Simplify your data center infrastructure by consolidating Layer 2-7 LAN switching into IBM @server BladeCenter

Nortel Networks Layer 2-7 Gigabit Ethernet Switch Module for IBM @server BladeCenter

Highlights

This switch helps:

- ***Improve application availability and boost application performance***
- ***Increase application and server scalability***
- ***Simplify server deployment and management***
- ***Enhance application and server security***
- ***Reduce data center Total Cost of Ownership (TCO)***

Enterprises are continuously retooling their data center infrastructure to meet the seemingly insatiable appetite for more IT services and users. This constant retooling has left CIOs with an extremely complex topology in their data centers with many different servers, an array of LAN switches, multiple management consoles and a variety of application-specific appliances—all from different manufacturers. As a result, CIOs are faced with managing this complex infrastructure while having to respond to demands for better performance, higher availability, more scalability and better security—all this with a shrinking IT budget.

New switch solution

IBM provides a solution—the Nortel Networks® Layer 2-7 Gigabit Ethernet Switch Module—a new option that enables you to consolidate full Layer 2-7 LAN switching capabilities into IBM @server BladeCenter™. Consolidation flattens the topology of the data center infrastructure and reduces the number of discreet devices, management consoles and manufacturers that you have to deal with. And the L2-7 Switch Module includes advanced security, high availability and performance features, further reducing the need for discrete function-specific appliances.

The result? Dramatic simplification of the data center infrastructure. And that can translate into faster performance, higher availability, greater scalability, stronger security, simplified management and significantly lower TCO.

The L2-7 Switch Module is the latest addition to the comprehensive consolidation capabilities of the BladeCenter platform that also includes server and storage fibre

switch consolidation. The L2-7 Switch Module allows CIOs to consolidate more of their data center infrastructures into the BladeCenter chassis, continually simplifying the infrastructure.

The L2-7 Switch Module leverages award-winning switching technology in an innovative integrated package. Nortel Networks, an industry-leading developer of communications products and an IBM strategic partner, developed the L2-7 Switch Module specifically for BladeCenter. BladeCenter leads the industry by offering integrated Layer 2-7 switch intelligence.

Improve application availability

The L2-7 Switch Module boosts availability by helping reduce planned and unplanned outages of applications, server blades, switch modules and the BladeCenter chassis.

With the L2-7 Switch Module, you can perform scheduled maintenance—such as upgrading server blade firmware, operating systems and application software, and upgrading L2-7 Switch Module firmware—without shutting down the system.

In addition, the L2-7 Switch Module provides automatic failover at several levels to reduce application outages. Multiple L2-7 Switch Modules in a BladeCenter chassis monitor each other's health as well as the health of every server blade in the chassis and applications running on the server blades. When a L2-7 Switch Module, server blade or application fails, or a server blade is removed for maintenance, the functioning switch module(s) detects the event and automatically switches affected users to designated hot standby server blades. Such failovers are easy, so users are unaware of any system outage.

When there is more than one chassis, the L2-7 Switch Modules in adjacent chassis also monitor each other's health; and in the event of a chassis outage, a designated standby chassis picks up the workload of the failed chassis.

Boost application performance

With its ability to dynamically reallocate compute capacity to more demanding applications, the L2-7 Switch Module enables on demand computing. The switch module can dynamically help repurpose and reallocate server blades where they are most needed, enabling optimum utilization of resources and fast performance. You can also add new server blades to available slots in the chassis to increase computing power—any time. The L2-7 Switch Module automatically recognizes the new blades and optimally directs application traffic to them.

In addition, unlike many network devices that support only "Active-Passive" modes of operation, multiple L2-7 Switch Modules in the same chassis can operate in an "Active-Active" mode. This permits multiple L2-7 Switch Modules to deliver data simultaneously to and from applications and server blades, increasing BladeCenter's overall performance for bandwidth intensive applications.

What's more, the L2-7 Switch Module includes a rich array of built-in, application-specific features. These features enhance application availability, performance and security, and reduce the need to purchase additional function-specific appliances that increase infrastructure complexity and costs.

Increase scalability

The L2-7 Switch Module supports N+1 scalability. Also, it is a key enabling technology for building an on demand computing grid by coupling multiple BladeCenters to create one large virtual "super-server." With the L2-7 Switch Module, you can group server blades and the BladeCenter chassis to create large logical server nodes. You can further group multiple logical server nodes into one massive logical server node. If a logical node fails, the L2-7 Switch Module automatically reassigns the tasks of the failed node to a designated standby node.

Simplify deployment and management

Consolidating rack-optimized servers, Layer 2-7 LAN switches and function-specific appliances into a single package, BladeCenter greatly simplifies deployment by dramatically reducing cabling and rack space requirements, and utilizing common configuration interfaces. Such device consolidation also simplifies data center management and the costs associated with infrastructure deployment. You can now manage multiple servers, LAN switches and appliances with a single management system, such as IBM Director, reducing training requirements and increasing service quality.

The Switch Module installs easily in the rear of the BladeCenter chassis.

Enhance security

The L2-7 Switch Module enhances BladeCenter security via a number of built-in security features. SYN Attack detection and TCP rate limiting help prevent Denial-of-Service attacks. Wirespeed access-list filtering and Network Address Translation (NAT) secure access to physical servers. In addition, the ability of the L2-7 Switch Module to perform deep (Layer 4 and 7) packet inspection helps block application layer attacks and viruses.

In addition to these powerful features, the L2-7 Switch Module strengthens security by consolidating and embedding significant portions of the data center infrastructure functionality into the BladeCenter chassis. That makes the infrastructure much more secure compared to a multitude of discrete devices (servers, LAN switches and function-specific appliances) scattered about the data center.

Reduce TCO

The L2-7 Switch Module flattens the topology of the data center infrastructure, resulting in fewer discrete devices. That can translate into lower capital and operating expenses.

By simplifying the topology and reducing management complexity in the data center, the L2-7 Switch Module helps lower operating expenses. It also helps lower capital expenses because there are fewer devices to purchase, cable and house. In a recent report, IDC estimates that embedding Layer 2-7 switch functionality within the BladeCenter chassis can significantly help reduce costs for server and network infrastructure, in some cases by an additional 33% by bringing similar consolidation and maintenance savings to the networking infrastructure and by further reducing acquisition costs.[1]

Take the next step

Find out more about how BladeCenter with the L2-7 Switch Module can help you improve the availability, performance, scalability, manageability and security of your data center infrastructure—all while helping reduce TCO.

Nortel Networks Switch Module at a glance

Major applications	
Server load balancing	Local server load balancing
	Application health checks
	IP, FTP, LDAP, DNS, RTSP and others
Network device load balancing	VPN
	Intrusion detection
	Uplink to Core Routing Infrastructure
	WAP gateway
Application redirection and load balancing	SSL acceleration
	Cache
	Streaming media
Advanced filtering	Layer 2-7 attributes
	VLAN
	Accept, deny, NAT, redirect
	Rewrite ToS byte
Content intelligence	Layer 7 inspect
	Cookie, URL, HTTP header, user agent
Embedded security services	Access control
	Denial of service attack prevention

Technical specifications	
Total ports: 20	4 External 10/100/1000 Mbps Base TX
	14 Internal 1000 Mbps Base TX
	2 Management (internal) 100 Mbps Base TX
Layer 2 and Layer 3 throughput	Line rate
Concurrent sessions	300,000
Layer 4 sessions per second	Up to 64,000 (with zero session loss)
Layer 7 sessions per second	Up to 28,000 (with zero session loss)
IP routing interfaces	128
Virtual server support	64
Real server support	64
Policy filters	1,024
VLANs	128
Default gateways	255
Trunk groups (for external ports)	2

Network protocol and standards compatibility	
10Base-T/100Base-TX/1000 Base-TX	IEEE 802.3-2000
Spanning Tree	IEEE 802.1d
Logical link control	IEEE 802.2
Flow control	IEEE 802.3x
Link negotiation	IEEE 802.3z
VLANs	IEEE 802.1Q
Frame tagging on all ports when VLANs enabled	IEEE 802.1Q
SNMP support	RFC 1213 MIB-II, RFC 1493 Bridge MIB, RFC 1398 Ethernet-like MIB, RFC 1757 RMON1 (groups 1-4), and RFC 1573 MIB compliant. Alteon Enterprise MIB.
Denial of service attack prevention	IP

For more information

Visit **ibm.com**/servers/eserver/bladecenter/ for more information on BladeCenter and other BladeCenter options.

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[1] IDC's estimate of cost savings was based on factors such as savings from greater application availability, improved manageability and performance. For that reason, any estimate of cost savings from use of this switch is highly dependent on the cost and revenue structure of the business implementing the switch. There is no guarantee of comparable results.

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