Cisco Catalyst Switch Module 3110 for IBM BladeCenter

The Cisco Catalyst® Switch Module 3110 for IBM BladeCenter represents the next-generation networking solution for blade server environments. Built from the ground up on the purpose-built Cisco® hardware and market-leading Cisco IOS® Software, the Cisco Catalyst Switch Module 3110 (Figure 1) is engineered with unique technologies specifically designed to meet the rigors of blade server–based application infrastructure. Specifically, the switch is designed to deliver scalable, high-performance, highly resilient connectivity while supporting ongoing IT initiatives to reduce server infrastructure complexity and total cost of ownership (TCO).

Figure 1. Cisco Catalyst Switch Module 3110 for IBM BladeCenter

Configurations

The Cisco Catalyst Switch Module 3110 for IBM BladeCenter has two configurations and SKUs.

Configuration 1: Cisco Catalyst Switch Module 3110G for IBM BladeCenter

- Supports up to 4 Gigabit Ethernet uplink ports: 4 10/100/1000BASE-T ports

Configuration 2: Cisco Catalyst Switch Module 3110X for IBM BladeCenter

- Supports one X2-based 10 Gigabit Ethernet port

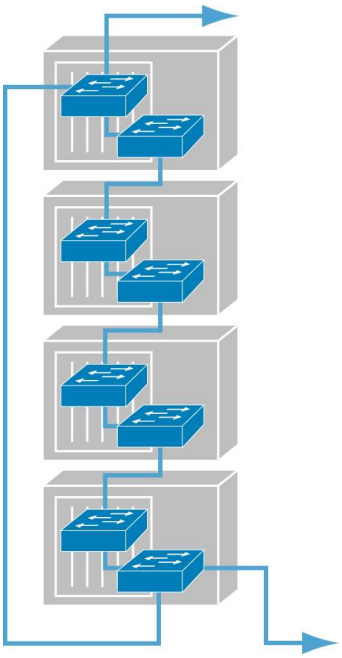
Virtual Blade Switch Technology

With the Cisco Catalyst Switch Module 3110, Cisco introduces a unique technology called the virtual blade switch (VBS). This switch virtualization technology treats interconnected physical switches within a rack as one logical switch (Figure 2).

Main Benefits of VBS Technology

- VBS reduces infrastructure complexity, improves network resiliency, and increases the operational manageability of the blade-switching environment.
- VBS offers exceptional scalability by providing up to 80 Gbps of upstream bandwidth.
- VBS can increase the bandwidth available to a server sixfold.
- Because the VBS appears as a single node, both the Layer 2 and Layer 3 topologies are greatly simplified, increasing fabric stability and reducing convergence times after a topology change.
- The capability to mix-and-match 10 Gigabit Ethernet switches provides customers with a cost-effective migration path. In addition, the advanced operations and troubleshooting tools reduce operating expenses.

Figure 2. Switches in a Rack Are Treated as a Single Logical Switch



Cisco Catalyst switch modules provide an easy, smart, and flexible blade server I/O solution that allows customers to reap the full benefits offered by the blade server architecture:

- **Easy:** Easy to operate and deploy
  - Because there are fewer switches to manage with VBS technology, helps solve the problem of switch sprawl
  - Provides consistent management interface and tools throughout the Cisco data center and blade switch portfolio, accelerating service provisioning and simplifying troubleshooting
  - Through VBS technology, provides operational transparency and efficiency during replacement and addition of switches
- **Smart:** Feature-rich, “server-smart” networking solution
  - Provides highly resilient LAN uplinks to increase blade server and virtual machine availability using innovations such as trunk failover and EtherChannel
  - Helps secure application servers and virtual machines using private VLANs and access control lists (ACLs)
  - Provides intelligent congestion management mechanisms to optimize network bandwidth using quality of service (QoS)
  - Provides advanced Layer 2 and 3, IPv4 and IPv6, and multicast capabilities to facilitate smart end-to-end server networking in the data center
- **Flexible:** Flexible solution to scale resources and facilitate data center virtualization
  - Through VBS, provides flexibility to configure network topology based on application needs such as performance, scalability, and resiliency
  - Through VBS, provides investment protection and a flexible transition path with the capability to mix and match Gigabit Ethernet and 10 Gigabit Ethernet switches
  - Provides flexible options for configuration and management such as a command-line interface (CLI) and a GUI

Cisco Catalyst Switch Module 3110 Software

The Cisco Catalyst Switch Module 3110 ships with the IP Base feature set. The IP Base feature set includes advanced QoS, a suite of security features, rate-limiting, ACLs, and basic static and Routing Information Protocol (RIP) routing capability.

Customers can upgrade the software to the IP Services feature set. The IP Services feature set provides a richer set of enterprise-class features, including advanced hardware-based IP unicast and multicast routing: Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Protocol Independent Multicast (PIM), IPv6, and so on.

Features and Benefits

Table 1 summarizes the features and benefits of the Cisco Catalyst Switch Module 3110.

Table 1. Features and Benefits

Features	Benefits
Ease of use • Capability to virtualize 8 switches into 1 • Automatic software version checking • Automatic configuration synchronization • Dynamic Trunking Protocol (DTP)	• Reduces network complexity and simplifies configuration and maintenance • Provides automatic configuration and versioning that allows true immediate availability (plug-and-play) capabilities during scheduled maintenance
Availability • Multiswitch EtherChannel • Trunk failover • FlexLink • Rapid Spanning Tree Protocol (RTSP) • Multiple Spanning Tree (MST) Protocol	• Increases resiliency and availability during switch failures • Quickly reroutes traffic during uplink failures • Achieves convergence within 100 milliseconds (ms) during link failures • Provides fast convergence to reduce downtime during spanning-tree failures
QoS • Wire-rate QoS performance • Policing and rate limiting • Traffic shaping • Queuing	• Provides industry-leading mechanisms for marking, classification, and scheduling to deliver superior performance for data, voice, and video traffic, all at wire speed • Can prioritize traffic based on application criticality • Can tightly control the amount of traffic a particular server or application can send or receive
Security • Dynamic Address Resolution Protocol (ARP) Inspection (DAI) • Dynamic Host Configuration Protocol (DHCP) snooping • IP source guard • Private VLANs • Unicast Reverse Path Forwarding (URPF) • IEEE 802.1x port-based security • ACLs and VLAN ACLs (VACLs) • Secure Shell (SSH) Protocol • MAC address notification • Port security • Spanning Tree Protocol root guard and Bridge Protocol Data Unit (BPDU) guard	• Provides comprehensive set of security features for connectivity and access control • Defends the network against various smurf, “man-in-the-middle,” and denial-of-service (DoS) attacks • Protects against excessive broadcasts and multicasts
High-performance IP routing • RIPv1 and v2, OSPF, EIGRP, and BGPv4 • IPV6 Bridge Protocol Data Unit (RIPng) and OSPFv3 • Policy-based routing (PBR) • IP multicast routing (PIM Sparse Mode [SM], Dense Mode [DM], and Sparse-Dense Mode [SDM])	• Provides feature-rich routing options to bring Layer 3 intelligence to the access switches • Helps ensure effective use of bandwidth resources by supporting Layer 3 multicast • Better utilizes network resources through load balancing

Features	Benefits
Manageability • Single IP address for up to 8 switches • Cisco IOS Software CLI • SPAN and Remote SPAN (RSPAN) support • Layer 2 traceroute • Traffic statistics: Packet and error counters • Simple Network Management Protocol (SNMP) v1, v2, and v3 • Remote monitoring (RMON) • Cisco Discovery Protocol • Limited support for Cisco IOS Embedded Event Manager (EEM)	• Uses the user interface and command set common to all Cisco routers and Cisco Catalyst switches • Can remotely monitor ports in a Layer 2 switch network from any other switch in the same network • Provides rich set of MIB and object identifier (OID) support for comprehensive in-band management • Provides excellent troubleshooting resources, including debugging tools, logs, and counters, to enable quick diagnosis of network problems
Management tools • CiscoWorks LAN Management Solution (LMS) • Cisco Network Assistant • Cisco Device Manager	• Provides powerful management tools that simplify the configuration, administration, monitoring, and troubleshooting of Cisco networks • Improves the accuracy and efficiency of operations staff and increases the overall availability of the network

Product Specifications

Table 2 lists hardware specifications, Table 3 lists management and standards support, and Table 4 lists safety and compliance information for the Cisco Catalyst Switch Module 3110.

Table 2. Hardware Specifications

<table>
<tr><th>Description</th><th colspan="5">Specification</th></tr>
<tr><td>Performance</td><td colspan="5">• Up to 128-Gbps switching fabric
• Forwarding rate based on 64-byte packets; up to 35.5 million packets per second (mpps)
• 256 MB double-data-rate (DDR) synchronous dynamic RAM (SDRAM) and 64 MB flash memory
• Configurable maximum transmission units (MTUs) of up to 9018 bytes (jumbo frames)
• MAC, routing, security, and QoS scalability numbers depend on the type of template used in the switch:</td></tr>
<tr><td></td><td></td><td>Default Template</td><td>Access Template</td><td>VLAN Template</td><td>Routing Template</td></tr>
<tr><td></td><td>MAC addresses</td><td>6K</td><td>4K</td><td>12K</td><td>3K</td></tr>
<tr><td></td><td>IGMP groups and multicast routes</td><td>1K</td><td>1K</td><td>1K</td><td>1K</td></tr>
<tr><td></td><td>Total unicast routes</td><td>8K</td><td>6K</td><td>0</td><td>11K</td></tr>
<tr><td></td><td>Directly connected hosts</td><td>6K</td><td>4K</td><td>0</td><td>3K</td></tr>
<tr><td></td><td>Indirect routes</td><td>2K</td><td>2K</td><td>0</td><td>8K</td></tr>
<tr><td></td><td>Security access control entries</td><td>1K</td><td>2K</td><td>1K</td><td>1K</td></tr>
<tr><td></td><td>QoS access control entries</td><td>0.5K</td><td>0.5K</td><td>0.5K</td><td>0.5K</td></tr>
<tr><td></td><td>PBR access control entries</td><td>0</td><td>0.5K</td><td>0</td><td>0.5K</td></tr>
<tr><td>Connectors and Cabling</td><td colspan="5">SKU 1: Cisco Catalyst Switch Module 3110G
• Supports up to 4 Gigabit Ethernet uplink ports: 4 10/100/1000BASE-T ports
SKU 2: Cisco Catalyst Switch Module 3110X
• Supports one X2-based 10 Gigabit port
Common on both SKUs
• Management console port: RJ-45-to-DB9 cable for PC connections
• 2 high-speed stack connectors
Table 5 later in this document lists supported X2 modules.</td></tr>
<tr><td>Power Consumption</td><td colspan="5">12V at 3.75A (45W) (max)</td></tr>
</table>

Description	Specification
Indicators	Total of 12 LEDs on the faceplate for Cisco Catalyst Switch Module 3110G: • 8 LEDs for uplink port status • 4 switch-status LEDs Total of 6 LEDs on the faceplate for Cisco Catalyst Switch Module 3110X: • 2 LEDs for uplink port status • 4 switch-status LEDs
Dimensions (L x W x H)	10.2 x 4.4 x 1.2 in. 26 x 11.2 x 3 cm
Weight	Approximately 2.5 lb (1.14 kg)
Environmental Ranges	• Operating temperature: 32°to 104°F (0 to 40°C) • Storage temperature: -13°to 158°F (–25 to 70°C) • Operating relative humidity: 10 to 85% noncondensing • Storage relative humidity: 5 to 95% noncondensing
Predicted Mean Time between Failure (MTBF)	Approximately 436,000 hours

Table 3. Management and Standards Support

Description	Specification	
MIB support	• BRIDGE-MIB • CISCO-CDP-MIB • CISCO-CLUSTER-MIB • CISCO-CONFIG-MAN-MIB • CISCO-ENTITY-FRU-CONTROL-MIB • CISCO-ENVMON-MIB • CISCO-FLASH-MIB • CISCO-FTP-CLIENT-MIB • CISCO-HSRP-MIB • CISCO-HSRP-EXT-MIB • CISCO-IGMP-FILTER-MIB • CISCO-IMAGE-MIB • CISCO-IP-STAT-MIB • CISCO-L2L3-INTERFACE-CONFIG-MIB • CISCO-POE-EXTENSIONS-MIB • CISCO-MAC-NOTIFICATION-MIB • CISCO-MEMORY-POOL-MIB • CISCO-PAGP-MIB • CISCO-PING-MIB • CISCO-PROCESS-MIB • CISCO-RTTMON-MIB • CISCO-STP-EXTENSIONS-MIB • CISCO-SYSLOG-MIB • CISCO-TCP-MIB • CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB • CISCO-VLAN-MEMBERSHIP-MIB	• CISCO-VTP-MIB • ENTITY-MIB • ETHERLIKE-MIB • IF-MIB • IGMP-MIB • IPMROUTE-MIB • OLD-CISCO-CHASSIS-MIB • OLD-CISCO-FLASH-MIB • OLD-CISCO-INTERFACES-MIB • OLD-CISCO-IP-MIB • OLD-CISCO-SYS-MIB • OLD-CISCO-TCP-MIB • OLD-CISCO-TS-MIB • OSPF-MIB (RFC 1253) • PIM-MIB • RFC1213-MIB • RFC1253-MIB • RMON-MIB • RMON2-MIB • SNMP-FRAMEWORK-MIB • SNMP-MPD-MIB • SNMP-NOTIFICATION-MIB • SNMP-TARGET-MIB • SNMPv2-MIB • TCP-MIB • UDP-MIB

Description	Specification
Standards	• IEEE 802.1s • IEEE 802.1w • IEEE 802.1x • IEEE 802.3ad • IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports • IEEE 802.1D Spanning Tree Protocol • IEEE 802.1p CoS Prioritization • IEEE 802.1Q VLAN • IEEE 802.3 10BASE-T specification • IEEE 802.3u 100BASE-TX specification • IEEE 802.3ab 1000BASE-T specification • IEEE 802.3z 1000BASE-X specification • 10GBASE-SR • 10GBASE-LR • 10GBASE-LX4 • 10GBASE-LRM • 10GBASE-CX4 • RMON I and II standards • SNMPv1, SNMPv2c, and SNMPv3

Table 4. Safety and Compliance

Description	Specification
Safety certifications	• UL/CUL Recognition to UL/CSA 60950-1 • TUV Bauart to EN 60950-1 • CB report and certificate to IEC 60950-1 with all country deviations • CE Marking
Electromagnetic compatibility certifications	• FCC Part 15 Class A • EN 55022 Class A (CISPR22 Class A) • EN55024 (CISPR24) • VCCI Class A • AS/NZS CISPR22 Class A • MIC • China EMC requirements • GOST
Telecommunications	CLEI code
Warranty	90 days

Ordering Information

Table 5 lists ordering information for the Cisco Catalyst Switch Module 3110.

Table 5. Ordering Information

Part Number	Description
Switches	
WS-CBS3110G-S-I	Cisco Catalyst Switch Module 3110G for IBM BladeCenter w/ IP Base
WS-CBS3110X-S-I	Cisco Catalyst Switch Module 3110X for IBM BladeCenter w/ IP Base
Upgrade Licenses	
3110-IPS-LIC-I	Software Upgrade License for Cisco Catalyst Switch Module 3110 to IP Services
X2 Modules	
X2-10GB-CX4=	10GBASE-CX4 X2 Module
X2-10GB-SR=	10GBASE-SR X2 Module
X2-10GB-LRM=	10GBASE-LRM X2 Module
X2-10GB-LX4=	10GBASE-LX4 X2 Module

Part Number	Description
X2-10GB-LR=	10GBASE-LR X2 Module
Cisco SMARTnet® Options	
CON-SNT-CBS3110G	Cisco SMARTnet with 8x5 next business day (NBD) hardware advance replacement
CON-SNTE-CBS3110G	Cisco SMARTnet with 8x5 4-hour hardware advance replacement
CON-SNTP-CBS3110G	Cisco SMARTnet with 24x7 4-hour hardware advance replacement
CON-S2P-CBS3110G	Cisco SMARTnet with 24x7 2-hour hardware advance replacement
CON-SNT-CBS3110X	Cisco SMARTnet with 8x5 next business day (NBD) hardware advance replacement
CON-SNTE-CBS3110X	Cisco SMARTnet with 8x5 4-hour hardware advance replacement
CON-SNTP-CBS3110X	Cisco SMARTnet with 24x7 4-hour hardware advance replacement
CON-S2P-CBS3110X	Cisco SMARTnet with 24x7 2-hour hardware advance replacement

Service and Support

Cisco is committed to reducing TCO and offers technical support services to help ensure that Cisco products operate efficiently, remain highly available, and benefit from the most up-to-date system software. Table 6 describes service and support that is available directly from Cisco and through resellers.

Table 6. Service and Support

Technical Support Service	Features	Benefits
Cisco SMARTnet	• Access to Cisco IOS Software updates • Web access to technical support tools and repositories • 24-hour telephone support through the Cisco Technical Assistance Center (TAC) • Advance replacement of hardware	• Minimizes network downtime through reliable day-to-day support and prompt resolution of critical network issues • Lowers TCO by using Cisco networking expertise and knowledge • Protects network investments through Cisco IOS Software updates that provide patches and new functions

For More Information

For more information about Cisco products visit http://www.cisco.com, or contact:

- United States and Canada (toll free): 800-553-6387
- Europe: 32-2-778-4242
- Australia: 612-9935-4107
- Other: 408-526-7209

For more information about the IBM BladeCenter, visit http://www.ibm.com.

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