# Cisco Unified Computing System
## Delivering on Cisco's Unified Computing Vision

## Unified Computing Realized

Today, IT organizations assemble their data center environments from individual compo-nents. Their administrators spend significant amounts of time manually accomplishing basic integration tasks rather than focusing on more strategic, proactive initiatives. The industry is in a transition away from the rigid, inflexible platforms that result and moving toward more flexible, integrated, and virtualized environments.

The Cisco Unified Computing System™ is a next-generation data center platform that unites compute, network, storage access, and virtualization into a cohesive system designed to reduce total cost of ownership (TCO) and increase business agility. The system integrates a low-latency, lossless 10 Gigabit Ethernet unified network fabric with enterprise-class, x86-architecture servers. The system is an integrated, scalable, multichassis platform in which all resources participate in a unified management domain (Figure 1).

**Figure 1:** The Cisco Unified Computing System Integrates Network, Compute, Storage Access, and Virtualization into a Single Cohesive System
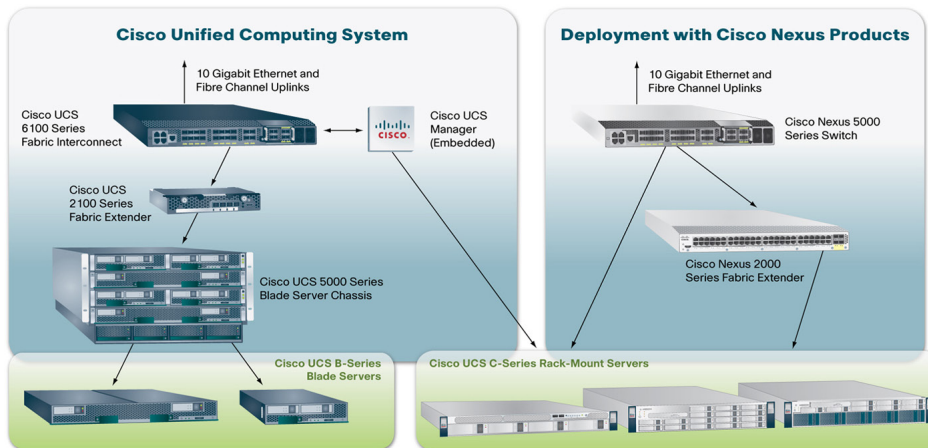


Managed as a single system whether it has one server or hundreds of servers with thousands of virtual machines, the Cisco Unified Computing System decouples scale from complexity. The Cisco Unified Computing System accelerates the delivery of new services simply, reliably, and securely through end-to-end provisioning and migration support for both virtualized and nonvirtualized systems.

The Cisco Unified Computing System is designed to deliver:

- Reduced TCO at the platform, site, and organizational levels
- Increased IT staff productivity and business agility through just-in-time provision-ing and mobility support for both virtualized and nonvirtualized environments
- A cohesive, integrated system that is managed, serviced, and tested as a whole
- Scalability through a design for hundreds of discrete servers and thousands of virtual machines, and the capability to scale I/O bandwidth to match demand
- Industry standards supported by a partner ecosystem of industry leaders

## Innovations Supporting Business Benefits

Each of the Cisco Unified Computing System business benefits is supported by a rich set of technical innovations that contribute to this first implementation of the Cisco® unified computing vision.

- **Embedded system management:** Management is uniquely integrated into all the components of the system, enabling the entire solution to be managed as a single entity through Cisco UCS Manager. Cisco UCS Manager provides an intuitive GUI, a command-line interface (CLI), and a robust API to manage all system configura-tion and operations. Cisco UCS Manager enables IT managers of storage, network-ing, and servers to collaborate easily on defining service profiles for applications.
- **Just-in-time provisioning with service profiles:** Cisco UCS Manager imple-ments role- and policy-based management using service profiles and templates. Infrastructure policies—such as power and cooling, security, identity, hardware health, and Ethernet and storage networking—needed to deploy applications are encapsulated in the service profile. This construct improves IT productivity and business agility. Now infrastructure can be provisioned in minutes instead of days, shifting IT's focus from maintenance to strategic initiatives.
- **Unified fabric:** Cisco's unified fabric technology reduces cost by eliminating the need for multiple sets of adapters, cables, and switches for LANs, SANs, and high-performance computing networks. The system's fabric extenders pass all network traffic to parent fabric interconnects, where it can be processed and managed centrally, improving performance and reducing points of management. The unified fabric is a low-latency lossless 10-Gbps Ethernet foundation that enables a "wire-once" deployment model in which changing I/O configurations no longer means installing adapters and recabling racks and switches.
- **VN-Link virtualization support:** Cisco VN-Link technology extends the network to the virtual machine. This enables a consistent operational model, whether networks are connected to physical servers or virtual machines. Now all links can be cen-trally configured and managed without introducing additional switching layers into virtualized environments. I/O configurations and network policies move with virtual machines, helping increase security and efficiency while reducing complexity.

- **Cisco Extended Memory Technology:** This Cisco technology provides twice as much memory (384 GB) as traditional two-socket servers, increasing performance and capacity for demanding virtualization and large-data-set workloads. Alternatively, this technology offers a more cost-effective memory footprint for less-demanding workloads. Cisco also offers up to 512 GB of Samsung 40 nm class DDR3, high-efficiency memory in a four-socket rack-mount server, expanding the scope of Cisco UCS to a broader range of applications.

- **State-of-the-art performance:** Intel® Xeon® 5500, 5600 and 7500 series processors automatically and intelligently adjust server performance according to application needs, increasing performance when needed and achieving substantial energy savings when not. Performance and power settings can also be manually configured.

- **Energy efficiency:** The system is designed for energy efficiency. Power supplies are 92 percent efficient, and the Intel Xeon 5500, 5600 and 7500 series processors use automated low-power states to better match power consumption with workloads. The simplified design of the Cisco UCS B-Series Blade Servers improves airflow efficiency and can reduce the number of components that need to be powered and cooled by more than 50 percent compared to traditional blade server environments; similar component reduction can be achieved with the Cisco UCS C-Series Rack-Mount Servers. In addition, the Samsung 40 nm class DDR3, high-efficiency memory now offers even greater energy efficiency.

## Cisco Unified Computing System Components

- **Cisco UCS 6100 Series Fabric Interconnects** comprise a family of line-rate, low-latency, lossless, 10-Gbps Ethernet interconnect switches that consolidate I/O within the system. Both 20-port one-rack-unit (1RU) and 40-port 2RU versions accommodate expansion modules that provide Fibre Channel and 10 Gigabit Ethernet connectivity.

- **Cisco UCS 5100 Series Blade Server Chassis** support up to eight blade servers and up to two fabric extenders in a 6RU enclosure without the need for additional management modules.

- **Cisco UCS 2100 Series Fabric Extenders** bring unified fabric into the blade-server chassis, providing up to four 10-Gbps connections each between blade servers and the fabric interconnect, simplifying diagnostics, cabling, and management.

- **Cisco UCS B-Series Blade Servers**, based on Intel Xeon 5500, 5600 and 7500 series processors, adapt to application demands, intelligently scale energy use, and offer best-in-class virtualization. Cisco's unique memory-expansion technology substantially increases the memory footprint, improving performance and capacity for demanding virtualization and large-data-set workloads. In addition, the technology offers a more cost-effective memory footprint for less-demanding workloads.

- **Cisco UCS C-Series Rack-Mount Servers** based on Intel Xeon 5500, 5600 and 7500 series processors, extend unified computing innovations to an industry-standard form factor. Designed to operate both in standalone environments and as part of the Cisco Unified Computing System, the series incorporates standards-based unified network fabric, Cisco VN-Link virtualization support, and Cisco Extended Memory Technology. It supports an incremental deployment model with a future migration path to unified computing.

- **Cisco UCS network adapters** offer a range of options to meet application requirements, including adapters optimized for virtualization, converged network adapters (CNAs) for access to unified fabric and compatibility with existing driver stacks, Fibre Channel host bus adapters (HBAs), and efficient, high-performance Ethernet adapters.

- **Cisco UCS Manager** provides centralized management capabilities, creates a unified management domain, and serves as the central nervous system of the Cisco Unified Computing System.

## Cisco Unified Computing Services

Using a unified view of data center resources, Cisco and our industry-leading partners deliver services that accelerate your transition to a unified computing architecture. Cisco Unified Computing Services help you quickly deploy your data center resources, simplify ongoing operations, and optimize your infrastructure to better meet your business needs. For more information about these and other Cisco Data Center Services, visit http://www.cisco.com/go/unifiedcomputingservices.

## Why Cisco?

The Cisco Unified Computing System continues Cisco's long history of innovation in delivering integrated systems for improved business results based on industry standards and using the network as the platform. Recent examples include IP telephony, LAN switching, unified communications, and unified I/O. Cisco began the unified computing phase of our Data Center 3.0 strategy several years ago by assembling an experienced team from the computing and virtualization industries to augment our own networking and storage access expertise. As a result, Cisco delivered foundational technologies, including the Cisco Nexus® Family, supporting unified fabric and server virtualization. The Cisco Unified Computing System completes this phase, delivering innovation in architecture, technology, partnerships, and services. Cisco is well-positioned to deliver this innovation by taking a systems approach to computing that unifies network intelligence and scalability with innovative ASICs, integrated management, and standard computing components.

## For More Information

Please visit http://www.cisco.com/go/unifiedcomputing.