



# Converged Infrastructure Benefits and Selection Criteria

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## PREFACE

The data center has a significant influence on a company's success, and so it is of utmost importance to ensure continuous data center modernization to maintain the competitive edge. "Converged infrastructure" is a technology that can be used as basis for a high-performance, efficient data center.

NetApp and Fujitsu have commissioned Information Services Group to prepare this white paper to demonstrate the benefits and selection criteria of converged infrastructures.

The information and data contained in this paper were gathered conscientiously and with the utmost care. Nevertheless, we cannot guarantee their exhaustiveness and accuracy. Nobody should take action, based on this information, without expert advice and an in-depth analysis of the specific situation.

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## Benefits of Converged Infrastructure Solutions

The data center is key for business success. While powerful infrastructures help companies to ensure their success, longer data center outages may negatively affect or even ruin the respective company. Therefore, it is very important to keep the data center up-to-date and state-of-the-art – quite a challenge for corporate decision-makers, considering the profound and ongoing transformation of data center technologies. Examples include virtualization and hybrid cloud approaches. Companies can choose among various solutions to meet respective requirements. This paper will examine converged infrastructures.

A converged infrastructure combines data center components into a centrally managed system. Such systems are closely integrated components in preconfigured appliances or reference architectures (blueprints) for the set-up and centralized management of a (scalable) infrastructure. They consist of network, storage and compute resources equipped with orchestration and life cycle management software.

*Hyper*-converged systems are a relatively new trend; based on the even deeper integration of resources, including storage virtualization; user organizations benefit from various advantages; including faster implementation, very good scalability, easier management, lower space requirements and reduced power and cooling consumption.

On the other hand, decisions on the selection of a converged or hyper-converged system must also account for related disadvantages. For instance, system flexibility and extensibility are limited. Due to the high degree of integration and strong alignment of components a specific design and defined elements are required, resulting in a vendor and system lock-in, which may be disadvantageous for customers in case the software vendor experiences a negative development.

While customers have the option to add storage and compute capacities separately and based on their respective requirements, such approach implies higher administration efforts for resource allocation and is therefore not advisable. For instance, additional processor capacity requires additional network and storage capacities as well. Also, significantly higher licensing costs may incur for purchased, but unused resources in cases where costs for the operating system license are based on processor cores and more processors must be bought, although only additional storage capacities are required, indirectly increasing processor-based licensing costs for application software running on the system.

Storage components are highly integrated with the other components of the hyper-converged system but are isolated from the existing storage infrastructure; storage integration might be difficult and respective data may not be available for other purposes.

Converged systems, on the other hand, feature a lower degree of integration, ensuring more freedom regarding the structure and later extension of the system, specifically when it comes to individual (storage and compute) components, where granular extension is possible. This is a major advantage for user organizations that must ensure options to respond flexibly to unpredictable challenges of the future. Considering the long-term character of data center investments, this decision-making factor should not be underestimated. Therefore, ISG expects converged systems to remain a useful option for many user organizations and use cases.

## Users' Requirements for and Expectations of Converged Infrastructure Solutions

### **Fast and easy implementation**

Today, business challenges have a major impact on data centers and related requirements. Shorter times to market and cost savings must be ensured to meet high competitive pressures. New data center capacities must be provisioned quickly, while related implementation efforts and costs should be limited. Traditional data centers with their diversity of hardware and software components require a lot of planning, investment and implementation efforts, time-wise and financially. Increasing system complexity requires more know-how, and unless a company has internal resources, external service providers must be involved and paid accordingly.

Converged systems can address users' need for fast and cost-efficient deployment. Converged systems, with their tightly integrated and preconfigured components and validated architecture blueprints, make it easier for users to build up their data center. Based on this principle, converged system providers take over a large part of tasks, reducing users' workload accordingly, for instance, through the respective alignment of components.

### **Easy management**

Following implementation, user companies and, specifically, midmarket businesses that lack the required operations know-how, appreciate easy operations and easy system modifications to save costs, for instance, for external service providers.

The centralized, standardized management of all integrated converged system components ensures easy handling and eliminates operations problems. Later system extensions are easy, based on integrated and preconfigured elements.

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## **Powerful and secure solutions**

Customers expect highly optimized data center solutions; besides the actual performance, related parameters include the following:

- Scalability
- Availability
- Stability

Security is another increasingly relevant feature of data center solutions.

Solution performance is highly important, for many reasons: Increasing hardware resources are required to ensure fast and stable applications, and thus, the company's efficiency and competitiveness. A high degree of performance is especially important for highly virtualized infrastructure, since a high degree of server and desktop virtualization requires a higher performance of the overall system. Examples include "boot storms", when many virtual machines for virtual desktop PCs are booted in the morning concurrently.

Also, highly powerful systems help companies to adjust to changing business requirements, for instance in case capacity utilization is increasing rapidly and IT systems must be adjusted rapidly accordingly.

Converged systems, with their optimized system design, ensure the perfect alignment of components for maximum security and performance. Vendors have the best, in-depth know-how of their technology and can provide an optimized combination of elements.

## **Efficient support**

Often, user organizations complain about a lack of support by the respective providers in case of data center incidents and disruptions. For data centers based on self-assembled best-of-breed components by multiple vendors, the first challenge is to identify which component by which vendor has caused the problem, which may be a time-consuming task and support may be delayed accordingly. Today, companies cannot afford such downtimes, due to reasons such as described above and specifically when business-critical applications are concerned. While converged systems often consist of components by multiple vendors, these vendors are engaged in respective alliances to provide highly integrated systems and can set up a single point of contact for respective support.

## **Converged infrastructure use cases**

Based on converged infrastructure solutions, user companies can address a multitude of use cases and leverage related benefits.

Converged infrastructure solutions continue to play an important role for business-critical workload operations, since related advantages, as described above, can be leveraged accordingly, and additional workloads can be migrated onto the same platform successively to achieve complete consolidation. Large enterprises often combine workload consolidation with desktop virtualization initiatives for better cost control. In the wake of respective market trends, convergent infrastructures are increasingly used as on-premise platform for hybrid cloud infrastructures to benefit from the advantages of this deployment model.

## How does NFLEX address users' requirements?

NFLEX is a preconfigured converged infrastructure solution by NetApp and Fujitsu. NFLEX has been launched early 2018.

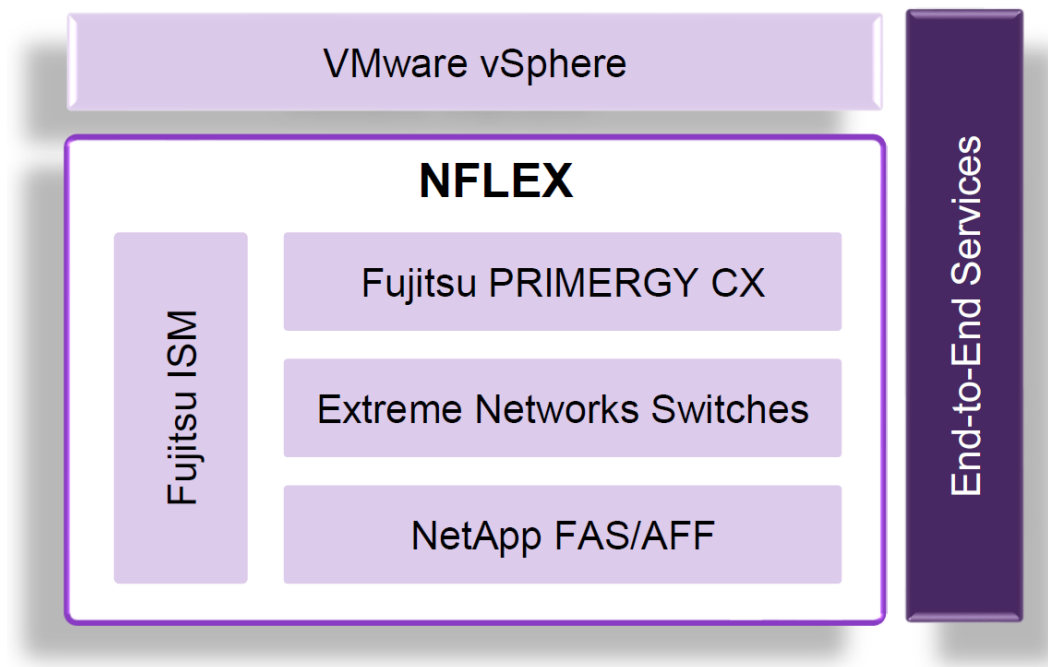


Figure: NFLEX Ecosystem. Source: NetApp and Fujitsu, 2018.

Based on the features described in the following, NFLEX can be used to successfully address customers' requirements.

### Powerful performance by renowned technology providers

NetApp and Fujitsu are highly powerful storage & server as well as converged infrastructure providers. During the last few years, both companies have been able to reach leadership positions in ISG's/Experton Group's vendor benchmarks. Both providers have much experience in the converged infrastructure segment; the first integrated system available in the market was developed by Fujitsu, with NetApp Storage as a core component.

Fujitsu's PRIMERGY servers have repeatedly ranked number one across all three categories of VMware's performance benchmark.



**Fast implementation and easy operations**

NFLEX enables companies to initiate operations much faster than would be possible with a do-it-yourself data center, which is an advantage of converged infrastructures in general; NetApp and Fujitsu provide additional benefits. For instance, both vendors offer an optimized ordering and delivery process. Customers can order the whole system either through NetApp or Fujitsu. The offering also includes on-premise installation services. Both racked and non-racked installation options are available. Some steps have already been completed ex works in advance.

The Fujitsu ServerView Infrastructure Manager (ISM) as part of the NFLEX system greatly facilitates operations. ISM can be used to ensure the standardized and consistent management of all NFLEX system components across the whole life cycle.

**Offerings to cover all requirements**

Customers' requirements differ greatly and are subject to influences such as the kind of applications (workload) and the number of virtual machines – to name just two. NFLEX can address these requirements, based on multiple performance levels.

**Efficient support**

As a preconfigured converged infrastructure solution provided by a vendor alliance, a single point of contact can be set up for NFLEX support and NetApp and Fujitsu have implemented such support accordingly. It is available for the whole stack, including the Extreme Networks switches. Customers can rely on NetApp's or Fujitsu's tested and efficient support (depending on which vendor has supplied the system).

## Bottom Line

Converged infrastructure solutions provide many benefits, including fast implementation, easy management, flexibility, high performance and efficient support. These are demands that must be addressed by many data centers - and NFLEX solutions are highly suitable to meet these requirements.

## About NetApp

NetApp is the data authority for hybrid cloud. We provide a full range of hybrid cloud data services that simplify management of applications and data across cloud and on-premises environments to accelerate digital transformation. Together with our partners, we empower global organizations to unleash the full potential of their data to expand customer touchpoints, foster greater innovation, and optimize their operations.

For more information, visit [www.netapp.com](http://www.netapp.com). #DataDriven

## About Fujitsu

Fujitsu is the leading Japanese information and communication technology (ICT) company, offering a full range of technology products, solutions, and services. Approximately 155,000 Fujitsu people support customers in more than 100 countries. We use our experience and the power of ICT to shape the future of society with our customers. Fujitsu Limited (TSE: 6702) reported consolidated revenues of 4.5 trillion yen (US \$40 billion) for the fiscal year ended March 31, 2017.

For more information, please see <http://www.fujitsu.com>.

## About ISG

ISG (Information Services Group) (ISG), (NASDAQ: III) is a leading global information technology market research and consulting company. ISG acts as trusted business partner for more than 700 clients, including 75 of the Fortune Global 100, and supports companies, public organizations as well as service and technology providers to achieve operational excellence and faster growth. The company's focus is on digital transformation services, including automation, cloud and data analytics, and also on sourcing consulting, managed governance and risk services, network operations services, technology strategy and operational design, change management, market research and analysis on new technologies. Founded in 2006, ISG with headquarters in Stamford, Connecticut, employs more than 1,300 experts and is present in more than 20 countries. The global ISG team is renowned for its innovative thinking, its highly appreciated voice in the market, in-depth industry and technology expertise and globally leading market research and analysis resources, based on the most comprehensive market data in the industry.

More information on our research can be found under:

<http://research.isg-one.de> and <https://www.isg-one.com/research>