

BladeCenter Layer 2/3 Gb Ethernet Switch Modules

BladeCenter Ethernet switches simplify your data center and help lower your cost of ownership



As organizations demand more business applications, data centers have become more complex, cumbersome and expensive to manage. The BladeCenter® platform offers solutions to help lower costs while enhancing performance by accommodating many integration technologies.

The BladeCenter Layer 2/3 Gb Ethernet Switch Modules (GbE SMs) offer integrated switching that lets you consolidate full Layer 2 and Layer 3 LAN switching and routing capabilities into a single BladeCenter chassis, lower costs and simplify deployment. This consolidation helps flatten the data center infrastructure and reduce the number of discrete devices, management consoles and equipment vendors that administrators need to manage. Clients have the choice of either a fiber or copper version of this switch.

Simplify deployment, help reduce costs

The BladeCenter Layer 2/3 GbE SMs¹ offer the following benefits:

- Provide port flexibility and efficient traffic management to improve maintenance.
- Offer significantly high 1 GbE uplink bandwidth, making these switches ideal for applications like virtualization, where you want to limit oversubscription.
- Provide high return on investment through the strong price/performance of the BladeCenter Ethernet switch module options.
- First blade-based switches to offer integrated Layer 2 and enterprise-class Layer 3 functionality available as standard software. The Fiber model is ideal for those needing to carry data over greater distances.



Improve network traffic management and security

By improving availability, the GbE SMs help enhance network traffic management. This is achieved through advanced availability capabilities, including advanced Spanning Tree Protocols and link aggregation control. Application delivery and performance features, such as granular quality of service (QoS), Internet Group Management Protocol (IGMP) snooping and multicast, also help boost availability. Layer 3 filtering helps improve traffic management by simplifying provisioning. It improves security by eliminating routes to a denied destination. With support for a large 16K MAC address forwarding table, larger flat networks with minimum aging activity can be accommodated and broadcast traffic is minimized.

Layer 3 routing also adds security, power and flexibility to BladeCenter. The advanced Layer 3 functionalities, such as Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP) allow the GbE SM to integrate easily into a large, multivendor routed network environment, in addition to allowing the switch to segregate traffic into segments to improve latency and security within each segment. Traffic is contained, allowing communication between blades without using bandwidth to and from an external Layer 3 device, and data is secured inside the chassis. Multilevel defined access helps secure the switch against unauthorized access, while Simple Network Management Protocol (SNMP v3), Secure Shell (SSH v2) and HTTPS help protect switch configuration data.

The line-rate performance eliminates dropped packets for the best performance possible. With support for up to eight priority queues, excellent flexibility and granularity is provided to classify priority traffic in case network congestion occurs.

Maintain high availability

The GbE SMs offer integrated, high-availability support in both Layer 2 and 3 to help minimize single points of failure and deliver network reliability and performance. Layer 2 high-availability support includes link aggregation control, Cisco UplinkFast compatibility, 802.1Q virtual local area networks (VLANs), broadcast storm control and more.

- Uplink Failure Detection supports network adapter teaming, and allows the switch to monitor specific uplink ports to detect link failures. If the switch detects a link failure, it automatically disables specific downlink ports. The corresponding server's network adapter can detect the disabled downlink and trigger a network-adapter failover to another port on the switch or another switch in the chassis.
- Compatibility with Cisco EtherChannel enables trunking on other networking devices.
- 802.1d Spanning Tree Protocol (STP) ensures that only one path to a destination is available at any time by detecting loops and blocking ports as required.
- 802.1w Rapid Spanning Tree Protocol (RSTP) offers fast convergence reducing packet loss and downtime in high-availability and high resilient networks.
- 802.1s Multiple Spanning Tree Protocol (MSTP) provides easy integration, resiliency and availability for network topologies using VLANs into networks running 802.1s. MSTP enables networks to use individual uplinks for separate VLANs, thus improving the overall performance of the network. MSTP also enables network administrators to map multiple VLANs to a reduced number of Spanning Tree instances to provide multiple forwarding paths and load balancing for data traffic.

- Virtual Router Redundancy Protocol (VRRP) in Layer 3 enables redundant router configurations within a LAN, providing alternate router paths for a host to help eliminate single points-of-failure within a network.
- Internet Group Management Protocol (IGMP) Snooping allows the switch to intercept IGMP packets to build multicast tables for hosts that want to receive or stop receiving multicast streams. System x networking product's IGMP snooping capability not only improves the overall bandwidth but also conserves CPU cycles of the servers, thus postponing the need to upgrade servers. Networks that experience heavy multicast traffic, such as Internet Protocol television (IPTV) or Video on Demand (VOD), benefit from the ability to "prune" the traffic so that it travels only to those hosts that require the multicast frames.

Reduce total cost of ownership

The GbE SMs flatten the topology of the data center infrastructure, resulting in fewer discrete devices. You can save on both acquisition costs and operating expenses, because the GbE SMs:

- Reduce cabling costs, in addition to deployment and management time through the elimination of cables running between server blades and upstream switches.
- Use only 27 W per switch, offsetting the growing concern about power and cooling from both an environmental and cost standpoint.

Easy integration and management

The Layer 2/3 GbE SMs provide:

- Standards-based integration into Cisco and other networks that reduce downtime and learning curves with certified interoperability
- Common look and feel among System x networking switches (Layer 2-7, 1/10 Gb Uplink and 10 GbE SM) help administrators minimize the learning curve

- Support for two CLI options—the BLADEOS CLI and industry-standard CLI (Cisco-like) that helps administrators minimize configuration time
- Easy software upgrades through web user interface, Trivial File Transfer Protocol (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 Layers 2 and 3 secure traffic passing through the GbE SM 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 those wanting robust network management capabilities, System x networking products offer optional System x networking Element Manager software. System x networking Element Manager is a web-based, client/server management application for our embedded and top-of-rack switches. Just point and click to administer and monitor switches in a single blade chassis, multiple blade chassis, or large multi-rack deployments. System x networking Element Manager also supports integration with industry-leading enterprise management systems, including IBM Systems Director, and existing authentication servers, improving security and lower training and other costs. Visit ibm.com/networking for more information on System x networking products.

Take the next step

The GbE SMs help significantly consolidate your data center infrastructure with full Layer 2/3 capabilities to improve performance, security, availability and network flexibility, while reducing TCO.

Specifications

Part numbers	32R1860 (Copper) 32R1861 (Fiber)
Form factor	
BladeCenter Layer 2/3 Copper GbE SM	Fits in the standard switch bay of BladeCenter® S, E, T, H, HT or high-speed switch bay when using MSIM
BladeCenter Layer 2/3 Fiber GbE SM	Fits in the standard switch bay of BladeCenter® S, E, T, H, HT or high-speed switch bay when using MSIM
Interface options	
External ports	6 ports: 1000BASE-T or 1000BASE-SX (6 SFPs included) depends on version
Internal ports	14 ports: 1000BASE to the server blades 2 ports: 100 Mbps
Full line-rate performance	40 Gbps or 29.76 million packets per second
Power	27 Watts
Availability/Resiliency	Ready for mission-critical applications: <ul style="list-style-type: none"> • Link Trunk Failover, NIC teaming • IEEE 802.1 (s, d, w, q) • PVRST • VRRP (RFC2338 + active-active extension) • Cisco EtherChannel compatibility • Broadcast storm control • IEEE 802.3 ad • User configurable hashing options for LACP: SMAC, DMAC, SIP and DIP
MAC addresses	Up to 16 K
VLANs	Customizable VLAN support <ul style="list-style-type: none"> • 1,024 configurable VLANs (802.1Q) • 4K VLAN IDs and protocol-based VLANs

Specifications

Optimized traffic management and routing

Security	<p>Filtering based on:</p> <ul style="list-style-type: none"> • 802.1x port authentication • MAC and IP address (source, destination) • Application type (Telnet, FTP, SMTP, and so forth) • TCP flags (ACK, URG, PSH, RST, SYN, FIN) • IP address range or TCP port range, IP options and VLAN ID • HTTPS, SSH v2 and SNMP v1-3 • RADIUS and TACACS+
CLI	Industry-based CLI (Cisco like) and BLADEOS CLI
Secure management	<p>Flexible and secure:</p> <ul style="list-style-type: none"> • Automatic chassis detection • Management through CLI, telnet, Web, SNMP v1 • Secure management via HTTPS, SSH v2, SNMP v1-3 • Dual software images • System Networking Element Manager for cluster management • Upgrade through 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	<p>Complete logging of all changes:</p> <ul style="list-style-type: none"> • Identification of the user, time and date stamp, parameters changed • Changes attempted and denied • Local log with the option to export data to a remote

Why System x

System x is the leading provider of x86 systems for the data center. The portfolio includes rack, tower, blade, dense and converged systems, and supports enterprise class performance, reliability and security. System x also offers a full range of networking, storage, software and solutions, and comprehensive services supporting business needs throughout the IT lifecycle.

For more information

Visit ibm.com/systems/networking for more information or contact your Lenovo marketing representative or Business Partner.

Visit ibm.com/bladecenter for more information on BladeCenter servers, chassis, and other BladeCenter options.

¹ Previously known as Nortel/BNT Layer 2/3 Gigabit Ethernet Switch Module

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