

White Paper

Fujitsu Storage ETERNUS DSP series

Storage Foundations for Digital Transformation: Fujitsu's New SDS Solutions



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1. Evolving System Requirements for DX

Digital transformation (DX) is gaining in importance.

Japan's Ministry of Economy, Trade and Industry issued the *DX Promotion Guidelines* in December 2018.

The guidelines state that utilization of data and digital technologies can boost competitive edge.

Specifically, the following five actions are required:

1. Improve productivity through efficient operations
2. Add new value to existing products and services
3. Create new products and services
4. Transform the business model
5. Transform the corporate culture and mindset

Among these, 1, 2, and 3 are deeply rooted in Information Technology.

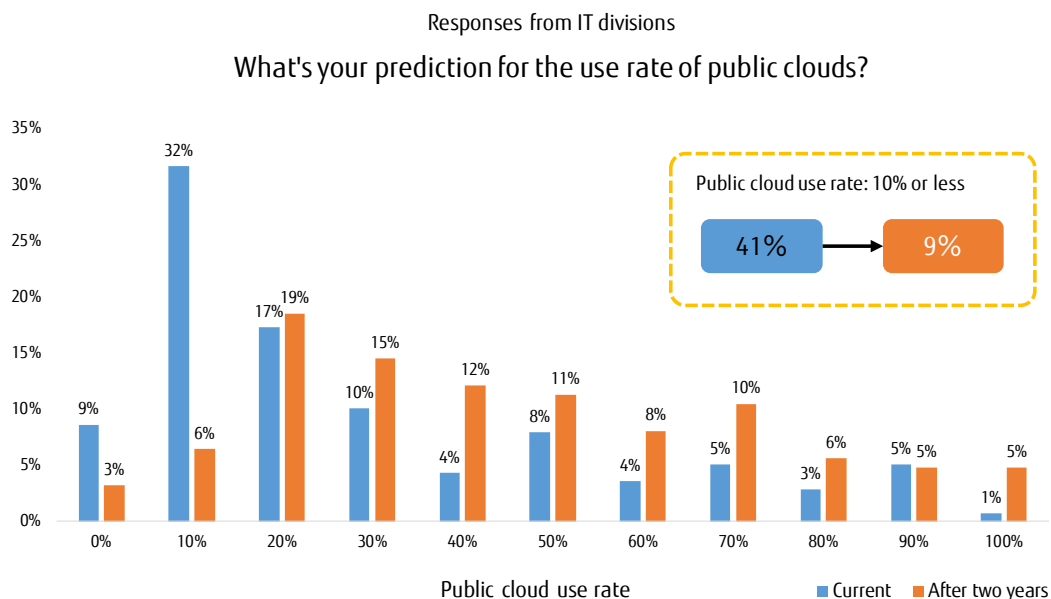
As for the operational efficiency in the first action, it can be improved by introducing sensors and IoT, and productivity can be increased by applying RPA to manual Excel based operations.

The second and third actions should be handled in terms of establishing connections with customers through Customer Experience (CX). By linking data via smartphones, the user's needs can be instantly determined and assessed, and by collecting and analyzing that data, existing products can be reevaluated and new products/services can be tailor made.

2. Transforming Systems

In this situation, IT systems are also experiencing big changes.

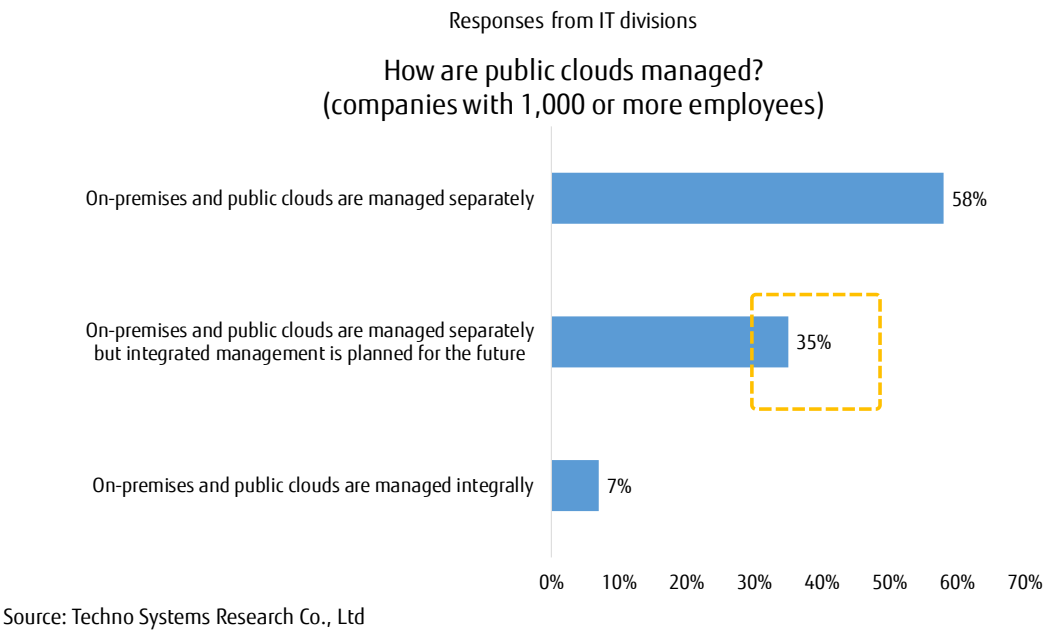
For developers who want to launch new business applications as quickly as possible, public clouds are the first choice to provide these services because of their responsiveness.



Source: Techno Systems Research Co., Ltd.

The percentage of users who run no more than 10% of their entire system on public clouds is expected to be reduced from 41% to 9% in two years.

Even in this situation, there are not many users who want to construct their entire system on public clouds. This means that on-premises environments will be used continuously. Therefore, how hybrid clouds are utilized is the key to a successful future.



Today, only 7% of users have implemented integrated management of public clouds and on-premises environments. The percentage of users who want to implement integrated management is 35%. As hybrid clouds and multicloud, which consists of multiple public clouds, are gaining in popularity, integrated management is almost certainly becoming a necessity.

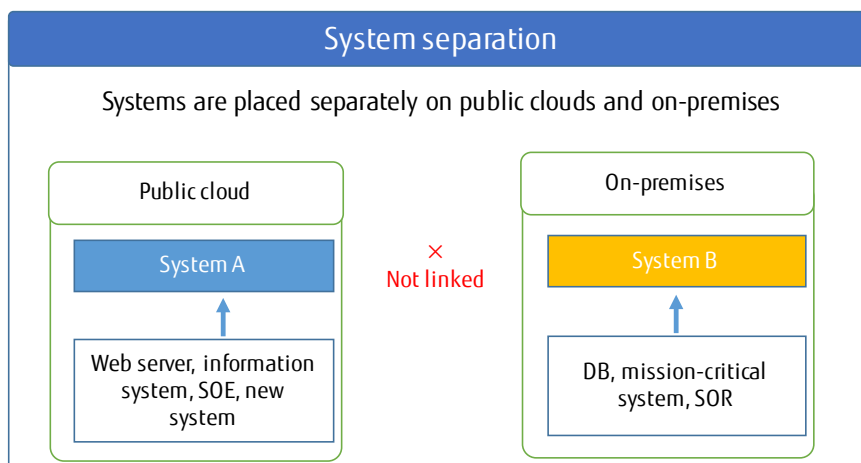
3. Four Hybrid Cloud Options

The options are as follows:

1. System separation
2. Secondary storage
3. Data separation
4. Full system linkage

Due to the misconception that all the above are a single hybrid cloud, many people lose sight of what they really need. To clarify the differences, the four models are explained below.

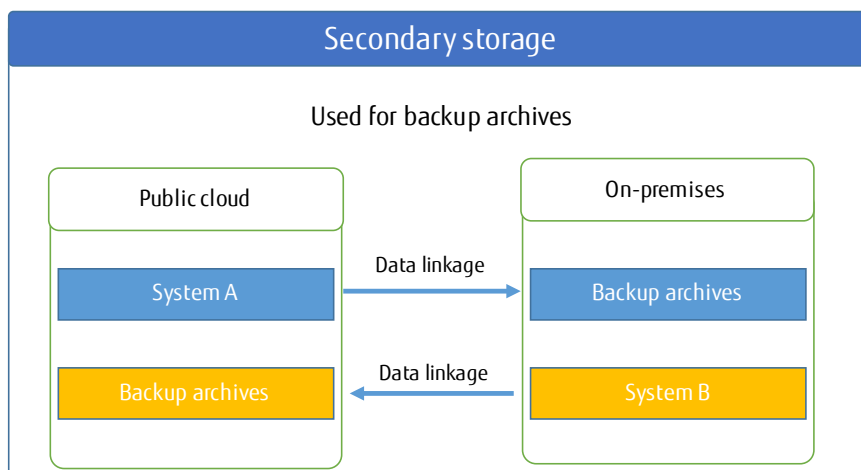
3.1. System Separation



This is the most common model where different systems use different infrastructures. For example, System A is on a public cloud and System B is on-premises.

Because developing and operating a new system is easier to start on public clouds than migrating an existing on-premises system to a public cloud, there are increasing number of cases where existing on-premises systems are left as is while public clouds are used for new systems.

3.2. Secondary Storage

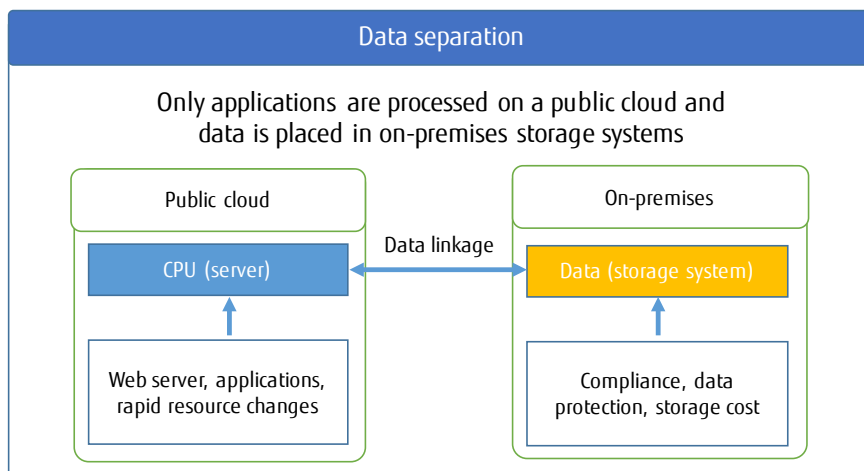


In this model, the primary system is on a public cloud and the secondary storage, such as backup archives, is placed on-premises, or vice versa.

The secondary storage model functions as the BCP and DR infrastructures and can reduce storage costs.

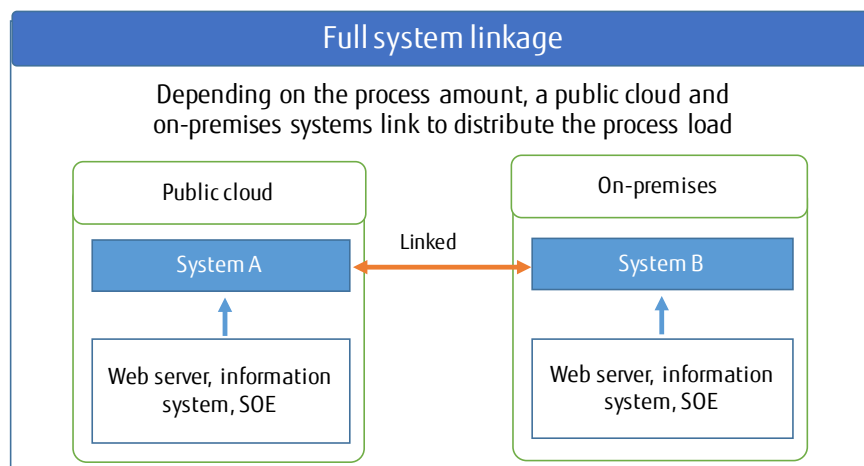
Recently, stored backup archives are used for different purposes such as development and data analysis.

3.3. Data Separation



In this model, applications are processed on a public cloud and data, such as databases, is placed in on-premises storage systems. This model has recently been started by innovative cloud-native companies that provide EC site services and cloud services. The daily amount processed by web applications that offer BtoC services varies. To handle the varying loads, server resources may have to be scaled out all at once. In-house resources are limited and insufficient but by using public clouds which have greater resources, the server resources can be easily scaled out. However, there are several challenges to address such as a higher level of security to protect private user information, data protection, and the cost of storing large amounts of data. These challenges must be addressed in the on-premises environments. As a result, to process applications on a public cloud and to manage data on-premises, a hybrid cloud is required.

3.4. Full System Linkage



In this model, an on-premises system is normally used but processes are migrated to a public cloud when its amount increases. Resource sharing and simple migrations are ideal when a public cloud and on-premises work together; however, if the two infrastructures are not integrally managed, resource sharing and migrations are incredibly difficult to realize. The emergence of container technology makes it possible to migrate processes but including data with that migration requires the handling of inconsistent data and other problems.

4. Data Separation Model and Next-Generation SDS

"4. Full system linkage" is the ideal form of hybrid clouds.

However, this model is technologically challenging and requires more time to be realized because containers, based on their technology, need to move freely between cloud and on-premises, and in addition to CPUs, storage systems must also keep up with that technology.

At this time, the best practice model is "3. Data separation".

Although application developers assume everything should be completed on highly responsive public clouds, the reality is that due to compliance issues and security risks, the use of public clouds must be firmly managed by the IT operation division.

Because data leakage, for example, can cause big problems, data must be protected by the company.

In addition, public clouds can become expensive to store large data capacities.

For the data separation model, SDS for cloud is required because traditional enterprise storage systems are not designed to link with public clouds.

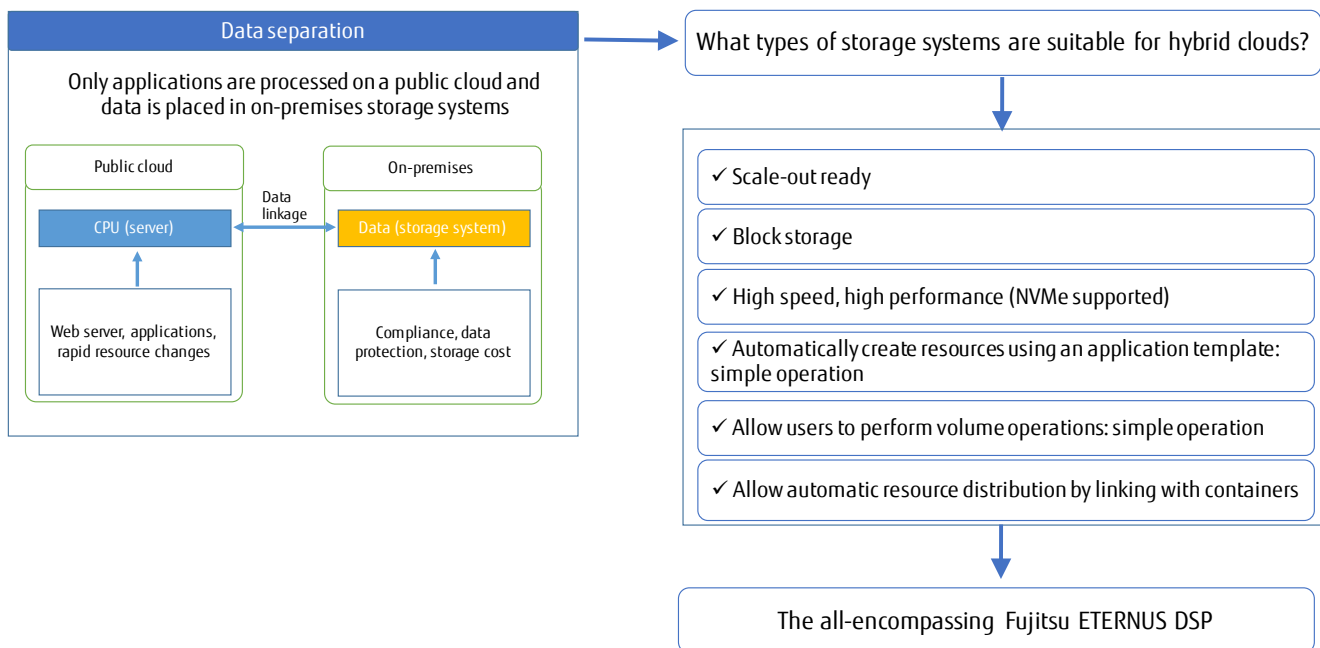
	Traditional storage	SDS	Next generation SDS
Storage type	Block, file	File, object	Block, file, object
Container support	Partially yes	No	Yes
Links to public clouds	Partially yes	Partially yes	Yes
Scale-out	No	Yes	Yes
Flash technology	NVMe	NVMe	NVMe
Simple operation	Partially yes	Partially yes	Yes

SDS is advancing to the next generation.

The current SDS is developed mainly for object storage which is characterized by scale-out readiness and a large-capacity at low cost.

However, the next generation SDS, which is evolving for block-based storage that forms system foundations, is becoming available as products that provide linkage with public clouds, support for containers, a product that takes ease of operation into consideration, and of course, support for new technologies such as NVMe.

5. Fujitsu's DSP Is Suitable for the Data Separation Hybrid Cloud Model



Fujitsu storage ETERNUS Data Services Platform (ETERNUS DSP) is the next generation SDS that is suitable for use with the data separation hybrid cloud model.

This product satisfies the above-mentioned requirements for the data separation model and also features simple operation and container support.

The following features are available for simple operation:

- Application template: template for batch volume creation
- Autonomous control: data and resources are autonomously controlled according to the system load and used capacity
- Self-service storage: volume operations can be performed by storage users such as developers
- Simple step: nodes can be added or deleted with a single click

These features have the advantage of significantly reducing operating expenses.

Support for containers is also becoming an important factor.

The use of container technology in web applications for BtoC is growing at a rapid rate.

In particular, because smartphone applications need to be updated quickly, container technology is indispensable.

Currently, not many storage systems support the Kubernetes Container Storage Interface (CSI). Additionally, the current CSI can only connect and allow communications between Kubernetes and storage systems.

Support for CSI has also started in traditional enterprise storage systems. For CSI-supported storage systems, although the volumes can be created in Kubernetes, all the settings must be changed manually to change volumes and their performance might be reduced.

By contrast, the next generation SDS, such as DSP, is designed for use in container environments. For example, by using a template policy, the settings can be changed automatically with a batch process without performance degradation.

Conclusion

As efforts toward DX are accelerating in companies, innovating IT system foundations for DX is an important issue for IT divisions. Public clouds are essential for speedy and flexible DX but the core business functions that each company has to take responsibility for must be on-premises. Therefore, the need for integrated management is growing to realize hybrid clouds. However, to achieve an ideal system where data and processes can be linked flexibly between two different infrastructures, public clouds and on-premises, many technological challenges must be solved. In other words, hybrid clouds need to be constructed based on practical technological factors. It is safe to say that the next generation SDS is the best choice as a storage system that comprises the data separation model which is the most realistic hybrid cloud. By constructing IT systems based on this perception and outlook, automated operation can improve operational efficiency in the IT division and these systems can form a foundation that supports business expansion and high profitability due to DX.

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