

White Paper



Top 5 Reasons to Choose Cisco HyperFlex Systems



Cisco HyperFlex™ Systems
with Intel® Xeon® Processors



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Top 5 Reasons to Choose Cisco HyperFlex Systems



If you need agile, efficient, and adaptive IT infrastructure, Cisco HyperFlex systems can help you achieve your goals.

“Cisco HyperFlex took 80 percent less time to deploy than our previous solution, and speed equals efficiency. When you run as lean as we do, every minute is valuable.”

Derek DePasture
Senior network engineer
BluePearl Veterinary Partner

<http://www.cisco.com/c/dam/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/cisco-bluepearl-case-study.pdf>

First-generation hyperconvergence promised fast and easy deployment. But if you tried any of these systems, you may have found them to be complex and inflexible, providing underwhelming performance. This makes it difficult to scale, optimize, and manage your data center.

Cisco HyperFlex™ next-generation systems eliminate the compromises that hampered the previous generation of solutions. Engineered on Cisco Unified Computing Systems™ (Cisco UCS®) technology, Cisco HyperFlex systems include rack and blade servers built with Intel® Xeon® processors, built-in networking, integrated management, and a high-performance and highly available data platform, with preinstalled software. You can mix and match blade and rack servers to tune your cluster with the right mix of processing and storage capacity for your workloads. Cisco® networking interconnects the system from a single point, eliminating the do-it-yourself projects of previous-generation systems. Integrated management makes the system self-aware and self-integrating, automatically detecting changes to the hardware and incorporating new components automatically. The Cisco HyperFlex HX Data Platform makes your data instantly accessible and highly available, with always-on deduplication and compression that reduces your storage needs. In addition, the preinstalled VMware ESXi hypervisor accelerates both provisioning and scaling.

With Cisco HyperFlex systems, you have flexible pools of computing, network, and storage resources that are easy to deploy and maintain. You can bring the pay-as-you-grow economics of the cloud to your data center to support diverse application needs and help you propel business innovation. The system offers one-click integration with VMware vSphere, allowing your IT staff to extend their virtualization skills to storage and management to get better visibility into and control over your

computing, network, and storage resources from a single console, improving productivity and infrastructure operation. With systems designed to be upgraded as new technologies become available, you have infrastructure that is easy to deploy, scale, and manage, while providing investment protection.

Here are five reasons for choosing Cisco HyperFlex systems.

Reason 1: Intelligent End-to-End Automation—Including Networking Automation

In first-generation hyperconverged systems, networking was an afterthought. At Cisco, we consider networking to be an integral and essential part of hyperconvergence. Cisco HyperFlex systems provide comprehensive end-to-end automation across computing, storage, and networking resources. Using a simple and intuitive wizard, the entire deployment process takes minutes to complete. The process uses Cisco UCS Manager service profile templates optimized for hyperconverged environments to help ensure rapid deployment and expansion.

Our fabric interconnects create a redundant dual network fabric that connects to Cisco UCS virtual interface cards (VICs) in server nodes. These cards establish a programmable I/O infrastructure. You can configure the number and type of I/O interfaces on demand with a zero-touch model that increases staff efficiency and accelerates operations. We preconfigure Cisco UCS service profiles to automatically create the appropriate devices to support your cluster with no guesswork required. Our programmable I/O infrastructure dramatically reduces the number of network adapters, cables, and switches you need. Cisco VICs support up to 256 PCI Express (PCIe) devices with a high rate of I/O operations per second (IOPS), lossless Ethernet, and 20-Gbps connectivity to each server. Network interface card (NIC) teaming with automated fabric failover increases reliability and availability.

We simplify deployment by preconfiguring the network with automated workflows. Our network fabric gives you:

- Traffic segmentation and security through dedicated virtual links connecting each server to the fabric interconnect: We automatically create the multiple interfaces used by VMware networking in accordance with VMware best practices (Figure 1).
- Storage and management traffic shared on the network fabric: This approach enables optimal performance.
- Quality of service (QoS) policies enabled for well-defined and predictable service: Policies include no-drop and jumbo frames policies for optimal performance.
- Multicast policy for Cisco HyperFlex system clusters: This feature is a part of our automated configuration process that other vendors do not even consider.
- No need to configure IPv6 or IPv4 multicasting or Internet Group Management Protocol (IGMP) snooping on your upstream switches as a network prerequisite: We keep all the required networking configuration information in the fabric interconnect and automatically configure it all for you.

“We chose Cisco HyperFlex because Cisco UCS and networking technologies are best of breed.”

Mark Myers
Director of information technology
Ready Pac Foods

<http://www.cisco.com/c/dam/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/ready-pac-cs.pdf>

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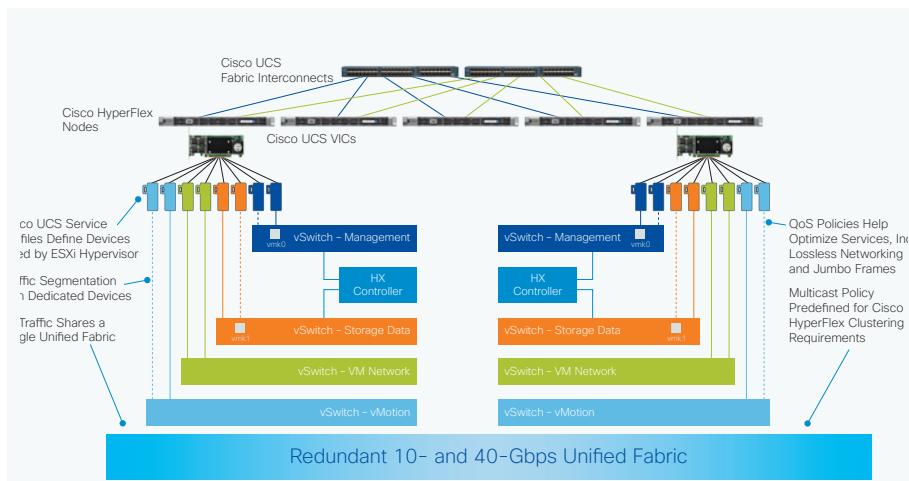


Figure 1 Cisco HyperFlex Systems Incorporate Networking as Part of the System

The included fabric interconnects give you a single point of connectivity and management for your Cisco HyperFlex systems and other Cisco UCS blade and rack servers. All traffic reaches any node in the cluster through a single network hop. This approach delivers high-bandwidth and low-latency networking for fast application response. As your cluster scales, the network scales with it to easily handle storage and production IP networking traffic.

Reason 2: Unified Management for All Workloads

If your data center supports virtualized environments, you already use VMware vCenter to manage your virtual infrastructure. With Cisco HyperFlex systems, you can continue to do so without creating yet another management silo. With a single vCenter plug-in, you can manage your physical and virtual hyperconverged infrastructure through a single, intuitive interface. If you have already started to manage your data center infrastructure with workflow-based Cisco UCS Director, you can use it to manage and automate your hyperconverged environment as well. The reason for this flexibility is that each of these management approaches use a unified API provided by Cisco UCS Manager. This integrated, model-based management software is built into all your Cisco server and storage infrastructure (Figure 2).

Avoid Management Silos

Traditional virtualized environments force you to manage your virtual servers and storage systems and physical infrastructure separately. With Cisco HyperFlex systems, you avoid management silos. You can view, manage, and optimize your vSphere environments—including virtual servers, physical servers, and storage devices—all from a single vCenter interface. Integration with vCenter through the system's XML API eases provisioning, configuration, and orchestration operations, facilitating quick and efficient response to DevOps requests. Native storage functions are integrated into vCenter, allowing instant provisioning, cloning, and snapshotting of applications. These capabilities dramatically simplify daily operations and allow you to operate without the need for additional management tool sets.

“We wanted an all-in-one solution that would be data center ready without spawning new islands of infrastructure. Our goal was to eliminate silos, not create them.”

Derek DePasture
Senior network engineer
BluePearl Veterinary Partners

<http://www.cisco.com/c/dam/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/cisco-bluepearl-case-study.pdf>

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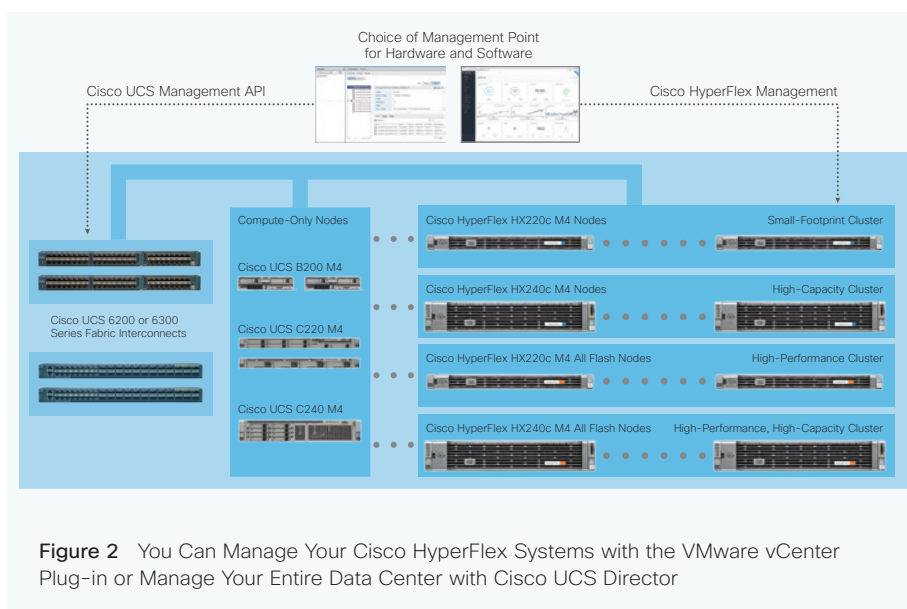


Figure 2 You Can Manage Your Cisco HyperFlex Systems with the VMware vCenter Plug-in or Manage Your Entire Data Center with Cisco UCS Director

Use Cisco UCS Manager Technology

Below the VMware integration level, the system incorporates Cisco UCS model-based management, enabling you to deploy nodes quickly and consistently regardless of whether you are deploying 1 node or 100. Integration with vSphere deploys service profiles that fully define server node identity, configuration, connectivity, and storage. You can access the user-friendly HTML 5 interface technical preview while still maintaining the functions of the vCenter plug-in.

To scale the system, simply use the Cisco HyperFlex installer. With a few clicks, the newly detected hardware and the server nodes are automatically configured exactly as required for the environment—and configured consistently—every time. Cisco UCS model-based management empowers your IT staff members to extend their virtualization skills to storage management and gain better visibility into and control over computing, network, and storage resources from a single console. Together, these capabilities will accelerate your operations.

Use Cisco UCS Director for Your Entire Data Center

If you want to manage your entire data center infrastructure with a single workflow-based automation tool, you can choose to do so with Cisco UCS Director. A single tool can manage your full application lifecycle, whether applications are deployed in your hyperconverged environment; on your blade or rack servers, or on your networking, storage, or third-party systems. Our management automates tasks to reduce the chance of errors that can cause downtime. Cisco UCS Director provides easy-to-use automation, extends to heterogeneous environments, maintains its awareness of your environments, and organizes your environments into a holistic unified view so you can see and control everything.

Cisco UCS management encompasses all your Cisco UCS infrastructure, whether it is converged, hyperconverged, or bare metal. You can even automate processes yourself with interfaces to Cisco UCS Manager through Microsoft PowerShell and Python. In addition, you can integrate the Cisco CloudCenter™ (formerly CliQr®)

“With Cisco HyperFlex Systems, we can respond much faster to business and application needs because CPU, storage, and network resources are independently scalable. It’s easy to adjust the underlying infrastructure as workloads change.”

Paul Bauwens
IT architect
Meander Medisch Centrum

<http://www.cisco.com/c/dam/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/cisco-meander-case-study-08262016.pdf>

solution with your Cisco HyperFlex system to facilitate hybrid cloud mobility across clouds, further increasing your infrastructure agility.

Reason 3: Independent Resource Scaling

Cisco HyperFlex Systems include a purpose-built, high-performance distributed file system that expands the boundaries of hyperconverged infrastructure. You can scale your environment simply by adding nodes to the configuration. Unlike with any other hyperconverged product, you can choose to independently scale computing or storage capacity to meet the specific needs of your applications. Our predefined networking resources expand to incorporate the new nodes (Figure 3). All this is accomplished without the need for you to change or adjust your software or networking configuration or interrupt your cluster operations. The new node is efficiently and automatically added to your environment with no downtime.

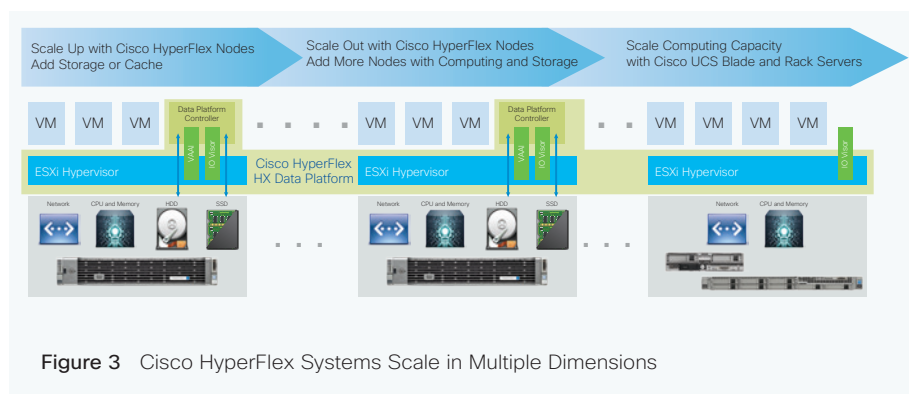


Figure 3 Cisco HyperFlex Systems Scale in Multiple Dimensions

With Cisco HyperFlex systems, you can scale your storage by adding a Cisco UCS rack server-based storage node to the cluster. You can scale your computing performance by adding Cisco UCS blade server-based computing nodes. You can scale with a graphics-processing-intensive computing node by adding Cisco UCS C240 Rack Servers to the cluster.

Reason 4: Single Data Center Architecture Based on Cisco UCS

Cisco UCS provides the foundation for cloud computing, business-critical applications, software development, and big data deployments in data centers and remote- and branch-office locations. By basing Cisco HyperFlex systems on Cisco UCS, we allow you to extend the popular Cisco UCS Manager policy automation capabilities to your Cisco HyperFlex clusters. Deployment and expansion processes both use service profiles, simplifying daily operations and increasing overall infrastructure consistency and reliability across the data center.

We offer the only hyperconverged infrastructure platform in the industry that can logically create virtual host bus adapters (vHBAs), supporting the presentation of external storage, including Fibre Channel storage, to the Cisco HyperFlex nodes. With Cisco HyperFlex systems, you can easily bring outside resources and data

into your new systems, allowing you to move data and applications from existing environments to Cisco HyperFlex systems. This capability also supports virtual machine mobility, allowing you to move virtual machines through VMware Storage vMotion without having to take applications offline. You also can simply and quickly back up and archive your data to traditional Fibre Channel-based storage systems. With just a change to the Cisco UCS service profile, you can easily add Fibre Channel.

You manage Cisco HyperFlex nodes just like other Cisco UCS resources in your data center. As a result, you can shift these resources across hyperconverged infrastructure (HCI), converged infrastructure, and traditional infrastructure. You can use the computing-only nodes to support a hyperconverged cluster, and then, according to seasonal or daily application demands, you can shift them to support traditional infrastructure, providing true cloud-like agility across your data center (Figure 4).

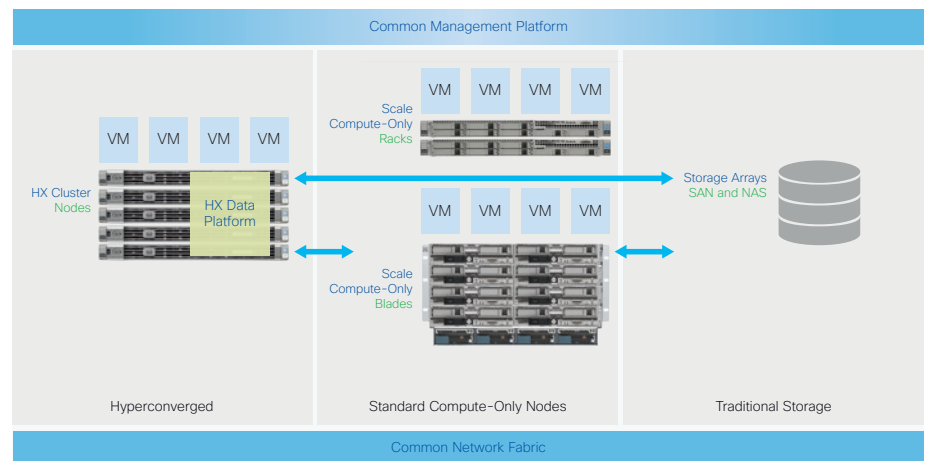


Figure 4 Share Resources Across HyperFlex and Traditional Infrastructure

“We’re saving more than \$50,000 a year in power and cooling costs on top of that. We’re also reducing software license costs because Cisco HyperFlex nodes can handle much greater virtual-machine density than our previous hosts.”

Mark Myers
Director of information technology
Ready Pac Foods

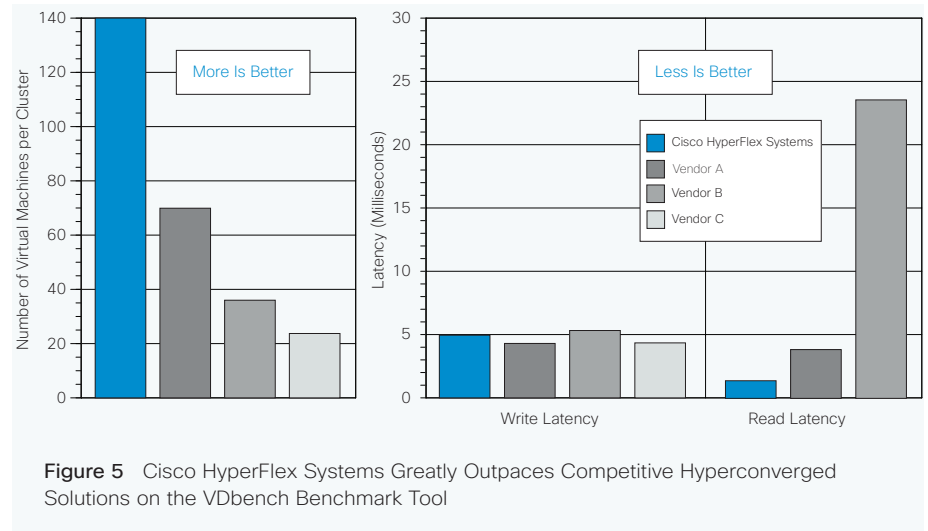
<http://www.cisco.com/c/dam/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/ready-pac-cs.pdf>

Reason 5: Greater Virtual Machine Density and Lower and More Consistent Latency

The Cisco HyperFlex HX Data Platform is a file system that is specifically built for hyperconverged systems. It uses dynamic data distribution, in which data is striped and distributed across the cluster, using all available resources for optimal I/O performance. As a result, Cisco HyperFlex systems achieve significantly greater performance than competing solutions, allowing you to run up to three times more virtual machines, dramatically lowering your overall total cost of ownership (TCO), and providing more flexibility for your environment.

The solutions used for comparison had configurations that were either equivalent to or exceeded the Cisco HyperFlex configuration. All competitive solutions in this comparison used two cache solid-state disks (SSDs), whereas the Cisco HyperFlex system used only one. Everything else—the number of nodes, the type of processors, and the memory—was the same.

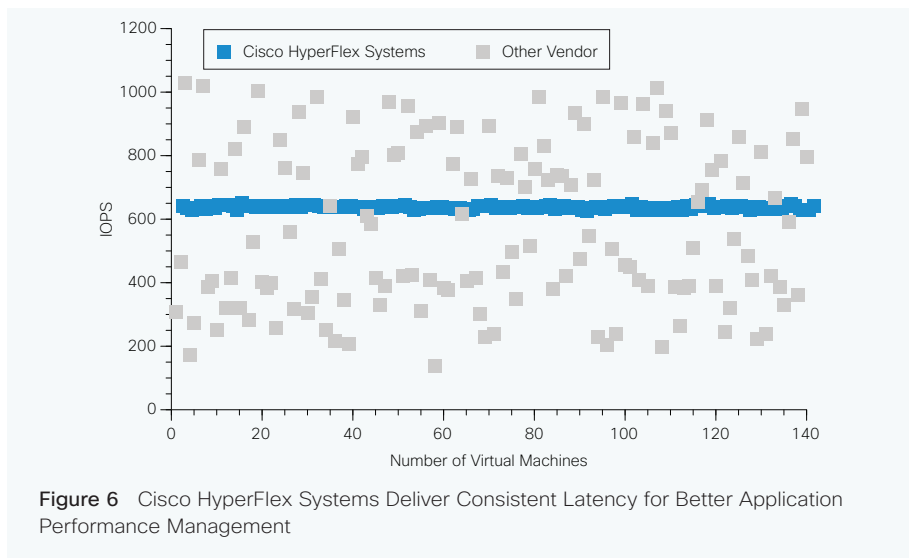
Figure 5 shows the results of a test using the enterprise-class, industry-standard VDbench testing tool running a heavy virtual machine load. The results show that while maintaining the same write latency, Cisco HyperFlex systems can support significantly more (three times more) virtual machines per cluster than the competition. Additionally, the latency for read and write operations was tested for all the solutions running 140 virtual machines under a heavy load. The Cisco solution delivered radically lower latency.



By using intelligent and dynamic data distribution across all nodes in the cluster, the HX Data Platform avoids performance bottlenecks and provides consistent latency and performance. When running a heavy load, you can expect up to three times lower latency with Cisco HyperFlex systems than with competing solutions. And the HX Data Platform provides lower latency while maintaining consistent virtual machine performance across the cluster for long periods of time.

Cisco HyperFlex Systems deliver more than low latency—they deliver more consistent latency between virtual machines. This is important when hosting enterprise applications that must meet specific service-level agreements. If your latency for traffic between virtual machines varies, so will your application performance and your user experience. Figure 6 shows the average IOPS of every virtual machine under load. With IOPS from another measured vendor that has a range from lows below 100 IOPS to over 1000 IOPS, it's hard to manage performance, because I/O for each virtual machine is simply unpredictable. Compare this to the consistent performance you can expect from Cisco HyperFlex Systems and you will see the direct impact our data platform can have on how well your IT organization can meet its goals.

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Get Business-Class Hyperconvergence

Cisco HyperFlex systems give you five good reasons to make this solution your hyperconverged system of choice:

1. The well-known benefits of Cisco UCS technology and a better overall architecture for increased adaptability
2. Integrated, simplified networking for superior efficiency
3. A single management approach that delivers efficiency
4. Independent scaling to match your workload today and into the future
5. Increased virtual machine density and lower network latency

Cisco HyperFlex systems offer the only truly hyperconverged infrastructure available today. You gain the advantages of exceptional agility, quick deployment, and easy management. With these factory-installed systems and Cisco's comprehensive support offerings, you can achieve the benefits of hyperconvergence that is truly business class.

For More Information

For more information about Cisco HyperFlex systems, visit <http://www.cisco.com/go/hyperflex>.

For more information about Cisco UCS management, visit http://www.cisco.com/c/en/us/products/servers-unified-computing/cisco_ucs_management.html.



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