

# The Right Platform for Database and Application Deployments

## Cisco HyperFlex Systems and Microsoft SQL Server



### Simplify

- Use preintegrated clusters that are fast to deploy, simple to manage, and easy to scale



### Respond

- Deliver results faster with a solution that provides fast access to growing volumes of data



### Optimize

- Take advantage of always-on inline compression, deduplication, and monitoring



### Perform

- Eliminate bottlenecks with a system that securely distributes and optimizes data across scalable servers and storage tiers

**Our solution offers the capacity and performance you need to reduce IT sprawl and deliver insight faster and at less cost.**

If your organization is like most, Microsoft SQL Server databases are used throughout your operation. Maybe you rely on these databases for online transaction processing (OLTP), data warehousing, or batch processing. Perhaps you use business intelligence, online analytical processing (OLAP), or report generation tools. Most likely, you use a mix of these systems. Whatever the workloads, your databases need to perform if they are going to be able to give your business applications and users fast access to information.

## Cisco HyperFlex Systems and Microsoft SQL Server

As computing and storage resources are added to accommodate and process growing volumes of data, your IT organization is left with a sprawling complex of databases and infrastructure. That's when performance starts to decline and costs start to rise. Cisco HyperFlex™ systems running Microsoft SQL Server deliver the scalability and performance you need at a price you can afford. Our solution is fast to deploy, simple to manage, and easy to scale and secure, making it a trusted platform that won't get in the way of running your business.

“HyperFlex’s approach ensures high performance of Microsoft SQL and Oracle databases and critical applications with faster delivery of the environment, lower costs, and more effective management.”

**Edivaldo Rocha**  
CEO, CorpFlex

Read the [case study](#).

## Innovative foundation

These innovative systems combine software-defined computing in the form of Cisco Unified Computing System™ (Cisco UCS®) servers and software-defined storage with the powerful Cisco HyperFlex HX Data Platform software. The result is a cluster that powers up and configures itself in an hour or less and is ready to accept your application, database, and other workloads.

Innovation does not end at the server. Our hyperconverged solutions place added emphasis on the network, as storage I/O becomes east-west traffic. When you investigate hyperconverged offerings, choose one whose roadmap includes innovation across computing, storage, and network components, improving the entire system: Cisco HyperFlex.

## Fast deployment

Time is money. Cisco HyperFlex systems are delivered as a preintegrated cluster that is up and running within an hour. Integrated management detects new components, allowing this self-aware and self-integrating system to adapt quickly to changes in hardware configuration. This is made possible through Cisco UCS. Within the system, every aspect of a node’s identity, configuration, and connectivity can be set through software. This capability significantly increases efficiency and security, and reduces deployment time. From unboxing to being ready to run a workload, nothing deploys more quickly than Cisco UCS.

## Proven performance

Our all-flash configurations allow you to run your database and applications on one platform and get predictable performance every time. All of the storage devices are combined into a single distributed, multitier, object-based data store that allows all cluster resources to participate in I/O responsiveness. A purpose-built, high-performance, scale-out file system dynamically distributes data across the data store. As you scale the cluster, every new and existing component contributes processing power and storage capacity. When every cluster resource can participate in I/O responsiveness, you experience faster results.

### Performance at every layer

When Microsoft SQL Server virtual machines can access all of the resources in the cluster, performance skyrockets. Why does this matter? The databases and applications within your virtual machines need massive amounts of east-west traffic bandwidth and low latency to handle bursts of application and user activity. With our solution, you get a solution designed to eliminate bottlenecks.

- **Fast response:** The data platform is built on a log-structured file system that uses a caching layer to accelerate read requests and write responses. Incoming data is striped across the number of nodes you define to meet your data availability requirements. When data is added or updated, the system simply appends a new block and updates the metadata, requiring little use of the server’s

processors. Data being moved from cache to disk is deduplicated and compressed. This process occurs after the write operation is acknowledged, so there is no performance penalty for these operations. In addition, we store the most frequently used data in the caching layer to accelerate read operations.

- **Access to capacity and bandwidth:** The distributed architecture allows every virtual machine to use the storage storage input/output operations per second (IOPS) and capacity of the entire cluster, regardless of physical location.
- **Fast storage and networking:** All-flash configurations and high throughput at the networking layer deliver fast access to large databases and consistent performance.
- **Fast fabric interconnects:** Our interconnects provide

high-bandwidth, low-latency connectivity that carries all production IP traffic, hyperconvergence-layer traffic, and management traffic over a single set of cables.

- **Consistent network performance:** All traffic reaches any other node in the cluster with only a single network hop that accelerates east-west traffic. There is no switching that adds latency. Our latency is deterministic.
- **Security:** Every connection in the cluster is treated as its own microsegment, with the same level of security as if it were supported with a separate physical link, making the integrated network more secure.

### Stunningly fast

The Enterprise Strategy Group tested Cisco HyperFlex hybrid and all-flash systems using HCI Bench,

an industry-standard tool that tests the performance of hyperconverged clusters. Months of baselining and iterative testing using various read/write profiles and block sizes showed that Cisco HyperFlex systems handle more I/O—and handle it faster—than other tested platforms (Figure 1).

### Storage efficiency

The HyperFlex Data Platform optimizes storage tiers for an excellent balance between price and performance, delivering an environment that exceeds most database service-level agreements (SLAs). Data is continuously optimized with real-time, always-on deduplication, compression, and optional encryption, helping reduce your storage costs without affecting performance. Dynamic data placement in server memory, caching, and capacity tiers increases

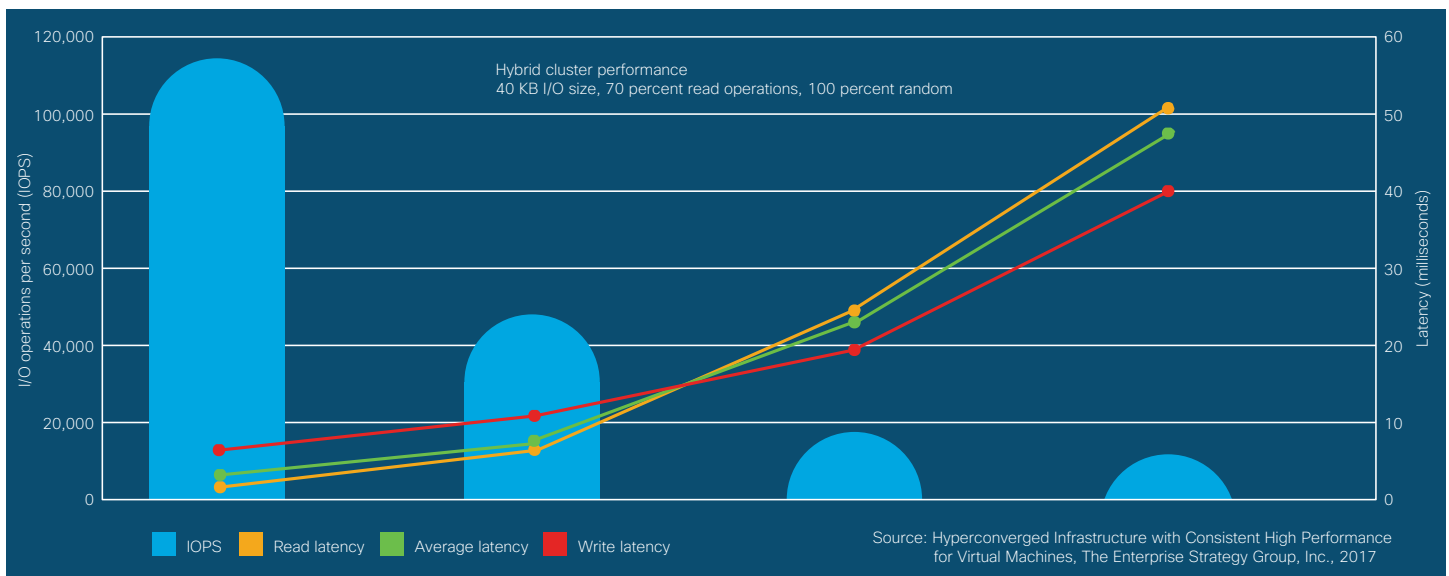


Figure 1 Cisco HyperFlex systems are stunningly fast

application performance and reduces performance bottlenecks.

## Easy scalability

Independent scaling allows you to match the resource needs of your Microsoft SQL Server environments. You can start small and scale to support hundreds or thousands of users and petabytes of data. As you add nodes to the cluster to expand capacity, data is automatically rebalanced across shared resources. Using thin provisioning, you can size your data store larger than the cluster and expand the solution as your databases grow.

## Integrated network fabric

In many platforms, networking is an afterthought. In contrast, Cisco UCS fabric interconnects give you a single point of connectivity that lets you use Cisco HyperFlex nodes and Cisco UCS servers together—a feature that no other hyperconverged vendor offers. After deployment, you can scale the cluster to its maximum size without needing to redesign the network.

As your environment grows and begins to span your enterprise, you can use Cisco® Application Centric Infrastructure (Cisco ACI™) to implement a software-defined network. Cisco ACI provides automated, policy-based network deployment that secures your applications within isolated containers. The network can attach directly to virtual machines and physical servers with increased security, real-time monitoring and telemetry, and automated performance optimization. You

can interconnect your entire data center network, integrating your hyperconverged cluster into your existing infrastructure, and achieve consistency at scale.

## High data availability

Your enterprise applications and databases must be available all the time. The system distributes data across nodes based on policies that you set to meet your data availability requirements. You can even replicate data to local or remote clusters for backup or disaster-recovery purposes. In the unlikely event of a failure, systems configured with five nodes or more can keep running even if all drives fail on two nodes simultaneously. And the cluster automatically recovers. In the event of a drive or node failure, lost data is regenerated using the redundancy mechanisms built into the system. Plus your administrators can perform system maintenance tasks without disruption. That's a database deployment you can count on.

## Unified management helps reduce costs

IT management shouldn't be an afterthought. All Cisco UCS platforms, including Cisco HyperFlex systems, have embedded model-based management. Automation is controlled through the Cisco UCS management API by higher-level tools that allow you to configure a cluster in minutes, with no risk of configuration creep or noncompliant settings. You can choose from a set of unified management tools (Figure 2).

## Continuous workload performance

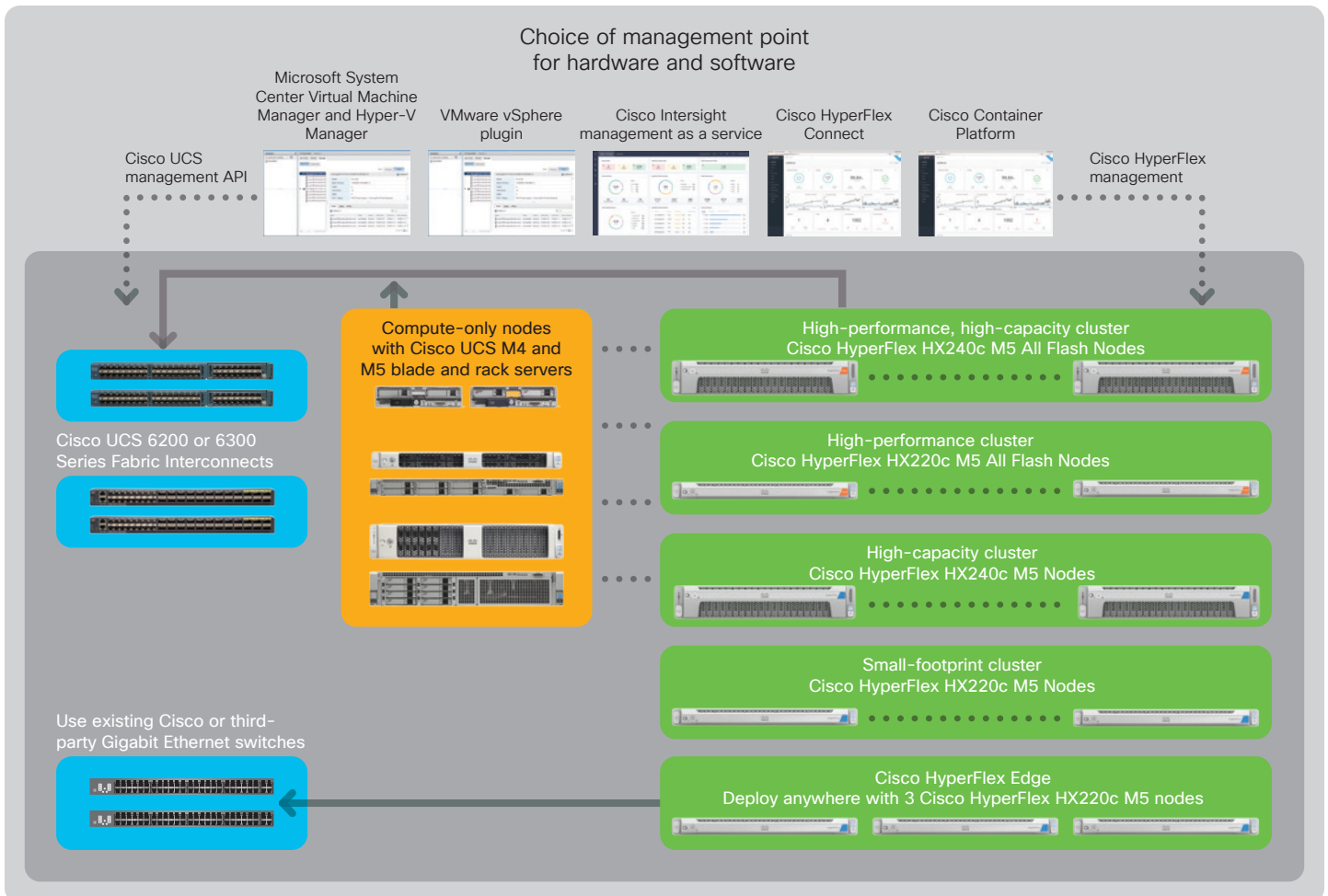
When software makes the right workload decisions in real time, your teams benefit. Cisco Workload Optimization Manager is a real-time decision engine. It continuously analyzes workload consumption, costs, and compliance constraints and automatically allocates resources in real time so that your databases and workloads get the resources they need when they need them. You can:

- Validate that workload requirements are met
- Use an optimization analysis to better place workloads in the cluster
- Understand the amount of hardware your databases and workloads actually need
- Increase workload density
- Improve application response times

- Cisco HyperFlex Connect:** This intuitive, HTML 5-based management tool is device independent, giving you access to all cluster features through any device, anywhere. All cluster data platform features can be managed through this interface.
- Cisco Intersight™ management as a service:** This cloud-based interface gives you instant access to all of your clusters, regardless of where they are deployed. High-level resource inventory and status are provided by Cisco Intersight dashboards. A recommendation

engine helps you proactively respond to impending issues such as the need to scale capacity. Install edge deployments simply by claiming your nodes in the interface and the platform will configure a cluster remotely in minutes. Drill down into data platform operations and you have exactly the same control as Cisco HyperFlex Connect provides—except that you do not have to host management software and you always have the most up-to-date versions.

- Hypervisor management integration:** Cisco HyperFlex systems management integrates with both Microsoft Windows 2016 Hyper-V and VMware vCenter. This level of management integration enables you to manage the lifecycle of virtual machines—including storage management—without leaving the interface familiar to your administrators. These management tools include Microsoft System Center Virtual Machine Manager (SCVMM), Microsoft Hyper-V Manager, and a VMware vCenter plug-in.



**Figure 2** The Cisco HyperFlex product family is supported by a choice of unified management tools

## Next steps

Read the Cisco Validated Design [Cisco HyperFlex All-Flash Systems for Deploying Microsoft SQL Server Database](#).

Read the Enterprise Strategy Group report [Cisco HyperFlex: Hyperconverged Infrastructure with Consistent High Performance for Virtual Machines](#).

## For more information

- [Cisco HyperFlex systems](#)
- [Microsoft solutions](#)

## Get the most out of your databases and applications

There are many ways that our solution can help your business.

### Infrastructure refresh and database migrations

If your applications and databases run on infrastructure that is due for a refresh, explore Cisco HyperFlex systems. The solutions you thought required traditional converged architecture often can run on higher-performing hyperconverged systems that are easy to manage and less costly to operate. Indeed, migrating your existing databases to Microsoft SQL Server running on Cisco HyperFlex systems can give a boost to your existing mission-critical applications that use those databases. Your applications and users will benefit from the impressive capacity and performance improvements across CPU, memory, disk, and system I/O.

### Private and hybrid clouds

Integration with Cisco ACI and Cisco Enterprise Cloud Suite make it easy to create a hybrid cloud based on Cisco HyperFlex systems. Your customers and clients can use the software's integrated service catalog to order application-local infrastructure customized the way they need it within the constraints that you determine. And when you need to augment capacity to handle periodic workload peaks, you can use a policy-based

approach for engaging third-party public cloud services.

### Managed services

Using applications and Microsoft SQL Server databases that run in a cloud built on Cisco HyperFlex systems can help your IT staff accelerate service delivery and lower costs. You can also tap into the high availability delivered by dedicated staff at a managed services provider.

### What can you expect?

Customers tell us that the move to Cisco HyperFlex systems running Microsoft SQL Server delivers many benefits, including:

- Increased database availability
- Accelerated response times
- Lower latency for critical database and application systems
- Reduced storage footprint
- Reduced total cost of ownership

## Get started

We make it easy to get started with hyperconverged infrastructure. Using our Cisco HyperFlex sizing tools, you can determine which configuration is the right starting point for your workload. You can also take the risk and guesswork out of deployment with our Cisco Validated Design guide for deploying Microsoft SQL Server Database on Cisco HyperFlex all-flash systems. The time is right for you to deploy high-performance databases that support your applications at any scale.