



 FlexPod

Safeguard Your IT Investments

Why FlexPod Is the Smart Choice for Converged Infrastructure

Since the FlexPod® architecture was introduced in 2010, dozens of vendors have emerged with converged and hyperconverged infrastructure offerings. However, many of them lack the scale and the flexibility that are needed to meet the critical business and IT requirements of the future.



The Converged Infrastructure Advantage

Traditionally, IT resources have been siloed based on companies' technology choices, their organizational structures, and their business application designs. These siloed resources severely limited interoperability and business agility, driving up costs and increasing data center complexity. Day-to-day operations and maintenance tasks burdened skilled IT staff, consuming time and resources that could have been better spent on designing and deploying new capabilities.

Converged infrastructure (CI) addresses these challenges by consolidating infrastructure into a single design and centralizing the management of the combined IT resources. This approach increases IT productivity, and it also minimizes compatibility problems between servers, storage systems, and network devices. A CI design also reduces costs for cabling, cooling, power, and floor space. In addition, CI enables a rapid migration to cloud-based models, which can significantly increase agility, scalability, and security. For all these reasons, as organizations refresh their aging data centers and move to cloud-centric platforms to meet new business demands, CI represents a highly compelling approach.

Converged Versus Hyperconverged Infrastructure

There are now two approaches to infrastructure convergence—converged infrastructure (CI) and hyperconverged infrastructure (HCI). The simplest distinction between them is that CI designs are optimized for flexibility and scale, and HCI designs are optimized for simplicity. This distinction creates specific advantages and disadvantages for each platform, depending on the applications to be supported and the desired business outcomes.

CI consolidates multiple components into a single platform that combines the four major elements of modern data center infrastructure—compute, storage, networking, and virtualization software. This approach promotes increased efficiencies by virtualizing and pooling resources, enabling more workloads to be run with fewer physical systems and in a smaller data center footprint.

With CI solutions, a storage network is used to scale storage performance and capacity independently from the other hardware components. This flexible approach enables a variety of storage media types, including all flash, hybrid flash, all disk, or any mix of these three options.

Hyperconverged solutions achieve simplicity of operation by using a hypervisor-centric design along with off-the-shelf hardware building blocks that combine compute and direct-attached storage (DAS) in a single enclosure. These HCI designs pool all the local storage resources across networked nodes in a cluster. The hypervisor-centric approach simplifies day-to-day administrative tasks, such as provisioning and performance management, and it enables a single IT generalist to manage an HCI cluster. For these reasons, HCI can be a good option for SME and remote office environments, as well as for niche applications within the enterprise.

However, HCI designs can quickly run into limitations as they are scaled out. Intercluster “east-west” network traffic can introduce delays as many data access requests must traverse the entire cluster to reach data that is housed on nonlocal HCI nodes. Compute and storage cannot be scaled independently, leading to overprovisioning of one or the other and costly inefficiencies. The mixing of storage technologies within a cluster is usually not supported, leading to an inability to optimize service levels and manage costs across multiple application workloads.

These HCI limitations make CI a better choice for applications that Gartner refers to as “Mode 1,” in which a premium is placed on performance and reliability, availability, and serviceability (RAS). Examples of Mode 1 applications include enterprise resource planning, customer relationship management, databases, and enterprise messaging. The CI advantages for performance and RAS also make it the better option for consolidating multiple workloads and tenants onto a single platform.

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IT Flexibility Supports Business Agility

As IT organizations continue to evolve in response to new business demands, flexibility is essential to future-proofing infrastructure investments. Many CIOs now realize that an ability to efficiently flex resources in support of emerging opportunities can make the difference between success and failure. They can no longer afford to rely on rigid IT infrastructures that were architected for predictable workloads.

HCI impedes the efficient scalability of IT resources, limiting responsiveness. By contrast, the standalone components of CI can be reconfigured as needed, giving IT teams the flexibility to scale up or down in response to changing demands. In this way, as enterprises evolve, they can continue to maximize their IT investment, without limiting their ability to innovate and expand.

FlexPod Uses Proven, Enterprise-Grade Hardware

When choosing a CI solution, it's critical to understand that the value of the whole is only as good as the quality of the individual components. FlexPod relies on a best-in-class approach, with elements selected from the Cisco and NetApp® product portfolios based on the target workloads. The hardware designs include NetApp all-flash and hybrid arrays, Cisco Unified Computing System (UCS) servers and management software, and Cisco Nexus fabric switches. FlexPod also features VMware vSphere hypervisor technology, along with the flexibility to use other hypervisors, such as Kernel-Based Virtual Machine and Microsoft Hyper-V.

To promote the rapid and effective deployment of infrastructure and applications while reducing cost and risk, FlexPod architectures have been validated for an extensive array of enterprise workloads. These workloads include Microsoft applications, Oracle, SAP, VMware, and virtual desktop infrastructure, among others. Pre-validation reduces risk not only during deployment, but for upgrades as well.

FlexPod is also prevalidated for application use cases in specific industries, including healthcare, oil and gas, and others. More than 115 validated designs have been tested in Cisco and NetApp labs. The NetApp Interoperability Matrix Tool defines compatibility between all the major components of a FlexPod design—hypervisor, server, network, and storage.

Best-in-Class Support for Converged Infrastructure

Any CI solution is only as reliable as the support that backs it up. Led by Cisco and NetApp, FlexPod Cooperative Support is a partnership that also draws upon the expertise of technology partners such as Microsoft, VMware, Citrix, and Red Hat. This partnership streamlines the support process by combining the resources and the deep expertise of dedicated product specialists to quickly address whatever issue may arise.

IT teams can choose which resource to contact based on their initial assessment of the issue. Support engineers work to resolve problems by using shared communications. This process allows a more rapid, coordinated response, helping to keep your business-critical infrastructure at peak performance.



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FlexPod Cooperative Support also partners with other application and management vendors through the Technical Support Alliance Network (TSANet), an industry leader in multivendor support management. This partnership extends access to an additional pool of engineering experts who can help resolve support issues across complex enterprise ecosystems.

Lifecycle management is another critical consideration when investing in a CI solution. FlexPod Lifecycle Management provides the tools, upgrade procedures, and ongoing validations that are needed to reduce business disruption and protect the value of a FlexPod data center investment over the life of the asset. Interoperability testing certifies that storage protocol interoperability is maintained as software advances.

A Secure On-Ramp for Hybrid Clouds

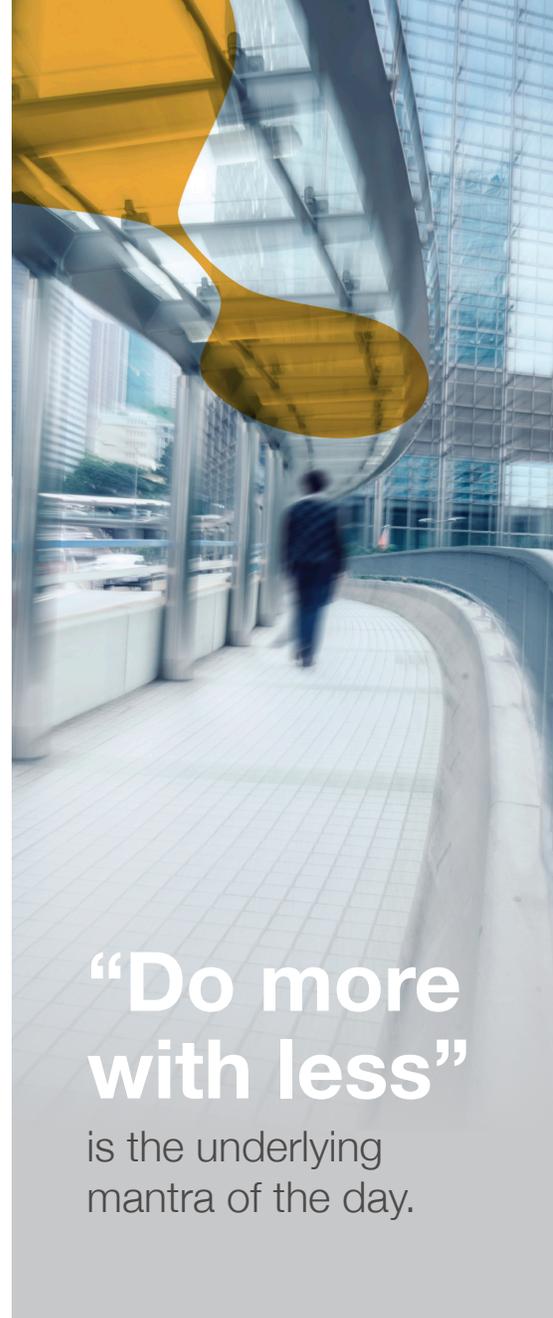
IT teams are challenged to integrate emerging capabilities, deliver on new business demands, and continually improve speed and reliability, all while facing tightening budgets. “Do more with less” is the underlying mantra of the day. In response, organizations are increasingly leveraging the potential efficiencies of cloud, as well as software as a service.

At the same time, intrusions by well-equipped hackers and criminals have brought cyber security to the forefront. Security has been made all the more complex by the advent of mobility and the explosion in the number of connected devices that are in the hands of vastly disparate users. The CI solution of choice must address this array of demands and challenges.

FlexPod simplifies and accelerates the transition to cloud-based computing, supporting the migration of data and application deployment, both on the premises and in the public cloud. FlexPod includes validated designs for enterprise private clouds, and with the NetApp ONTAP® universal data platform, you can create a private cloud services delivery model and extend it to a hybrid cloud. This capability is backed by a global network of world-class partners who offer a comprehensive array of cloud services. These services include file and object storage, infrastructure, desktop, backup, disaster recovery, messaging and collaboration, and SAP—all delivered “as a service.”

Even while providing an on-ramp to the cloud, FlexPod systems provide IT teams with the tools to maintain superior levels of security. FlexPod offers end-to-end controls over all aspects of the environment, including the compute platform, network connectivity, storage resources, and data management. Its secure multitenancy architecture is a lab-validated solution that provides secure separation, service assurance, and resource management.

FlexPod is the smart choice for high performance today, and it is the safe choice for providing value into the future. Designed to scale as the enterprise grows, the platform is engineered to efficiently add on and adjust to provide new data center capabilities as needed. NetApp’s data fabric is essential to navigating the changes, enabling your IT organization to control how it manages, secures, and moves data across the hybrid cloud through a common set of data services. When combined with Cisco Intercloud Fabric software, it enables enterprise customers to extend their private clouds into public cloud environments, while maintaining the security and policy levels of private clouds. With such best-in-class capabilities, FlexPod helps customers avoid getting locked into underperforming solutions.



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FlexPod Use Case Examples



MacLean-Fogg Company

MacLean-Fogg Company was founded nearly a century ago to produce locknuts for railroads. Today this family-owned business has grown into a global enterprise with 32 offices and manufacturing sites producing components for utility, telecom, automotive, aerospace, mining, and other industries. Annual sales exceed \$900 million.

The company's challenge: to support business and manufacturing needs while protecting data and critical application availability across several systems and manufacturing operations.

The solution: to standardize database operations company-wide through a prevalidated FlexPod Datacenter solution, providing a converged hub from which to centralize and manage critical applications.

Outcomes:

- Improved IT agility, scalability, and availability help boost customer satisfaction, profitability, and business potential.
- A converged FlexPod infrastructure, coupled with standardized, automated backup and recovery, turns the work of four or five into a job for one.
- About 20 Microsoft Exchange servers were replaced by FlexPod with zero impact on 24/7 manufacturing operations.



The University of São Paulo (USP)

The University of São Paulo (USP) is one of South America's most prestigious universities. It has produced more doctorate graduates annually than any other university in the world and is among the top five in the number of scientific articles published.

The university's challenge: to meet service levels and coordinate backups across more than 150 environments, while scaling to support the growing performance demands from users, including 100,000+ students, faculty, and administrative staff.

The solution: Cloud USP, a scalable platform that is built on FlexPod and NetApp flash, and hybrid storage that incorporates all the university's corporate systems.

Outcomes:

- Consolidated 150 data centers into six, with all corporate, educational, and research data in a single private cloud, one of the largest such deployments in Latin America.
- Met USP's aggressive six-month deployment schedule.
- Streamlined manageability of the entire infrastructure.
- Achieved optimal performance on time and on budget.

DuPage Medical Group

DuPage Medical Group (DMG)

DuPage Medical Group (DMG) has 3,300 employees, including 425 physicians, and serves 1.1 million patients at over 50 facilities throughout Illinois.

The group's challenge: to perform an almost complete physical-to-virtual migration of its server environment, without any disruption to operations, to gain performance efficiencies, improve scalability, and eliminate downtime—both planned and unplanned.

The solution: FlexPod with the NetApp clustered Data ONTAP® operating system to deliver high availability that was simple to scale and upgrade and for the close integration between NetApp and Cisco.

Outcomes:

- Achieved almost 100% virtualization for a much easier, more fluid environment to work in and manage.
- Gained flexibility to add new users with minimal impact to existing operations.
- Gained scalability to expand capacity by adding nodes and to reallocate resources without end users even being aware.
- Saved \$600,000 to \$800,000 in server purchases alone over the first 2.5 years.
- Can grow infrastructure faster than having to grow IT staff.

Simplify. Accelerate. Perform. Refresh.

Only FlexPod with All Flash FAS delivers the superior performance, increased agility, and exceptional value required for enterprise success today. By helping organizations simplify IT management and reduce their costs, FlexPod amplifies IT responsiveness while providing a cost-efficient path to the future. In an era in which organizations must partner speed with simplicity, FlexPod with All Flash FAS offers the smarter path to infrastructure innovation and performance.

Learn more about FlexPod at www.flexpod.com
and NetApp.com/flexpod



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