Turbocharge Your Microsoft SQL Server Deployments
Why upgrade?

If you’re thinking about upgrading your Microsoft SQL Server deployment, you’re not alone. Modernizing your databases lets you tap into advancements that help accelerate access to business insight and keep your business running.

**Improved analysis**
- Faster record staging
- Tabular model enhancement
- New graph database capabilities
- Improved machine learning support
- Python support

**Faster query response time**
- Query processing improvements
- Adaptive optimization strategies
- Automatic database tuning
- In-memory enhancements
- Resumable online index rebuilds

**Better availability and recovery**
- Support for Linux and Docker containers
- Dynamic management views
- Scale out high-availability features
- Improvements for transaction log monitoring
- New Common Language Runtime (CLR) security model
The cloud holds promise for many applications, but it isn’t right for every situation. Cost, ease and speed of access, security, policies, and compliance often make on-premises database deployment and data analysis the right choice.

Although public clouds seem to provide low-cost services that are easy to adopt, your costs can increase as your data sets grow. In addition to paying for storage capacity, you’re likely to also pay fees based on how frequently you need to access that data and where it needs to be distributed geographically. Add the requirement for fast data access and analysis, and performing calculations in the cloud may not be the right choice. Storing your data close to where it will be processed accelerates time to results.

Explore your options
- AWS or private cloud or both? What’s your strategy?
- Cisco HyperFlex versus public cloud
- Understanding the cost premium of public cloud for active data
- Cloud’s challenges and opportunities for IT pros
Why Cisco?

There’s no perfect solution or one-size-fits-all approach that can support every nuance of every situation. Our spectrum of products—from individual servers to converged and hyperconverged systems—lets you choose from a family of solutions that are designed to work together for your organization. You can deploy one type of solution for one set of needs, and a different solution for other workloads. You get to choose, and we make it easy to deploy and manage your choices in a consistent way.

Cisco is the market leader in all things networking. IT our networking and Fibre Channel switching solutions continue to be the first choice of professionals.

We partner with NetApp and Pure Storage to deliver tested and validated converged infrastructure solutions that are optimized for your applications.

Our hyperconverged systems provide an adaptive platform that powers any application, on any cloud, anywhere. You can deploy them in your data center and all the way to the edge.

Cisco and Microsoft: a strong partnership

• Microsoft SQL Server requires IT infrastructure that can unlock its full potential. Cisco® solutions are integrated with the Microsoft stack to deliver ideal platforms for Microsoft SQL workloads.
• Cisco solutions continue to provide consistent leadership on Microsoft SQL Server industry-standard benchmarks.
• Cisco and Microsoft continue to make R&D investments to integrate their technologies to deliver seamless data center management and automation.
• The combination of Microsoft SQL Server and Cisco solutions provides highly reliable, enterprise-ready database performance.
• Advanced integration at every level in the stack—compute, network, I/O, virtualization and management—helps accelerate existing and new Microsoft SQL Server features, including faster analytics, shorter query response times, and better availability and recovery.
• The optimization of the Microsoft stack on Cisco solutions supports a modern, simple, cost-effective database solution.
Cisco HyperFlex systems deliver more

As resources are added to accommodate and process growing volumes of data, your IT staff is left with a sprawling complex of databases and outdated infrastructure. That’s when performance starts to decline and costs start to rise.

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<thead>
<tr>
<th><strong>Innovative hyperconvergence</strong></th>
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<tr>
<td>• Scalability and performance at an affordable price.</td>
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<td>• Fast to deploy and simple to manage.</td>
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<td>• A platform that won’t get in the way of running your business.</td>
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<th><strong>Rapid deployment</strong></th>
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<td>Delivered as a pre-integrated cluster</td>
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<td>Up and running within an hour</td>
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<td>Detects new components</td>
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<td>Adapts quickly to changes in hardware configuration</td>
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<th><strong>Performance at every layer</strong></th>
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<td>Deliver massive amounts of east-west traffic bandwidth</td>
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<td>Offer low latency</td>
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<td>Handle bursts of activity</td>
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<td>Eliminate bottlenecks</td>
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<th><strong>Easy scalability</strong></th>
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<td>Scale independently</td>
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<td>Match resource needs</td>
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<tr>
<td>Start small and scale</td>
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<td>Support hundreds or thousands of users and petabytes of data</td>
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<td>Automatically rebalance resources</td>
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<td>Size data stores larger than the cluster and expand as needed</td>
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<th><strong>Efficiency</strong></th>
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<td>Optimize storage tiers</td>
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<td>Balance price and performance</td>
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<tr>
<td>Meet or exceed most database service-level agreements (SLAs)</td>
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<tr>
<td>Optimize data with always-on deduplication, compression, and optional encryption</td>
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<td>Reduce storage costs without affecting performance</td>
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More integration, faster deployment

Navigating the technology maze can be enlightening and frustrating. Our converged infrastructure solutions remove guesswork. We make it easy to move to timely, flexible, automated, and secure database infrastructure that lets you innovate at a fast pace.

Cisco UCS converged infrastructure solutions

If you’re invested in Network-Attached Storage (NAS) or SAN strategies, Cisco’s converged infrastructure solutions can fit right in. The solutions combine Cisco UCS® blade and rack servers, Cisco Nexus® switches, and storage from NetApp and Pure Solutions to deliver pre-engineered, tested, and supported systems that are ideal for database consolidation efforts. These FlexPod and FlashStack solutions can simplify and accelerate your Microsoft SQL Server deployments, whether on physical or virtual IT infrastructure.

Innovation with Intel Xeon Scalable processors

- Up to 28 cores per socket.
- Top-of-the-line memory channel performance.
- Scalability and fast inter-core data flow with Intel UltraPath Interconnect (UPI) links.
- More performance for advanced analytics with Intel Advanced Vector Extension 512.
- Strengthened and accelerated data encryption and security with Intel AES-NI.
When it comes to managing IT infrastructure, simplicity is key

We give you simplified management with a choice of tools so that you can use the ones that best fit your needs. Because we designed our systems to be deployed, provisioned, and managed through an API, our products are simpler, and so are our tools.

Our programmable infrastructure approach and unified management API work with your existing data center management and monitoring solutions so that you can optimize IT operations and improve visibility and control.

- **Cisco UCS Manager**, which runs in the system’s fabric interconnects, controls all parts of the system. Using configuration models, your IT staff can help ensure the consistent, error-free policy-based alignment of server personalities with workloads.

- **Cisco HyperFlex™ Connect** provides unified, intuitive, robust, secure, and simple management. It lets you manage and monitor your clusters from anywhere and at any time. It delivers a smart, insightful dashboard with metrics and trends to support your entire management lifecycle.

- **Cisco Intersight™** is cloud-based management as a service. It allows you to manage all your Cisco HyperFlex and Cisco UCS infrastructure—traditional, converged, hyperconverged, edge, and remote and branch offices—through a single cloud-based GUI.
We give you the tools you need to perform

IT infrastructure should never be the reason for poor application performance. Our tools help performance metrics drive better decisions so that your IT infrastructure can be more application-aware and adapt to the needs of your Microsoft SQL Server environments.

**AppDynamics®:**
- Monitors, correlates, analyzes, and acts on performance data in real time.
- Provides automated, cross-stack intelligence.
- Allows your staff to watch every line of code and understand its impact on user experience and application performance.
- Delivers real-time insight into your digital business.

**Cisco Workload Optimization Manager makes it easy to:**
- **Gain insight.** Continuously analyze workload consumption, costs, and compliance constraints.
- **Optimize cluster performance.** Determine when, where, and how to move and resize workloads to safely increase efficiency and maintain continuous health across clusters.
- **Scale compute and storage resources.** Automatically allocate resources in real time to support applications.
- **Maximize elasticity across clouds.** Take advantage of Amazon Web Services and/or Azure public cloud resources.
- **Modernize at the pace of your business.** Quickly model infrastructure and workload growth scenarios to determine how much infrastructure you will need and when you will need it.

- **Cisco Tetration**
  A digital economy requires tools that help you identify security incidents, contain lateral movement, and reduce your attack surface. Cisco Tetration™ offers holistic workload protection for multicloud data centers by enabling a zero-trust model using segmentation. You get a composite security score for workloads based on various parameters. You can:
  - Use real-time telemetry data from application components and behavior-analysis algorithms to view the connections between SQL Server data and applications.
  - Track behavior changes to keep policies up to date and minimize exposure to malware-style attacks.
  - Enforce a consistent whitelist policy across on-premises data centers and public clouds.
  - Continuously monitor for and identify compliance deviations.
  - Detect software vulnerabilities.
Our results speak volumes

The performance of shared infrastructure is determined by every component, not just the software it runs. We engineered our solutions to perform at every level so that your applications and business can outperform competitors.

Our HyperFlex solutions allow you to run your enterprise applications and Microsoft SQL Server databases on one platform and get predictable performance. Every component in the cluster contributes processing power, storage capacity, and I/O responsiveness for faster results—and data is distributed across a unified data store for accelerated results.

The Enterprise Strategy Group tested Cisco HyperFlex systems using HClBench, an industry-standard testing tool. Months of baseline and iterative testing showed that HyperFlex systems handle more I/O—and handle it faster—than other tested platforms. The report revealed:

• 3 times better latency performance for mission-critical workloads.
• 2 times higher input/output operations per second (IOPS) availability.
• 96 percent higher virtual machine performance consistency.
• 30 percent cost savings.

Reveal the insights in your data in less time and at less cost

- **Gain consistency.** With Cisco UCS service profiles, every aspect of a node’s identity, configuration, and connectivity is set through software, increasing efficiency and security and reducing deployment time.
- **Simplify and save.** High consolidation ratios for Microsoft SQL Server workloads means less hardware and lower licensing costs. You can run your databases and applications on the same platform for even greater efficiency.
- **Speed development.** Fast and easy provisioning allows your developers to quickly deploy dev/test environments, try new approaches faster, and deliver a proper image to production teams.
- **Integrate.** A unified management API connects our systems into existing environments, operations processes, and higher-level management tools from Cisco and other vendors. Your IT staff can use the tools with which they are familiar, reducing administrative overhead and lost time.

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

Edivaldo Rocha, CEO, CorpFlex

Learn more
Get up and running fast

Cisco makes it easy to build cost-effective IT infrastructure for SAP environments. Verified, lab-tested architectures provide detailed design and implementation guidebooks that help reduce risk and guesswork by giving your architects and administrators step-by-step guidance. By following the guidelines in these Cisco Validated Designs, you can use a proven approach for the deployment, use, and management of your SAP infrastructure resources. To search the library of Cisco Validated Designs, visit the Cisco Design Zone.
Learn more

Microsoft SQL Server
What's New in Microsoft SQL Server 2017
Microsoft and Cisco solutions
Customer and partner questions: azurestack-customer-inquiry@cisco.com

Cisco solutions
Cisco hyperconverged infrastructure
Cisco HyperFlex HX-Series systems
Cisco UCS converged infrastructure
Cisco UCS management
Optimize Hyperconverged Workloads with Cisco Workload Optimization Manager and Cisco HyperFlex Systems

Performance
Cisco UCS C240 M5 Rack Server Delivers Unsurpassed Price per Performance on the TPC-H Benchmark
Engineering the new performance class of hyperconverged infrastructure

Disclosures
The Transaction Processing Performance Council (TPC) is a nonprofit corporation founded to define transaction processing and database benchmarks, and to disseminate objective and verifiable performance data to the industry. TPC membership includes major hardware and software companies. TPC-H, QphH, and $/QphH are trademarks of the TPC. The performance results described in this document are derived from detailed benchmark results available as of June 12, 2018, at www.tpc.org/tpch/default.asp.

Cisco UCS C240 M5 Rack Server: 1,029,593 QphH and $0.47/QphH at 3000-GB. HPE ProLiant DL380 Gen 10: 1,014,374 and $0.53/QphH at 3000-GB. Percentages calculated from detailed TPC-H benchmark results available as of June 12, 2018, at www.tpc.org/tpch/default.asp.

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