

Intel® Optical Pass-thru Module SBCEOPM: Installation and User's Guide

A Guide for Technically Qualified Assemblers of Intel Identified Subassemblies & Products

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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.
- When lifting any heavy object:
 1. Ensure you can stand safely without slipping.
 2. Distribute the weight of the object equally between your feet.
 3. Use a slow lifting force. Never move suddenly, or twist, when you attempt to lift.
 4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. Do not attempt to lift any object that weighs more than 16 kg (35lb) or any object that you think is too heavy for you.
- Do not perform any action that causes hazards to the customer, or makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- 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.

- Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not protect you when working with live electrical currents.
- Many customers have rubber floor mats (near their equipment) that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the emergency power-off (EPO) switch, disconnect switch, or electrical outlet in the room. If an electrical accident occurs, you can quickly turn off the switch or unplug the power cord.
- Do not work alone under hazardous conditions, or near equipment that has hazardous voltages.
- Disconnect all power before:
 - Performing a mechanical inspection
 - Working near power supplies
 - Removing or installing main units
- 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.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
 - Ensure that another person, familiar with the power-off controls, is near you. Remember: another person must be there to switch off the power, if necessary.
 - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
 - Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
- When using testers, set controls correctly and use the approved probe leads and accessories for that tester.
- Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.
- Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of the maintenance information. Use extreme care when measuring high voltages.
- 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.
- When the power is on and power supply units, blowers and fans are removed from their normal operating position in a machine, do not attempt to service the units. This practice ensures correct grounding of the units.
- If an electrical accident occurs, use caution:
 - Switch power off
 - Send another person to get help/medical aid

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 is insulative 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.
 - 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.

⇒ NOTE

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



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 procedures.
- 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
<ol style="list-style-type: none"> 1. Turn everything OFF. 2. First, attach all cables to devices. 3. Attach signal cables to connectors. 4. Attach power cords to outlet. 5. Turn device ON. 	<ol style="list-style-type: none"> 1. Turn everything OFF. 2. First, remove power cords from outlet. 3. Remove signal cables from connectors. 4. Remove all cables from devices.



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 degrees C (212 degrees 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.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)



CAUTION:

Use safe practices when lifting.



CAUTION:

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



2



1



CAUTION:

Do not place any object weighing more than 82 kg (180 lbs.) on top of rack-mounted devices.



CAUTION:

Do not place any object weighing more than 82 kg (180lbs.) on top of rack-mounted devices.

**CAUTION:**

To avoid personal injury, before lifting the unit, remove all the blades to reduce the weight.

**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/CB to EN60950 3rd Edition TUC/CB - EMKO-TSE (74-SEC) 207/94
International:	TUVCB to IEC 60950, 3rd Edition plus all international deviations
Australia/New Zealand:	CB Report to IEC 60950, 3rd Edition plus Australia/New Zealand deviations

Electromagnetic compatibility (ECM)	
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 EN6100-3-3 Voltage Flicker
Japan:	VCCI Class A ITE (CISPR 22, Class A Limit) IEC 1000-3-2 Limit for Harmonic Current Emissions
Australia/New Zealand:	AS/NZS 3548, Class A Limit
Taiwan:	BSMI Approval
Korea:	RRL Approval
Russia:	GOST Approval

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 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.

⇒ NOTE

This product is intended to be installed with CAT5 cable, or equivalent, to minimize electrical interference.

Electromagnetic compatibility notices (International)

Europe (CE Declaration of Conformity): This product has been tested in accordance too, 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自主規制協議会（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 Canadien 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:

기종별	사용자안내문
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.

※ 비교

A급 기기 : 업무용 정보통신기기를 말한다.

B급 기기 : 가정용 정보통신기기를 말한다.

English translation of the notice above:

Device	User's Information
Class A device	This device complies with RRL EMC and is operated in a commercial environment so that distributors or users pay attention to this point. If this product is sold or purchased improperly, please exchange this product to one that 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.
<p>⇒ NOTE Class A device: operated in a commercial area. Class B device: operated in a residential area.</p>	

1 Introducing the Intel® Optical Pass-thru Module SBCEOPM

This *Installation Guide* for the Intel® Optical Pass-thru Module SBCEOPM contains information about:

- Installing your Optical Pass-thru Module
- Connecting the Optical Pass-thru Module to your existing network infrastructure

For installation details, see “Installing and removing an Intel® Optical Pass-thru Module SBCEOPM” on page 5. For additional information, see the instructions in your Intel® Server Blade Chassis SBCE publications.

The Intel® Server Blade Chassis SBCE, also known as the SBCE unit, supports installation of up to four I/O modules that enable it to communicate with your external resources. Several types of I/O modules are available, each specifically designed to communicate with a specific environment. The Intel® Optical Pass-thru Module SBCEOPM, also called an I/O module throughout this document, provides an unconfigured network connection that enables the blade servers in the SBCE unit to connect to an existing network infrastructure. No configuration of the Optical Pass-thru Module is required.

Blade servers communicate with the Optical Pass-thru Module using their integrated Ethernet controllers or through an optional blade server I/O expansion card. Ethernet controllers integrated on the blade server system board are connected to I/O-module bay 1 and bay 2. The I/O expansion cards are connected to I/O-module bay 3 and bay 4.

Performance, reliability, and expansion capabilities were key considerations in the design of your Optical Pass-thru Module. These design features make it possible for you to customize the system hardware to meet your needs today, while providing flexible expansion capabilities for the future.

The product name and serial number are located on the identification label on the side of the Optical Pass-thru Module. See “Major components of the Intel® Optical Pass-thru Module SBCEOPM” on page 3 for an illustration that shows the location of the identification label.

⇒ NOTE

The illustrations in this document might differ slightly from your hardware.

Related publications

This *Installation Guide* contains detailed installation and setup instructions for the Intel® Optical Pass-thru Module SBCEOPM. This publication also provides general information about your Optical Pass-thru Module, including information about features and how to get help.

In addition to this *Installation Guide*, the following related documentation is provided with your SBCE unit and blade server:

- *Rack Installation Instructions*

This publication contains the instructions to install your SBCE unit in a rack.

- *Intel® Blade Server Chassis SBCE: Installation and User’s Guide*

This publication is provided in PDF on the SBCE Resource CD. It provides general information about the SBCE unit, including:

- Information about features
- How to set up, cable, and start your SBCE unit
- How to install options in your SBCE unit
- How to configure your SBCE unit
- How to perform basic troubleshooting of your SBCE unit

- How to get help
 - Intel® blade server *Installation and User's Guides*
Each type of blade server has a customized *Installation and User's Guide*. These publications are provided in PDF on the blade server Resource CD. They provide general information about your blade server, including:
 - Information about features
 - How to set up and start your blade server
 - How to install options in your blade server
 - How to configure your blade server
 - How to install an operating system on your blade server
 - How to perform basic troubleshooting of your blade server
 - How to get help
 - *Safety Information*
This publication is in PDF on the SBCE Resource CD. It contains translated caution and danger statements.
 - *Hardware Maintenance Manual and Troubleshooting Guides*
These publications are in PDF on the SBCE Resource CD. They contain information to help you solve problems yourself, and they contain information for service technicians.
- Depending on your blade server model, additional publications might be included on the Resource CD included with your blade server.

Features and specifications

This section provides a summary of the features and specifications for your Intel® Optical Pass-thru Module SBCEOPM.

The Intel® Optical Pass-thru Module SBCEOPM features include:

- Ports
 - Four external optical ports for making connections to network infrastructure. Each port provides connections for up to four bi-directional optical channels.
 - Fourteen internal full-duplex ports, one connected to each of the blade servers
- Status and failure LEDs
Information LEDs on the front panel indicate I/O module and port status and faults.
- Cables:
 - Up to four optical pass-thru module cables (not included) can be connected to the Optical Pass-thru Module.
 - The optical pass-thru module cable are terminated with industry-standard duplex connectors
 - Optical couplers enable cables to be extended up to 1000 meters
 - Adapters are available to convert SC connectors to LC connectors

Notices and statements used in this book

The following 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.

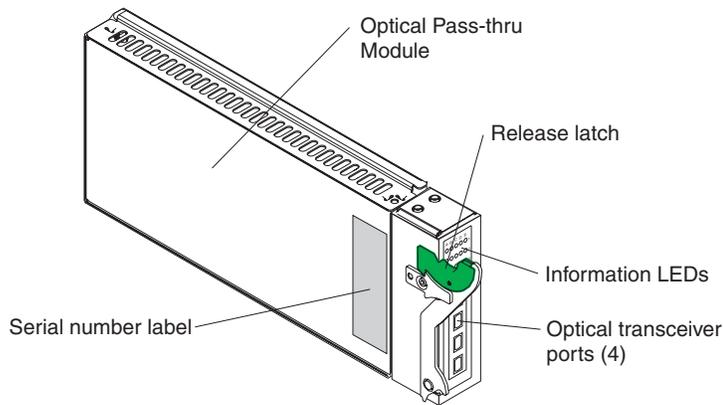
Major components of the Intel® Optical Pass-thru Module SBCEOPM

The following illustrations show the major components of your Optical Pass-thru Module.

NOTE

The illustrations in this document might differ slightly from your hardware.

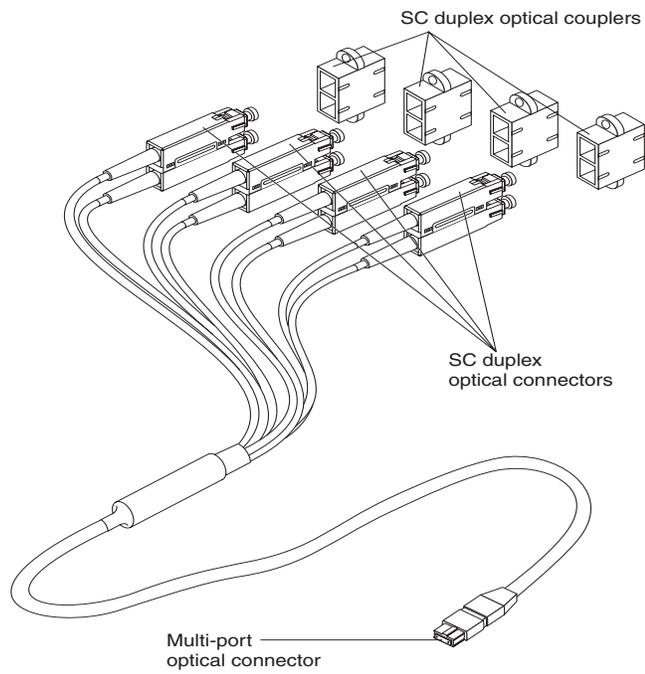
Optical Pass-thru Module:



For more information about the components of the front panel, see Chapter 3, “Information LEDs and external ports,” on page 13.

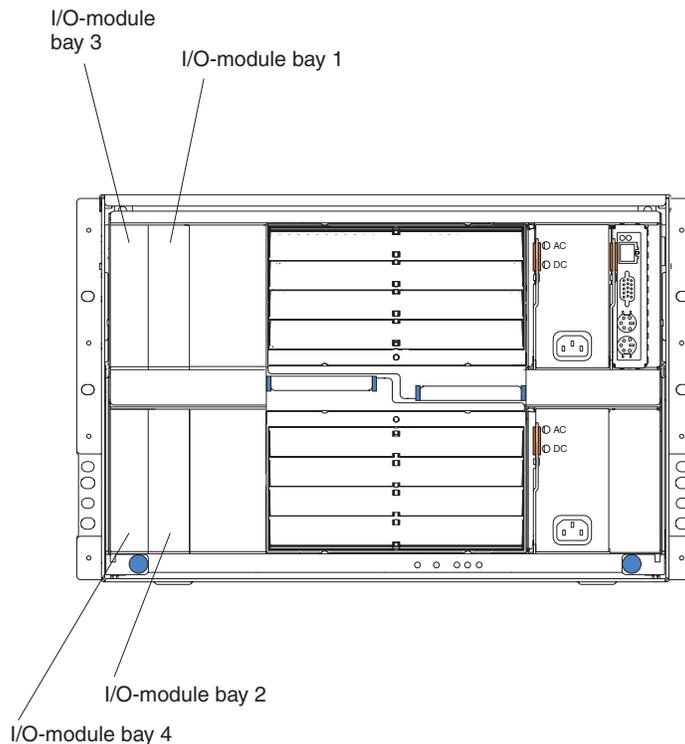
Optical Pass-thru Module Cables:

Up to four optical pass-thru module cables can be connected to the Optical Pass-thru Module. Each cable comes with optical couplers (attached) that enable cables to be extended up to 1000 meters. A sample Intel® Optical Pass-thru Module SBCEOPM SC Cable is shown in the following figure. No optical pass-thru module cables come with the Optical Pass-thru Module.



2 Installing and removing an Intel® Optical Pass-thru Module SBCEOPM

The following illustration shows the SBCE I/O-module bay locations.



Attention: To maintain proper system cooling and performance, each module bay must contain either a module or a filler module; each blade bay must contain either a blade server, expansion unit, or a filler blade.

I/O module interface requirements

Your SBCE unit has four I/O-module bays and supports a minimum of one hot-swap I/O module in I/O-module bay 1 or bay 2. Several types of I/O modules are available to meet specific network requirements. Each of the I/O modules must support the blade server interface it connects to.

The blade server integrated Ethernet controllers support connection with the Ethernet switch modules and pass-thru modules. The I/O module in I/O-module bay 1 provides a network connection to one of the Ethernet controllers in all the blade servers in the SBCE unit. To provide a network connection for the second Ethernet controller in each blade server, install an I/O module in I/O-module bay 2.

If you install an I/O expansion card on any blade server, you must install a hot-swap I/O module that supports the interface type used in I/O-module bay 3 to obtain connection 1 for the I/O expansion card. To provide connection 2 for the I/O expansion card, install an I/O module that supports the interface type used in I/O-module bay 4. The I/O modules in I/O-module bay 3 and bay 4 provide connections to all the I/O expansion cards in the SBCE unit.

Important: The I/O modules in I/O-module bays 3 and 4 on the SBCE unit must both be of the same type and must both support the I/O expansion card network-interface type. For example, if you add an Ethernet expansion card to a blade server, the modules in I/O-module bays 3 and 4 on the SBCE unit must both be the same and of a type compatible with the Ethernet expansion card. All other I/O expansion cards installed on other blade servers in the SBCE unit must also be compatible with these I/O modules. In this example, you could then install two Ethernet switch modules or two pass-thru modules. Because pass-thru modules are compatible with a variety of I/O expansion cards, installing two pass-thru modules would enable use of several different types of compatible I/O expansion cards within the same SBCE unit.

For additional information, see the *Installation and User's Guide* for your SBCE unit on the SBCE Resource CD.

Blade server Ethernet controller enumeration

The enumeration of the Ethernet controllers in a blade server is operating-system dependent. You can verify the Ethernet controller designations a blade server uses through your operating system settings.

The routing of an Ethernet controller to a particular I/O-module bay depends on the type of blade server. You can verify which Ethernet controller is routed to which I/O-module bay by using the following test:

1. Install only one Ethernet switch module or pass-thru module, in I/O-module bay 1.
2. Make sure the ports on the Ethernet switch module or pass-thru module are enabled (**I/O Module Tasks - Management - Advanced Management** in the management module Web-based user interface).
3. Enable only one of the Ethernet controllers on the blade server. Note the designation that the blade server operating system has for the controller.
4. Ping an external computer on the network connected to the I/O module. If you can ping the external computer, the Ethernet controller that you enabled is associated with the I/O module in I/O-module bay 1. The other Ethernet controller in the blade server is associated with the I/O module in I/O-module bay 2.

If you have installed an I/O expansion card on a blade server, communications from the option are routed to I/O-module bays 3 and 4. You can verify which controller on the card is routed to which I/O-module bay by performing the same test, using a controller on the I/O expansion card and a compatible Ethernet switch module or pass-thru module in I/O bay 3 or 4.

Installation guidelines

Before you begin to install the Optical Pass-thru Module in your SBCE unit, read the following information:

- Become familiar with the safety and handling guidelines specified under “Safety and regulatory information” on page v and “Handling static-sensitive devices” on page 7, and read the safety statements in the SBCE unit option publications.
- The orange color on components and labels in your SBCE unit identifies hot-swap or hot-plug components. You can install or remove hot-swap modules while the SBCE unit is running. For complete details about installing or removing a hot-swap or hot-plug component, see the detailed information in this chapter.
- The blue color on components and labels identifies touch points where you can grip a component, move a latch, and so on.
- You do not need to turn off the SBCE unit to install or replace any of the hot-swap modules on the rear of the SBCE unit.

System reliability considerations

Attention: To help ensure proper cooling, performance, and system reliability, make sure that:

- Each of the module bays on the rear of the SBCE unit has either a module or filler module installed.
- A removed hot-swap module is replaced with an identical module or filler module within 1 minute of removal.
- Cables for the optional modules are routed according to the illustrations and instructions in this document.

Handling static-sensitive devices

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

To reduce the possibility of 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 printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its static-protective package, touch it to any *unpainted* metal surface of the SBCE chassis or any *unpainted* metal surface on any other grounded rack component in the rack you are installing the device in 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 your SBCE unit without setting it down. If it is necessary to set the device down, place it in its static-protective package. Do not place the device on your SBCE unit or on a metal table.
- Take additional care when handling devices during cold weather because heating reduces indoor humidity and increases static electricity.

Installing an SBCE Optical Pass-thru Module

Statement 3:



 **CAUTION:**

When laser products (such as CD-ROMs, DVD 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:

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

Statement 8:



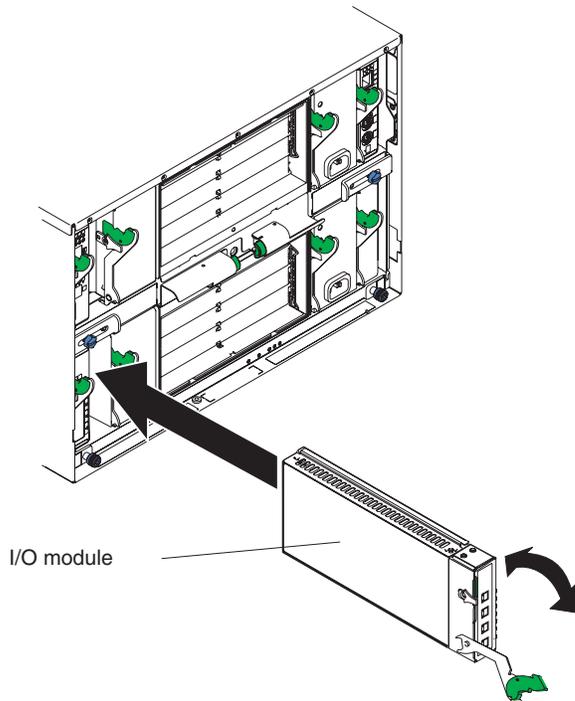
 **CAUTION:**
Never remove the cover on a power supply or any part that has the following label attached.

 **CAUTION:**



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

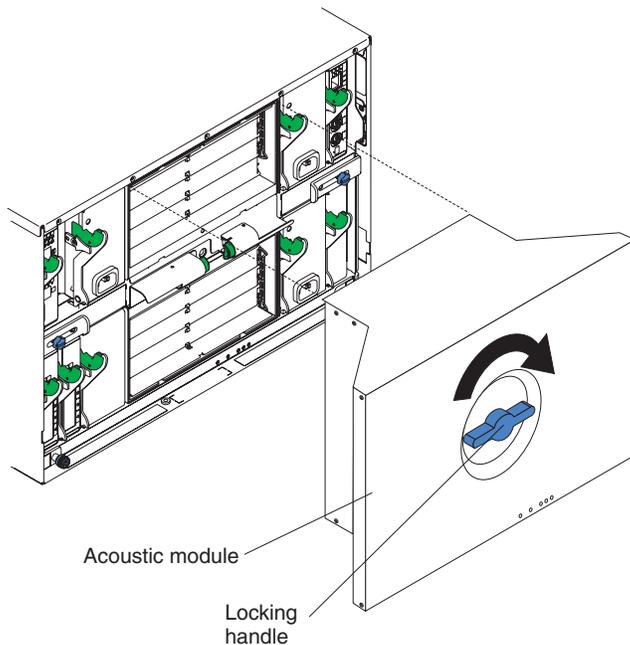
The following illustration shows how to install an Optical Pass-thru Module in an I/O module bay in the rear of the SBCE unit.



Complete the following steps to install an Optical Pass-thru Module:

1. Make sure you are using the latest versions of device drivers, firmware, and BIOS for your blade server and management module.
2. Review the information in “Safety and regulatory information” on page v and “Installation guidelines” on page 6 through “Handling static-sensitive devices” on page 7.

3. Remove the acoustic attenuation module, if one is installed, from the rear of the SBCE unit.



4. Select an I/O-module bay in which to install the Optical Pass-thru Module, in accordance with the instructions in “I/O module interface requirements” on page 5.
5. Remove the filler module from the selected bay. Store the filler module for future use.
6. If you have not already done so, touch the static-protective package that contains the Optical Pass-thru Module to any *unpainted* metal surface of the SBCE chassis or any *unpainted* metal surface on any other grounded rack component in the rack you are installing the Optical Pass-thru Module in for at least two seconds.
7. Remove the Optical Pass-thru Module from its static-protective package.
8. Ensure that the release latch on the Optical Pass-thru Module is in the open position (perpendicular to the module).
9. Slide the Optical Pass-thru Module into the appropriate I/O-module bay until it stops.
10. Push the release latch on the front of the Optical Pass-thru Module to the closed position.
11. Make sure that the LEDs on the Optical Pass-thru Module indicate that it is operating properly. (See “Information LEDs” on page 15 for LED locations.) Verify that:
 - The green power LED is lit.
 - The amber Optical Pass-thru Module error LED is off.If LED conditions are not as specified, see “Troubleshooting” on page 19.
12. If you have other modules to install, do so now; otherwise, go to step 13.
13. Attach any cables required by the Optical Pass-thru Module. See “Completing the installation” on page 17 for instructions. For the location of the connectors on the SBCE unit, see the *Installation and User’s Guide* for your SBCE unit on the SBCE Resource CD.
14. Replace the acoustic attenuation module, if you removed it in step 3.
15. Make sure the ports on the Optical Pass-thru Module are enabled (**I/O Module Tasks - Management - Advanced Management** in the management module Web-based user interface).

Removing an SBCE Optical Pass-thru Module

Statement 8:



CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.

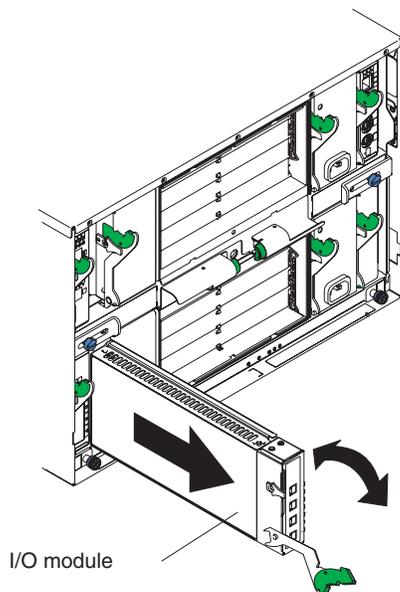
CAUTION:



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Complete the following steps to remove an Optical Pass-thru Module:

1. Remove the acoustic attenuation module, if installed, from the rear of the SBCE unit (see step 3 on page 10 for location).
2. Disconnect any cables from the selected Optical Pass-thru Module.
3. Pull the release latch toward the bottom of the Optical Pass-thru Module as shown in the illustration. The module moves out of the bay approximately 0.64 cm (0.25 inch).



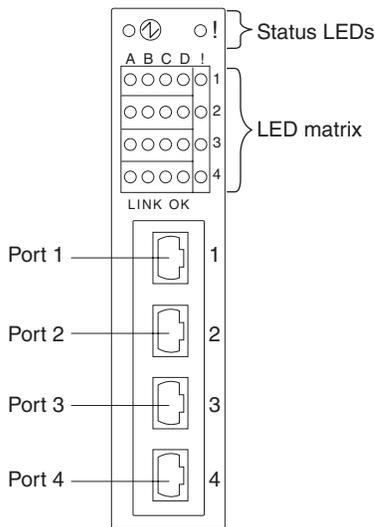
4. Slide the Optical Pass-thru Module out of the bay and set it aside.
5. Place either another I/O module or a filler module in the bay within 1 minute.
6. If you placed another Optical Pass-thru Module in the bay, reconnect any cables that you disconnected in step 2.
7. Replace the acoustic attenuation module option, if you removed it in step 1.

3 Information LEDs and external ports

This chapter describes the information LEDs (also known as indicators) on the Intel® Optical Pass-thru Module SBCEOPM and identifies the Optical Pass-thru Module external ports.

Front panel

The front panel of the Optical Pass-thru Module has status LEDs, an LED matrix, and four external optical interface ports, as shown in the following illustration. Each interface port supports up to four-channels of bi-directional communication, for a total of 14 external communication channels (two channels on port 4 are not used).



The Optical Pass-thru Module contains:

- LEDs that display the status of the Optical Pass-thru Module and its network connections (see “Information LEDs” on page 15).
- Four external bi-directional interface ports. The optical pass-thru module cable that connects to each port on the Optical Pass-thru Module provides four channel pairs of optical connectors for connecting to your existing network infrastructure. Table 1 shows how each blade server bay is assigned to an optical pass-thru module cable connector-pair (as shown in the illustration on page 14).
- Fourteen internal ports, one connected to each of the blade servers.

Table 1. Blade server bay to port and cable assignments

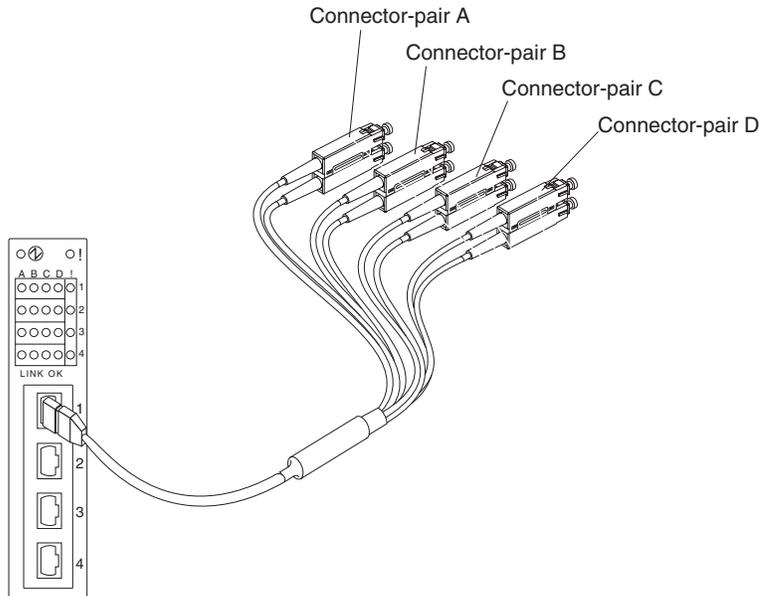
Blade server bay	Optical Pass-thru Module external port	Optical pass-thru module cable connector-pair
1	Port 1 (transceiver 1)	A
2	Port 1 (transceiver 1)	B
3	Port 1 (transceiver 1)	C
4	Port 1 (transceiver 1)	D

Table 1. Blade server bay to port and cable assignments (continued)

Blade server bay	Optical Pass-thru Module external port	Optical pass-thru module cable connector-pair
5	Port 2 (transceiver 2)	A
6	Port 2 (transceiver 2)	B
7	Port 2 (transceiver 2)	C
8	Port 2 (transceiver 2)	D
9	Port 3 (transceiver 3)	A
10	Port 3 (transceiver 3)	B
11	Port 3 (transceiver 3)	C
12	Port 3 (transceiver 3)	D
13	Port 4 (transceiver 4)	A
14	Port 4 (transceiver 4)	B

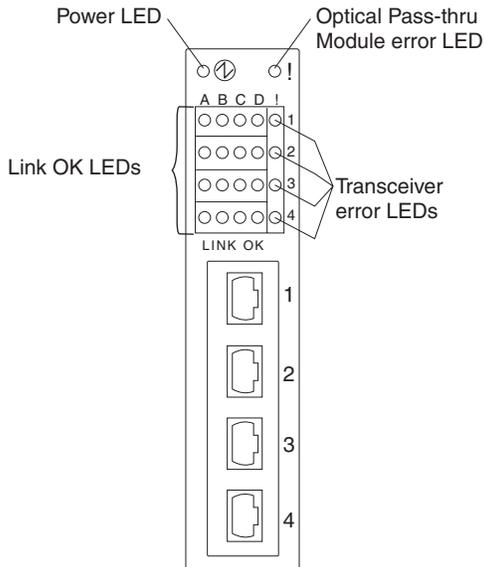
Notes:

1. Optical pass-thru module cable connector-pairs are marked as A, B, C, and D to indicate their channel number.
2. The C and D connector-pairs for Optical Pass-thru Module port 4 are not used.



Information LEDs

There are two sets of LEDs on the Optical Pass-thru Module front panel. The first row of LEDs at the top of the I/O module represent I/O module status and include the power LED and the ! (Optical Pass-thru Module error) LED. The second set of LEDs are grouped in an LED matrix that indicates the link status for each optical port channel and optical port failures. The following illustration shows the LEDs on the Optical Pass-thru Module. A description of each LED follows the illustration.



Notes:

1. The illustrations in this document might differ slightly from your hardware.
2. An amber LED is lit when an error or event has occurred. To identify the error or event, check the other LEDs on the Optical Pass-thru Module.
3. An LED test occurs whenever the I/O module is turned on. All LEDs are lit and remain lit for approximately 5 seconds and then return to a normal state.

Power LED

This green LED is at the top of the I/O module on the front panel. When this LED is lit, it indicates that the I/O module has passed the POST and is operational.

! (Optical Pass-thru Module error) LED

This amber LED is at the top of the I/O module on the front panel. This LED indicates that the I/O module has an error. If the I/O module fails the POST, this error LED is lit.

Link OK LEDs

There are sixteen green Link OK LEDs on the left side of the LED matrix on the front panel. Each of these LEDs indicates that there is a valid connection to a device on that port channel and that both ends of this connection are successfully communicating using compatible network protocols. (See Chapter <\$elemparamonlyCompleting the installation,” on page 17 for information about supported networking environments.) The Link OK LEDs are arranged in a way that identifies each port channel (LED columns A, B, C, and D) and the transceiver (LED rows 1, 2, 3, and 4) that is associated with it.

! (transceiver error) LEDs

There are four amber transceiver error LEDs on the right side of the LED matrix on the front panel. Each of these LEDs indicates that one of the Optical Pass-thru Module transceivers has a fault. If the Optical Pass-thru Module fails the POST, one or more of these fault LEDs might be lit.

4 Completing the installation

This chapter provides instructions for connecting the Intel® Optical Pass-thru Module SBCEOPM to your existing network infrastructure.

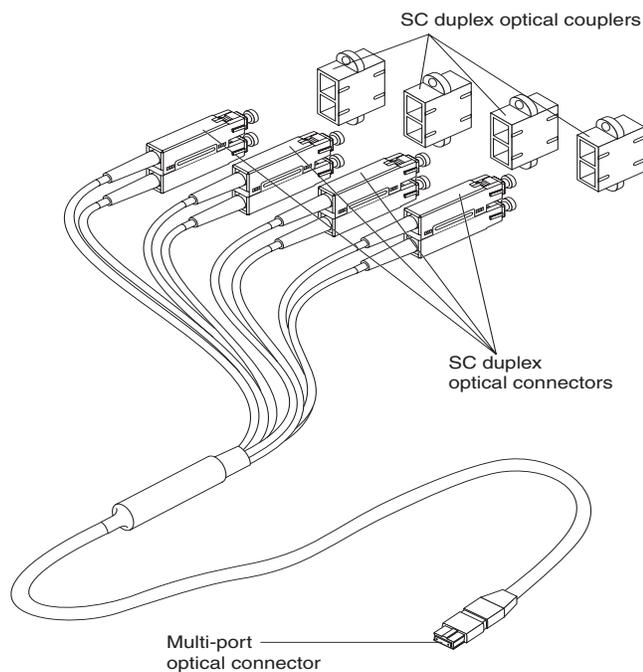
The module automatically configures itself to operate in several networking environments. No manual configuration or special device drivers are needed. Supported networking environments include:

- 1x/2x multi-mode fibre channel (requires installation of an optional fibre channel expansion card in one or more blade servers with Intel® Optical Pass-thru Module SBCEOPM installed in I/O-module bay 3 and bay 4)
- Gigabit Ethernet (fiber optic)

See the documentation for your existing network infrastructure for configuration information.

Cable connection

The SBCE Optical Pass-thru Module is connected to existing network infrastructure using fiber-optic cables. These cables do not come with the Optical Pass-thru module and must be ordered separately. Optical couplers come attached to each Optical Pass-thru Module Cable that allow these cables to be extended up to 1000 meters. SC-to-LC adapters are also available. A sample Intel® Optical Pass-thru Module SBCEOPM SC Cable is shown below.



The fiber-optic cable connectors that are attached to your network infrastructure are numbered to identify their port channel. See Table 1 for blade-server-to-port mapping information.

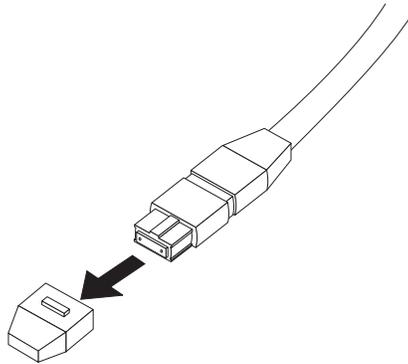
Attention: To avoid damage to your fiber-optic cable, follow these guidelines:

- Use care when routing the cable along a folding cable-management arm.
- For devices on slide rails, leave enough slack in the cable so that it does not bend to a radius less than 38 mm (1.5 in.) when extended or become pinched when retracted.
- Route the cable away from places where it can be damaged by other devices in the rack cabinet.
- Do not use plastic cable ties in place of cable straps.
- Do not overtighten the cable straps or bend the cables to a radius less than 38 mm (1.5 in.).
- Do not put excess weight on the cable at the connection point. Be sure that the cable is well supported.

Connecting to the Optical Pass-thru Module

The end of the optical pass-thru module cable with one connector is attached to one of the port connectors on the Optical Pass-thru Module. Complete the following steps to connect an optical pass-thru module cable to the Optical Pass-thru Module:

1. Grasp the protective cap on its sides; then, pull the cap to remove it from the optical cable connector. Save the protective cap for future use.



NOTE

You might need to remove a protective cap from the port connector of the Optical Pass-thru Module before you can plug the cable into it.

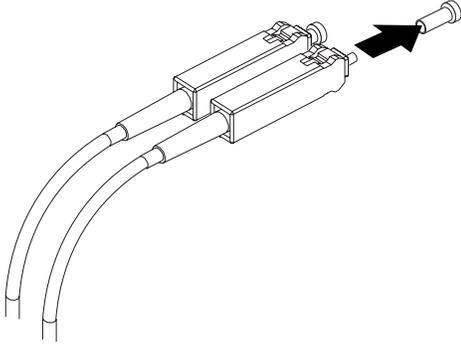
2. Orient the cable connector so that the cable connector key aligns with the key in the port connector of the Optical Pass-thru Module; then, insert the cable connector in the port connector.
3. Press the optical cable connector forward until it clicks and locks in place.

To disconnect the cable, release the lock before removing the cable from the port. Be sure to cover the cable end with its protective cap.

Connecting to network infrastructure

The end of the Optical Pass-thru Module Cable with four duplex SC connectors is connected to your network infrastructure. Each duplex connector provides a transmit-and-receive pair for one of the four bi-directional channels supported by the cable. (See Table 1 on page 13 for blade-server-bay-to-SC-connector mapping.) Complete the following steps to connect one of the Optical Pass-thru Module SC Cable channels to your network infrastructure:

1. Remove the protective caps from both SC connectors of a cable pair. Save the protective caps for future use.



⇒ **NOTE**

You might need to remove a protective cap from the port connectors of your infrastructure before you can plug the cables into them.

2. Orient the cable connectors with the port connectors of your infrastructure, making sure that the cable connector keys align with the keys in the port connectors; then, insert the cable connectors in the port connectors.
3. Press forward on the connector shells to lock the connectors in place.

To disconnect the cable, pull firmly on both connector shells to remove the cables from the ports. Be sure to cover the cable ends with their protective caps.

Configuring the Optical Pass-thru Module

The Optical Pass-thru Module provides an unconfigured network connection and requires no configuration to communicate with network resources. See the Intel® Server Management Module SBCECMM *Installation and User's Guide* for general information on managing SBCE I/O modules.

Troubleshooting

If you are having a problem, use the following information to help you determine the cause of the problem and the action to take. Additional troubleshooting and debugging procedures are available in the *Hardware Maintenance Manual and Troubleshooting Guide* for your SBCE unit on the SBCE Resource CD.

Make sure you are using the latest versions of device drivers, firmware, and BIOS for your blade server and management module. If these items are obsolete, the SBCE unit might not recognize the I/O module and might not turn it on.

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

- Verify that the I/O module is installed correctly.
- Verify that all peripheral devices connected to the I/O module are turned on, operating properly, and are properly connected.
- Verify that the blade servers and I/O expansion cards using the I/O modules are installed correctly in the SBCE unit.

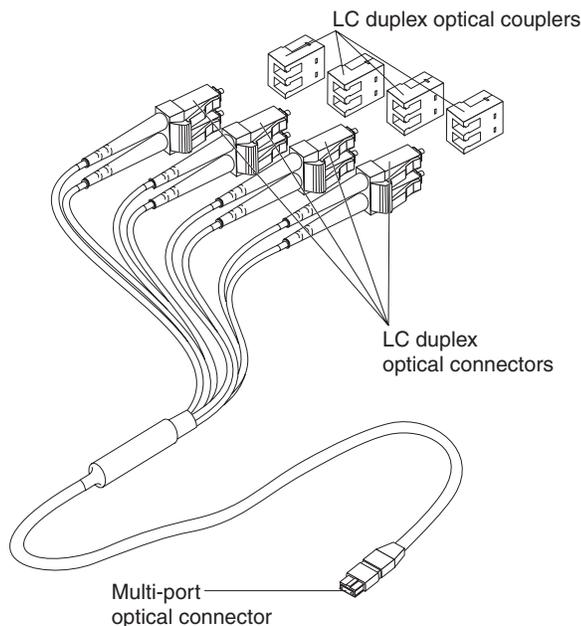
To determine whether your installation problem is caused by the system configuration, check the I/O module settings using the management module web-based interface. See the Intel® Server Management Module SBCECMM *Installation and User's Guide* on the SBCE Resource CD for general information on managing SBCE I/O modules.

A Intel® Optical Pass-thru Module LC Cable SBCEOPMLC

Use the Intel® Optical Pass-thru Module LC Cable SBCEOPMLC to connect an optional Intel® Optical Pass-thru Module SBCEOPM to your existing network infrastructure. The cable provides eight industry-standard duplex LC fiber-optic cable connections that support four bi-directional optical channels. This optical cable kit contains the warranty information and the following component for this option. The kit also comes with optical couplers (attached) that enable the cables to be extended up to 1000 meters.

Fiber-optic cable connectors have protective caps that must be removed before installing the cable. These caps should be saved for future use.

Note: The following illustration might be slightly different from your hardware.



Attention: To avoid damage to your fiber-optic cable, follow these guidelines:

- Use care when routing the cable along a folding cable-management arm.
- For devices on slide rails, leave enough slack in the cable so that it does not bend to a radius less than 38 mm (1.5 in.) when extended or become pinched when retracted.
- Route the cable away from places where it can be damaged by other devices in the rack cabinet.
- Do not use plastic cable ties in place of cable straps.
- Do not overtighten the cable straps or bend the cables to a radius less than 38 mm (1.5 in.).

- Do not put excess weight on the cable at the connection point. Be sure that the cable is well supported.

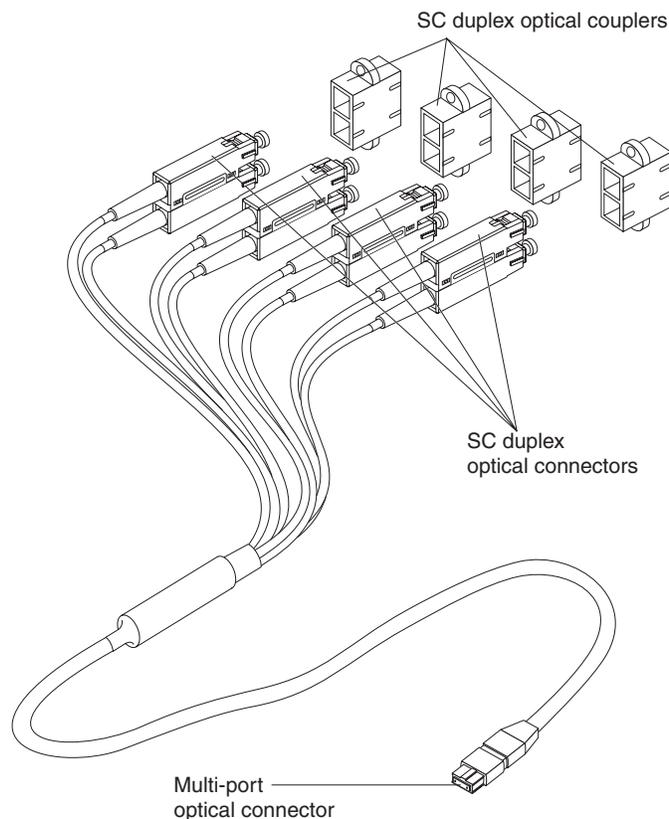
B Intel® Optical Pass-thru Module SC Cable SBCEOPMSC

Use the Intel® Optical Pass-thru Module SC Cable SBCEOPMSC to connect an optional Intel® Optical Pass-thru Module SBCEOPM to your existing network infrastructure. The cable provides eight industry-standard duplex SC fiber-optic cable connections that support four bi-directional optical channels. This optical cable kit contains the warranty information and the following component for this option. The kit also comes with optical couplers (attached) that enable the cables to be extended up to 1000 meters.

Fiber-optic cable connectors have protective caps that must be removed before installing the cable. These caps should be saved for future use.

NOTE

The following illustration might be slightly different from your hardware.



Attention: To avoid damage to your fiber-optic cable, follow these guidelines:

- Use care when routing the cable along a folding cable-management arm.
- For devices on slide rails, leave enough slack in the cable so that it does not bend to a radius less than 38 mm (1.5 in.) when extended or become pinched when retracted.
- Route the cable away from places where it can be damaged by other devices in the rack cabinet.
- Do not use plastic cable ties in place of cable straps.

- Do not overtighten the cable straps or bend the cables to a radius less than 38 mm (1.5 in.).
- Do not put excess weight on the cable at the connection point. Be sure that the cable is well supported.

C Getting help and technical assistance

If you need help, technical assistance, or just want more information about Intel® products, you will find a wide variety of sources available from Intel to assist you. This appendix contains information about where to go for additional information about Intel and Intel products, and what to do if you experience a problem with your blade server system.

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 came with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* on the Resource CD that came with your blade server or blade chassis.

You can solve many problems without outside assistance by following the troubleshooting procedures in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most Intel® systems and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes.

Using the documentation

Information about your Intel® Optical Pass-thru Module SBCEOPM is available in the documentation that comes with your system. That documentation may include printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions on 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. Use the Intel Business Link (IBL) Web site at <http://www.intel.com/ibl> or contact your Intel support representative to obtain the latest technical information and download device drivers and updates.

Getting help and information from the World Wide Web

The IBL Web site includes up-to-date information about the Intel® Optical Pass-thru Module SBCEOPM. The IBL support site may be accessed from <http://www.intel.com/ibl>. You may also find support at the Intel support site:
<http://support.intel.com/support/motherboards/server/blade.htm>.