



FlexPod: Flexible Data Center Infrastructure to Accelerate Application Deployment

IT Seeking Faster Infrastructure Options

Speed of Business Demands More Complete Solutions

Businesses continue to exert pressure on IT to be faster and reduce costs. With the majority of the IT budget spent on just maintaining equipment, only a small amount is available for new projects and innovation. And where new systems can be deployed, it typically takes weeks if not months of design, planning, procurement, deployment, and testing. So IT is evolving to meet this challenge.

To reduce the time and cost of deploying infrastructure and applications, companies are adopting a converged infrastructure (CI). According to one industry analyst, "In a few years, we'll move away from people buying the piece parts... Whatever they buy has to be designed and tested to work together."¹ By deploying converged solutions, IT teams are trimming months of design, planning, and testing.

FlexPod Accelerates Application Deployment

Prevalidated Architectures Reduce Time and Risk for Leading Business Applications

Enterprises and service providers alike need tested, converged infrastructure solutions that support both virtualized and nonvirtualized environments. They are seeking solutions that can leverage existing IT investments, be managed with existing frameworks and tools, and scale without disruption to meet future growth and organizational objectives.

FlexPod®, jointly developed by NetApp and Cisco, is a flexible converged infrastructure platform composed of prevalidated storage, networking, and server reference architectures. It's designed to increase IT responsiveness to business needs while reducing the overall cost of computing with maximum uptime and minimal risk.

FlexPod differs from other virtualization solutions by providing:

- A flexible design for differing workloads and scale, while leveraging existing IT components
- A broad range of reference architectures for popular top-tier business applications
- A cooperative support model that requires only a single ticket to resolve issues
- A choice of validated FlexPod management and orchestration solutions

KEY FEATURES

Speed Deployment

Improve IT agility and reduce time to deployment with a flexible, prevalidated architecture that shortens the time needed to design, plan, and test.

Enhance Efficiency

Slash both administration time and TCO by 50% with a converged virtualized infrastructure that is faster to deploy, is easier to manage, and more efficiently stores data than the alternatives.

Reduce Risk

Minimize business disruption with a prevalidated platform, built on a defined architecture that eliminates deployment guesswork and accommodates ongoing workload optimization.

1. Peter Ffolkes, analyst 451 Group, "TheInfoPro: 'Sea Change' Towards Converged Infrastructure," Data Center Knowledge, 1/21/2013.

Investment Protection with Standardized, Flexible IT

Together, NetApp and Cisco offer a data center platform that's ready for virtualized environments, yet is flexible enough to grow at your own pace to a fully private cloud. The FlexPod unified architecture runs multiple workloads on all protocols and fits right into your current infrastructure, leveraging existing resources and minimizing or eliminating technology replacement costs.

FlexPod components are integrated and standardized to help you achieve timely, repeatable, consistent deployments that eliminate guesswork and minimize risk. As a result, you can understand and better predict the exact power, floor space, usable capacity, performance, and cost of each FlexPod deployment.

Scalability for Any Cloud Solution

FlexPod can be scaled up or down and then duplicated in modular fashion to fit your capacity needs. For example, large enterprises or service providers with mature IT processes and rapid growth expectations can deploy and scale out one or more FlexPod configurations to:

- Transition to a converged infrastructure with many applications
- Improve agility to meet growth and business initiatives
- Lower the cost per user without sacrificing scalability
- Reduce needed skills, processes, and cost
- Deploy dedicated software as a service, virtual desktop infrastructure, and business-critical applications
- Securely separate multi-tenant environments for virtualized workloads alongside nonvirtualized ones

FlexPod can also be used as a cost-effective starting point for infrastructure consolidation and virtualization solutions. Organizations can then scale up storage and compute pool capacity or performance within a FlexPod configuration while maintaining centralized management.

They can also scale to a larger FlexPod configuration with a clearly defined upgrade path that leverages all existing components and management processes for smooth growth and superior investment protection.

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® View®
- VMware vSphere®
- Citrix XenDesktop
- Red Hat Enterprise Linux® (RHEL)
- Oracle® (RAC, JD Edwards, Oracle Linux, Oracle VM Server)
- SAP®
- Microsoft® Exchange, SQL Server®, and SharePoint®
- FlexPod with Microsoft Private Cloud

FlexPod can be optimized to support several of these workloads simultaneously. NetApp and Cisco have jointly developed reference architectures to help you integrate and flex the solution to meet your specific requirements for the following critical environments:

- **Workload consolidation.** FlexPod is versatile platform that supports your ability to consolidate and virtualize your business applications onto less hardware. This can reduce your infrastructure costs by up to 50% while still protecting your applications with best-in-class availability. Along with improved hardware utilization, this approach frees up data center space and reduces power and cooling requirements.
- **Virtual desktop infrastructure (VDI).** FlexPod is an easy-to-deploy, self-contained virtual desktop solution in a rack. Its modular design facilitates rapid, repeatable deployment of thousands of virtual desktops. FlexPod integrates with, and is optimized for, VMware View and Citrix XenDesktop. A virtual desktop solution built on FlexPod provides unmatched

“Among the biggest benefits of FlexPod are integrated components that help enable us to centrally manage all our data center requirements.”

— **Darrell Williams,**
Director of Information Systems,
Katz, Sapper & Miller

price/performance. You gain extreme efficiencies by deduplicating up to 90% of redundant user and OS data, and I/O performance can be accelerated by up to 50% with NetApp® Virtual Storage Tier. The extended memory technology of Cisco Unified Computing System™ provides the industry's greatest number of VMs per core density.

- **Development and test.** FlexPod enables rapid provisioning and deprovisioning of virtual resources, making it an ideal platform for development and test environments. This capability is especially valued in Oracle database environments as well as any enterprise IT shop. NetApp FlexClone® software facilitates rapid dev/test setup with cloning technology that lets you deploy thousands of space-efficient VMs for new projects in minutes, accelerating time to production and time to market. Resources can be easily cloned and redeployed, reducing preparation time for other initiatives such as DR testing.
- **Business and disaster recovery.** FlexPod can be configured with integrated data protection software to provide fast recovery from system, site, and regional outages for business continuity. The combination of NetApp MetroCluster™ and SnapMirror® with Cisco UCS® Manager and WAAS offers automated monitoring and failover, as well as cost-effective replication to a secondary site for continuous protection against unplanned downtime. Our solution also lets you move virtual server and storage resources and data nondisruptively across hardware to eliminate planned downtime.
- **Secure multi-tenancy and secure separation.** FlexPod leverages the Cisco® SAFE architecture and NetApp MultiStore® technology to deliver a secure multi-tenancy architecture. Secure multi-tenancy enables each tenant—application, business unit, or customer—to be securely isolated within the FlexPod environment. It provides the data separation and service-level guarantees offered by application silos, while delivering the efficiencies of a converged, virtualized infrastructure. FlexPod also securely separates nonvirtualized workloads across the data center and has undergone and passed several security compliance tests, PCI compliance validation, FISMA certification, and an ICSA audit.

“Our executives loved the simplicity and power of the integrated stack in FlexPod. And for IT, the prevalidated architecture with prescriptive sizing and design guides reduced our risk.”

— **Wojciech Biernacki,**
IT Systems Administrator,
University of Tennessee

Best-in-Class Components for Enhanced Data Center Efficiency

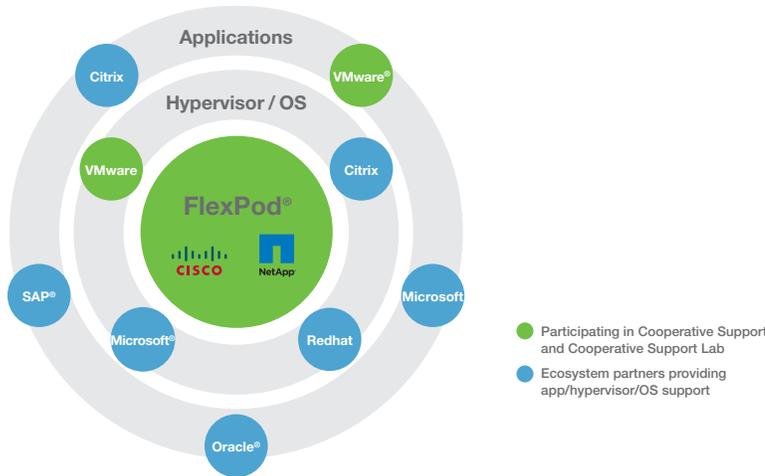
FlexPod includes the following components in a standardized configuration that scales from entry-level designs for hundreds of users up to enterprise and service provider sizing for thousands of users. This integrated solution can significantly reduce your capital and operating expenses through end-to-end virtualization and higher efficiencies at each layer.

- Cisco Unified Computing System is a data center platform that is designed to eliminate time-consuming manual configuration, reduce TCO, and increase business agility. Cisco UCS combines compute, network, storage access, and virtualization into a scalable, modular system that is easily managed as a single entity by Cisco UCS Manager. The radically simplified architecture greatly reduces the number of devices that must be purchased, configured, managed, and secured. Service profile templates enable automatic, policy-based hardware configuration and deployment for large, stateless computing environments. The highly efficient Cisco UCS extended memory technology also reduces memory requirements by up to 60%.
- Cisco Nexus® data center switches use award-winning unified fabric technology to identify and consolidate all network traffic onto a single simplified, cost-effective architecture. Cisco Nexus switches offer “zero-touch” installation, automatic configuration, and excellent scalability, including in-service upgrades. A single point of policy management also increases efficiency, availability, and security. The added option of the Cisco Nexus 7000 Series switch provides even greater networking scale, throughput, availability, and advanced features for data center interconnect requirements.
- NetApp FAS systems reduce 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. You can slash capacity use by up to 50% with built-in deduplication and thin provisioning, as well as space-efficient backup and cloning. NetApp systems also enhance operational efficiency with automated storage management, data protection, and security and optimize performance with 10GbE or FCoE. Clustered Data ONTAP brings a new level of nondisruptive operations, scalability, and efficiency to enterprise storage.

Cooperative Support to Speed Problem Resolution

FlexPod includes a simplified cooperative support model that is coordinated among NetApp, Cisco, and VMware. The joint support model offers global, 24/7 support with streamlined response from technical experts, and it spans across new and legacy products from each company for maximum flexibility. It also includes a Cooperative Support Lab designed to replicate and rapidly resolve complex customer issues, leveraging on-site experts and state-of-the-art equipment from all three vendors.

Figure 1. Cooperative Support: An Ecosystem of Partners



NetApp and Cisco extend world-class technical support to a broadening range of hypervisor, business application, and IT management vendors through the Technical Support Alliance Network (TSANet).

Choice of Management Solutions

NetApp and Cisco work with trusted partners to provide you with a choice of management solutions. The FlexPod architecture enables this by providing APIs at each layer so it is easily integrated with a broad range of software solutions for end-to-end management. Validated FlexPod management solutions have been tested in NetApp and Cisco labs to verify that they deliver essential functionality. Together with partners, we provide a variety of capabilities, including 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 trained and enabled solution delivery partners to implement FlexPod. These partners understand your business requirements and are certified on NetApp, Cisco, and complementary technologies to deliver a complete cloud solution that fits your business needs.

Getting Started

To learn how FlexPod enables you to build a flexible and efficient converged virtualized infrastructure today as your foundation for future-ready IT, contact your local NetApp or Cisco representative or partner. Learn more at www.netapp.com/flexpod.

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