

White Paper

The FUJITSU Storage ETERNUS AF series and ETERNUS DX series Offer a Selection of Suitable Migration Methods

Greater amounts of data are being stored in storage systems as business operations diversify. A data migration method that does not affect business operations during storage system replacement is ideal.

The FUJITSU Storage ETERNUS AF series and ETERNUS DX series offer a selection of suitable migration methods.



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Preface

In recent years, the amount of data stored in storage systems has increased rapidly and subsequently, the amount of time required for data migration during storage system replacement has increased as well.

This situation makes minimizing business downtime a challenge during data migrations.

The FUJITSU Storage ETERNUS AF series and ETERNUS DX series provide the online Storage Migration function, which allows significantly reduced business downtime by allowing data to be migrated while continuing business and also provide the Non-disruptive Storage Migration function, which allows data to be migrated while continuing business operations without any business downtime.

■ Purpose of This Document

The purpose of this document is to provide an understanding of the data migration methods offered by the FUJITSU Storage ETERNUS AF series and ETERNUS DX series, and provide the hardware and business operation requirements for each migration method.

■ Naming Conventions

The following abbreviations are used in this document.

- FUJITSU Storage ETERNUS AF series..... ETERNUS AF series
- FUJITSU Storage ETERNUS DX series ETERNUS DX series
- FUJITSU Software PRIMECLUSTER..... PRIMECLUSTER

■ Notes

The product lineup and product information stated in this document are current as of November 2019.

1. Data Migration Methods of the ETERNUS AF series and the ETERNUS DX series

1.1. Conventional Data Migration

When replacing a storage system, the method for migrating data from the storage system must be taken into consideration.

The three most common conventional methods for data migrations are online Storage Migration, which minimizes the storage downtime; offline Storage Migration, which provides faster data migrations; and data migrations with a server, which allows for migrations even in the absence of a data transfer function between the existing storage system (source storage system) and the new storage system (destination storage system).

(1) Online Storage Migration

With online Storage Migration, business operations must be temporarily suspended because the FC cables must be disconnected from the source storage system and then connected to the destination storage system. However, since business operations can be immediately resumed, downtime is reduced significantly.

When connecting the FC cables, migrate the WWNs that are assigned to the FC ports of the source storage system to the destination storage system. This allows a connection to the destination storage system without having to change the connection destination WWNs of the HBA on the business server.

Data can then be migrated by connecting the migration paths between the storage systems.

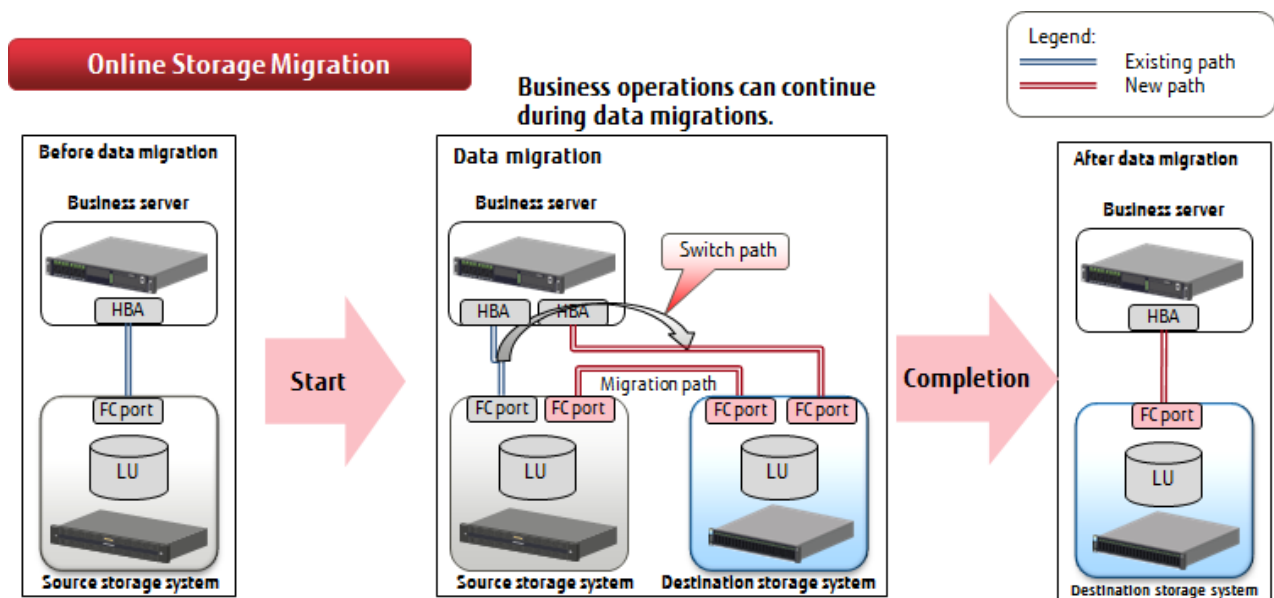


Figure 1-1 Online Storage Migration

For the ETERNUS AF series and the ETERNUS DX series, storage migrations are performed directly between the source storage system and the destination storage system, which reduces the impact on business operations when compared to a migration with a server.

(2) Offline Storage Migration

For offline Storage Migration, a path connection is performed in the same way as for online Storage Migration, however operations are stopped to allow for a high-speed data migration.

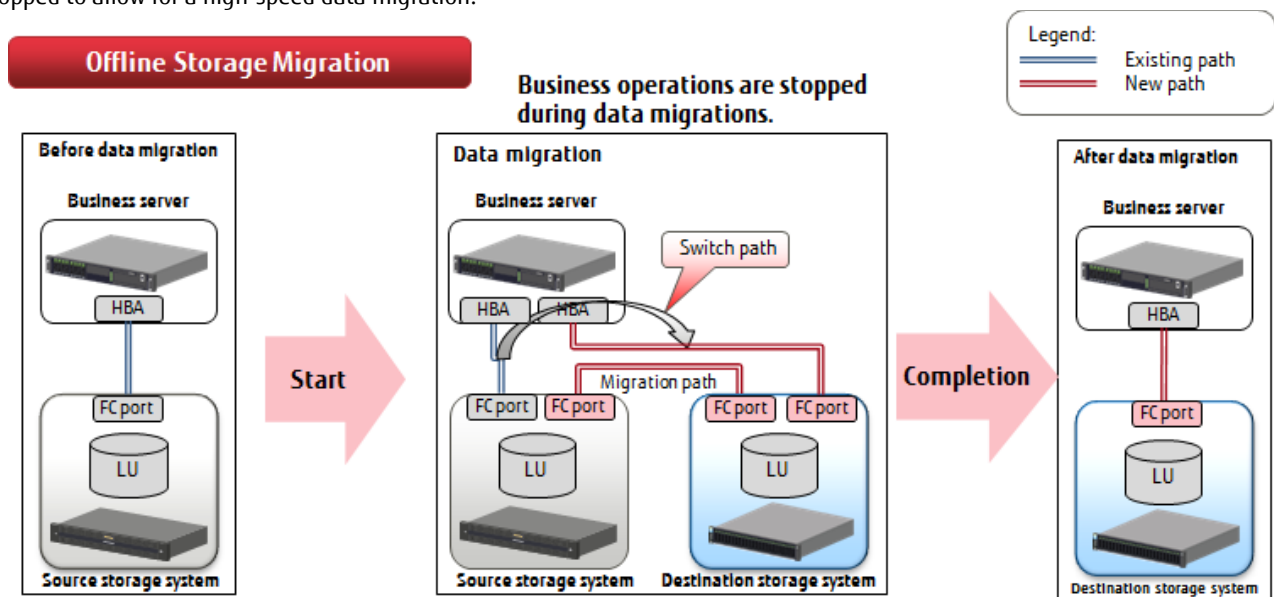


Figure 1-2 Offline Storage Migration

Provides a fast, effective migration if business downtime is allowable.

(3) Data migration with a server

If a direct data migration between the source storage system and destination storage system is not possible, the data can be migrated with a server. Data migrations with a server is a method of migrating data to the destination storage system after migrating the data of the source storage system to an external storage media. Therefore, this migration method takes more time than a migration performed by connecting the source and destination storage systems directly.

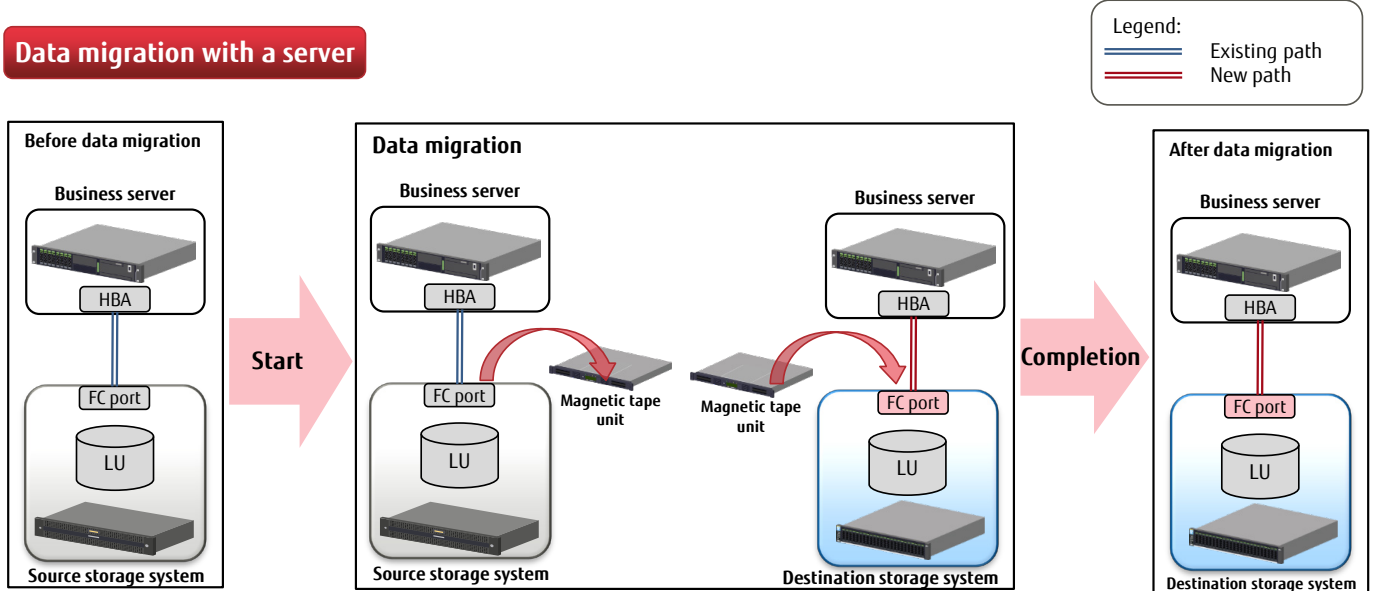


Figure 1-3 Data migration with a server

Regardless of the types and models of the business server or the storage system, this migration method can be used for any system as long as an external media, such as a magnetic tape unit, can be connected.

1.2. New Data Migration Method: Non-disruptive Storage Migration

By installing the ETERNUS AF series or the ETERNUS DX series, a "Non-disruptive Storage Migration" can be performed with even less disruption of business operations than conventional methods.

This method is used for migrating volume data from a source storage system to a volume in the destination storage system without stopping the business server.

This method connects the business server, the source storage system, and the destination storage system with FC cables. With the RAID Migration function, data is read from the migration target volume of the external storage system and then written to the migration destination volume of the local storage system.

At this time, by matching the identification information of the destination volume with the source volume, the server recognizes both volumes as a single volume multipath. As a result, by configuring and disconnecting the multipath, the workload I/Os are switched to the destination storage system (the ETERNUS AF series or the ETERNUS DX series). This eliminates the need for the business server to recognize the destination volume.

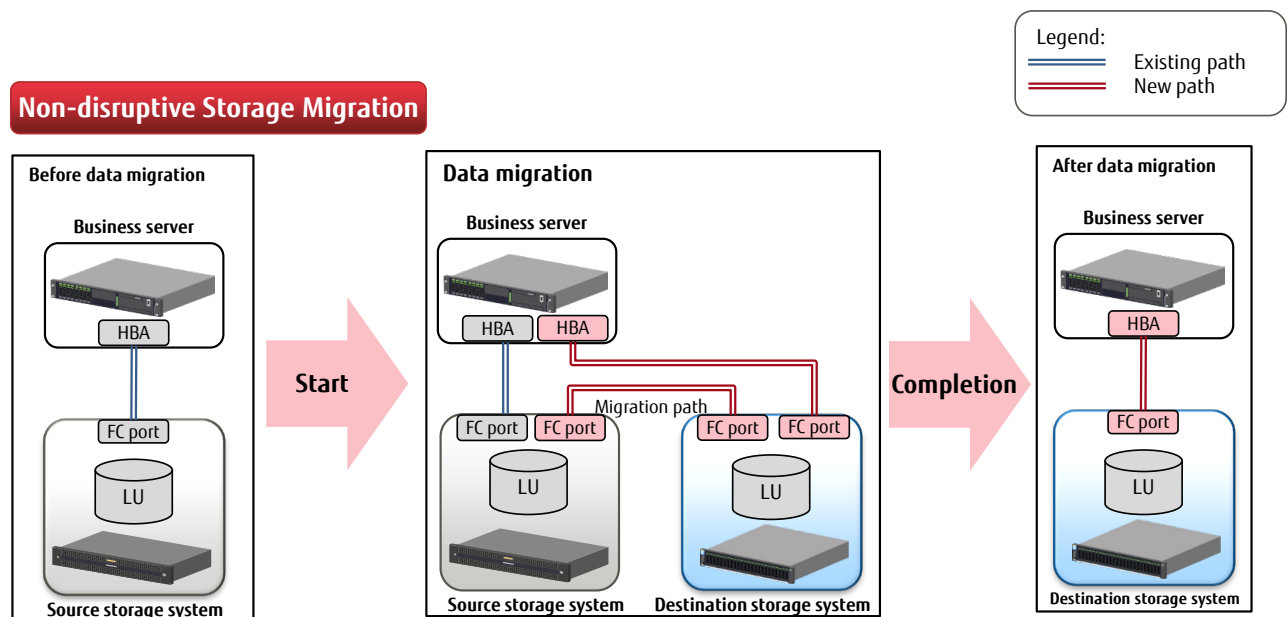


Figure 1-4 Non-disruptive Storage Migration

Non-disruptive Storage Migration supports redundant business server configurations using PRIMECLUSTER.

2. Determining Which Data Migration Method to Use

2.1. Considering the Backup Acquisition Point

For data migrations, the point at which to perform a backup acquisition of the migration data must be taken into consideration. A backup point is a specific time when a snapshot of the folders, files, and application data on a business server are taken. The acquired data is used to restore data to the backup acquisition point in case of trouble during a migration or to check the consistency of the data before and after a migration.

The timing for a backup acquisition point differs according to the data migration method. For data migrations with a server or offline Storage Migration, a backup is performed when business operations are stopped prior to a migration. For online Storage Migrations, a backup is performed when business operations are stopped prior to switching the path. For Non-disruptive Storage Migrations, a backup can be performed at any time since stopping business operations is not required.

The following figure shows the different backup acquisition points.

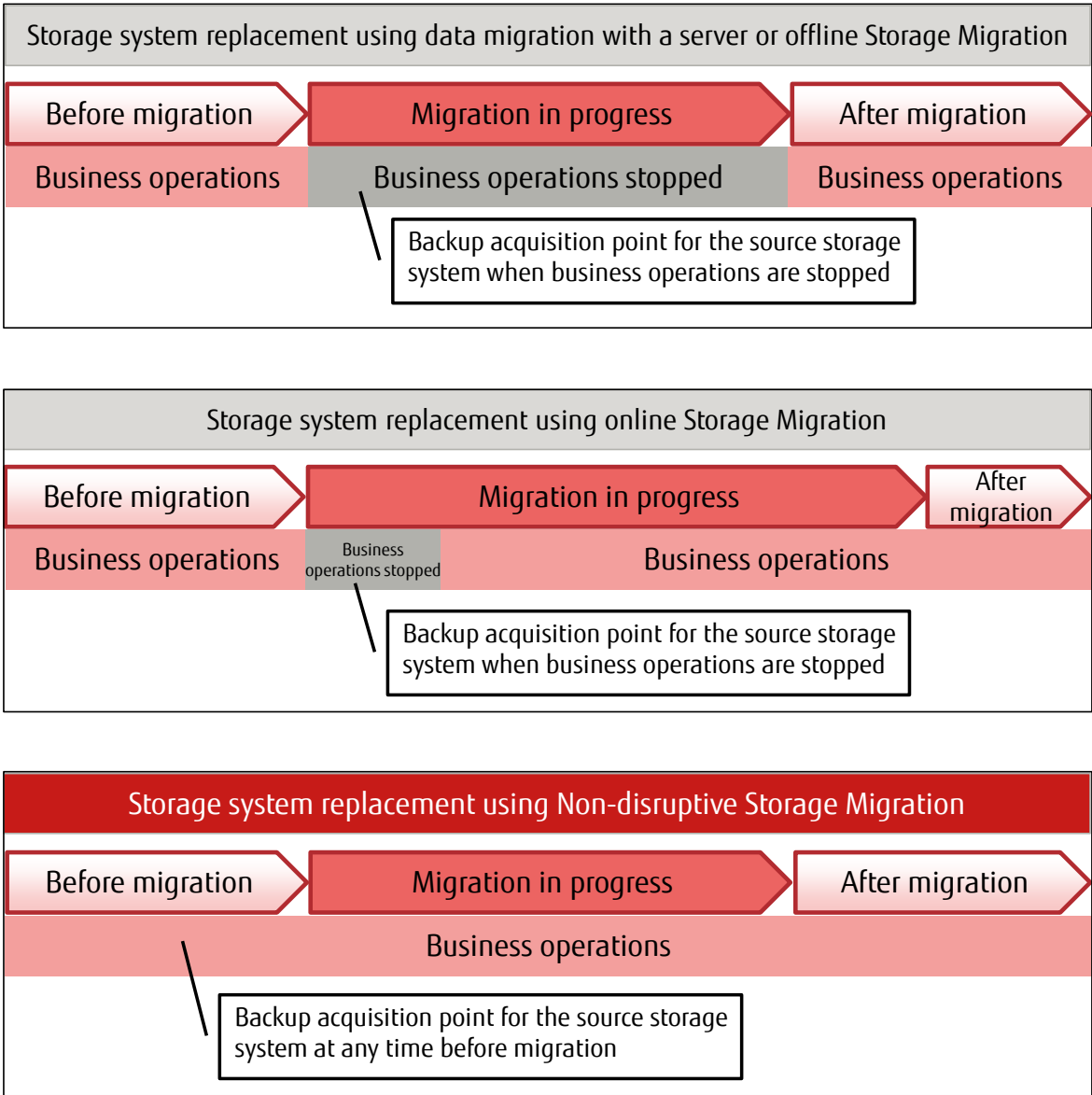


Figure 2-1 Timing for Backup Acquisition Points

2.2. Business Downtime Due to Data Migrations

Estimating the business downtime is necessary for each migration method to secure the necessary time for data migrations. However, the necessary time for a data migration varies depending on the amount of data to be migrated, which makes estimations difficult. Compare the following business downtime and select a migration method that best suits the type of business operations.

Business Downtime	Recommended Migration Method	Reason
Long downtime required	Data migration with a server or Offline Storage Migration	These methods require that business operations be stopped until the data migration is completed. These are suitable for preventing changes to the migration source data until the migration to the destination storage system is complete. Storage system replacement using a server can be performed for various types of systems. Because offline Storage Migration migrates data between storage systems, it allows high-speed data migrations.
Minimal downtime required	Online Storage Migration	This method migrates data while business operations continue. It is suitable for keeping business downtime short because a downtime is required only when the path is being changed from the source storage system to the destination storage system.
No downtime required	Non-disruptive Storage Migration	This method migrates data without stopping business operations. It does not require the FC cables to be reconnected from the business server to the destination storage system prior to a data migration and is suitable when business operations cannot be stopped.

The following figure shows the differences between the business downtimes by the data migration method.

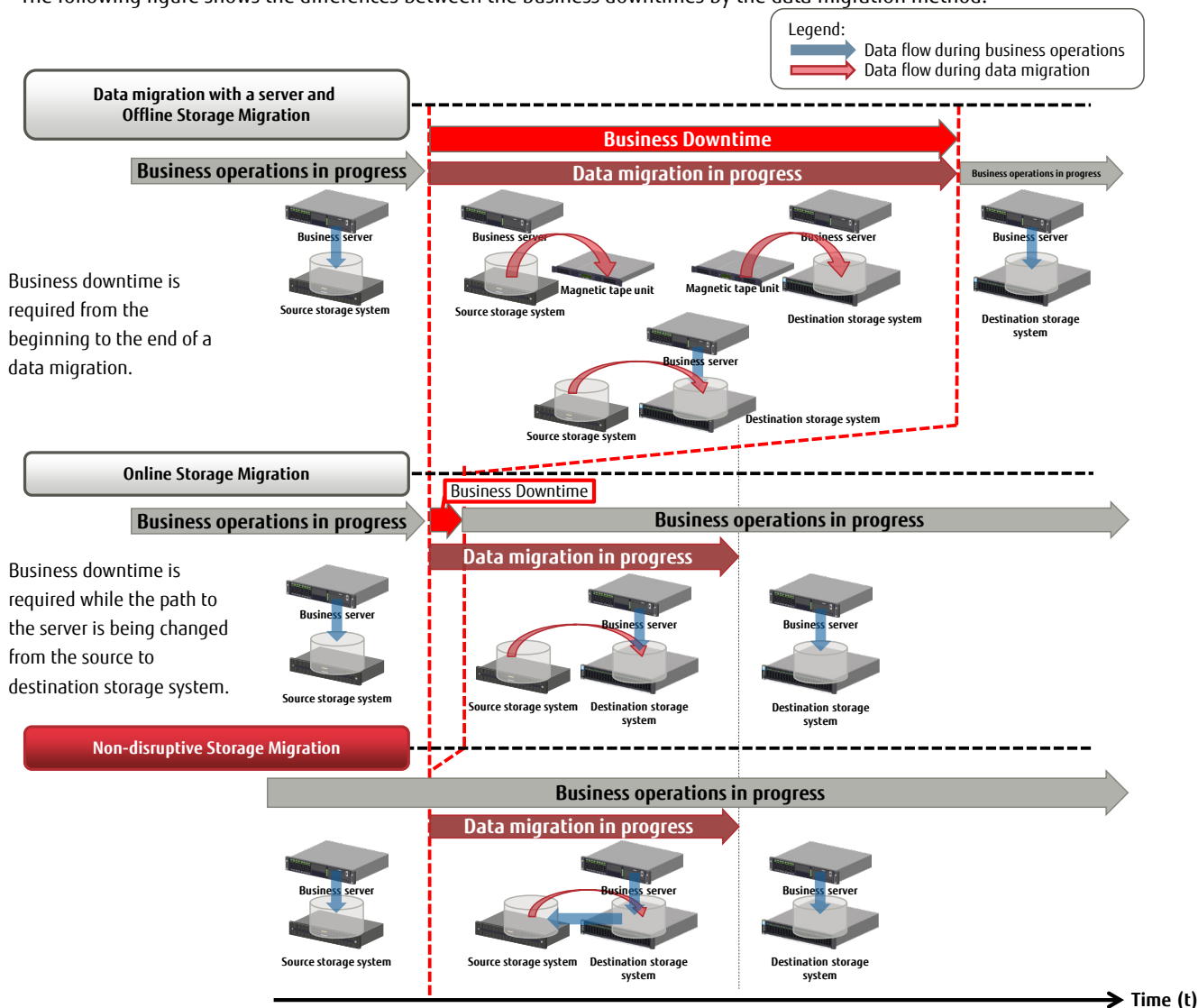


Figure 2-2 Comparison of Business Downtimes

3. Conclusion

Online Storage Migration and Non-disruptive Storage Migration of the ETERNUS AF series and the ETERNUS DX series are performed between storage systems without burdening the business server. This means that no migration load is imposed on the business server so the impact on business operations is minimized.

Moreover, since data can be migrated between storage systems at high-speed by using FC, the larger the number of volumes to be migrated, the greater the benefit.

For the ETERNUS AF series and the ETERNUS DX series, selection of the most suitable migration method is possible.

4. Appendix

4.1. Items to Check for Online or Offline Storage Migration

- The destination storage system requires a migration path that connects to the source storage system and an FC-CA port that connects to the business server.
- For offline Storage Migration, business operations are stopped during the data migration. Therefore, business downtime must be taken into consideration.

[Applicable Series]

- FUJITSU Storage ETERNUS AF150 S3, AF250 S3/S2, and AF650 S3/S2
- FUJITSU Storage ETERNUS DX60 S5/S4, DX100 S5/S4, DX200 S5/S4, DX500 S5/S4, DX600 S5/S4, DX900 S5, and DX8900 S4

4.2. Items to Check for Non-disruptive Storage Migration

- A free license is required for Non-disruptive Storage Migration. For a free license, refer to the following website:
www.fujitsu.com/eternus
- The destination volume used by Non-disruptive Storage Migration must not be used for the destination volume of Storage Migration.
- The destination storage system requires a migration path that connects to the source storage system and an FC-CA port that connects to the business server.
- To use software such as the clustering software for server redundancy, refer to the following website:
www.fujitsu.com/eternus

[Applicable Series]

- FUJITSU Storage ETERNUS AF150 S3, AF250 S3/S2, and AF650 S3/S2
- FUJITSU Storage ETERNUS DX60 S5/S4, DX100 S5/S4, DX200 S5/S4, DX500 S5/S4, DX600 S5/S4, DX900 S5, and DX8900 S4

Contact

FUJITSU Limited

Website: <https://www.fujitsu.com/eternus/>

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