissions, a less experienced administrator may forget or not consider moving permissions. In our manual migration, our administrator used the “cp” command with no permissions flags. This meant our admin would have to track and reconfigure permissions later—which could be a daunting task for organizations with many users. While IT admins performing a manual migration may choose to research other migration methods that do transfer permissions, Dell Data Migration Services automatically takes this into consideration as yet another way of contributing to a smoother migration.



### Preparing for the migration

#### Manual

To prepare for the migration, our administrator had to set up software on local machines and then locate and download Dell PowerStore documentation. They spent approximately 2 hours and 53 minutes reviewing Dell setup information, service scripts, and networking and planning guides.

#### Data Migration Services

Data Migration Services provides a complete package for migrating software that simplifies this part of the process. In the manual approach, our administrator had to do research in multiple places and build their own processes. In contrast, Data Migration Services provided the proper resources to ensure a standardized migration using Dell tools.



## Configuring the storage

### Manual

Before they could begin moving data to the new array, our administrator spent approximately 46 minutes configuring the new PowerStore array as well as the storage components on the servers. This included adding hosts to the array, creating LUNS and network-attached volumes, and attaching those to the hosts.

### Data Migration Services

This portion of the migration was very similar to the manual approach. Our administrator spent time configuring the array and storage components on the servers, again spending approximately 46 minutes. Using Data Migration Services required one extra task before migration: setting up three virtual machines to enable the migration. This took our administrator approximately 1 hour and 15 minutes to complete.



## Migrating block storage data

### Manual

Downtime: 1 hour and 2 minutes

In the manual approach, copying block storage data and moving it to the new array took 1 hour and 2 minutes to complete. Our administrator used the “cp” command to copy this data, which meant that hour-long migration took the infrastructure completely offline. This would leave users unable to fully access data for the duration that the block migration was taking place, disrupting business operations.

### Data Migration Services

Downtime: None

Using Data Migration Services to move block storage data resulted in no downtime for end users. From start to finish, Data Migration Services took 4 hours and 30 minutes to copy and move block storage data to the new PowerStore array—but the data was always available for changes. This is because Data Migration Services mirrors block data at the volume group level and runs activities in the background to prevent disruption to your organization’s daily work.

## Migrating data at scale: Single-threaded or multi-threaded?

*In this paper, we’ve looked at migrating data from a small Linux environment. What if you have many servers and old arrays to move onto new systems?*

This is especially where using Dell Data Migration Services could make the process simpler. The resources and tools that Data Migration Services employ can allow teams to multi-thread the migration process for larger infrastructures, meaning multiple processes can happen simultaneously while sharing their resources. Using the manual single-threaded approach, where each process completes in a serial fashion, your administrator is the bottleneck—which means migrations of large arrays could take much more time.



## Migrating file storage data



## Validating block and file data

### Manual

Downtime: 17 hours

Moving file data from the 3PAR array to the new PowerStore array took our administrator 17 hours to complete. The “cp” command they used requires shutting down the database, which resulted in 17 hours where users couldn’t access their file data, which would slow or halt many business operations.

The files migrated successfully, but due to their experience level, our administrator used commands that did not preserve user permissions, which could add time and hassle after the successful migration. While more experienced administrators may use a different method that preserves permissions and checks for data corruption, this is something administrators might overlook, creating problems down the line.

### Manual

As we state above, our manual approach didn’t have a built-in way to verify that data migrated successfully to the new array. Our administrator used the “diff” command, which compared the number of files as well as file size from the old environment to the new. This does not take into account user permissions or access controls.

Validating data using the manual approach took 2 hours and 56 minutes for block and file data combined.

### Data Migration Services

Downtime: 5 minutes

During the migration of file data, Data Migration Services ensured that data was accessible to users throughout the entire process, save a 5-minute cutover period at the end of the migration. The total time to complete the file migration was 42 hours, but with only that single 5-minute disruption to end users. In fact, by moving this data over a longer period of time, Data Migration Services reduces the likelihood of bandwidth problems for users while the data is in motion. Data Migration Services runs incremental copies for data changes, which allows users to continue to read and write data throughout the migration process.

Data Migration Services also transfers user permissions along with the files, which means that the correct users have access to their data after migration without any further administrator planning.

### Data Migration Services

Dell Data Migration Services builds validation into the process, taking a combined 45 minutes to validate the successful migration of both block and file data. Data Migration Services copies and verifies permissions and compares files, directories, byte counts, and timestamps to ensure that data integrity remains intact.



## Post-migration considerations

### Manual

After successfully migrating to the new PowerStore array, our administrator spent 24 minutes logically decommissioning the old 3PAR storage from the environment.

### Data Migration Services

Post-migration, our administrator had to spend just 5 minutes cleaning up, where they disconnected file shares from the clients to the old 3PAR array and applied IP addresses to the new PowerStore array.

## Conclusion

When it's time to migrate data from an older Linux environment to a new array, it's important to assess the potential impact of migration on your IT staff and on end users trying to complete their daily tasks. Compared to our example manual migration, using Data Migration Services reduced infrastructure downtime by 99.5 percent and helped to ensure we planned the details of data migration, including preserving important user permissions. Dell Data Migration Services can provide you with a straightforward path out of the migration maze by employing careful planning and minimizing downtime to achieve a successful migration.

1. Dell, "Data Migration Services," accessed May 4, 2022, <https://www.dell.com/en-us/dt/services/data-migration.htm>.



Read the science behind this report at <https://facts.pt/XZi163q> ▶



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