

IBM eServer™ BladeCenter™: Switch Module Solutions

Highlights

IBM and Intel® have made publicly available the design specification for compatible networking switches, blade adapter cards (daughter cards), and appliance and communications blades for the IBM eServer BladeCenter™ platform. The open BladeCenter design specification is intended to enable hardware developers to now more easily develop and build compatible blade products in these categories and participate in the rapidly growing blades marketplace served by the IBM eServer BladeCenter and Intel Enterprise Blade Server platforms. Through the release of the design specification, we can harness the development power of the industry and deliver a more comprehensive solution roadmap for our diverse customer base.

Highlighted here is an overview of the content for the Blade Server Base Specification for Switch Module Subsystems volume of the base specification. For more information and access to the open design specification, go to:

<http://www.ibm.com/servers/eserver/bladecenter/signin.html>

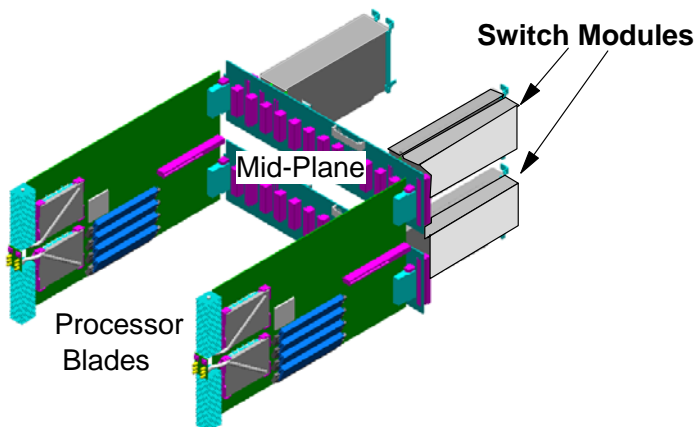


Figure 1. Location of Switch Modules on Mid-Plane

Functional Overview

The standard IBM eServer BladeCenter chassis is a 7U, rack-mounted enclosure which provides 14 slots for Processor Blades. The BladeCenter chassis will accept a wide variety of Processor Blades that can deliver enhanced capabilities. The chassis mid-plane provides interconnections and communication paths among the blades, power, fan control, Management Modules, high-speed communication Switch Modules, and shared resources such as front and back-panel LEDs, CD-ROM drive, and diskette drive. These interfaces are duplicated on the mid-plane through two identical sets of connectors to provide redundancy and eliminate single points of failure.

Each Processor Blade is capable of up to four networking connections via point-to-point links across the mid-plane to each of the four Switch Module slots. At a minimum, BladeCenter requires one Switch Module for communication between Processor Blades, Management Modules and the outside environment. Additional switch Modules may be added for the purpose of providing redundancy, speed expansion, or additional function. Each switch Module provides external links (the actual number may vary: 2, 4, or 6 ports), fourteen internal point-to-point (up to 2.5 Gbps) links to the Processor Blades, two point-to-point internal 100 Mbps Ethernet links to the Management Modules, and two I²C interfaces to the Management Modules. The Switch Module should provide an IP path between the Processor Blades and the Management Modules. Other signals for the switch Module include power, slot ID, and presence indicator. Since the internal interfaces are across the mid-plane, SerDes technology is utilized in order to save cost, power and space. Each point-to-point connection consists of two differential pairs (i.e., transmit and receive) with the peak-to-peak transmit differential voltage in the 750 to 1700 mV range and the peak-to-peak receive differential voltage in the 200 to 1700 mV range. Any type of defined Switch Module (e.g., Ethernet, Fibre Channel, etc.) may be inserted into slots 3 and 4. The Processor Blade I/O card(s) must match the installed Switch Module type.

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Board: 247.6 x 100 mm
 Thickness: 2.54 mm
 Enclosure: 259.8 x 111.8 x 28.1 mm
 Sheet metal enclosure with removable cover
 EMC protection:
 one gasket on left of enclosure and multiple gaskets on the chassis
 Retention: single cam lever with snap latch

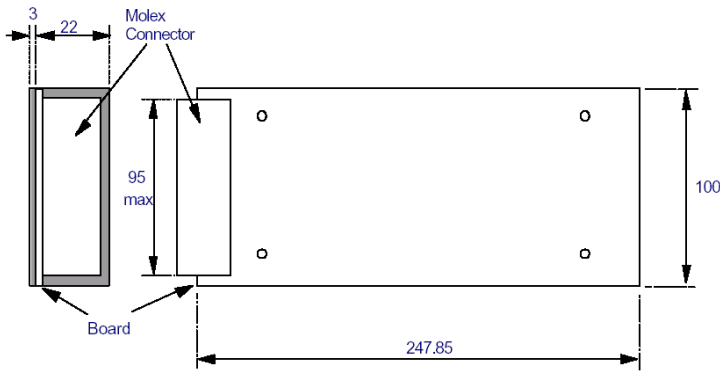


Figure 2: View of Switch Module board and connector

Connectors: Molex VHDM signal and power with an alignment pin

Cooling: 45 Watt max heat dissipation
 Air flow : 150 to 400 LFM vertical (top => bottom / bottom -> top)
 Max Temperature rise : 20 C
 Nominal air inlet temperature (based on a 23 C server inlet air temperature): 40 C
 Maximum air inlet temperature (based on a 35 C server inlet air temperature): 52 C

Interface (LEDs, buttons, connectors)
 LED per external port: Activity, Link
 LED per Module: OK, Fault
 Connectors: Based on switch type (Ethernet, Fibre Channel, etc.)

Signal pins	Qty	Wire Count	Type	Destination
Network	14	4	I/O – 1-2.5 Gbps	Processor Blades
Mgmt Enet	2	4	I/O – 100Mbps	Management Mod
Mgmt I2C	2	3	I/O – 100 Kbps	Management Mod
Presence/ID	1	4	1 out, 3 in - DC	Management Mod
MM Failover	2	1	In - DC	Management Mod
I2C reset	1	1	In - DC	Management Mod
GND	62	1	In - DC	Chassis Gnd
total		139		
Power pins	Qty	Wire Count	Type	Destination
12V	2	1	In - DC	2 Power Mod
GND	2	1	In - DC	Chassis Gnd
total		4		

Table 1: Pins available on the interface connector

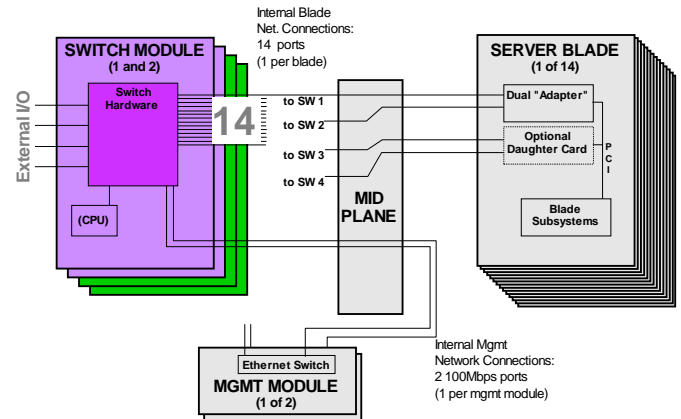


Figure 3: Block diagram of BladeCenter components



Open Specifications for Industry suppliers

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The *BladeServer Base Specification for Switch Module Subsystems* contains the following sections:

1. Preface
2. Switch Module Overview
3. Chassis configurations
4. Interface Definitions
 - 4.1 External Switch Interface(s)
 - 4.2 Internal Switch Interfaces
 - 4.2.1 Processor Blade Interfaces
 - 4.2.2 Management Module Interfaces
 - 4.3 User Interface
 - 4.3.1 Switch Management
 - 4.3.2 SNMP/MIB
 - 4.3.3 SNMP Traps
 - 4.3.4 Text Sessions for Management
 - 4.3.5 RS232 Serial Port
 - 4.3.6 Web Browser Management Interface
 - 4.3.7 Other Basic Functions
- 5 External user Indicators and Controls
 - 5.1 System LED Indicators
 - 5.2 Behavior of OK and Fault LED's
- 6 Power and Thermal
 - 6.1 Power
 - 6.2 Hot Plug Capabilities
 - 6.3 Reset
 - 6.4 Thermal/Environmental Requirements
- 7 Mid-Plane Pin Assignment and Signal Description
- 8 I²C Interface Architecture
 - 8.1 Overview
 - 8.1.1 I²C Bus Transactions
 - 8.2 Reference I²C Electrical Design
 - 8.3 I²C VPD Specification
 - 8.3.1 I²C Bus Definitions for VPD Address Space
 - 8.3.2 I²C Bus Operations for VPD Address Space
 - 8.3.3 I²C VPD Operational Latency
 - 8.3.4 VPD Tables
 - 8.4 I²C Register Specification
 - 8.4.1 I²C Bus Operations for Register Address Space
 - 8.4.2 I²C Register Operational Latency
 - 8.5 I²C Register Descriptions
 - 8.6 Management Module Usage Scenarios
- 9 Switch Mechanical
 - 9.1 General dimensions
 - 9.2 Switch Module Mechanical Drawings
 - 9.3 Chassis Requirements
- 10 Firmware Upgradeability
- 11 Agency Compliances
 - 11.1 Enterprise Server Requirements
 - 11.2 Telco Server Requirements

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