Integrated Switching: Cisco Blade Switch Modules for HP BladeSystem Enclosures

Reduce data center complexity

Increase agility and decrease TCO with integrated switching

As a company's data center expands, complexity increases. A proliferation of cabling and management tools hinders a company's ability to adapt quickly to changing business needs. Meanwhile, total cost of ownership (TCO) creeps steadily upward because of rising power and cooling costs, increased rack space requirements and more complicated provisioning and management needs.

Companies around the world have simplified their data center infrastructures using the HP BladeSystem, an all-in-one data center infrastructure combining servers and storage as well as storage area networking (SAN) and Ethernet network connectivity. Consolidating multiple blades and an integrated network appliance into a single chassis increases data center efficiency by reducing cabling requirements and simplifying management. It also decreases power costs, increases reliability with redundant, heavy-duty power supplies and fans and conserves rack space. What's more, TCO drops as a result of using shared HP BladeSystem resources, which reduce both up-front and ongoing costs over the life of the data center.

Customers have multiple options to connect HP BladeSystems to the network. The most effective is an integrated switch. Connecting the HP BladeSystem enclosure using an integrated switch provides high application availability, simplified management and troubleshooting, lower total cost of ownership than an external switch, and the ability to more rapidly provision new applications to adapt to changing business conditions.

Traditionally, organizations had only one option for server connectivity: an external switch. The major drawback of this approach is complicated cable management and diagnostics. Each pair of redundant cables represents two potential points of failure, and cabling complexity can also delay problem resolution and affect service levels. Another downside of connecting with an external switch is high costs, including rack space, power and cooling. In addition, separate management interfaces for servers and switches—and separate support relationships—tax already overburdened IT groups. Finally, separate provisioning for servers and switches can delay the introduction of new services for customers or employees, postponing productivity gains or revenue realization.

Now companies can overcome the limitations of external server connections with integrated switching solutions for the HP BladeSystem.

HP BladeSystem c-Class Benefits Summary

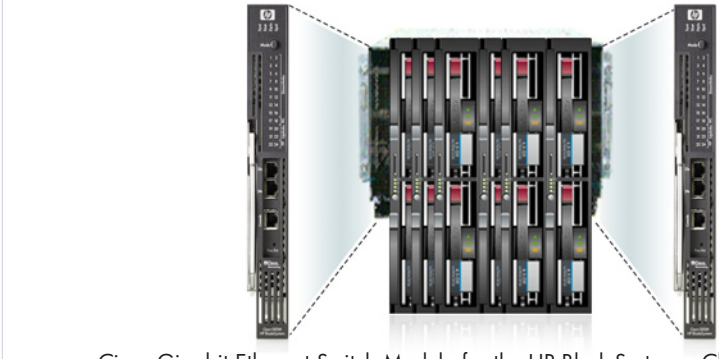
Connecting an HP BladeSystem c-Class server with a blade switch instead of an external switch is:

- **More efficient.** An integrated system consumes up to 20% less power and reduces cables by up to 94%. IT wires the HP BladeSystem just once, and then all other servers take advantage of the same connection.
- **More compact.** Companies can support the same number of integrated servers in 40% less space.
- **More reliable.** Eliminating internal cables avoids the possibility of cable disconnection—the prime cause of server downtime. Shared, redundant power supplies for all blades in the chassis, as well as redundant fans in the HP BladeSystem c-Class server, reduce the number of hardware parts that can fail.
- **Easier to manage.** IT staff manages the blade switch modules with the same management tools and skills used to manage other devices. In addition, management software such as HP OpenView provides IT with a cohesive management view of network devices and servers.
- **Faster to provision.** IT wires the enclosure only once no matter how many blades are subsequently added. After the blade switch modules are installed and provisioned, adding additional server blades typically takes less than 30 minutes.

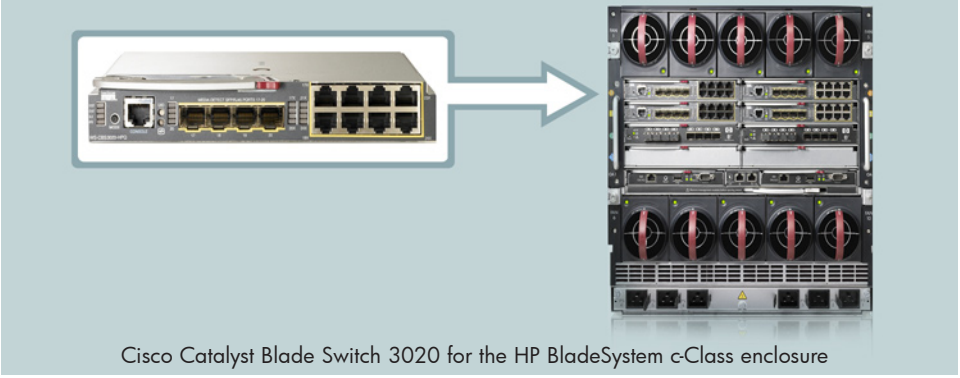
Cisco Blade Switch Modules: Overview

Cisco blade switch modules extend the benefits of the HP BladeSystem to Ethernet networking, increasing the value of the infrastructure investment. Multiple Cisco blade switch modules fit into the HP BladeSystem enclosure to connect all servers while taking advantage of the improved efficiency, lower cost and greater flexibility of the HP blade enclosure design (Figure 1).

Figure 1. Cisco Blade Switch Modules



Cisco Gigabit Ethernet Switch Module for the HP BladeSystem p-Class enclosure



Cisco Catalyst Blade Switch 3020 for the HP BladeSystem c-Class enclosure

Cisco blade switch modules take advantage of the same power supply, cooling and other features of the enclosure design.

Cisco blade switch modules are compatible with well-established Cisco technology standards for management, application-specific integrated circuits and architecture. Therefore, companies experience the high-performance server connectivity they have come to expect from Cisco networking solutions and can take advantage of existing network management skills and tools, including CiscoWorks. Companies that use HP OpenView enjoy simpler management than they would with an external switch because they can view alerts for Cisco blade switch modules and access CiscoWorks from the same management console.

Major Benefits for Business and IT

End-to-End Solution

Cisco blade switch modules interoperate seamlessly with existing Cisco Catalyst switches, avoiding the interoperability problems and business disruption that can result from different implementations of features such as Spanning Tree Protocol and EtherChannel. The Cisco blade switch module can be managed as an integrated component of the HP BladeSystem, easing management requirements. An end-to-end Cisco networking solution also provides networking capabilities not otherwise available, such as Quality of Service, security, network management and multicast support, helping to ensure maximum server uptime.

High Availability and Resiliency

Connecting the HP BladeSystem to the network with a Cisco blade switch module helps increase application availability in the following ways:

- Dramatically reduces the number of connections. An HP BladeSystem with redundant modules and redundant connections needs only four cables, compared to 32 for connection to an external switch. Cables consume 25% of system administration time and are the prime cause of downtime.
- Improves Mean Time Between Failures (MTBF) because Cisco blade switches attach directly to the backplane instead of with Ethernet cables, which can become disconnected.
- Takes advantage of the redundant, heavy-duty power supplies and cooling efficiencies in the HP BladeSystem enclosure.
- Optimizes application performance with wirespeed performance on all ports.
- Enables failover to a redundant Cisco blade switch module in the same enclosure.
- Improves network reliability through enhancements to the Spanning Tree Protocol including: PortFast, UplinkFast, BackboneFast, rootguard and Bridge Protocol Data Unit (BPDU) Guard/Filter, per-VLAN Spanning Tree+ (PVST+) and Unidirectional Link Detection (UDLD).

Integrated Management

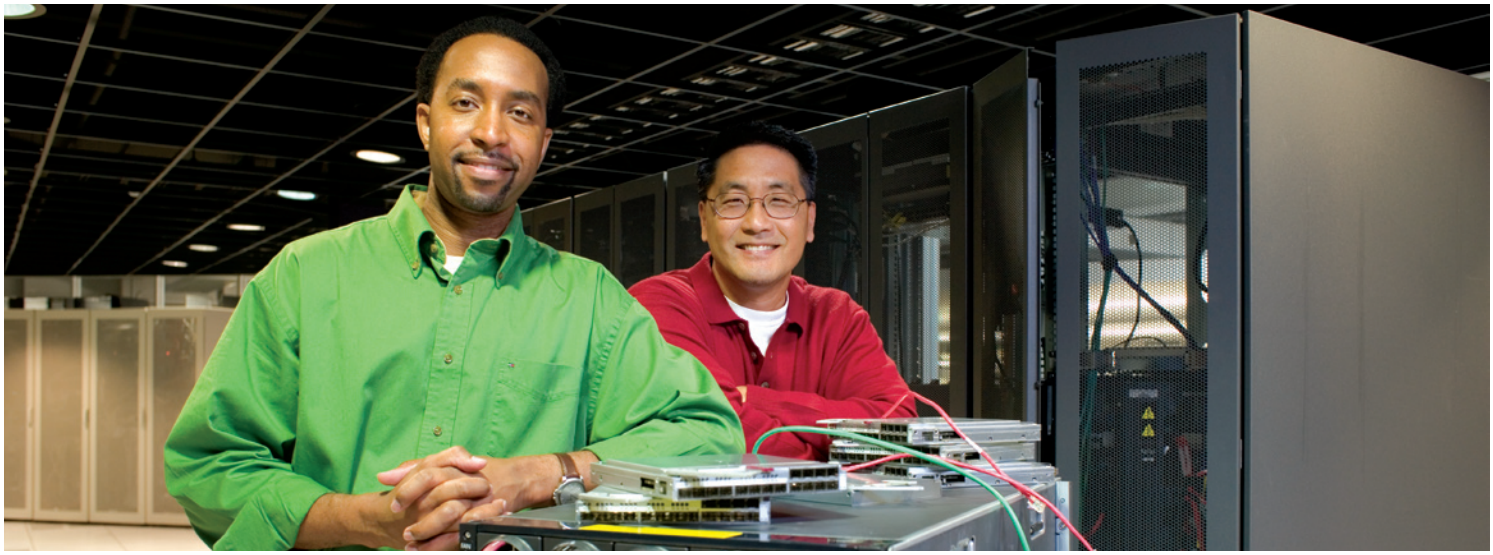
IT can manage HP servers and Cisco network devices in an integrated fashion, using HP System Insight Manager (SIM), HP OpenView and CiscoWorks software. Using a single console to monitor the status of servers as well as switches saves time for IT. The ability to proactively monitor and manage servers and switches

end-to-end saves even more time and can increase availability. Reports on utilization trends and customer service levels help IT plan capacity to sustain service levels, and automated maintenance activities such as updating the Cisco IOS™ Software can free up staff to manage other infrastructure.

HP's SIM software helps simplify provisioning, monitoring and control of the HP BladeSystem infrastructure. By streamlining fundamental IT processes, HP SIM helps ensure that scarce IT talent can focus on a proactive response to business needs instead of a reactive response to system issues or time-consuming manual processes.

Familiar Network Management Tools

IT manages Cisco blade switch modules with the same skills and familiar tools used to manage other Cisco network devices, simplifying diagnostics and avoiding training time and costs. Supported management tools include CiscoWorks, the Cisco IOS™ Software command-line interface (CLI), Simple Network Management Protocol (SNMP) Management Information Bases (MIBs), Telnet interface support, and diagnostic tools like Switched Port Analyzer (SPAN) and Remote SPAN (RSPAN). For enhanced traffic management, monitoring and analysis, the Embedded Remote Monitoring (RMON) software agent in Cisco blade switch modules supports four RMON groups: history, statistics, alarms and events. Cisco Device Manager Software provides an easy-to-use, Web-based management interface that even IT personnel without extensive training can use to quickly set up switches.



Network Security

To protect the availability of mission-critical applications—and keep the business running—enterprises need comprehensive network security, including automatic threat defense against viruses, worms and denial-of-service attacks. Cisco blade switch modules protect the HP BladeSystem with technologies for preventing unauthorized network access, infection and attacks, including network admission control (NAC), 802.1 enhancements, security access control lists and server segmentation using virtual LANs (VLANs) to isolate applications and users. In addition, management commands are sent securely using Secure Shell (SSH) and SNMPv3.

Lower Capital and Operating Costs

Cisco blade switches cost less to acquire than comparable rack-mount switches. Ongoing operational costs are lower, as well, because of:

- Reduced power consumption. Over three years, companies using HP BladeSystem c-Class servers can save more than $130,000 in power costs and more than $67,000 in cooling expenses.[1] The source of the savings is HP Thermal Logic technology, which automatically adjusts cooling, power and processor speed based on real-time requirements.
- Space savings. The HP BladeSystem c-Class requires 40% less floor space than single-unit rack-mount servers.
- Avoidance of business disruption. Fewer cables, power supplies and fans mean fewer points of failure.
- Lower annual support costs. A consolidated service and warranty program for the HP BladeServer and blade switch costs less than separate programs for each.

Greater Agility Through Faster Capacity Expansion

After being wired just once, the HP BladeSystem enclosure can be fully populated with additional blades in an average of less than 30 minutes. Faster capacity expansion helps businesses become adaptive enterprises that can quickly deploy new applications in response to new opportunities and changing business conditions.

Single-Vendor Support

Both the HP BladeSystem and Cisco blade switch modules are supported through HP Consulting, Support, and Break/Fix Services, simplifying upgrades as well as problem resolution. Just one phone call initiates problem resolution, regardless of whether the source is the server or switch.

1. Compared to 320 single-unit rack-mounted servers. Calculation assumes three years of operational use @ $0.10 kilowatts per hour.

Solution Components

- **HP BladeSystem hardware.** Modular data center infrastructure. The HP BladeSystem c-Class enclosure offers innovations in virtualization, power and cooling, as well as system management capabilities that can reduce both operational and capital costs.
- **Management software.** HP System Insight Manager (SIM), HP OpenView and CiscoWorks software enable IT to manage HP servers and Cisco network devices in an integrated fashion.
- **Cisco Gigabit Ethernet Switch Module (for HP BladeSystem p-Class enclosure) or Cisco Catalyst Blade Switch 3020 (for HP BladeSystem c-Class enclosure).** These intelligent Gigabit-Ethernet switches for the HP BladeSystem chassis offer Layer 2+ features and the Cisco IOS™ Software. The access layer resides inside the blade chassis, providing high performance, low-latency server connectivity, server partitioning for security, and resilience.
- **HP Consulting, Support, and Break/Fix Services.** With 69,000 service professionals in 170 countries, HP provides one of the largest IT customer support organizations in the world.

Why HP and Cisco?

An HP BladeSystem with an integrated network switching solution from Cisco Systems provides unique advantages:

- Global companies receive consistent services worldwide because HP is the first Cisco Global Gold Certified Partner, having earned the highest level of Cisco certification. HP's in-depth technology expertise, global strategic partnerships, and more than 40 years of IT experience contribute to quality solutions that deliver high levels of performance and flexibility at low cost.
- Customers gain the benefit of both vendors' breadth and depth of experience. HP's standards-based servers lead the industry with their high processor and memory density, on-board storage and innovations such as built-in integrated lights-out (iLO) technology. Cisco networking solutions, in turn, connect nearly three times as many customers as all other networking vendors combined.
- CiscoWorks and HP OpenView management tools integrate seamlessly, helping IT groups to do more, faster and with less staff.

For more information on Cisco blade switch modules for the HP BladeSystem, contact your HP or Cisco Systems account manager or reseller, or visit us on the Web at: www.hp.com/go/blades or www.cisco.com/go/cbs3020.

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