

Power your blade-based architecture with high performance 10Gb Ethernet switching



Highlights

- **Industry's-first all-10Gb Ethernet switch module for BladeCenter® H and BladeCenter® HT**
- **Enables high performance computing (HPC) clusters, and bandwidth-intensive and time-sensitive applications. Examples include financial analytics, medical imaging, rendering, Virtualization, Video on Demand, HD IPTV and VOIP.**
 - **Up to 9x lower latency than competitors***
 - **Up to 31% lower latency than Infiniband****
 - **Up to 40Gb throughput per blade using a quad port 10G adapter & four 10G switches**
- **Eliminates the complexity of managing separate network fabrics by enabling consolidation onto 10 Gb Ethernet for networking and iSCSI storage**
- **Simplifies deployment and help reduce costs by integrating Layer 2-3 LAN switching and routing into a single BladeCenter® chassis**
- **Maintains system uptime with unmatched high availability and proven resilience**
- **Helps meet stringent requirements of both enterprise and telecommunication environments, including seamless integration into Cisco® core networks.**

Networks are changing. Voice, video, storage and data are fast converging to form a single backbone. Web 2.0, multimedia content is pushing datacenter bandwidth demand to the edge. The growth of virtualization and consolidation is demanding more I/O bandwidth. Compliance requirements for data archival means that companies need to grow their storage, and provide effective means transmit data to local and remote storage networks. Gigabit Ethernet link aggregation is reaching its limits with cable management issues, power and cooling costs for supporting multiple switches, and administrative overhead. Multi-core processing environments, graphics-heavy processing applications like medical imaging, video production, and HD IPTV all require substantial bandwidth, and sometimes separate network fabrics.

As the demands of mission-critical and real-time applications continue to expand, servers must offer higher processing capabilities in order to keep up. Because existing switch architectures can't handle the data throughput required for these applications, they are fast becoming bottlenecks.

More bandwidth for heavy workloads

BLADE Network Technologies (BNT) Layer 2/3 10Gb Ethernet Switch Module for IBM BladeCenter® H and BladeCenter HT is your answer to bandwidth-intensive applications when using blades equipped with 10G Ethernet adapters from Broadcom, Chelsio or NetXen. Take advantage of the popular Ethernet standard while future proofing your network with 10Gb.



Broadcom 2-port and 4-port 10Gb Ethernet Expansion Card for IBM BladeCenter



NetXen 10Gb Ethernet Expansion Card for IBM BladeCenter

This switch module provides 400Gbps non-blocking, wire-speed bandwidth to meet your application requirements without compromising the integrity of your data. With six 10Gb uplink ports that can be trunked together – and 14 non-blocking 10Gb internal ports—the 10Gb Ethernet Switch Module offers great performance with bandwidth to spare for growing application needs. 10 Gigabit Ethernet at the server edge makes it possible to run applications requiring low latency (as low as 1.60 microseconds) consistently high performance and high availability. Embedded 10Gb Ethernet switching in the BladeCenter decreases application latency and increases reliability as traffic routes securely through the backplane. IBM BladeCenter H and HT can support up to four 10G Ethernet switch modules per chassis providing 240Gb of uplink bandwidth per chassis



Unified networking and storage

A number of IT organizations are starting to look closely at 10G Ethernet as the potential for converged fabric. As we have seen the continued growth of IP SAN's and iSCSI, plus virtualization vendors support, 10G Ethernet is becoming a more compelling technology for networking and storage.

Additionally, BladeCenter H or HT with 10Gb Ethernet iSCSI protocol running over TCP/IP can provide more than double the bandwidth of 4G Fibre Channel switches, with the ease of deployment, flexibility and scalability of Ethernet.

Lower Total Cost of Ownership

With the wide adoption and understanding of Ethernet today, IT resource and skill sets are widely available. Plus the learning curve for IT staff to move from 1G to 10G Ethernet is minimal. Add on top of that the cost per Gb of uplink bandwidth and you will notice that the 10G Ethernet Switch Module is priced extremely competitive, especially compared to other vendors offerings.

By collapsing the networking access layer and aggregation layers into one, these modules can help businesses lower their total cost of ownership. How? Traditional blade Ethernet switches are only used to provide access to the “aggregation/edge switches” from the chassis. These aggregation switches perform all the advanced features, including routing and filtering. But 10Gb ESM next-generation blade switches provide full L2 and L3 capabilities, including OSPF and VRRP dynamic routing, eliminating the need for aggregation layer switches. And of course, fewer discrete devices in a network means fewer potential points of failure, less time spent on management and lower procurement costs. Blade



switches also save money in the long term, by providing more than 4 times the power savings over leading standalone switches with only 3W of power used per 10G port.

Integrating 10Gb Ethernet in the BladeCenter H/HT chassis enables cost-effective 10Gb deployment because of the direct connection between the blades and switches within the chassis. No expensive transceivers and cables between the blade and the switches, means significant acquisition costs savings, in addition to faster deployment and easier management.

High reliability and availability

Because the 10Gb ESM offers integrated, high-availability support in both Layer 2 and 3, it helps minimize single points of failure, ensuring network reliability and performance.

- Layer 2 - high availability is supported with Link Aggregation Control, Rapid Spanning Tree, Cisco® UplinkFast compatibility, PortFast compatibility, 802.1Q VLANs, broadcast storm control and controlled link failover with NIC. VRRP Hot-Standby further enables the effective use of Layer 2 NIC teaming.
- Layer 3 - high availability is supported in a special extended version of VRRP that allows multiple 10Gb ESMs to process traffic in an active-active configuration. The result - all switches in the VRRP group can concurrently process traffic, enabling maximum switch performance while allowing easy failover in the unlikely event of a system problem.

Seamless Integration & Easy management

The 10G ESM is provides:

- **Standards-based integration** into Cisco and other networks that help reduce downtime and learning curves.
- **Common look & feel among BNT switches** (Layer 2/3, Layer 2-7 or 1/10Gb Uplink) helps administrators minimize the learning curve when they have a requirement for different switches.
- **Support for two CLI options**—the BLADEOS CLI, as well as an industry-standard CLI that helps administrators minimize the learning curve for new platforms.
- **Easy software upgrades** through Web user interface, TFTP, telnet or serial download allow for easy adaptation to existing maintenance procedures.
- **Enhanced security and traffic management:** 802.1x with port security allows dynamic, port-based security, providing server authentication. Easy to configure filters in L2 and L3 secure traffic passing through the Layer 2/3 10Gb Ethernet Switch Module by allowing or denying traffic based on MAC address, IP address or VLAN ID. Dedicated VLAN for management traffic between the management module and the switch improves the overall performance, segregating management traffic from data traffic.

For more information

Visit ibm.com/bladecenter

IBM Part Number: 39Y9267

BNT 6-port 10Gb Ethernet Switch Module at a Glance (formerly known as Nortel 10Gb Uplink Ethernet Switch Module)

Interface options	
External ports	Six 10Gb XFP (Requires Optional XFP Transceiver) <ul style="list-style-type: none">• IBM 10GBase-Short Range XFP available from IBM part # 32R1877• 10GBase-CX4 XFP available from BLADE Network Technologies part #BN-CKM-X-CX4 One 10/10/100 Copper RJ-45 used for management or data
Internal ports	14 ports: 10Gb to the server blades Internal 2 ports: 100Base-Tmanagement
Console interface	1 port: RS 232 mini-USB connector
Full Line rate performance	400 Gbps
Latency (average LIFO)	From 1.60 μ sec with 64-byte packets to 4.28 μ sec with 1,518 byte packets
Availability/Resiliency	Ready for mission critical applications: Link Trunk Failover, NIC teaming IEEE 802.1s, d, w, q and ad UplinkFast and Cisco Port Fast compatibility VRRP (RFC2338 + active-active extension) Cisco EtherChannel compatibility Broadcast storm control User configurable hashing options for LACP: SMAC, DMAC, SIP and DIP
MAC Addresses	Up to 16K
VLANs	Customizable Virtual LAN support 1,024 configurable VLANs (802.1Q) 4K VLAN IDs Protocol-based VLANs
Traffic Management/Routing	<ul style="list-style-type: none">• Optimized for best performance:• Relay (RFC 3046)• QoS (metering, remarking, DSCP/CoS)• IEEE 802. BGP 4, RIPv1, RIPv2• OSPF v2 (RFC 2328) with ECMP, OSPF (RFC 3101)• DHCP/BootP 1p (Priority Queues), IEEE 802.3x Flow Control• IGMPv1 (RFC 1112), IGMPv2 (RFC 2236) Multicast Snooping• IGMP Filtering, IP Forwarding• Jumbo Frame (12K), Static Routing
Security	Filtering based on: <ul style="list-style-type: none">○ 802.1x port authentication○ MAC and IP address (source, destination)○ Application type (Telnet, FTP, SMTP, etc.)○ TCP flags (ACK, URG, PSH, RST, SYN, FIN)○ IP address range or TCP port range○ IP options and VLAN ID <ul style="list-style-type: none">• HTTPS• SSH v1/v2 and SNMP v1-3• RADIUS (authentication and accounting) and TACACS+ and LDAP
CLI	Industry-based CLI (Cisco like) BLADEOS CLI
Secure Management	<ul style="list-style-type: none">• Flexible and secure:• Automatic chassis detection• Management via CLI, telnet, Web, SNMP• Secure management via HTTPS, SSH v1/v2, SNMP v1-3• Dual software images• BladeHarmony Manager for cluster management• Upgrade via TFTP, FTP and serial download• Network Time Protocol (multiple servers)• Port Mirroring• Detailed statistics and switch diagnostics• Management ports physically isolated from data ports
Configuration Tracking:	Complete logging of all changes: <ul style="list-style-type: none">• Identification of the user, time and date stamp, parameters changed• Changes attempted and denied• Local log with option to export data to a remote server

* Tolly Group study: <http://www.tolly.com/DocDetail.aspx?DocNumber=206168>

** STAC's Reuters Market Data System study: http://www.bladenetwork.net/userfiles/file/PDFs/WP_STAC_10GbE_RMDS_RH_MRG.pdf

©2009 BLADE Network Technologies, Inc. All trademarks are properties of their respective owners. All rights reserved. Information in this document is subject to change without notice. BLADE Network Technologies assumes no responsibility for any errors that may appear in this document.

MKT090127