FlexPod

Modernize your Data Center with a Platform Built for Innovation

The Challenge

Modern data centers face increasing demands to deliver agile, high-performance service. Digital transformations are driving an ever-increasing number of new applications that rely on more sources of data. The maturity and acceptance of cloud-based platforms mean that more mission-critical applications are now being run in 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 and quickly to meet dynamic business requirements. IT departments also require a proven solution that is agile and flexible for a broad set of applications with the ability to integrate advanced hybrid and multicloud services.

A proven solution eliminates guesswork and gives IT departments the tools to quickly respond to these new and changing customer demands.

The Solution

FlexPod Datacenter Architecture

FlexPod is built on groundbreaking technology from NetApp and Cisco, and trusted by thousands of customers around the world, the FlexPod® platform meets and exceeds these requirements. Composed of prevalidated, cloud-connected storage, networking and server technologies, 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.

Key Benefits

Platform for innovation

Fuel adoption of innovation enabled by a core platform for your cloud strategy.

Unmatched versatility

Tailored to meet your business needs with a large selection of validated designs and reference architectures.

The prevalidated FlexPod converged infrastructure platform offers unmatched versatility to fuel your adoption of the latest technological innovations. FlexPod confidently powers AI and modern enterprise applications with a multicloud-enabled infrastructure based on next-generation compute, storage, and fabric. The solution is tailored to meet the specific needs of your business with validated designs that encompass more than 175 reference architectures. In addition, FlexPod offers the unique ability to integrate advanced cloud services with the only hybrid, multicloud infrastructure stack.

FlexPod offers:

Platform for innovation

- Transform your data center with next-generation technology enabled by cloud- and multicloud-based data services

- Unlock the value of your data to uncover critical insights

- Fast-track support for data and application pipelines

- Automate and simplify infrastructure and policy management

''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

Unmatched versatility

- Decrease time to market with reference architectures for many deployment scenarios and enterprise applications

- Grow seamlessly to meet increasing application demands

- Migrate data easily with unique flexibility from edge to core to cloud and back

Trusted worldwide

- Gain efficiencies with predictable and assured performance of a proven platform

- Minimize the risk of adopting new technologies and innovations

- Partner with an industry-leading ecosystem of skilled application and integration vendors

- Simplify your support experience with full stack support options from a single vendor

Choose your FlexPod configuration

FlexPod has a range of configuration options that are designed to meet your specific capacity and performance requirements:

- FlexPod Datacenter 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 Express for midsized organizations and branch departments, as a cost-effective starting point for infrastructure consolidation and virtualization solutions

- FlexPod Datacenter for workloads that require high-performance computing or very large data capacity environments such as databases, artificial intelligence (AI), machine learning (ML), big data analytics, and dedicated application optimization

> "FlexPod has transformed our performance and efficiency, so we can focus on applications and end-user services."
>
> Liam Cole
> IT Commercial Operations Team Leader, TasNetworks

All 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.

Solution differentiators

- Enable IT teams to simplify and automate IT operations with Cisco's Intersight software-as-a-service intelligent management platform

- Flexible design with a broad range of more than 175 reference architectures and validated designs for popular and cutting-edge workloads like AI and ML

- Elimination of costly, disruptive downtime through NetApp® ONTAP® storage and NetApp and MetroCluster™ software

- Security everywhere: flexible encryption and key management help guard your sensitive data on the premises, in the cloud, and in transit

- 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 AFF and FAS arrays that unify 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

- Plugins, APIs and PowerShell commandlets for both storage and compute that enable 3rd party management tools

- Tier, DR and backup inactive data to public cloud storage without archive software or application changes

- Simplified support experience with choice of cooperative or full stack support from a single vendor: Cisco, NetApp, or a partner

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 Horizon View (VDI)

- Citrix XenDesktop (VDI)

- FabricPool Public Cloud Storage Tiering

- Red Hat Enterprise Linux

- Red Hat OpenStack Platform

- Cloud-based Kubernetes Services with Cisco CCP

- Oracle (RAC, JD Edwards, Oracle Linux, Oracle VM Server)

- SAP, non-HANA, HANA, vHANA (ACI Optional on all solutions)

- Microsoft Exchange, SQL Server, and SharePoint

- Microsoft Windows Server Hyper-V

- Hortonworks Data Platform

- Cloudera's Distribution, including Apache Hadoop

- Docker Containers

- Security Hardening and Best Practices

- AI/ML

- Epic

- MEDITECH

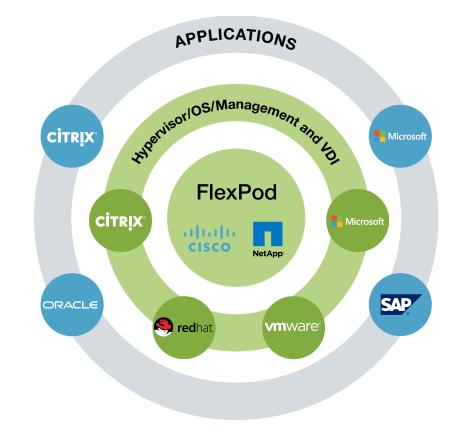- PACS/VNA/Enterprise Imaging

- Genomics

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

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 with Cisco UCS Manager, UCS Director or Cisco Intersight SaaS software.

Cisco UCS servers simplify your data center architecture by reducing the number 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 by 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 innovate with broad support for NVMe and industry-leading GPU density, particularly in blade servers, where Cisco offers the only half-width blade server in the industry with dual GPU support. These innovations allow customers to address general compute infrastructure as well as VDI, enterprise applications, real-time analytics, deep learning, and machine learning with a common system-based approach.

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 (Cisco 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 (FCoE). 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 AFF and FAS systems reduce the cost and complexity of virtualized infrastructures by meeting all of your storage requirements with a single, highly scalable solution.

The NetApp 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 AFF and FAS systems enhance operational efficiency with automated storage management, data protection, and security. The FlexPod ONTAP operating system brings a new level of nondisruptive operations,

scalability, and efficiency to enterprise storage. Performance is optimized with innovative flash technologies and end-to-end NVMe , 100GbE, FCoE, and Fibre Channel support. NetApp AFF systems can deliver up to 11.4M IOPS per cluster with an effective capacity of up to 700PB.With storage based on NetApp ONTAP, 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 hybrid cloud storage needs.

Choose your FlexPod support experience

The choice is yours. FlexPod Cooperative Support is a multivendor engagement model that comes with every FlexPod solution. You can also add Cisco or NetApp solution support for a single point of contact for all your FlexPod support needs.

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 the rapid resolution of your technical issues.

Solution Support simplifies problem resolution

In today's complex IT environments, enterprises are building solutions with a mix of vendors and products in order to reach their IT and business goals, especially with the increased use of converged infrastructures and cloud models. These solutions require a support model that focuses not on individual products or components, but on solutions as a whole, providing a central contact point, making it easy to open a case and get any issue with any product in a solution deployment resolved. FlexPod delivers choice with Solution Support offerings from Cisco, NetApp or the partner.

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) that 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.

In addition to the FlexPod Cooperative Support model offered in partnership with Cisco, NetApp also offers Solution Support for FlexPod as an add-on service with single-point-of-contact FlexPod solutions. The NetApp Solution Support team has expertise on the various products in each solution stack. The NetApp Solution Support team has support-to-

support access to the product or component vendor's support organizations and works with the vendors on your behalf. Cases are handled end to end, with no hand-off or finger pointing. NetApp Solution Support for FlexPod is a separate, optional offering on top of SupportEdge Premium.

Innovative management solutions

NetApp and Cisco validate and support a broad set of management solutions for new and changing cloud environments. Cisco Intersight™ is a SaaS, cloud-based, FlexPod-and-UCS management platform that empowers you to deploy, maintain, and get support for your FlexPod infrastructure from anywhere users are Internet-connected. Intersight for FlexPod is infrastructure lifecycle management and support done simply and intelligently. Cisco CloudCenter™ offers automated management for hybrid cloud solutions. Containers and virtual machine manage-ment 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 our partners, we offer 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 **flexpod. com** or **www.cisco.com/go/ flexpod** or **www.netapp.com/ flexpod**.

About NetApp

In a world full of generalists, NetApp is a specialist. We're focused on one thing, helping your business get the most out of your data. NetApp brings the enterprise-grade data services you rely on into the cloud, and the simple flexibility of cloud into the data center. Our industry-leading solutions work across diverse customer environments and the world's biggest public clouds.

As a cloud-led, data-centric software company, only NetApp can help build your unique data fabric, simplify and connect your cloud, and securely deliver the right data, services and applications to the right people— anytime, anywhere.