



Modernize Your Data Center with Flexible Infrastructure

The Challenge

Modern data centers face increasing demands for agile, high-performance service delivery. Digital transformations are driving an increased number of new applications, with more sources of data. Service delivery requirements continue to drive demand for simple, agile infrastructure resources. The maturity and acceptance of cloud-based platforms mean that more mission-critical applications are now being run on the cloud. Applications must be able to move quickly from development to a reliable, scalable platform. An ideal solution integrates best-in-class components that can scale compute and storage independently to meet the needs of dynamic business requirements. IT departments also require a proven solution that is agile and flexible for a broad set of applications. A proven solution eliminates guesswork and gives IT departments the tools to quickly respond to these new customer demands.

The Solution

The FlexPod converged infrastructure platform

Built on groundbreaking technology from NetApp and Cisco, the FlexPod® converged infrastructure platform meets and exceeds these challenges. FlexPod is trusted by thousands of customers across the globe. Composed of prevalidated storage, networking, and server technologies, FlexPod is designed to increase IT responsiveness to organizational needs and reduce the cost of computing with maximum uptime and minimal risk.

The prevalidated FlexPod architecture delivers proven value, agility, and performance that drive higher productivity, faster decision making, and greater opportunities for growth. Proven value is provided with accelerated deployments and efficient infrastructure. Proven agility is delivered with support for a broad set of workloads and

Key Benefits

Proven Value

Save time and money with a trusted best-in-class solution that consolidates infrastructure for a broad set of workloads.

Proven Agility

Securely and quickly respond to business demands with time-tested automation, accelerated deployments, and flexible scaling.

Proven Performance

Get reliable delivery of secure business applications with world-class speed and resilient design.



cloud environments and automation tools to more rapidly deploy services. Proven performance comes with groundbreaking technology from two industry leaders and resilient design for mission-critical applications.

Solution Differentiators

- Flexible design with a broad range of reference architectures and validated designs for popular applications
- Elimination of costly, disruptive downtime through ONTAP® or self-healing NetApp® SolidFire® storage
- Pervasive simplicity and agility with the software-driven architecture and high performance of Cisco UCS compute
- Cisco ACI for centralized, policy-driven automation that accelerates application deployments
- Multiprotocol FAS storage platform that unifies application silos, allowing NAS or SAN, file or block storage, on one converged platform
- Support for private, public, or hybrid cloud strategies with a consistent set of data management tools for edge, private, and public clouds
- Automation for rapid installation and delivery of new services

The FlexPod Family

FlexPod is offered in four solution categories that are designed to meet your specific capacity and performance requirements:

- FlexPod Express is ideal for midsized organizations and branch departments. It can be used as a cost-effective starting point for infrastructure consolidation and virtualization solutions.
- FlexPod Datacenter is suited for large enterprises and cloud service providers that have mature IT processes and rapid growth expectations and want to deploy a highly scalable shared infrastructure for multiple critical applications.
- FlexPod Select supports high-performance computing or very large data capacity environments such as big data analytics, scientific computing, and dedicated application optimization.
- FlexPod SF delivers 100% programmable storage with predictable performance through QoS, ideal for scale-out databases and web-native applications.

Any of these FlexPod solutions can be scaled up or out and duplicated in a modular fashion to accommodate your future growth. They can also scale to a larger FlexPod configuration with a clearly defined upgrade path that leverages all existing components and management processes.

“When we can keep many vital services working, we realize how great the payoff really is for our private cloud and clustered Data ONTAP deployment.”

Dan Steege
Assistant Director, Enterprise Infrastructure Services Division, City of Houston

Proven Across a Broad Range of Environments

FlexPod has been pretested and jointly validated with popular hypervisors, operating systems, applications, and infrastructure software, including:

- VMware vSphere
- VMware View
- Citrix XenDesktop
- Red Hat Enterprise Linux
- Red Hat Enterprise Linux OpenStack Platform
- Oracle (RAC, JD Edwards, Oracle Linux, Oracle VM Server)
- SAP and SAP HANA
- Microsoft Exchange, SQL Server, and SharePoint
- Microsoft Windows Server Hyper-V
- Hortonworks Data Platform
- Cloudera's Distribution, including Apache Hadoop
- Docker Containers

Best-in-Class Components for Enhanced Data Center Efficiency

FlexPod components are integrated in a standardized configuration that scales from entry-level designs for hundreds of users up to high-performance big data workloads for thousands of users. This integrated approach can significantly reduce your capital and operating expenses through end-to-end virtualization and higher efficiencies at each layer.

Cisco Unified Computing System

Cisco UCS offers a software-driven architecture that delivers pervasive simplicity and operational agility. It combines compute and network resources, storage access, and virtualization into a scalable, modular system that is easily managed as a single entity by Cisco UCS Manager. Cisco UCS servers simplify your data center architecture by reducing the number

“Our developers now have the tools they need to innovate quickly, and that translates directly into a better customer experience.”

Rafal Wozniczka
Director of IT, Kaufman Hall

of devices to purchase, deploy, and maintain and improving speed and agility for application deployments. The Cisco UCS system is versatile. It simultaneously supports unique performance and scale requirements of various applications using a common management and resource model. Service profile templates enable automatic, policy-based hardware configuration and deployment for large, stateless computing environments.

The fifth-generation Cisco UCS server platforms support the new Intel Xeon scalable processors, delivering faster CPUs and memory with increased core counts. Producing six new industry standard world records, the Cisco UCS M5 server portfolio continues to perform and innovate with broad support for NVMe and industry-leading GPU density, particularly in blades, where Cisco offers the only half-width blade in the industry with dual GPU support. These innovations allow customers to address general compute infrastructure as well as VDI, real-time analytics, deep learning, and machine learning with a common system-based approach: Cisco UCS.

Cisco data center switches

Cisco Nexus data center switches are built for scale, industry-leading automation, programmability, and real-time visibility. The Cisco Nexus 9000 series offers high performance, low density, low latency, and power efficiency that are taken to new levels with cloud-scale ASIC technology. Cisco Nexus 9000 switches also lay the foundation for software-defined innovations such as Cisco Application

Centric Infrastructure (ACI), allowing intelligent software to automate hardware resources across next-generation data centers. Cisco Nexus switches also offer options for unified fabric technology to identify and consolidate all network traffic onto a single simplified, cost-effective architecture based on Fibre Channel over Ethernet. Dedicated Fibre Channel support is available through Cisco MDS switches, which offer high-performance SAN extensions and reliable integration into existing SAN environments.

NetApp storage

NetApp All Flash FAS and FAS storage systems reduce the cost and complexity for virtualized infrastructures by meeting all of your storage requirements with a single, highly scalable solution. NetApp's unified storage platform supports all protocols, so you no longer need to purchase separate systems to accommodate different storage needs. These systems also offer a guaranteed workload-specific effective capacity with the NetApp all-flash guarantee. NetApp All Flash FAS and FAS systems enhance operational efficiency with automated storage management, data protection, and security. The ONTAP operating system brings a new level of nondisruptive operations, scalability, and efficiency to enterprise storage. Performance is optimized with innovative flash technologies and 40GbE, FCoE, and FC support. At up to 7M IOPS per cluster with submillisecond latency, NetApp All Flash FAS systems are the fastest all-flash arrays built on a true unified scale-out architecture. With storage based on NetApp ONTAP storage, you can deploy

the exact proportion of flash to spinning media for your particular environment and use a single storage operating system for flash, disk, and cloud storage.

FlexPod SF features NetApp SolidFire storage with the SF9608 node. The SF9608 node is an all-flash, scale-out, block-based storage platform built using Cisco UCS C220 M4 rack server technology and NetApp SolidFire Element® OS software. NetApp SolidFire storage offers predictable performance, scale-out flexibility, and agile storage infrastructure. You can independently set capacity and minimum, maximum, and burst performance at the storage volume level to help deliver predictable service for scalable multitenant workloads. FlexPod SF storage pools can add nodes nondisruptively for on-demand, scalable flexibility. Storage agility is provided with 100% programmable automation.

Cooperative Support Speeds Problem Resolution

FlexPod Cooperative Support is a partnership between NetApp; Cisco; and our technology partners Microsoft, VMware, Citrix, and Red Hat. Your IT staff chooses which vendor to call based on your initial assessment of the problem's origin. Knowledgeable FlexPod engineers work to resolve your issue quickly using shared communications, expertise gained through ongoing joint training, and a formal escalation process. The result is a rapid resolution to your technical issues.

Cisco Solution Support Simplifies Problem Resolution

Cisco Solution Support for FlexPod offers premium support for FlexPod customers. By moving to Cisco Solution Support, you get the advantage of a Cisco primary point of contact (1-800 number), who provides FlexPod and broader data center expertise, coordinates the issue

with any FlexPod cooperative support partner needed, and actively manages the concern to resolution. Cisco Solution Support for FlexPod is available for all FlexPod customers and is required for deployments that include Cisco ACI. Cisco Solution Support is highly recommended for new customers and is available as an upgrade for existing customers.

Innovative Management Solutions

NetApp and Cisco validate and support a broad set of management solutions for new and changing cloud environments. Cisco CloudCenter offers automated management for hybrid cloud solutions. Containers and virtual machine management options include tools from Docker, Red Hat, VMware, and Microsoft. The FlexPod architecture provides APIs at each layer so that it can easily integrate with a broad range of software solutions for end-to-end management. Validated FlexPod management solutions have been tested to

verify that they deliver essential functionality. Together with partners, we provide a variety of capabilities, including plug-ins, automation and orchestration, monitoring and analytics, and configuration management.

Global Service Delivery Ecosystem

You can choose from a global network of FlexPod Premium Partners and other highly qualified solution delivery partners to implement your FlexPod solution. These partners understand your unique requirements and are certified on NetApp, Cisco, and complementary technologies to deliver a complete cloud solution that fits your needs.

Getting Started

To learn how the FlexPod platform enables you to build a flexible and efficient converged virtualized infrastructure to modernize your data center, contact your local NetApp or Cisco representative or partner. Learn more at www.netapp.com/flexpod.

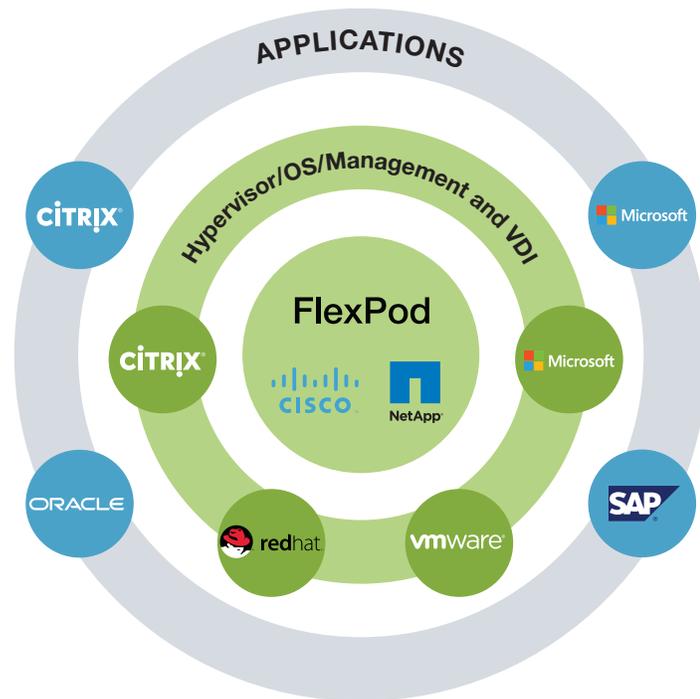


Figure 1) FlexPod Cooperative Support model: an ecosystem of a multivendor engagement.

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