Cisco Catalyst Blade Switch 3100 Series Design Considerations

Challenge

Companies continue to invest in blade server infrastructure as part of their strategies to manage the sprawl of their server infrastructure. Research continues to show that companies are investing in blade servers at a rate significantly higher than for any other server form factor or the server market in general.

It is easy to understand why, because a migration to blade severs can simplify the server environment, save space, simplify cable management, reduce power consumption, and reduce cooling costs.

However, note as blade servers play a more prominent role in the data center that blade switches do not just provide basic connectivity but also offer a level of function commensurate with their role as a data center access layer switch.

Benefits of the Cisco Catalyst Blade Switch 3100 Series

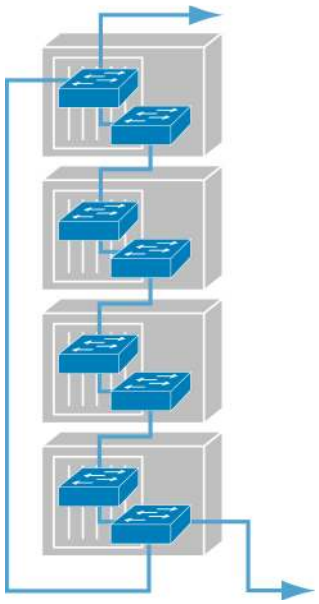
Built on the market-leading Cisco® hardware and Cisco IOS® Software, the Cisco Catalyst® Blade Switch 3100 Series is engineered with innovative technologies specifically designed to meet the rigors of blade server–based application infrastructure. Specifically, the switch is designed to support blade servers in their new role by delivering scalable, high-performance, highly resilient connectivity while supporting ongoing initiatives to reduce server infrastructure complexity and total cost of ownership (TCO).

Cisco Catalyst Blade Switch 3100 Series Solution

The Cisco Catalyst Blade Switch 3100 Series implements a number of technologies and features that provide new options when designing blade server architectures. Specifically, the new switch series provides new options for bandwidth, availability, and flexibility.

The Cisco Catalyst Blade Switch 3100 Series introduces an innovative new technology called the virtual blade switch (VBS). This technology, which allows up to 8 physical switches to be combined into a single logical switch, is the foundation of many of the added functions that the Cisco Catalyst Blade Switch 3100 Series delivers.

Figure 1. VBS technology creates a single virtual switch



Bandwidth

Because the VBS virtualizes network services, the virtual switch can deliver significant bandwidth to meet server and application needs.

- The VBS supports up to 160 Gbps of aggregate bandwidth out of the rack, and the VBS backplane supports 48 Gbps, giving the VBS the capacity to support even the most demanding applications.
- Intra-rack traffic stays in the rack. In many ways, the VBS operates as a top-of-rack switch, which allows better latency and performance for all traffic because intra-rack traffic does not have to traverse an aggregation-layer switch. As applications evolve that are more dependent on east-west traffic flows (for example, Web 2.0 and unified communications), this feature becomes a significant advantage.
- The VBS can double the bandwidth available to a given server by supporting active-active connectivity to that server from two switches, providing a significant advantage when supporting bandwidth-intensive applications.
- The VBS can be used to effectively provide 4 network interface cards (NICs) per server for high-bandwidth deployment scenarios such as dense VMware implementations.

Availability

The VBS takes advantage of link virtualization to deliver improved levels of system and application availability through multiple layers of redundancy.

- The VBS uplinks can use Cisco EtherChannel® technology to provide link redundancy, so a single link failure does not cause loss of connectivity.
- Uplinks can the spread across multiple aggregation layer switches, so an upstream switch failure does not cause loss of connectivity.
- The VBS offers 1:n redundancy. Each switch is a copy of the master switch, so the VBS will survive a physical switch failure.
- A rack can be configured with two VBSs, so each physical rack can connect to two separate VBSs to protect against VBS failure.
- The VBS simplifies Layer 2 and 3 topology because it appears as a single node. This simplification results in a more stable fabric and faster convergence.

Flexibility and Consistency

The Cisco Catalyst Blade Switch 3100 Series offers some unique features that allow flexible deployment of servers and incremental upgrades of bandwidth capacity and software features.

- The VBS allows a mixture of Gigabit Ethernet and 10 Gigabit Ethernet switches to provide investment protection and an incremental path to upgrade bandwidth capacity as needed.
- The master switch coordinates software to help ensure that each switch is running the appropriate image, simplifying the task of adding and removing features.
- Because the VBS runs Cisco IOS Software, end-to-end features such as quality of service (QoS) and security can be implemented in a consistent manner.

Why Cisco?

The Cisco Catalyst Blade Switch 3100 Series delivers a number of options to strengthen a blade server strategy by coupling the traditional advantages of blade servers with Cisco leadership in data center switching solutions.

For More Information

For more information, visit: http://www.cisco.com/go/bladeswitch.

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Printed in USA C11-439793-00 01/08