Intel® Server FC Expansion Card SBFCM: Installation and User's Guide

A Guide for Technically Qualified Assemblers of Intel® Identified Subassemblies and Products

Order Number: C39675-002

Contents

Safety and regulatory information

✏ **NOTE**

The service procedures are designed to help you isolate problems. They are written with the assumption that you have model-specific training on all computers, or that you are familiar with the computers, functions, terminology, and service information provided in this manual.

Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions. See *Intel Server Boards and Server Chassis Safety Information* on the Resource CD and/or at http:\\support.intel.com.

Wichtige Sicherheitshinweise

Lesen Sie zunächst sämtliche Warn- und Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie hierzu auch die Sicherheitshinweise zu Intel-Serverplatinen und -Servergehäusen auf der Ressourcen-CD oder unter http:\\support.intel.com.

重要安全指导

在执行任何指令之前，请阅读本文档中的所有注意事项及安全声明。参见 Resource CD（资源光盘）和/或 http:\\support.intel.com 上的 *Intel Server Boards and Server Chassis Safety Information*（《Intel 服务器主板与服务器机箱安全信息》）。

Consignes de sécurité

Lisez attention toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction. Consultez *Intel Server Boards and Server Chassis Safety Information* sur le CD Resource CD ou bien rendez-vous sur le site http:\\support.intel.com.

Instrucciones de seguridad importantes

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea *Intel Server Boards and Server Chassis Safety Information* en el CD Resource y/o en http:\\support.intel.com.

General Safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.

- Do not perform any action that causes hazards to the customer, or makes the equipment unsafe.

- Keep your tool case away from walk areas so that other people will not trip over it.

- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.

- Insert the ends of your necktie or scarf inside clothing, or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.

- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing. **Remember:** Metal objects are good electrical conductors.

- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.

- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.

- Reinstall all covers correctly before returning the machine to the customer.

Electrical Safety

⊠⊠**CAUTION:**

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the server system power cords, telecommunication systems, networks, and modems before you open the server covers, unless instructed otherwise in the installation and configuration procedures.

✏ **Important: Disconnect all power before performing a mechanical inspection. Observe the following rules when working on electrical equipment.**

- **Disconnect all power before performing a mechanical inspection.**

- Before you start to work on the machine, unplug the power cord or power-off at the wall box that supplies power to the machine and to lock the wall box in the off position.

- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box (that supplies power to the machine) and to lock the wall box in the off position.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.

- Do not use worn or broken tools and testers.

- Never assume that power has been disconnected from a circuit. First, check that it has been powered-off.

- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.

- Do not touch live electrical circuits with the reflective surface of a plastic dental inspection mirror. The surface is conductive; such touching can cause personal injury and machine damage.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (IC) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the server, the part, the work mat, and the person handling the part are all at the same charge.

✏ **NOTE**

Use product-specific ESD procedures when they exceed the requirements noted here.

Make sure that the ESD-protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.

- Avoid contact with other people.

- Wear a grounded wrist strap against your skin to eliminate static on your body.

- Prevent the part from touching your clothing. Most clothing insulates and retains a charge even when you are wearing a wrist strap.

- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.

- Select a grounding system, such as those in the following list, to provide protection that meets the specific service requirement.

    ✏ **NOTE**

    The use of a grounding system is desirable but not required to protect against ESD damage.

    Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.

    Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.

    Use the round ground-prong of the AC plug on AC-operated computers.

DANGER

Electrical current from power, telephone and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**

- **Connect all power cords to a properly wired and grounded electrical outlet.**

- **Connect to properly wired outlets any equipment that will be attached to this product.**

- **When possible, use one hand only to connect or disconnect signal cables.**

- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**

- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedure**s.

- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect	To Disconnect
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

CAUTION:
If your system has a module containing a lithium battery, replace it only with the same or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

CAUTION:
When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

✎ **DANGER**

✎ **Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:**

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

CAUTION:
Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

Regulatory specifications and disclaimers

Safety compliance:	
USA:	UL 60950 - 3rd Edition/CSA 22.2. No. 60950

Canada:	cUL certified - 3rd Edition/CSA 22.2. No. 60950- for Canada (product bears the single cUL mark for U.S. and Canada)
Europe:	Low Voltage Directive, 73/23/EEC TUV/GS to EN60950 2nd Edition with Amendments, A1 = A2+A3+A4
International:	UL/CB to IEC 60950 3rd Edition UL/CB - EN60 950 3rd Edition UL/CB - EMKO-TSE (74-SEC) 207/94
Australia/New Zealand:	CB Report to IEC 60950, 3rd Edition plus international deviations

Electromagnetic compatibility (EMC):	
USA:	FCC CFR 47 Part 2 and 15, Verified Class A Limit
Canada:	IC ICES-003 Class A Limit
Europe:	EMC Directive, 89/336/EEC
	EN55022, Class A Limit, Radiated & Conducted Emissions
	EN55024 ITE Specific Immunity Standard
	EN61000-4-2 ESD Immunity (Level 2 Contact Discharge, Level 3 Air Discharge)
	EN61000-4-3 Radiated Immunity (Level 2)
	EN61000-4-4 Electrical Fast Transient (Level 2)
	EN61000-4-5 AC Surge
	EN61000-4-6 Conducted RF
	EN61000-4-8 Power Frequency Magnetic Fields
	EN61000-4-11 Voltage Dips and Interrupts
Japan:	VCCI Class A ITE (CISPR 22, Class A Limit)
Australia/New Zealand:	AS/NZS 3548, Class A Limit
Taiwan:	BSMI Approval
Korea:	RRL Approval
Russia:	GOST Approval
International:	CISPR 22, Class A Limit

Electromagnetic compatibility notices (USA):

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

✎ **NOTE**

Class A device definition: If a Class A device is installed within the is system, then the system is to be considered a Class A system. In this configuration, operation of this equipment in a residential area is likely to cause harmful interference.

Electromagnetic compatibility notices (International):

Europe (CE Declaration of Conformity): This product has been tested in accordance to, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

Japan EMC Compatibility:

この装置は、情報処理装置等電波障害白主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

English translation of the notice above: This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

ICES-003 (Canada): Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadian des Communications.

English translation of the notice above: This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Canadian Department of Communications.

BSMI (Taiwan): The BSMI Certification number and the following warning is located on the product safety label which is located visibly on the external chassis.

警告使用者:
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

RRL Korea:

기 종 별	사 용 자 안 내 문
A급 기기	이 기기는 업무용으로 전자파 적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.
B급 기기	이 기기는 가정용으로 전자파 적합등록을 한 기기로서 주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

※ 비고
A급 기기 : 업무용 정보통신기기를 말한다.
B급 기기 : 가정용 정보통신기기를 말한다.

English translation of the notice above: If this device is certified by MIC-RRL (Korea EMC requirement), the following user's information shall be put on the conspicuous location of the front page of user's manual.

Device	User's Information
Class A device	This device complies with RRL EMC and is operated in commercial environment so that distributors or users pay attention to this point. If the product is sold or purchased improperly, please exchange this product to what can be used at home.
Class B device	This device complies with RRL EMC and is operated in a residential area so that it can be used at all other location as well as residential area.
Remark: Class A device - operated in a commercial area. Class B device - operated in a residential area.	

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1 Introduction

This *Installation and User's Guide* contains instructions for installing your Intel® Server FC Expansion Card SBFCM in the Intel® Server Compute Blade system. This publication contains information about:

- Installing and configuring the expansion card
- Updating the BIOS code and device drivers of the expansion card

The Fibre Channel expansion card is a 2 Gb Fibre Channel device that has two configurable adapter ports. Communication signals are routed from the blade server through the Fibre Channel high-speed connector on the Expansion Card to switch-module bay 3 and bay 4 in the Intel® Server Chassis SBCE. This provides a high-performance connection between the 64-bit PCI-X bus in the blade server and the two Fibre Channel Switch Modules in the SBCE unit.

✏ **NOTE**
> The modules in switch-module bay 3 and bay 4 in the SBCE unit must be Fibre Channel Switch Modules.

For service or assistance, see Appendix A, "Getting help and technical assistance," on page 29.

The Fibre Channel Expansion Card is referred to throughout this book as the SBFCM or the expansion card.

Fibre Channel overview

Fibre Channel technology is outlined in the SCSI-3 Fibre Channel Protocol (SCSI-FCP) standard. Fibre Channel is a high-speed data transport technology used for mass storage and networking.

By adding expansion cards to the blade servers and Fibre Channel switch modules to the unit, you can attach the blade server to an external storage area network (SAN) through the external 2 Gbps (gigabits per second) optical ports on the switch modules. The Expansion Card supports data-transfer rates up to 200 MB per second half-duplex and 400 MB per second full-duplex.

Related publications

This *Installation and User's Guide* contains setup and installation instructions for your Expansion Card, including information about getting started and how to configure your Expansion Card.

In addition to this *Installation and User's Guide*, the following related documentation is provided with your SBFCM resource CD:

- *Intel® Server Switch Module SBCEGBESW Installation Guide*

  This publication is provided in PDF on the *Resource* CD. This publication contains detailed setup and installation instructions for the fibre channel switch module and the Fibre Channel Module Manager (SAN Utility).

- *Intel® Server Switch Module SBCEFCSW Management and User's Guide*

This publication is provided in PDF on the *Resource* CD. This publication contains information about using the command line interface (CLI) or the SAN utility to manage the Fibre Channel switch module and your SAN.

- *Intel® SAN Solutions Guide*

  This publication is provided in PDF on the *Resource* CD. It provides a user-oriented discussion about how the Fibre Channel options are used to provide different SAN storage solutions for different application requirements. This document also provides an overview and description for backup and restore, business continuance and high availability solutions, and storage consolidation and data sharing solutions.

- *Intel® Switch Interoperability Guide*

  This publication is provided in PDF on the *Resource* CD. It provides detailed Fibre Channel switch configuration data and step-by-step configuration procedures for integrating the SBCE unit into other vendor switch fabrics. Each vendor configuration includes an initial integration checklist, configuration limitations, supported switch and firmware versions, specific management application operations, and a successful-integration checklist.

- *Intel® Server Boards and Server Chassis Safety Information*

  This multilingual publication is provided in Portable Document Format (PDF) on the *Resource* CD. It contains translated versions of the caution and danger statements that appear in the documentation for your server. Each caution and danger statement has an assigned number, which you can use to locate the corresponding statement in your native language.

- *Intel® Server Switch Module SBCEFCSW and FC Expansion Card SBFCM Hardware Maintenance Manual and Troubleshooting Guide*

  This publication is provided in PDF on the *Resource* CD. It contains information to help you solve problems yourself or to provide helpful information to a service technician.

Depending on your blade server model, additional publications might be included on the *Resource* CD.

Features and specifications

The Expansion Card has the following features:

- Compliance with Third Generation Fibre Channel Physical and Signaling Interface (PC-PH-3), revision 9.2

- Compliance with U.S. and international safety and emissions standards

- Support for direct memory access (DMA)

- Support for bus mastering

- Fast!UTIL basic input/output system (BIOS) utility program to customize the configuration parameters on the Expansion Card and attached drives

- Support for Fibre Channel protocol SCSI (FCP-SCSI) and Fibre Channel Internet protocol (FCP-IP)

- Support for point-to-point fabric connection (F-port fabric login)

- Support for Fibre Channel service (classes 2 and 3)

The following list and table provide a summary of the specifications of your Fibre Channel Expansion Card.

Temperature and altitude

- Blade server on: 10° to 35°C (50° to 95°F) at an altitude of 0 to 914 m (2998.69 ft)

- Blade server on: 10° to 32°C (50° to 89.6°F) at an altitude of 914 m to 2134 m (2998.69 ft to 7000 ft)

- Blade server off: -40° to 60°C (-40° to 140°F)

- Shipping temperature: -40° to 60°C (-40° to 140°F)

- Storage altitude: 0 to 2133 m (6998 ft)

Humidity

- Blade server on: 8% to 80%

- Blade server off: 5% to 80%

Table 1. Expansion Card specifications

Type	Specification
Expansion card bus	Supports subset of PCI local bus specification, revision 2.2 and the PCI-X specification 1.0a
PCI/PCI-X signaling environment	Supports 3.3 V only
PCI/PCI-X transfer rate	The burst transfer rate is based on the input clock speed multiplied by the number of bytes (8). • PCI - 66 = 525 MB per second • PCI-X - 100 = 800 MB per second
Fibre Channel specifications	• Bus transfer rate: 200 MB per second maximum at half-duplex and 400 MB per second maximum at full-duplex • Support for both FCP-SCSI and IP protocols • Support for point-to-point fabric connection: F-Port Fabric Login • Support for FCAL public loop profile: FL-Port Login • Support for Fibre Channel services class 2 and 3 • Support for FCP SCSI initiator and target operation • Support for full-duplex operation • Copper interface ac coupled
Processor	Single-chip design with two completely independent 2 Gb serial Fibre Channel ports. Each port provides: • RISC processor • Integrated serializer/deserializer • Receive direct memory access (DMA) sequencer • Frame buffer • Five-channel DMA controller
Host data transfer	64-bit, 100 MHz bus-master DMA data transfers to 800 MB per second
RAM	512 KB sync burst SRAM per channel supporting parity protection
BIOS ROM	BIOS ROM 128 KB of flash memory (the flash is field programmable)
NVRAM	NVRAM 256 bytes, field programmable
Onboard DMA	Five-channel DMA controller for each port: transmit, receive, command, auto-request, and auto-response
Frame buffer FIFO	Integrated 4 KB transmit and 6 KB receive frame buffer FIFO for each data channel
Connectors (internal only)	• Board-to-board Molex HSM type for serial interfaces • 200 pin board-to-board for PCI-X interface
Dimensions	Approximately 9.35 cm x 13.14 cm (3.683 in. x 5.275 in.)

Table 1. Expansion Card specifications (continued)

Type	Specification
Operating power	Less than 12 watts

Inventory checklist

The Expansion Card option package contains the following items:

- SBFCM Expansion Card
- I/O expansion option tray
- *Intel® Server FC Expansion Card SBFCM Resource CD*

Notices and statements used in this book

The caution and danger statements used in this book are also in the multilingual *Intel Server Boards and Server Chassis Safety Information* book provided on the *Resource* CD.

The following types of notices and statements are used in this book:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Major components of the Expansion Card

The following illustration shows the top of the Expansion Card.

✏ **NOTE**
  The illustrations in this document might differ slightly from your hardware.
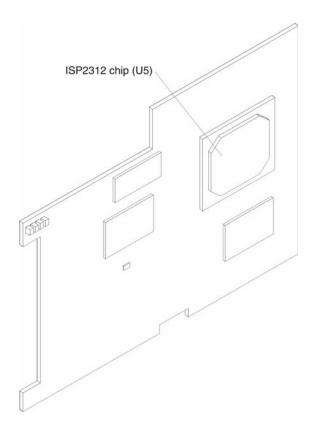
ISP2312 chip (U5)

Figure 1. Expansion Card (top)

ISP2312 chip (U5): The ISP2312 chip provides a PCI-X local bus interface and two completely independent 2 Gb serial Fibre Channel ports. Each port has a RISC processor, an integrated serializer/deserializer (SERDES), a receive DMA sequencer, frame buffer, five-channel DMA controller, and an external memory interface in a single-chip solution.

The following illustration shows the components on the bottom of the Expansion Card.
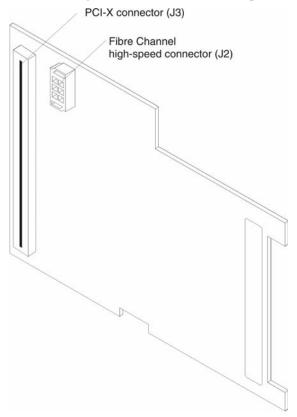
PCI-X connector (J3)

Fibre Channel
high-speed connector (J2)

Figure 2. Expansion Card (bottom)

PCI-X connector (J3): This connector is a 64-bit PCI-X interface with a 200-pin board-to-board connector that is connected to the blade server.

Fibre Channel high-speed connector (J2): Communication signals are routed from the blade server through the Fibre Channel high-speed connector on the Expansion Card to switch-module bay 3 and bay 4 in the SBCE unit.

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2 Installing the Expansion Card

This chapter provides detailed instructions for installing the Expansion Card in your blade server.

Installation guidelines

Before you begin installing the Expansion Card in your blade server, read the following information:

- Read the safety information beginning on page v. This information will help you work safely with your blade server and options.

- Have a small flat-blade screwdriver and a Phillips* screwdriver available.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices, including your blade server. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.

- Handle the device carefully, holding it by its edges or its frame.

- Do not touch solder joints, pins, or exposed circuitry.

- Do not leave the device where others can handle and damage it.

- While the device is still in its static-protective package, touch it to an unpainted metal part of the SBCE unit for at least 2 seconds. This drains static electricity from the package and from your body.

- Remove the device from its package and install it directly into the blade server without setting down the device. If it is necessary to set down the device, place it back into its static-protective package. Do not place the device on your blade server cover or on a metal surface.

- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.
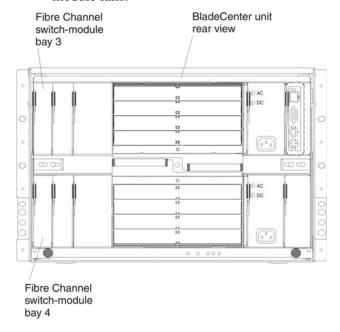
Installing the Expansion Card

Complete the following steps to install the Expansion Card in a blade server:

1. Review the safety information beginning on page v and the Intel Server Boards and Server Chassis Safety Information book that is provided in PDF on the *Resource* CD that comes with your blade server.

2. Read "Handling static-sensitive devices."

3. Ensure that one Fibre Channel Switch Module is installed in switch-module bay 3 or bay 4 in the SBCE unit. See the *Intel® Server Switch Module SBCEFCSW Installation Guide* for detailed installation instructions.

✎ **NOTE**

> You must install at least one Fibre Channel switch module in the SBCE unit when you install the Fibre Channel Expansion Card in a blade server. Installing a second Fibre Channel switch module in the SBCE unit provides a backup switch in case one switch module fails.
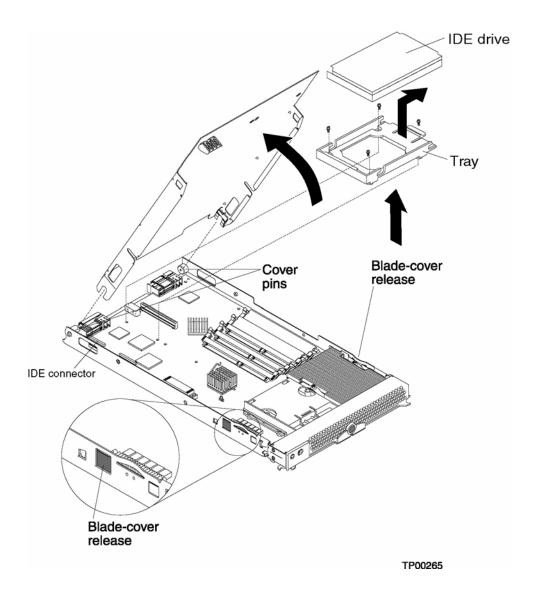
Fibre Channel
switch-module
bay 3

BladeCenter unit
rear view

○ AC
○ DC

○ AC
○ DC

Fibre Channel
switch-module
bay 4

4. If the blade server is operating, press the power-control button (behind the blade server control panel door) to shut down the operating system and turn off the blade server. For the location of the control panel door, see the illustration on page 13 Wait at least 30 seconds, until the drives stop spinning, before proceeding to the next step.

5. Open the two release levers. The blade server moves out of the bay approximately 0.6 cm (0.25 inch).

6. Pull the blade server out of the blade bay. Spring-loaded doors further back in the bay move into place to cover the bay temporarily.

7. Place either a filler blade or another blade server in the bay within 1 minute. The recessed spring-loaded doors will move out of the way as you insert the blade or filler blade.

8. Lay the blade server down on a flat, nonconductive surface, with the cover side up.

9. Press the blade-cover release on each side of the blade server. Open the cover and lay it flat, or lift it from the blade server.

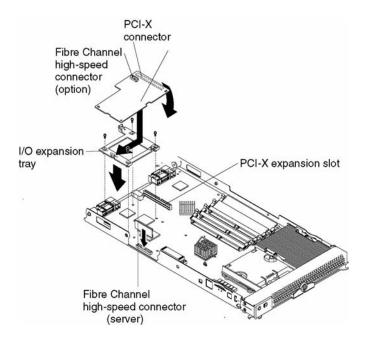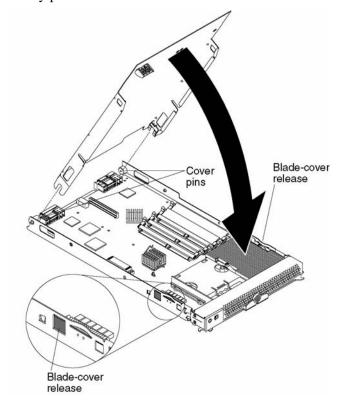**CAUTION:**
Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

IDE drive

Tray

Cover pins

Blade-cover release

IDE connector

Blade-cover release

TP00265

10. If an IDE hard disk drive is in IDE connector 2, remove the drive and tray (save the screws that secure the tray to the system board); otherwise, remove the two screws near IDE connector 2 that secure the system board to the chassis.

11. Install the I/O expansion option tray, which comes with the Expansion Card. Secure the tray to the system board using a Phillips* screwdriver and the screws from the option kit.

12. Remove the Expansion Card from the static-protective package.

13. Slide the narrow end of the Expansion Card into the raised hook on the tray.

14. Align the Expansion Card connectors with the network-interface option connector and the PCI-X expansion slot.

15. Gently press the card into the connectors.

Important: The blade server cannot be inserted into the SBCE unit until the cover is installed and closed. Do not attempt to override this protection.
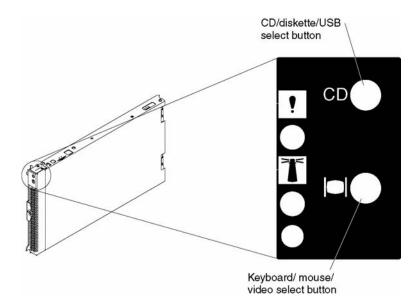
16. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the blade server, as shown in the illustration.

17. Pivot the cover to the closed position as shown in the illustration, until it clicks into place.

CAUTION:
Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

18. Ensure that the release levers on the blade server are in the open position (perpendicular to the blade server).

19. Slide the blade server into the bay until it stops. The spring-loaded doors that are further back in the bay and cover the bay opening move out of the way as you insert the blade server into the SBCE unit.

20. Push the release levers on the front of the blade server to close them.

21. Turn on the blade server. Press the keyboard/mouse/video select button.

✏ **NOTE**

The blade server control panel door is shown in the closed (normal) position in the illustration.

22. If the information displayed on the monitor screen is similar to the following text, update the BIOS code if necessary and install the expansion card device drivers. For more information, see Chapter 3.

23. If the information displayed on the monitor screen is not similar to this text and you have checked the expansion card configuration, go to

Chapter 5, "Troubleshooting," on page 25

 for problem-solving information.

QLogic Corporation
QLA2312 PCI Fibre Channel ROM BIOS Version X.XX
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www.qlogic.com

Press <Ctrl+Q> for Fast!UTIL

BIOS for Adapter 0 is disabled
ROM BIOS not installed

3 Updating the expansion card BIOS code and NVRAM code

After you install the Expansion Card, be sure that the latest BIOS code and the nonvolatile random access memory (NVRAM) code are installed; then, install the device drivers.

Before you can update the BIOS code and NVRAM code, you must create a BIOS Update Utility diskette. You will use the diskette to update the BIOS code and NVRAM code. For more information about creating a diskette, see "Creating a BIOS Update Utility diskette."

✏ **NOTE**

For the latest information about supported operating systems, versions of device drivers, utilities, and documentation, contact your Intel Support Representative.

Creating a BIOS Update Utility diskette

To create a BIOS Update Utility diskette, you can obtain the latest files from your Intel Support Representative. Extract all files to a single floppy diskette.

Updating the expansion card BIOS code and NVRAM code

Attention: Do not turn off or restart the blade server during the BIOS code or NVRAM code update process.

To update the Expansion Card BIOS code and NVRAM code, use one of the following methods:

- Use the flasutil command prompt method to type command-line options.
- Use the flasutil BIOS Update Utility menu to select a command-line option.

Using the flasutil command prompt

Complete the following steps to update the Expansion Card BIOS code and NVRAM code using the flasutil command prompt:

1. To associate the diskette drive with the blade server, press the CD/diskette/USB select button on the blade server. For the location of the CD/diskette/USB button, see the illustration on page 13 The LED on the button flashes while the request is processed, then is steady when the ownership of the CD-ROM or diskette drive is transferred to the blade server.

2. To associate the keyboard port, mouse port, and video port with the blade server, press the keyboard/mouse/video select button. The LED on this button flashes while the request is processed, then is steady when the ownership of the keyboard, mouse, and video is transferred to the blade server.

3. Insert the diskette you created from the support CD into the diskette drive.

4. Restart the blade server. The blade server starts to a DOS prompt.

5. To update the BIOS code and the NVRAM code on the Expansion Card, at the DOS prompt, type the following command and press Enter:

   ```
   flasutil /l /f /i
   ```

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Notes:
   a. You must add /i to each command for correct vendor recognition.
   b. Commands are not case sensitive.
6. To review additional command-line options that you can use, see "Command-line options"; then, return to step 6.
7. Remove the diskette from the diskette drive and restart the blade server.

Command-line options

To view a list of supported command-line options, at the DOS prompt, type the following command and press Enter:

```
flasutil /?
```

The following command-line options are displayed:

```
/F xxxx = Write Flash, adapter address = xxxx
    If no address specified then write Flash to all adapters
/W xxxx = Copy Flash to file: QLxxRIM.SAV, adapter type = xxxx
/O <filename.ext> = Use <filename.ext> instead of QLxxROM.BIN
/I = Ignore Subsystem ID
/M = Program all adapters
/Q = Quiet Mode, no messages will be displayed
/V xxxx = Display current version number of BIOS on adapters at address xxxx
    If no address specified then display the BIOS version of all adapters
/C xxxx = Verify Flash of adapter at address xxxx
    If no address specified verify the Flash of all adapters
/Y xxxx = Display port name of adapter at address xxxx
    If no address specified then display port name of all adapters
/i= Vendor recognition
```

Using the flasutil BIOS Update Utility menu

Complete the following steps to update the Expansion Card BIOS code and NVRAM code using the flasutil BIOS Update Utility menu:

1. To associate the diskette drive with the blade server, press the CD/diskette/USB select button on the blade server. For the location of the CD/diskette/USB button, see the illustration on page 13. The LED on the button flashes while the request is being processed, then is steady when the ownership of the CD-ROM or diskette drive is transferred to the blade server.
2. To associate the keyboard port, mouse port, and video port with the blade server, press the keyboard/mouse/video select button. The LED on this button flashes while the request is processed, then is steady when the ownership of the keyboard, mouse, and video is transferred to the blade server.
3. Insert the diskette you created from the support CD into the diskette drive.
4. Restart the blade server. The blade server starts to a DOS prompt.
5. From the DOS prompt, type the following command and press Enter:
   ```
   flasutil /i
   ```
   The Expansion Card has two I/O addresses. Both port I/O addresses are displayed.
6. At the **Enter adapter I/O address** prompt, type the I/O address of the port for which you want to update the BIOS code and NVRAM code. Press Enter.
7. The following option menu is displayed:

```
L = Write NVRAM
F = Write Flash
W = Copy Flash to file: QLxxROM.SAV
S = Display serial number
V = Display current BIOS version
C = Verify Flash
X = Verify NVRAM
Y = Display port name
```

8. At the **Enter Option** prompt, type l and press Enter.

9. At the DOS prompt, type the following command and press Enter:

    `flasutil /i`

10. At the **Enter adapter I/O address** prompt, type the same I/O address that you typed in step 5 on page 16

    The following option menu is displayed:

```
L = Write NVRAM
F = Write Flash
W = Copy Flash to file: QLxxROM.SAV
S = Display serial number
V = Display current BIOS version
C = Verify Flash
X = Verify NVRAM
Y = Display port name
```

11. At the **Enter Option** prompt, type f and press Enter.

12. For each additional option that you want for the same I/O address, repeat step 8 on page 17 through step 11 on page 17 substituting the option letter for f.

13. Repeat step 4 on page 16 through step 12 on page 17 for the second I/O address.

14. Remove the diskette from the diskette drive and restart the blade server.

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4 Using Fast!UTIL

This chapter provides detailed configuration information for advanced users who want to customize the configuration of the Expansion Card. You can configure the expansion card using the Fast!UTIL utility.

Starting Fast!UTIL

Start or restart the blade server. On the blade server control panel, press the keyboard/video/mouse select button.To access Fast!UTIL, press Ctrl+Q during the expansion card BIOS initialization (it might take a few seconds for the Fast!UTIL menu to be displayed). The Expansion Card has dual adapter ports that can be configured separately with Fast!UTIL. After changing the settings that are described in the "Configuration Settings menu options" section, Fast!UTIL restarts the blade server to enable the new parameters.

Important: If the configuration settings are incorrect, the Expansion Card might not function properly. Do not modify the default configuration settings unless you are instructed to do so by an Intel technical-support representative or in the installation instructions.

Configuration Settings menu options

✏ **NOTE**

> For information about Remote Boot options, contact your
> Intel technical-support representative.

Use the options described in this section to configure the Expansion Card. The **Configuration Settings** menu displays several options that you can use to configure your expansion card.

Select host adapter

Use this option to select, configure, or view either of the two I/O port addresses on the Expansion Card.

Host Adapter Settings

To access this option, select **Host Adapter Settings**. The default settings and the modifiable settings for the expansion card are listed in Table 2 and are described in this section. The Expansion Card is always point-to-point connected in the blade server with the 2-port Fibre Channel switch module.

✏ **NOTE**

> The loop reset delay, adapter hard loop ID, and hard loop ID settings are not applicable.

Table 2. Modifiable expansion card default settings

Setting	Options	Default
Host adapter BIOS	Enabled or disabled	Disabled

Table 2. Modifiable expansion card default settings (continued)

Frame size	512, 1024, 2048	2048
Loop reset delay	0-60 seconds	5 seconds
Adapter hard loop ID	Enabled or disabled	Enabled
Hard loop ID	0-125	125
Spin up delay	Enabled or disabled	Disabled

Host adapter BIOS: When this option is disabled, the read-only memory (ROM) BIOS code on the Expansion Card is disabled, freeing space in upper memory. The default is **Disabled**.

Frame size: This setting specifies the maximum frame length supported by the Expansion Card. The default size is 2048. If you are using F-port (point-to-point) connections, use the default size for maximum performance.

Spin up delay: When this option is enabled, the BIOS code waits up to 5 minutes to find the first drive. The default is **Disabled**.

✏ **NOTE**
> The Expansion Card settings and default values will vary, based on the version of BIOS code installed for the expansion card.

There are specific expansion card settings that you cannot modify. Table 3 describes these settings and gives examples.

✏ **NOTE**
> See the device-driver installation instructions for the required operating- system-specific modifications to the NVRAM.

Table 3. Nonmodifiable expansion card settings and examples

Setting	Example
BIOS address	CD400
Revision	1.25
Adapter serial number	E59719
Interrupt level	3
Adapter port name	210000E08B07C703

BIOS address: The BIOS address is the Expansion card I/O address where the BIOS code is stored when you press Ctrl+Q. This is the address of the BIOS code in ROM shadow memory.

Revision: The BIOS revision is the revision number of the loaded BIOS code on the Expansion Card.

Adapter Serial Number: This number is for manufacturing use only. It does not correlate to external labels or to the adapter port name of the Expansion Card.

Interrupt level: The interrupt level is the interrupt that is used by the Expansion Card. The interrupt level can change when the operating system is installed.

Adapter port name: This is the worldwide port name of the expansion card.

Selectable Boot Settings

To access this option, select **Selectable Boot Settings.** For more information about boot settings, contact your Intel technical-support representative.

Restore Default Settings

This option is in the **Configuration Settings** menu. It restores the
 Expansion Card default NVRAM settings.

Raw NOVRAM data

This option displays the Expansion Card NVRAM contents in hexadecimal format. This is a troubleshooting tool; you cannot modify the data.

Advanced Adapter Settings

Use this option to view and set advanced adapter settings. The default settings for the Expansion Card are listed in Table 4 and are described in this section.

Table 4. Advanced Adapter Settings

Setting	Options	Default
Execution throttle	1-256	256
>4GByte addressing	Enabled or Disabled	Disabled
LUNs per target	0, 8, 16, 32, 64, 128, 256	0
Enable LIP reset	Yes or No	No
Enable LIP full login	Yes or No	Yes
Enable target reset	Yes or No	Yes
Login retry count	0-255	30
Port down retry count	0-255	30
IOCB allocation	1-512 buffers	256 buffers
Extended error logging	Enabled or Disabled	Disabled

Execution throttle: This setting specifies the maximum number of commands that can run on any one port. When a port reaches its execution throttle, Fast!UTIL does not run any new commands until the current command is completed. The valid options for this setting are 1 through 256. The default (optimum) is 256.

>4GByte addressing: Enable this setting when the blade server has more than 4 GB of memory available. The default is **Disabled**.

LUNs per target: This setting specifies the number of logical unit numbers (LUNs) per device. Multiple LUN support is typically for redundant array of independent disks (RAID) enclosures that use LUNs to map drives. The default is **0**.

Enable LIP reset: This setting determines the type of loop initialization process (LIP) reset that is used when the operating system initiates a bus reset routine. When this option is set to **Yes**, the device driver initiates a global LIP reset to clear the target device reservations. When this option is set to **No**, the device driver initiates a global LIP reset with full login. The default is **No**.

Enable LIP full logon: This setting instructs the application specific integrated circuit (ASIC) chip to log in to all ports after any LIP. The default is **Yes**.

Enable target reset: This setting enables the device drivers to issue a Target Reset command to all devices on the loop when a SCSI Bus Reset command is issued. The default is **Yes**.

Login retry count: This setting specifies the number of times the software tries to log in to a device. The default is **30** retries.

Port down retry count: This setting specifies the number of times the software retries a command to a port that is returning port-down status. The default is **30**.

IOCB allocation: This setting specifies the maximum number of buffers from the firmware buffer pool that are allocated to any one port. The default setting is **256**.

Extended error logging: When set to **Enabled,** this setting provides additional error and debugging information to the Windows operating system event error log. The default is **Disabled**.

Extended Firmware Settings

Use this option to view and set extended firmware settings. The default settings for the Expansion Card are listed in Table 5 and are described in this section.

Table 5. Extended firmware settings

Setting	Options	Default
RIO operation mode	0, 5	0
Connection Options	0, 1, 2	2
Fibre Channel tape support	Disabled	Disabled
Interrupt delay timer	0-255	0
Data rate	0, 1, 2	2

RIO operation mode: This setting specifies the reduced interrupt operation (RIO) mode, if supported by the software device driver. When the expansion card is in the RIO mode   you can post multiple command completions in a single interrupt (see Table 6). The default is **0**.

Table 6. RIO options and operation modes

Option	Operation mode
0	No multiple responses

Table 6. RIO options and operation modes (continued)

Option	Operation mode
5	Multiple responses with minimal interrupts

Connection options: This setting defines the type of connection (loop or point-to-point) or connection preference (see Table 7). The default is **2**.

Table 7. Connection options

Option	Type of connection
0	Loop only
1	Point-to-point only
2	Loop preferred; otherwise, point-to-point

Fibre Channel tape support: This setting is reserved for Fibre Channel tape support. The default is **Disabled**.

Interrupt delay timer: This setting contains the value (in 100-microsecond increments) used by a timer to set the wait time between accessing a set of handles and generating an interrupt using direct memory access (DMA). The default is **0**.

Data rate: This setting determines the data rate. The default setting is **2**.

Table 8. Data rate options

Option	Data rate
0	1 GB per second
1	2 GB per second
2	Auto select

Scan Fibre Channel devices

Use this option to scan and list all the connected devices. Information about each device is listed, for example, vendor name, product name, and revision. This information is useful when you are configuring the Expansion Card and attached devices.

Fibre Channel disk utility

The Fibre Channel disk utility is not supported in the Intel Fibre Channel Options

Use this option to scan the Fibre Channel loop bus and list all the connected devices by loop ID. You can select a disk device and perform a low-level format or verify the disk media or data.

Attention: Performing a low-level format removes all data on the disk.

Loopback data test

This option is not available with your SBCE configuration.

ExitFast!UTIL

After you complete the configuration, use this option to exit the menu and restart the blade server.

5 Troubleshooting

The following four types of installation problems might cause your Expansion Card to function incorrectly:

- Hardware problems
- Software problems
- System configuration problems
- Fibre Channel problems

If you are having a problem, use the following information to help you determine the cause of the problem and the action to take.

Hardware problems

To determine whether your installation problem is caused by the hardware, perform the following tasks:

- Verify that the Expansion Card is installed correctly.
- Verify that the Fast!UTIL data-rate setting is correct. See Chapter 4, "Using Fast!UTIL," on page 19.
- Verify that all peripheral devices are turned on and connected through the Fibre Channel Switch Module. See "Scan Fibre Channel devices" on page 23 for information about displaying attached Fibre Channel devices.
- Verify that the 2-Port Fibre Channel Switch Module for the SBCE unit is installed in a Fibre Channel connection.

Software problems

To determine whether your installation problem is caused by the software, perform the following tasks:

- Verify that the correct device driver is installed.
- Verify that the BIOS code in the expansion card is at the latest level.
- Verify that you have the correct expansion card NVRAM settings for your storage area network (SAN) and operating system.

System configuration problems

To determine whether your installation problem is caused by the system configuration, check the blade server to ensure that it is configured properly. For more information, see "Configuration Settings menu options" on page 19.

If you still have a system configuration problem, see the documentation that comes with your SBCE unit, or contact your Intel technical-support representative to determine whether your system board requires special configuration.

Fibre Channel problems

To determine whether your installation problem is caused by an attached Fibre Channel device, perform the following tasks:

- Verify that an 2-port Fibre Channel Switch Module is installed in switch-module bay 3, module bay 4, or both.

- Verify that the blade server is turned on.

- Verify that the Expansion Card settings are set to the correct values. See "Configuration Settings menu options" on page 19.

A Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about products, you can contact your Intel support representative. This appendix contains information about where to go for additional information about Intel products, what to do if you experience a problem with your SBCE unit or component, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.

- Check the power switches to make sure that the system is turned on.

- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.

You can solve many problems without outside assistance by following the troubleshooting procedures provided in the publications that shipped with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software.

Hardware/Software service and support

Contact your Intel Support Representative for additional hardware or software support.

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