Solution Brief

FlexPod®

Flexible Data Center Infrastructure Simplifies IT and Accelerates Applications

The Challenge

The need for agility and simplicity in deploying and managing infrastructure

Supporting objectives from an IT perspective is becoming more complex and elusive, as users require on-demand resources that are secure, reliable, and easy to use. IT organizations need to adapt with simpler approaches to deploying and managing infrastructure. IT must enable greater agility by optimizing costs and existing staff resources, while also maintaining data security and adherence to compliance requirements. With organizations' requests such as expansion to new opportunities and support for mobile users—as well as capabilities in analytics and hybrid cloud—IT must anticipate new requests by modernizing the data center to become an agile, innovative service provider.

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 unmatched application performance that drives higher productivity, faster decision making, and greater opportunities for growth. FlexPod simplifies and modernizes IT with continuous innovation, broad support for any cloud strategy, and improved operational efficiency to accelerate data center transformation and organizational evolution.

Key Features

Optimize your applications

Deliver increased application performance that drives greater productivity, speeds decision making, and provides opportunities for growth.

Embrace hybrid cloud

Transcend data center constraints with a secure and scalable foundation for cloud and as-a-service initiatives.

Simplify your IT

Reduce complexities, making room for better IT services, increased productivity, and continued innovation across the enterprise.

Solution Differentiators

- Flexible design with a broad range of reference architectures for popular applications
- Elimination of costly, disruptive downtime with clustered Data ONTAP® nondisruptive operations
- Cisco ACI centralized, policy driven automation that accelerates application deployments
- Multiprotocol storage platform that unifies application silos, allowing NAS or SAN, file or block, on one converged platform
- Support for private, public, or hybrid cloud strategies with a consistent set of data management tools from flash to disk to cloud

accelerated by up to 50% with the 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 ideal for development and test environments. NetApp FlexClone® software facilitates rapid development/test setup with cloning technology that lets you deploy thousands of space-efficient VMs for new projects in minutes, accelerating time to value. Clones can also be redeployed to secondary sites, reducing preparation time for initiatives such as disaster recovery testing.

Organizational 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® technologies with Cisco UCS Manager offers automated monitoring and failover, as well as cost-effective replication to a secondary site for continuous protection against unplanned downtime. FlexPod 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 Cisco and NetApp technologies to deliver secure multi-tenancy with solutions such as Cisco Secure Enclaves.

"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

Resources and data for each tenant—application, department, or customer—are securely isolated within the FlexPod environment. This combines the data separation and service-level guarantees offered by application silos with the efficiencies of a converged, virtualized infrastructure.

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 is a data center platform that eliminates time-consuming manual configuration, reduces TCO, and increases 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. Service profile templates enable automatic, policy-based hardware configuration and deployment for large, stateless computing environments. Highly efficient Cisco UCS extended memory technology reduces memory requirements by up to 60%.

Cisco Nexus data center switches

Cisco Nexus switches use award-winning unified fabric technology to identify and consolidate all network traffic onto a single simplified, cost-effective architecture based on Fibre Channel over Ethernet. The switches offer "zero-touch" installation, automatic configuration, enterprise-class scalability, and nondisruptive in-service upgrades. A single point of policy management also increases efficiency, availability, and security.

The option of Cisco Nexus 7000 Series switches provides even greater networking scale, throughput, availability, and advanced features for data center interconnect requirements. Cisco Nexus 9000 switches lay the foundation for software-defined innovations such as Cisco Application Centric Infrastructure, allowing intelligent software to automate hardware resources across next-generation data centers.

NetApp FAS storage

NetApp 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. You can slash capacity use by up to 50% with built-in deduplication, thin provisioning, and space-efficient backup and cloning.

Application Optimization Starts with FlexPod

- Host multiple instances of mixed applications, consolidated on a shared infrastructure with centralized, simplified management
- Speed database application performance by up to 20x with All Flash FAS
- Scale out and scale up as workloads increase, adding storage and compute layers as your organization changes

Hybrid Cloud Flexibility

- Operate across hybrid cloud resources with the software-defined capabilities of NetApp® Data Fabric, while maintaining security, control and workload portability with Cisco Intercloud Fabric
- Manage data from flash to disk to cloud with the simplicity of a single set of tools
- Optionally use OpenStack software on FlexPod to create a private or hybrid cloud

Simplified IT Infrastructure

- Use Cisco Unified Computing System (Cisco UCS) Director for end-to-end, single-view automation and orchestration, freeing IT staff to focus on new services
- Validated designs help you deploy FlexPod platforms in a wide range of operating environments with less risk and accelerated ROI
- Cooperative support is designed to simplify and streamline support for your FlexPod converged infrastructure

The FlexPod Family

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

"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

- **FlexPod Express** is ideal for midsized organizations and branch offices. 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 business-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.

Any of these FlexPod solutions can be scaled up or out and duplicated in 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.

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
- Microsoft Exchange, SQL Server, and SharePoint
- Microsoft Private Cloud
- Hortonworks Data Platform
- Cloudera's Distribution, including Apache Hadoop
- NetApp SnapProtect® technology
- Cisco Nexus data center switches

Reference Architectures

NetApp and Cisco have jointly developed numerous reference architectures to help you integrate and flex the solution to meet your specific requirements for the following critical environments:

Workload consolidation

FlexPod helps you consolidate and virtualize your applications onto less hardware. Along with improved hardware utilization, this approach frees up data center space and reduces power and cooling requirements, enabling you to slash your infrastructure costs by up to 50%.

Virtual desktop infrastructure

FlexPod is a self-contained virtual desktop solution in a rack. Its modular design facilitates rapid, repeatable deployment of thousands of virtual desktops. FlexPod is optimized for VMware View and Citrix XenDesktop. You gain efficiencies by deduplicating up to 90% of redundant user and OS data, and I/O performance can be

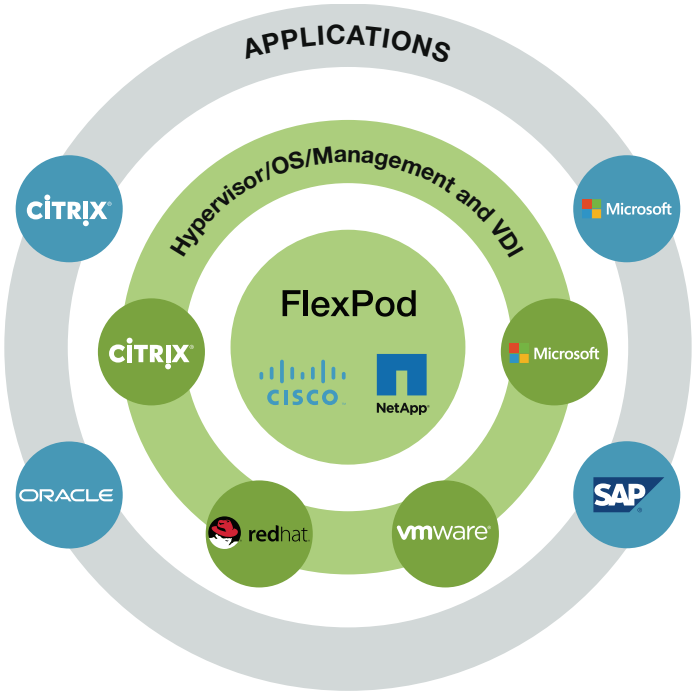

Figure 1) FlexPod Cooperative Support model: an ecosystem of a multivendor engagement.

NetApp systems enhance operational efficiency with automated storage management, data protection, and security. The clustered Data ONTAP operating system brings a new level of nondisruptive operations, scalability, and efficiency to enterprise storage. Performance is optimized with innovative flash technologies and 10GbE and FCoE support. With NetApp storage, you can deploy the exact proportion of flash to spinning media for your particular environment. And for extreme performance for dedicated workloads, NetApp All Flash FAS systems increase database application performance by up to 20x.

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. Multivendor 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, coordinated resolution to your technical issues.

Choice of Management Solutions

NetApp and Cisco work with trusted partners to provide you with a choice of management solutions. 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 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 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**

About UNICOM Government, Inc.

UNICOM Government, Inc. (UGI) provides federal, state, and local governments with technology, engineering, project management, financial services, and subject matter expertise. A reliable source for advanced IT products and services. UGI transforms technology components into complete IT infrastructure solutions that supports your mission.

UNICOM Government, Inc.
A Division of UNICOM Global
One Mission. Yours.

15010 Conference Center Dr. Suite 110
Chantilly, VA 20151
703-502-2000
www.unicomgov.com

CISCO NetApp