

# NovaScale Blade 2021 Series

Installation and User's Guide

NOVASCALÉ BLADE



REFERENCE  
86 A1 96EM 00



# NOVASCAL BLADE

# NovaScale Blade 2021 Series

## Installation and User's Guide

### **Hardware**

January 2005

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# NovaScale Blade safety and regulatory information

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## 📌 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. Read the manual *NovaScale Blade Series Boards and Chassis Safety Information*.

### **Consignes de sécurité**

Lisez attentivement toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction. Consultez le manuel *NovaScale Blade Series Boards and Chassis Safety Information*.

### **Wichtige Sicherheitshinweise**

Lesen Sie zunächst sämtliche Warn- und Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie auch dem Buch *NovaScale Blade Series Boards and Chassis Safety Information*.

### **Importanti istruzioni sulla sicurezza**

Leggere attentamente tutte le istruzioni sulla sicurezza contenute nel presente documento prima di eseguire qualsiasi operazione. Vedere il manuale *NovaScale Blade Series Boards and Chassis Safety Information*.

### **Instrucciones de seguridad importantes**

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea el documento *NovaScale Blade Series Boards and Chassis Safety Information*.

## 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: 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.

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

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

**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.**



≥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.



**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/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

<b>Electromagnetic compatibility (ECM)</b>	
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
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.

⇒ **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 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:**

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.

※ 비고

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 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.
note: Class A device: operated in a commercial area. Class B device: operated in a residential area.	

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# 1 Introducing the NovaScale Blade 2021 server

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This high-performance NovaScale Blade Server is ideally suited for networking environments that require superior processor performance, efficient memory management, flexibility, and reliable data storage.

This *Installation and User Guide* provides information about:

- Setting up the NovaScale Blade Server
- Starting and configuring the NovaScale Blade Server
- Installing hardware options
- Installing the operating system
- Performing basic troubleshooting of the NovaScale Blade Server

Record information about your NovaScale Blade 2021 in the following table.

⇒ **NOTE**

The model number and serial number are on the ID label that is behind the control panel door on the front of the NovaScale Blade Server, and on a label on the right side of the NovaScale Blade Server that is visible when the NovaScale Blade Server is not in the NovaScale Blade Chassis unit.

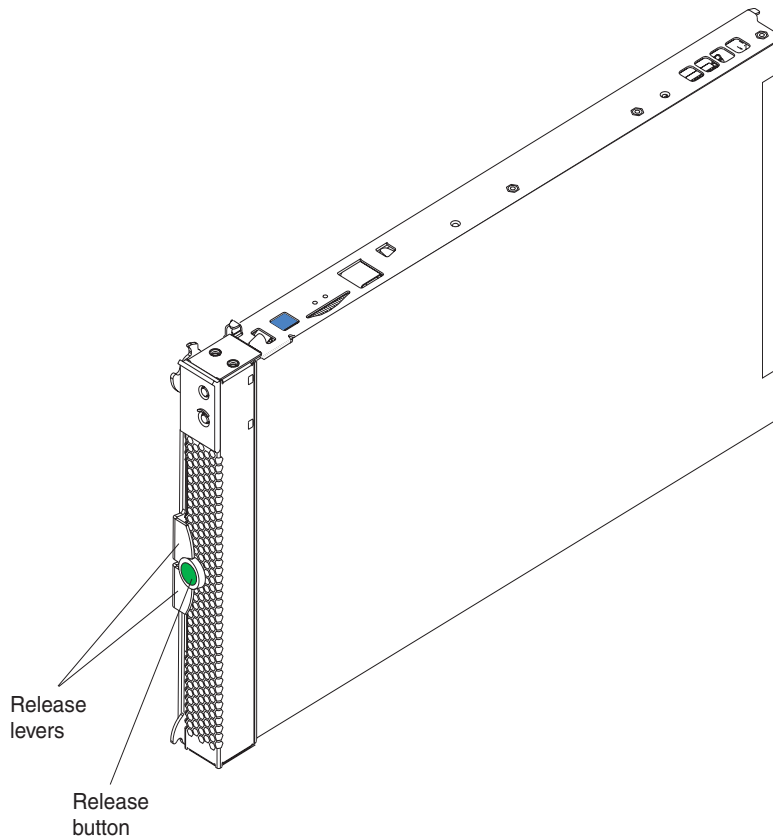
<b>Product name</b>	NovaScale Blade 2021
<b>Product code</b>	
<b>Model number</b>	_____
<b>Serial number</b>	_____

Your NovaScale Blade 2021 will have one of the bezels shown in the following illustration.

⇒ **NOTE**

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

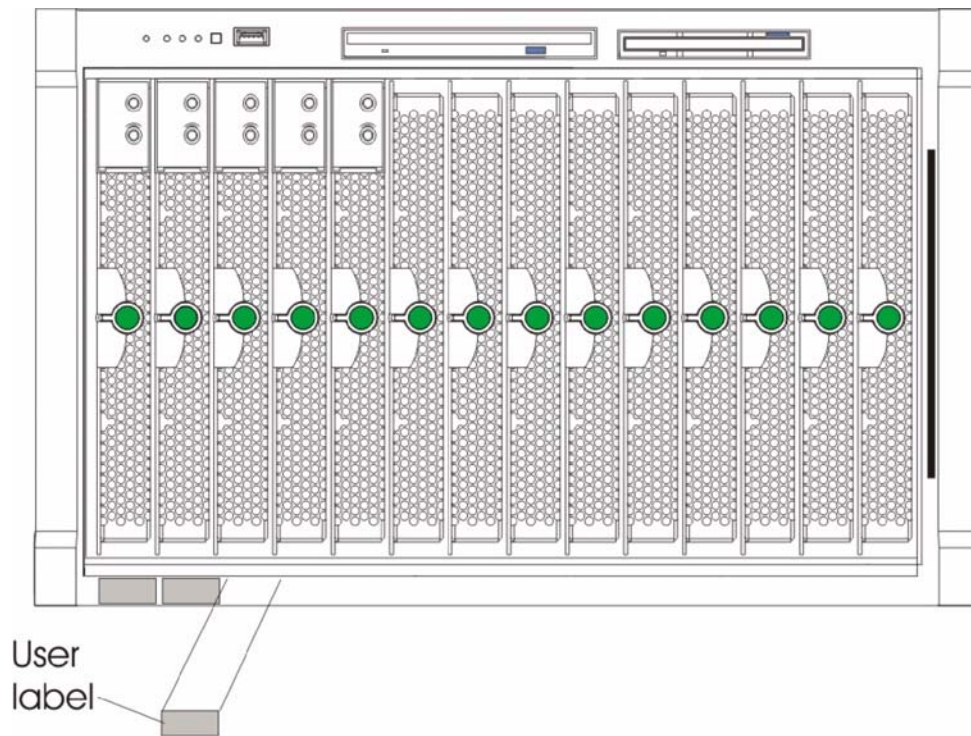
*Figure 1. NovaScale Blade Server release levers.*



A set of user labels comes with the NovaScale Blade 2021. When you install the NovaScale Blade Server in the NovaScale Blade Chassis unit, write identifying information on a label and place the label on the NovaScale Blade 2021 unit bezel.

Figure 2 shows the placement of the label, just below the NovaScale Blade Server, on the NovaScale Blade Chassis unit.

Figure 2. Label placement on the NovaScale Blade Chassis unit.



TP00216

**Important:** Do not place the label on the NovaScale Blade Server itself or in any way block the ventilation holes on the NovaScale Blade Server.

## Features and specifications

This section provides a summary of the features and specifications of your NovaScale Blade Server. Use the Configuration/Setup Utility program to determine the specific type of processor that is in the NovaScale Blade Server.

### Reliability, availability, and serviceability features

Three of the most important features in server design are reliability, availability, and serviceability (RAS). These RAS features help to ensure the integrity of the data stored on the NovaScale Blade Server; that the NovaScale Blade Server is available when you want to use it; and that should a failure occur, you can easily diagnose and repair the failure with minimal inconvenience.

The NovaScale Blade Server has the following RAS features:

- Advanced Configuration and Power Interface (ACPI)
- Automatic error retry or recovery
- Automatic server restart
- Built-in monitoring for temperature, voltage, hard disk drives, and flash drives
- Chipkill\* memory for DIMMs with a capacity of 512 MB or greater
- Customer upgradeable basic input/output system (BIOS) code
- Diagnostic support of Ethernet controllers
- Error codes and messages
- ECC protection on the L2 cache
- ECC memory
- Failover Ethernet support
- Hot-swap drives on optional small computer system interface (SCSI) storage expansion unit
- Light Path Diagnostics\* feature
- Power-on self-test (POST)
- Predictive Failure Analysis\* (PFA) alerts
- Processor serial number access
- Service processor that communicates with the management module to enable remote NovaScale Blade Server management
- SDRAM with serial presence detect (SPD) and vital product data (VPD)
- System error logging
- VPD (includes information stored in nonvolatile memory for easier remote viewing)
- Wake on LAN\* capability

## NovaScale Blade 2021 features

The design of your NovaScale Blade Server takes advantage of advancements in memory management and data storage. Your NovaScale Blade Server uses the following features and technologies:

- **Disk drive support**

The NovaScale Blade Server supports up to two 2.5-inch SCSI disk drives.

- **Intel Architecture**

Intel architecture technology leverages proven innovative technologies to build powerful, scalable, reliable Intel-processor-based servers. The technology includes features such as Light Path Diagnostics, Predictive Failure Analysis (PFA), and Advanced System Management.

- **Impressive performance using the latest processor technology**

Your NovaScale Blade Server supports up to two Intel® Xeon™ processors. The NovaScale Blade Server comes with at least one processor installed; you can install an additional processor to further enhance performance and symmetric multiprocessing (SMP) capability.

- **Integrated network environment support**

The NovaScale Blade Server comes with two integrated dual Gigabit Ethernet controllers. Each Ethernet controller has an interface for connecting to 10/100/1000-Mbps networks through an Ethernet-compatible switch module on the NovaScale Blade Chassis unit. The NovaScale Blade Server automatically selects between 10BASE-T and 100/1000BASE-TX environments. Each controller provides full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN). The controllers support Wake on LAN technology.

- **I/O expansion**

The NovaScale Blade Server comes with two connectors on the system board for an optional expansion card, such as the NovaScale Blade Server Fibre Channel Expansion Card or the NovaScale Blade Server Ethernet Expansion Card, for adding more network communication capabilities to the NovaScale Blade Server.

- **Large system memory**

The memory bus in your NovaScale Blade Server supports up to 8GB of system memory. The memory controller provides support for up to four industry-standard 1.8 V, 184-pin, double-data-rate (DDR2-400), PC3200, registered synchronous dynamic random-access memory (SDRAM) with error correcting code (ECC) DIMMs.

- **Light Path Diagnostics**

The Light Path Diagnostics feature provides light-emitting diodes (LEDs) to assist in isolating problems with the NovaScale Blade Server. An LED on the NovaScale Blade Server control panel is lit if an unusual condition or a problem occurs. If this happens, you can look at the LEDs on the system board to locate the source of the problem.

- **PCI Express\***

PCI Express\* is a fully serial interface that can be used for universal connectivity for use as a chip-to-chip interconnect, I/O interconnect for adapter cards, and an I/O attachment point to Gigabit networking devices. PCI Express bridges a PCI Express bus to a PCI-X bus and converts the transactions on the PCI bus to transactions on the PCI-X bus. Using the expansion card

connector you can add additional LAN interfaces. The expansion card connector supports PCI-X 133 and bridges PCI Express into PCI-X 133.

- **Power throttling**

Each NovaScale Blade Server is powered by two NovaScale Blade Chassis unit redundant 2000 W power supply modules. By enforcing a power policy known as oversubscription, the NovaScale Blade Chassis unit can load-share power between two power modules to ensure efficient power for each device in the NovaScale Blade Chassis unit. This policy is enforced when the initial power is applied to the NovaScale Blade Chassis unit or when a NovaScale Blade Server is inserted into the NovaScale Blade Chassis unit.

The possible settings for this policy are:

- Redundant without performance impact
- Redundant with performance impact
- Non-redundant

You can configure and monitor the power environment using the management module. For more information about configuring and using power throttling, refer to your management module manual.

## NovaScale Blade 2021 specifications

The following table provides a summary of the features and specifications of the NovaScale Blade 2021.

⇒ **NOTE**

Power, cooling, removable-media drives, external ports, and advanced system management are provided by the NovaScale Blade Chassis unit.

⇒ **NOTE**

The operating system in the NovaScale Blade Server must provide USB support for the NovaScale Blade Server to recognize and use the keyboard, mouse, CD-ROM drive, and diskette drive. The NovaScale Blade Chassis unit uses USB for internal communications with these devices.



<p><b>Processor:</b> Supports up to two processors</p> <ul style="list-style-type: none"> <li>• Intel® Xeon™ processors with an 800 MHz FSB at speeds up to 3.6GHz</li> <li>• Intel® E7520 chipset</li> </ul> <p><b>Memory:</b></p> <ul style="list-style-type: none"> <li>• Dual channel 400 MHz (DDR2) with four DIMM slots (8 GB maximum)</li> <li>• Type: 2-way interleaved, DDR2, PC3200, ECC SDRAM registered x4 (Chipkill*) DIMMs only</li> <li>• Supports 256 MB, 512 MB, 1 GB, and 2 GB DIMMs (four DIMM slots)</li> </ul> <p><b>Service Processor:</b> Rennasas 2166 supports:</p> <ul style="list-style-type: none"> <li>• RS-485 interface</li> <li>• Serial over LAN (SOL)</li> <li>• IPMI</li> </ul> <p><b>Drives:</b> Support for two internal small form-factor SCSI drives</p>	<p><b>Size:</b></p> <ul style="list-style-type: none"> <li>• Height: 24.5 cm (9.7 inches)</li> <li>• Depth: 44.6 cm (17.6 inches)</li> <li>• Width: 2.9 cm (1.14 inches)</li> <li>• Maximum weight: 5.4 kg (12 lb)</li> </ul> <p><b>Integrated functions:</b></p> <ul style="list-style-type: none"> <li>• Dual Gigabit Ethernet controllers</li> <li>• Expansion card interface</li> <li>• BMC with IPMI firmware</li> <li>• ATI* 7000M video controller</li> <li>• LSI* 1020 SCSI controller</li> <li>• Light Path Diagnostics</li> <li>• Local service processor</li> <li>• RS-485 interface for communication with the management module</li> <li>• Four USB buses for communication with keyboard, mouse, diskette drive, and CD-ROM drive</li> </ul> <p><b>Predictive Failure Analysis (PFA) alerts:</b></p> <ul style="list-style-type: none"> <li>• Processor</li> <li>• Memory</li> </ul>	<p><b>Electrical Input:</b> 12 V dc</p> <p><b>Environment:</b></p> <ul style="list-style-type: none"> <li>• Air temperature: <ul style="list-style-type: none"> <li>— NovaScale Blade Server on: 10° to 35° C (50° to 95° F). Altitude: 0 to 914 m (2998.69 ft)</li> <li>— NovaScale Blade Server on: 10° to 32° C (50° to 89.6° F). Altitude: 914 m to 2134 m (2998.69 ft to 7000 ft)</li> <li>— NovaScale Blade Server off: -40° to 60° C (-40° to 140° F)</li> </ul> </li> <li>• Humidity: <ul style="list-style-type: none"> <li>— NovaScale Blade Server on: 8% to 80%</li> <li>— NovaScale Blade Server off: 5% to 80%</li> </ul> </li> </ul>
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# Major components of the NovaScale Blade Server

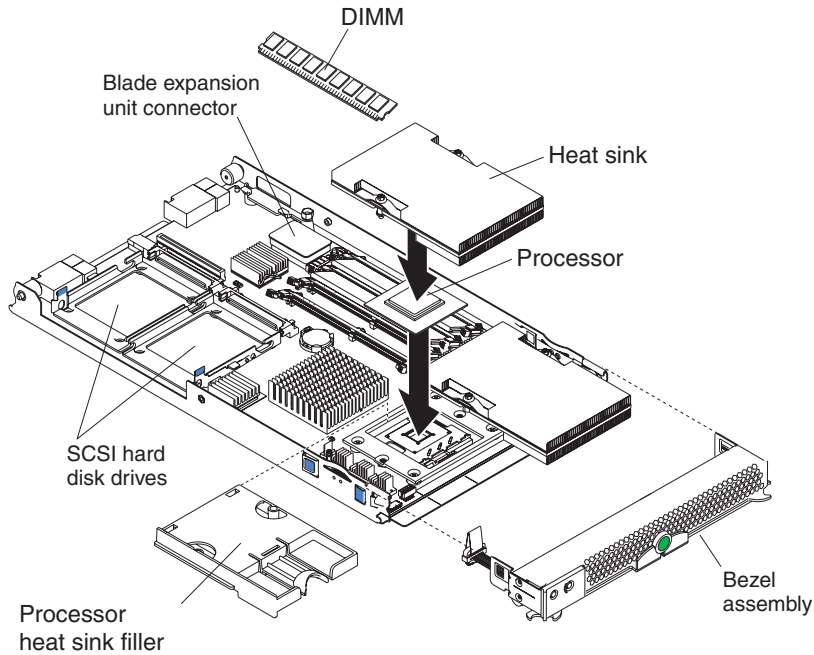
You must remove the NovaScale Blade Server from the NovaScale Blade Chassis unit and remove the cover to see the components.

⇒ **NOTE**

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

Figure 3 shows the major components of the NovaScale Blade 2021 unit.

*Figure 3. NovaScale Blade 2021 unit major components.*



## Related publications

In addition to this *Installation and User's Guide*, the following documentation is provided in Portable Document Format (PDF) on the CD-ROM *NovaScale Blade 2021 Resource CD* that came with your NovaScale Blade Server.

- *NovaScale Blade 2021 Hardware Maintenance Manual and Troubleshooting Guide*  
This document contains information to help you solve problems yourself. It also contains information for service technicians.
- *NovaScale Blade 2021 Installation and User's Guide* (this guide)  
This document contains instructions for setting up and configuring the NovaScale Blade 2021 unit and basic instructions for installing some options. It also contains general information about the NovaScale Blade 2021 unit.

## Notices and statements used in this document

The following notices and statements are used in the documentation:

- **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.



## 2 Using power, controls, jumpers, switches, and indicators

---

This chapter describes the power features, how to turn on and turn off the NovaScale Blade Server, what the controls and indicators mean, and where the system board jumpers and switches are located and how to use them.

### Turning on the NovaScale Blade Server

After you connect the NovaScale Blade Server to power through the NovaScale Blade Chassis unit, the NovaScale Blade Server can start in any of the following ways:

- You can press the power-control button on the front of the NovaScale Blade Server (behind the control panel door) to start the server.
  - ⇒ **NOTE**  
Wait until the power-on LED on the NovaScale Blade Server flashes slowly before pressing the NovaScale Blade Server power-control button. During this time, the service processor in the management module is initializing; therefore, the power-control button on the NovaScale Blade Server does not respond.
  - ⇒ **NOTE**  
While the NovaScale Blade Server is powering up, the power-on LED on the front of the server is lit. See “Understanding the control panel and LEDs” on page 13 for the power-on LED states.
- If a power failure occurs, the NovaScale Blade Chassis unit and then the NovaScale Blade Server can start automatically when power is restored if the NovaScale Blade Server is configured through the management module to do so.
- You can turn on the NovaScale Blade Server remotely by means of the service processor in the management module.
- If your operating system supports the Wake on LAN feature and the NovaScale Blade Server power-on LED is flashing slowly, the Wake on LAN feature can turn on the NovaScale Blade Server, if the Wake on LAN feature has not been disabled through the management-module Web interface.

## Turning off the NovaScale Blade Server

When you turn off the NovaScale Blade Server, it is still connected to power through the NovaScale Blade Chassis unit. The NovaScale Blade Server can respond to requests from the service processor, such as a remote request to turn on the NovaScale Blade Server. To remove all power from the NovaScale Blade Server, you must remove it from the NovaScale Blade Chassis unit.

Shut down your operating system before you turn off the NovaScale Blade Server. See your operating-system documentation for information about shutting down the operating system.

The NovaScale Blade Server can be turned off in any of the following ways:

- You can press the power-control button on the NovaScale Blade Server behind the control panel door. See “Understanding the control panel and LEDs” on page 13. This starts an orderly shutdown of the operating system, if this feature is supported by your operating system.

⇒ **NOTE**

After turning off the NovaScale Blade Server, wait at least 5 seconds before you press the power-control button to turn on the NovaScale Blade Server again.

- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the NovaScale Blade Server.
- The management module can turn off the NovaScale Blade Server.

⇒ **NOTE**

After turning off the NovaScale Blade Server, wait at least 30 seconds for its hard disk drives or flash drives to stop before you remove the NovaScale Blade Server from the NovaScale Blade Chassis unit.

# Understanding the control panel and LEDs

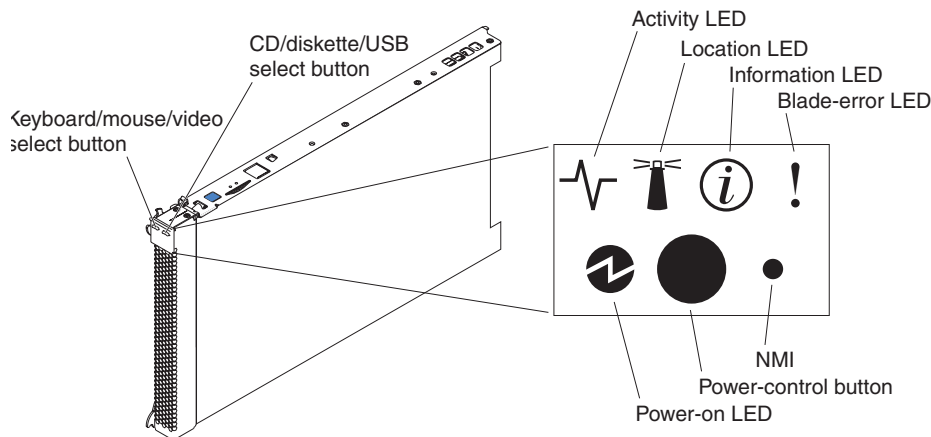
This section describes the controls and LEDs on your NovaScale Blade Chassis unit.

⇒ **NOTE**

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

⇒ **NOTE**

The control panel door is shown in the closed (normal) position in the illustration. To access the power-control button, you must open the control panel door.



**Keyboard/mouse/video (KVM) select button:** Press this button to associate the keyboard port, mouse port, and video port with this NovaScale Blade Server. The LED on this button flashes while the request is being processed, then is lit when the ownership of the keyboard, mouse, and video has been transferred to this NovaScale Blade Server. It can take approximately 20 seconds to switch the keyboard, video, and mouse control to the NovaScale Blade Server.

Although the keyboard that is attached to the NovaScale Blade Chassis unit is a PS/2\*-style keyboard, communication with it is through the USB. The operating system in the NovaScale Blade Server must provide USB support for the NovaScale Blade Server to recognize and use the keyboard and mouse. The NovaScale Blade Chassis unit uses USB for internal communication with these devices. When you are running an operating system that does not have USB device drivers, such as in the following situations, the keyboard responds very slowly:

- Running the NovaScale Blade Server integrated diagnostics
- Running a BIOS update diskette on a NovaScale Blade Server
- Updating the diagnostics on a NovaScale Blade Server
- Running the Broadcom firmware CD for a NovaScale Blade Server

If there is no response when you press the keyboard/mouse/video select button, you can use the management-module Web interface to determine whether local control has been disabled on the NovaScale Blade Server.

You can also press keyboard keys in the following sequence to switch keyboard/mouse/video control between NovaScale Blade Servers:

**NumLock NumLock *blade\_server\_number* Enter**

Where *blade\_server\_number* is the two-digit number for the blade bay in which the NovaScale Blade Server is installed.

**CD/diskette/USB select button:** Press this button to associate the CD-ROM drive, diskette drive, and USB port with this NovaScale Blade Server. The LED on this button flashes while the request is being processed, then is lit when the ownership of the CD-ROM drive, diskette drive, and USB port has been transferred to this NovaScale Blade Server. It can take approximately 20 seconds for the operating system in this NovaScale Blade Server to recognize the CD-ROM drive, diskette drive, and USB port.

The operating system in the NovaScale Blade Server must provide USB support for the NovaScale Blade Server to recognize and use the CD-ROM drive, diskette drive, and USB port. The NovaScale Blade Chassis unit uses the USB for internal communication with these devices. If there is no response when you press the CD/diskette/USB select button, you can use the management-module Web interface to determine whether local control has been disabled on the NovaScale Blade Server.

**Activity LED:** When this green LED is lit, it indicates that there is hard disk drive, flash drive, or network activity.

**Location LED:** When this blue LED is lit, it has been turned on remotely by the system administrator to aid in visually locating the NovaScale Blade Server. The location LED on the NovaScale Blade Chassis unit will be lit also. The location LED can be turned off through the management-module Web interface.

**Information LED:** When this amber LED is lit, it indicates that information about a system error for this NovaScale Blade Server has been placed in the system error log. The information LED can be turned off through the management-module Web interface.

**Blade Error LED:** When this amber LED is lit, it indicates that a system error has occurred in the NovaScale Blade Server. The blade error LED will turn off only after the error condition is corrected.

**Power-on LED:** This green LED indicates the power status of the NovaScale Blade Server in the following manner:

- Flashing rapidly: The service processor on the NovaScale Blade Server is handshaking with the management module.
- Flashing slowly: The NovaScale Blade Server has power but is not turned on.
- Lit continuously: The NovaScale Blade Server has power and is turned on.

**Power-control button:** This button is behind the control panel door. Press this button to turn on or turn off the NovaScale Blade Server.

⇒ **NOTE**

The power-control button has effect only if local power control is enabled for the NovaScale Blade Server. Local power control is enabled and disabled through the management-module Web interface.

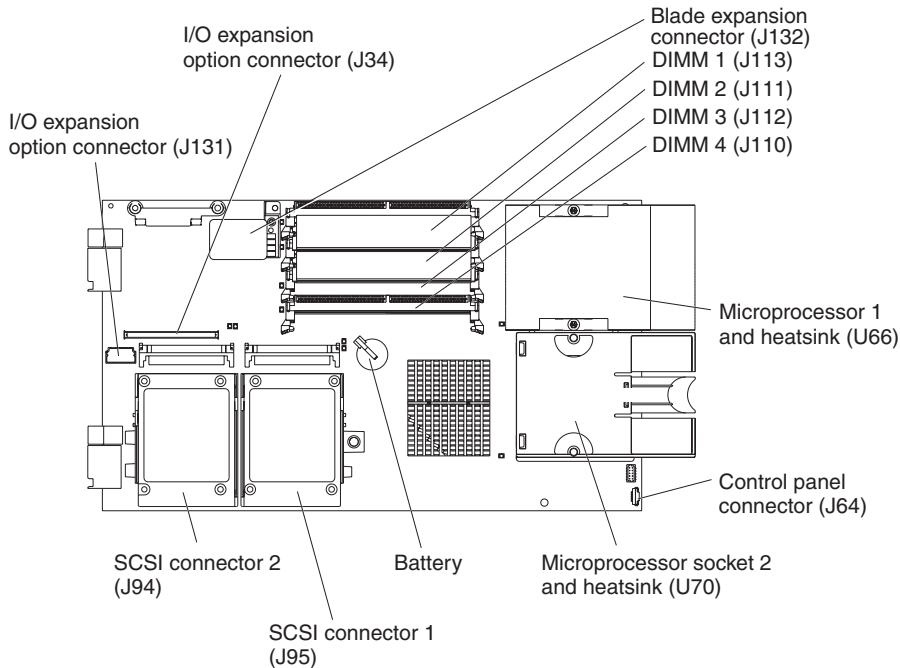
**Non-maskable interrupt (NMI) button:** Press this button to start diagnostic and debugging tests. Use the tip of a paper clip or other pointed object to reset this button.



## System board illustration

The following illustration shows the system-board components, including connectors for user-installable options, for the NovaScale Blade Server.

Figure 4. System board components.



## Using system board switches

This section describes the system board switches on your NovaScale Blade 2021.

### NOTE

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

Figure 5 on page 16 and Figure 6 on page 17 show the LEDs on the system board for the NovaScale Blade 2021. Refer to Table 1 on page 16 and Table 2 on page 17 for more information about the Light Path Diagnostics LED locations and settings. Refer to these illustrations and tables when solving problems with the NovaScale Blade Server.

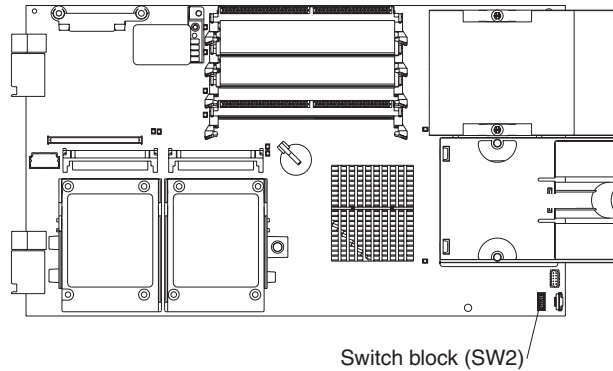
### NOTE

Power is available to relight the Light Path Diagnostics LEDs for a small period of time after the NovaScale Blade Server is removed from the NovaScale Blade Chassis unit. During that period of time, you can relight the Light Path Diagnostics LEDs for a maximum of 25 seconds (or less, depending on the number of LEDs that are lit and the length of time the NovaScale Blade Server is removed from the NovaScale Blade Chassis unit) by pressing the Light Path Diagnostics button. The Light Path Diagnostics power present LED (CR111) lights when the Light Path Diagnostics button is pressed if power is available to relight the blade-error LEDs. If the Light Path Diagnostics power present LED does not light when the Light Path Diagnostics button is pressed, no power is available to light the blade-error LEDs, and they will be unable to provide any diagnostic information.

## Using switch block 2 (SW2)

You must remove the NovaScale Blade Server from the NovaScale Blade Chassis unit, open the cover, and press the Light Path Diagnostics button to light any error LEDs that were turned on during processing. The following illustration and Table 1 on page 16 show the location and the settings for SW2.

*Figure 5. System board switch block (SW2) location.*



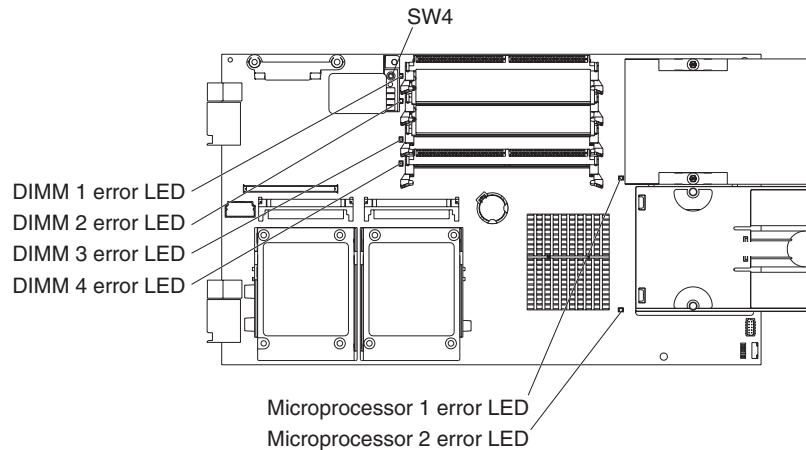
*Table 1. Switch block 2 (SW2) and settings*

Switch number	Description
SW2	<p>Switch block: Eight switches</p> <ul style="list-style-type: none"> <li>• 1 - BIOS backup page jumper. <ul style="list-style-type: none"> <li>- Open: the BIOS boots from the Primary BIOS page.</li> <li>- Closed: the BIOS boots from the backup BIOS page.</li> </ul> </li> <li>• 2 - Wake on LAN Bypass <ul style="list-style-type: none"> <li>- Open: Enabled</li> <li>- Closed: Disabled (default)</li> </ul> </li> <li>• 3 - Reserved</li> <li>• 4 - Reserved</li> <li>• 5 - Reserved</li> <li>• 6 - Clear CMOS <ul style="list-style-type: none"> <li>- Open: Disabled</li> <li>- Closed: Enabled</li> </ul> </li> <li>• 7 - Reserved</li> <li>• 8 - Bypass power-on password <ul style="list-style-type: none"> <li>- Open: Disabled (default)</li> <li>- Closed: Enabled</li> </ul> </li> </ul>

## Using Light Path Diagnostics to troubleshoot the system board

After the system board is removed from the chassis, you can press Light Path Diagnostics (SW4) to troubleshoot system board component problems. See Figure 6 on page 17 and Table 2 on page 17 for more information about locating Light Path Diagnostics LEDs and what to do if an error LED is lit.

*Figure 6. Light Path Diagnostics switch (SW4) and error LEDs.*



*Table 2. SW4 Light Path Diagnostics LED locations*

LED name and location	Description
DIMM 1 (CR6), DIMM 2 (CR5), DIMM 3 (CR4), DIMM 4 (CR201) error	There is a problem with the corresponding DIMM.
BMC fault (CR11)	There is a problem with the corresponding BMC.
Processor 1 error (CR12) Processor 2 error (CR13)	There is a problem with the corresponding processor.
System board fault (CR30)	There is a problem with the corresponding system board.
Light Path Diagnostics LED (CR111)	Lights to show the circuit is active and functioning.

*Figure 7. Light Path Diagnostics switch (SW4) and error LEDs.*



*Table 3. SW4 Light Path Diagnostics LED locations*

LED error	Action
NMI	Check the error log for additional information. Reboot the NovaScale Blade Server. If the error still exists, replace the system board.
MIS	Check the processors to make sure they are at the same speed.
SBRD	Reboot the NovaScale Blade Server. If the error still exists, replace the system board.
TEMP	Check the NovaScale Blade Chassis unit blowers and air inlets. Check the room temperature.
Light Path Diagnostics LED	Check the Light Path Diagnostics LED for errors
Light Path Diagnostics button (SW4)	Press SW4 to locate faults on the system board. If the processor or memory LED is lit, reseal the component. If the LED remains lit, replace the defective component.

See “Diagnosing problems using Light Path Diagnostics” on page 67 for information on what action to take if there is a component error.

## 3 Installing options

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This chapter provides instructions for installing hardware options in your NovaScale Blade Server. Some option-removal instructions are provided in case you need to remove one option to install another.

### Installation guidelines

Before you begin installing options in the NovaScale Blade Server, read the following information:

- Read the safety information beginning on page iii and the guidelines in “Handling static-sensitive devices.” This information will help you work safely with your NovaScale Blade Server and options.
- Back up all important data before you make changes to the disk drives.
- Before you remove a hot-swap NovaScale Blade Server from the NovaScale Blade Chassis unit, you must shut down the operating system and turn off the NovaScale Blade Server. You do not have to shut down the NovaScale Blade Chassis unit itself.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the NovaScale Blade Server, or open or close a latch.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the NovaScale Blade Server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

### System reliability considerations

To help ensure proper cooling and system reliability, make sure that processor socket 2 always contains either a processor heat sink filler or a processor and heat sink.

 **NOTE**

When using a single processor, you must install it into the CPU 1 socket.

### Handling static-sensitive devices

**Attention:** Static electricity can damage electronic devices and your NovaScale Blade Server. To avoid damage, keep static-sensitive devices in their non-conductive packages until you are ready to install them.

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

- When working on the NovaScale Blade Chassis unit, use an electrostatic discharge (ESD) wrist strap, especially when you will be handling modules, options, and NovaScale Blade Servers. To work properly, the wrist strap must have a good contact at both ends (touching your skin at one end and firmly connected to the ESD connector on the front or back of the NovaScale Blade Chassis unit).
- Limit your movement. Movement can cause static electricity to build up around you.

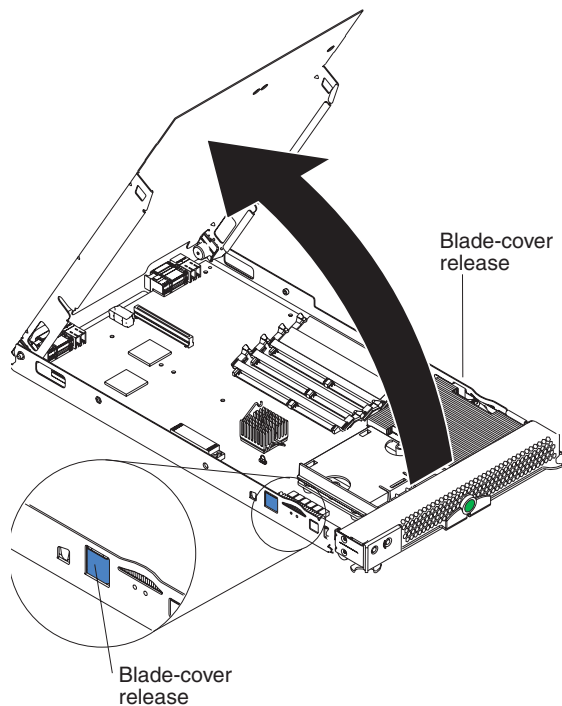
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and possibly damage it.
- While the device is still in its non-conductive package, touch it to an *unpainted* metal part of the NovaScale Blade Chassis unit 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 the NovaScale Blade Server without setting it down. If it is necessary to set the device down, place it back into its non-conductive package. Do not place the device on your NovaScale 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 and removing the NovaScale Blade Server from the NovaScale Blade Chassis unit

To install or remove a NovaScale Blade Server from the NovaScale Blade Chassis unit, see the documentation that came with your unit for instructions.

### Opening the NovaScale Blade Server cover

The following illustration shows how to open the cover on the NovaScale Blade Server.



Complete the following steps to open the NovaScale Blade Server cover:

1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. Carefully lay the NovaScale Blade Server down on a flat, non-conductive surface, with the cover side up.
3. Press the blade-cover release on each side of the NovaScale Blade Server and lift the cover open, as shown in the illustration.
4. Lay the cover flat, or lift it from the NovaScale Blade Server and store for future use.

**Statement 21:**

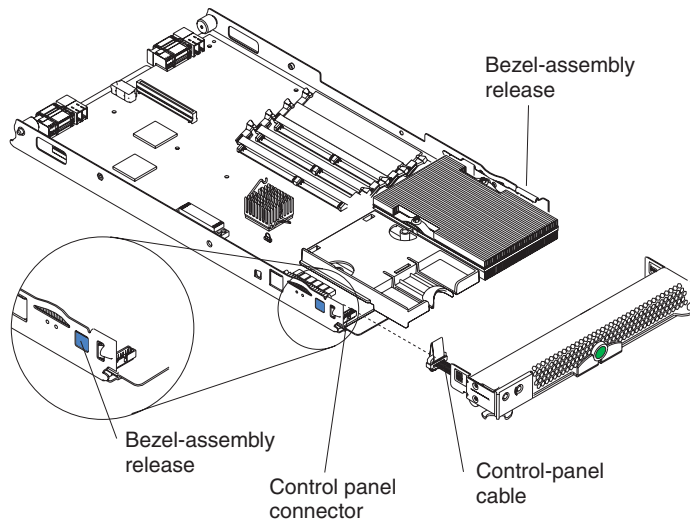


**CAUTION:**

Hazardous energy is present when the NovaScale Blade Server is connected to the power source. Always replace the blade cover before installing the NovaScale Blade Server.

## Removing the NovaScale Blade Server bezel assembly

To install certain options, you must first remove the NovaScale Blade Server bezel assembly. The following illustration shows how to remove the bezel assembly from the NovaScale Blade Server.



Complete the following steps to remove the NovaScale Blade Server bezel assembly:

1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. Open the NovaScale Blade Server cover (see “Opening the NovaScale Blade Server cover” on page 20 for instructions).
3. Press the bezel-assembly release and pull the bezel assembly away from the NovaScale Blade Server approximately 1.2 cm (0.5 inch).
4. Disconnect the control-panel cable from the control-panel connector.
5. Pull the bezel assembly away from the NovaScale Blade Server.
6. Store the bezel assembly in a safe place.

## Installing a SCSI hard disk drive

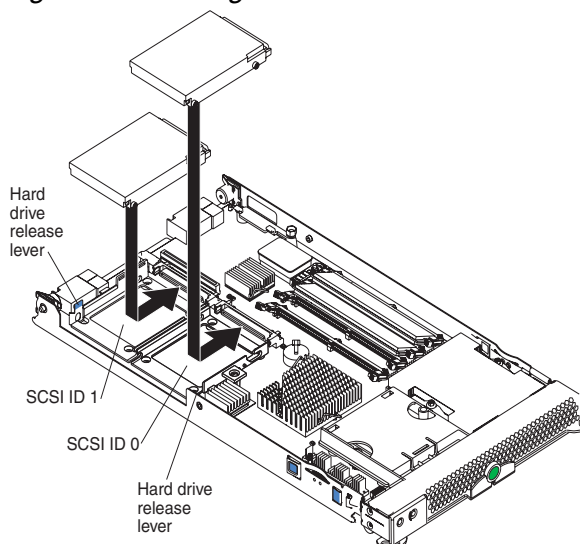
The NovaScale Blade Server has two connectors on the system board for installing optional Ultra320 SCSI hard disk drives.

Each Ultra320 SCSI connector is on the same bus. Depending on your NovaScale Blade Server, at least one SCSI hard disk drive might already be installed. If your NovaScale Blade Server is equipped with one SCSI hard disk drive, you can install an additional SCSI hard disk drive. These two SCSI hard disk drives can be used to implement and manage a redundant array of independent disks (RAID) level-1. See “Configuring a SCSI RAID array” on page 56 for information about SCSI RAID configuration.

**Attention:** To maintain proper system cooling, do not operate the system unit without a NovaScale Blade Server, expansion unit, or filler blade installed in each blade bay.

The following illustration shows how to install a SCSI hard disk drive and tray in the NovaScale Blade Server.

*Figure 8. Installing a SCSI drive.*



### **Note**

Do not install a SCSI hard disk drive in SCSI connector 1 (SCSI ID 1) if you intend to also install an optional standard expansion card. The standard expansion card occupies the same area as the second drive.

To install a SCSI hard disk drive, complete the following steps:

1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. Shut down the operating system, turn off the NovaScale Blade Server, and remove the NovaScale Blade Server from the NovaScale Blade Chassis unit (see “Installing and removing the NovaScale Blade Server from the NovaScale Blade Chassis unit” on page 20 for instructions).
3. Carefully lay the NovaScale Blade Server on a flat, non-conductive surface.



4. Open the NovaScale Blade Server cover (see “Opening the NovaScale Blade Server cover” on page 20 for instructions).
5. Locate SCSI connector 0 (J95).  
**Attention:** Do not press on the top of the drive. Pressing the top could damage the drive.
6. Place the drive into the tray and push it, from the rear edge of the drive, into the connector until the drive moves past the lever at the back of the tray. The drive clicks into place.
7. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 42.

## Removing a SCSI hard disk drive

To remove the SCSI hard disk drive, complete the following steps:

1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. Shut down the operating system, turn off the NovaScale Blade Server, and remove the NovaScale Blade Server from the NovaScale Blade Chassis unit (see “Installing and removing the NovaScale Blade Server from the NovaScale Blade Chassis unit” on page 20 for instructions).
3. Carefully lay the NovaScale Blade Server on a flat, non-conductive surface.
4. Open the NovaScale Blade Server cover (see “Opening the NovaScale Blade Server cover” on page 20 for instructions).
5. Locate SCSI connector 1 and slowly pull the blue lever at the back of the hard disk drive tray to disengage the drive from its tray.
6. From the rear edge of the drive, slide the drive out of the SCSI connector.

**Attention:** To maintain proper system cooling, do not operate the system unit without either a NovaScale Blade Server, expansion unit, or filler blade installed in each blade bay for more than 1 minute.

## Installing memory modules

The following notes describe the types of dual inline memory modules (DIMMs) that the NovaScale Blade Server supports and other information that you must consider when installing DIMMs:

- The system board contains four DIMM connectors and supports two-way memory interleaving.
- The DIMM options that are available for your NovaScale Blade Server are 256 MB, 512 MB, 1 GB, and 2 GB. Your NovaScale Blade Server supports a minimum of 256 MB and a maximum of 8 GB of system memory.
- Your NovaScale Blade Server comes with two DIMMs in the DIMM 1 (J113) and DIMM 2 (J111) memory connectors.

When you install additional DIMMs, be sure to install them as a pair, in DIMM connectors 3 (J112) and 4 (J110).

Install the DIMMs in the following order:

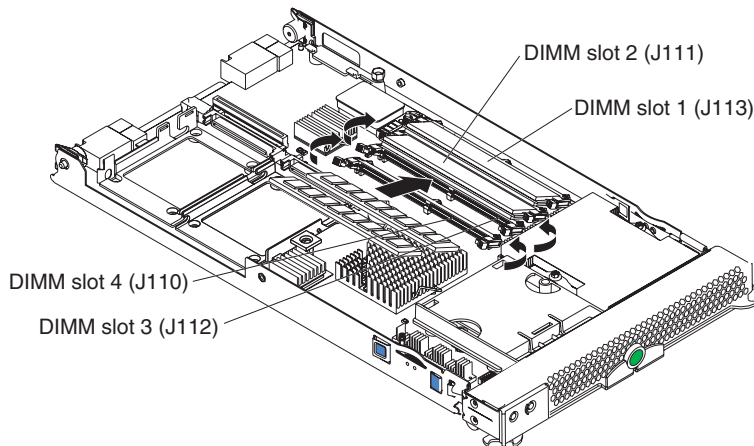
Pair	DIMM connectors
First	1 (J113) and 2 (J111)
Second	3 (J112) and 4 (J110)

When you install memory, you must install a pair of matched DIMMs.

- Both DIMMs in a pair must be the same size, speed, type, and technology. You can mix compatible DIMMs from various manufacturers.
- The second pair does not have to be DIMMs of the same size, speed, type, and technology as the first pair.
- Install only 1.8 V, 240-pin, DDR2, PC3200, registered SDRAM with ECC DIMMs. These DIMMs must be compatible with the latest PC3200 SDRAM Registered DIMM specification, which is available from <http://www.jedec.org/>. For a current list of supported DIMMs for your NovaScale Blade Server, see the *NovaScale Blade 2021 Memory Qualification List*.
- Installing or removing DIMMs changes the configuration information for the NovaScale Blade Server. Therefore, after installing or removing a DIMM, you must change and save the new configuration information by using the Configuration/Setup Utility program. When you restart the NovaScale Blade Server, it displays a message indicating that the memory configuration has changed. Start the Configuration/Setup Utility program and select **Save Settings**. See “Configuration/Setup Utility menu choices” on page 49 for more information.

Figure 9 shows how to install DIMMs on the system board for the NovaScale Blade Server.

*Figure 9. Installing DIMMS.*



Before you begin, read the documentation that comes with the DIMMs.

Complete the following steps to install a DIMM:

1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. Shut down the operating system, turn off the NovaScale Blade Server, and remove the NovaScale Blade Server from the NovaScale Blade Chassis unit (see “Installing and removing the NovaScale Blade Server from the NovaScale Blade Chassis unit” on page 20 for instructions).

3. Carefully lay the NovaScale Blade Server on a flat, non-conductive surface.
4. Open the NovaScale Blade Server cover (see “Opening the NovaScale Blade Server cover” on page 20 for instructions).
5. Locate the DIMM connectors on the system board. Determine the connectors into which you will install the DIMMs.
6. Touch the non-conductive package that contains the DIMM option to any *unpainted* metal surface on the NovaScale Blade Chassis unit or any *unpainted* metal surface on any other grounded rack component in the rack you are installing the DIMM option in for at least 2 seconds. Then remove the DIMM from the package.
7. To install the DIMMs, repeat the following steps for each DIMM that you install:
  - a. Turn the DIMM so that the DIMM key aligns correctly with the connector on the system board.

**Attention:** To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.
  - b. Insert the DIMM by pressing the DIMM along the guides into the connector. Make sure the retaining clips snap into the closed positions.

**Important:** If there is a gap between the DIMM and the retaining clips, the DIMM has not been properly installed. In this case, open the retaining clips and remove the DIMM. Reinsert the DIMM.
8. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 42.

## Installing an additional processor

The NovaScale Blade Server comes with one or two processors installed on the system board. The NovaScale Blade Server supports two processors. With two processors, your NovaScale Blade Server can operate as a symmetric multiprocessing (SMP) server. With SMP, certain operating systems and application programs can distribute the processing load between the processors. If your NovaScale Blade Server comes with one processor, you can install a second processor.

### Notes:

1. You can not remove the single processor and replace it with a different type of processor of greater or lesser speed.
2. If you install a second processor, it must be of the same processor type and speed as the first processor.

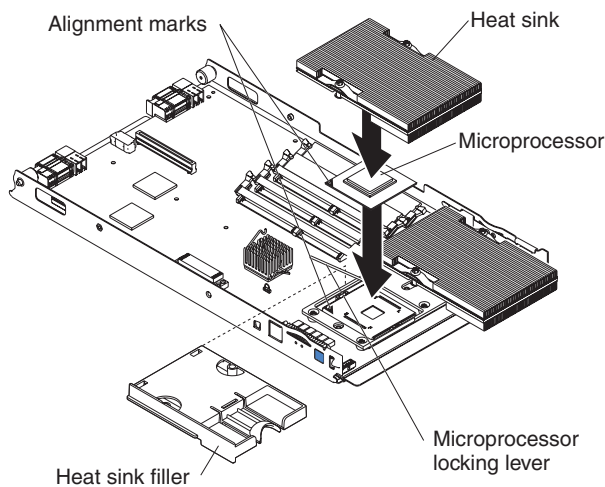
To use SMP, obtain an SMP-capable operating system.

The following notes describe the type of processor that the server supports and other information that you must consider when installing a processor. To ensure proper NovaScale Blade Server operation when you install a second processor, observe the following precautions.

- Always install processors that have the same cache size and type, the same clock speed, and identical internal and external clock frequencies (including system bus speed).
- Make sure that the processor with the lowest feature set is the startup (bootstrap) processor, installed in the processor 1 socket (U66).

- For a list of processors that are supported by your NovaScale Blade Server, ask your Support Representative.
- Thoroughly review the documentation that comes with the processor, so that you can determine whether you have to update the NovaScale Blade Server BIOS code. The latest level of BIOS code for your NovaScale Blade Server is available from your Support Representative.
- The processor sockets in this server contain built-in termination for the processor bus; therefore, no terminator card is required if a processor socket 2 is empty. However, for proper airflow, this socket must contain a processor heat-sink filler, sometimes called a processor baffle.
- The processor speeds are automatically set for this server; therefore, you do not have to set any processor frequency-selection jumpers or switches.

The following illustration shows how to install the second processor on the system board for the NovaScale Blade Server.



Complete the following steps to install an additional processor:

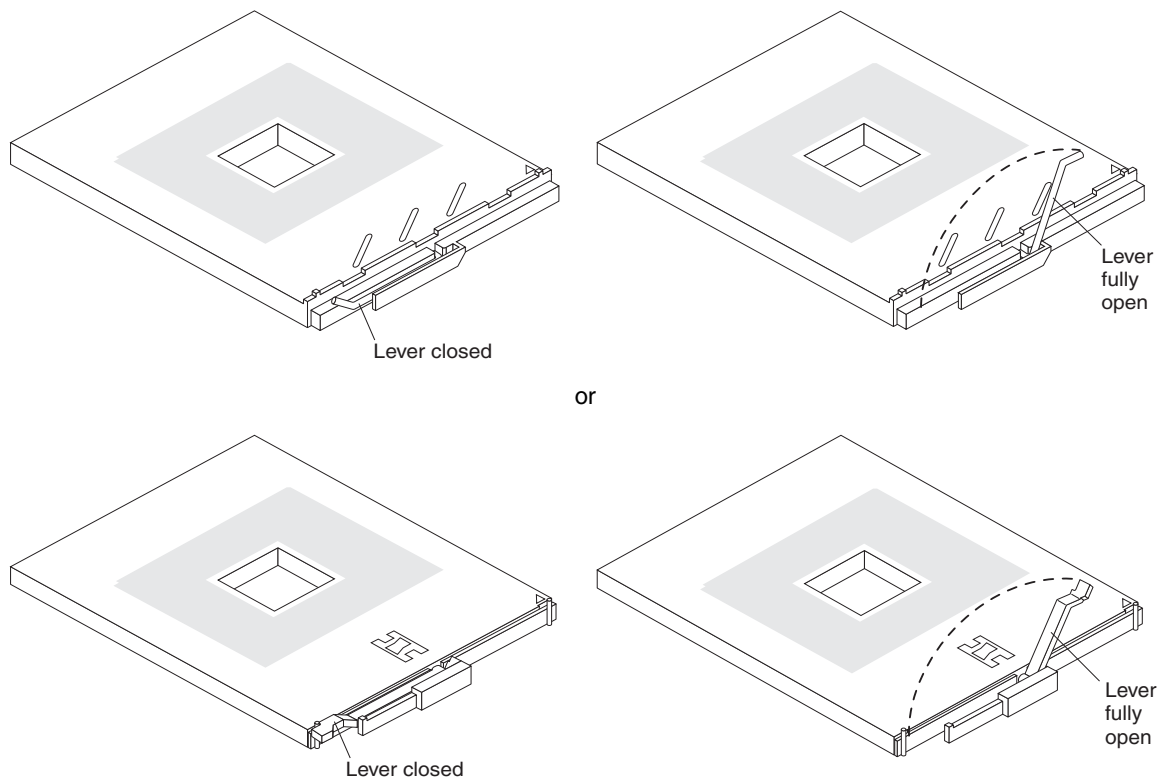
1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. Shut down the operating system, turn off the NovaScale Blade Server, and remove the NovaScale Blade Server from the NovaScale Blade Chassis unit (see “Installing and removing the NovaScale Blade Server from the NovaScale Blade Chassis unit” on page 20 for instructions).
3. Carefully lay the NovaScale Blade Server on a flat, non-conductive surface.
4. Open the NovaScale Blade Server cover (see “Opening the NovaScale Blade Server cover” on page 20 for instructions).
5. Remove the bezel assembly (see “Removing the NovaScale Blade Server bezel assembly” on page 21 for instructions).
6. Locate the processor socket on the system board.
7. Remove the heat-sink filler.
8. Install the processor:
  - a. Remove the protective cover, tape, or label from the surface of the processor socket, if one is present.

- b. Touch the non-conductive package containing the new processor to any *unpainted* metal surface on the NovaScale Blade Server or any *unpainted* metal surface on any other grounded rack component in the rack you are installing the processor in for at least 2 seconds; then remove the processor from the package.

**Attention:** Do not use any tools or sharp objects to lift the locking lever on the processor socket. Doing so might result in permanent damage to the system board.

- c. Rotate the locking lever on the processor socket from its closed and locked position until it stops or clicks in the fully open position (approximately a 135° angle), as shown.

**Attention:** You must make sure that the locking lever on the processor socket is in the fully open position before you insert the processor in the socket. Failure to do so might result in permanent damage to the processor, processor socket, and system board.



- d. Center the processor over the processor socket. Align the triangle on the corner of the processor with the triangle on the corner of the socket and carefully press the processor into the socket.

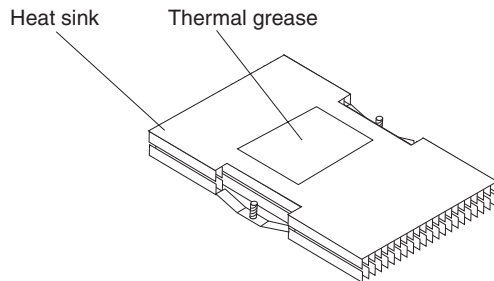
**Attention:**

- Do not use excessive force when pressing the processor into the socket.
  - Make sure that the processor is oriented and aligned correctly in the socket before you try to close the lever.
- e. Carefully close the lever to secure the processor in the socket.

9. Install a heat sink on the processor:

**Attention:**

- Do not set down the heat sink after you remove the plastic cover.
- Do not touch the thermal grease on the bottom of the heat sink. Touching the thermal grease will contaminate it. If the thermal grease on the processor or heat sink becomes contaminated, contact your service technician.



- a. Remove the plastic protective cover from the bottom of the heat sink.
  - b. Align and place the heat sink on top of the processor in the retention bracket, grease side down. Press firmly on the heat sink.
  - c. Using a screwdriver, secure the heat sink to the retention bracket on the system board using the two captive mounting screws. Press firmly on the screws and tighten them, alternating between them. Do not overtighten the screws. If you are using a torque wrench, tighten the screws to 8.5 to 13 Newton-meters (Nm) (6.3 to 9.6 foot-pounds).
10. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 42.

## Installing an I/O expansion card

You can add I/O optional expansion cards to your NovaScale Blade Server to give the NovaScale Blade Server additional connections for communicating on a network.

**Attention:**

When you add an expansion card, you must make sure that the I/O modules in I/O module bays 3 and 4 on the NovaScale Blade Chassis unit both support the expansion card network-interface type. For example, if you add an Ethernet expansion card to your NovaScale Blade Server, the modules in I/O module bays 3 and 4 on the NovaScale Blade Chassis unit must both be compatible with the expansion card. All other expansion cards that are installed on other NovaScale Blade Servers in the NovaScale Blade Chassis unit must also be compatible with these I/O modules. In this example, you could then install two Ethernet switch modules, two pass-thru modules, or one Ethernet switch module and one pass-thru module. Because pass-thru modules are compatible with a variety of I/O expansion cards, installing two pass-thru modules would enable the use of several different types of compatible I/O expansion cards within the same unit.

### ⇒ Important

Installation of a standard form-factor expansion card can require removing the SCSI drive installed in SCSI connector 2 (J94). The standard form-factor expansion card occupies the same space as this SCSI drive and replaces it. You cannot have a SCSI drive in SCSI connector 2 when a standard form-factor expansion card is going to be installed. Refer to “Removing a SCSI hard disk drive” on page 23.

If the SCSI drive that is installed in SCSI connector 2 contains any information that you want to keep, back it up to another storage device.

If the SCSI hard disk drive that is installed in SCSI connector 2 is part of a RAID array, delete this SCSI RAID array configuration before removing the hard disk drive. When you delete the RAID array, the array configuration information is removed; no data is deleted.

There are two types of I/O expansion cards supported by the NovaScale Blade Server:

- Gigabit Ethernet expansion card
- Fibre Channel expansion card

The Gigabit Ethernet and Fibre Channel expansion cards are only available as a small form-factor card.

The following sections describe how to install an I/O expansion card in the NovaScale Blade Server.

### ⇒ NOTE

You cannot install both sizes of I/O expansion cards in the same NovaScale Blade Server. You can install the small form-factor expansion card in addition to having two SCSI hard disk drives, but you cannot install a standard form-factor expansion card into a NovaScale Blade Server with two SCSI hard disk drives.

## Installing a small form-factor expansion card

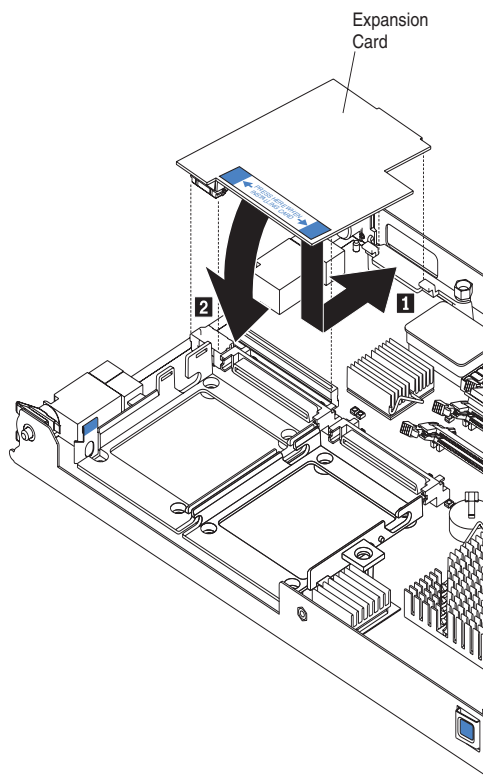
The small form-factor expansion option is installed near SCSI connector 2.

Complete the following steps to install the small form-factor expansion card:

1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. Shut down the operating system, turn off the NovaScale Blade Server, and remove the NovaScale Blade Server from the NovaScale Blade Chassis unit (see “Installing and removing the NovaScale Blade Server from the NovaScale Blade Chassis unit” on page 20 for information).
3. Carefully lay the NovaScale Blade Server on a flat, non-conductive surface.
4. Open the cover (see “Opening the NovaScale Blade Server cover” on page 20 for instructions).

5. Install the small form-factor I/O expansion card:

*Figure 10. Installing a small form-factor I/O card in the NovaScale Blade Server.*



- a. Orient the I/O expansion card as shown by number 1 in Figure 10.
  - b. Slide the notch at the narrow end of the card into the raised hook on the tray; then gently pivot the card into the expansion card connectors, as shown by number 2 the illustration.  
For device driver and configuration information to complete the installation of the expansion card, see the documentation for the expansion card.
6. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 42.



## Installing a standard form-factor expansion card

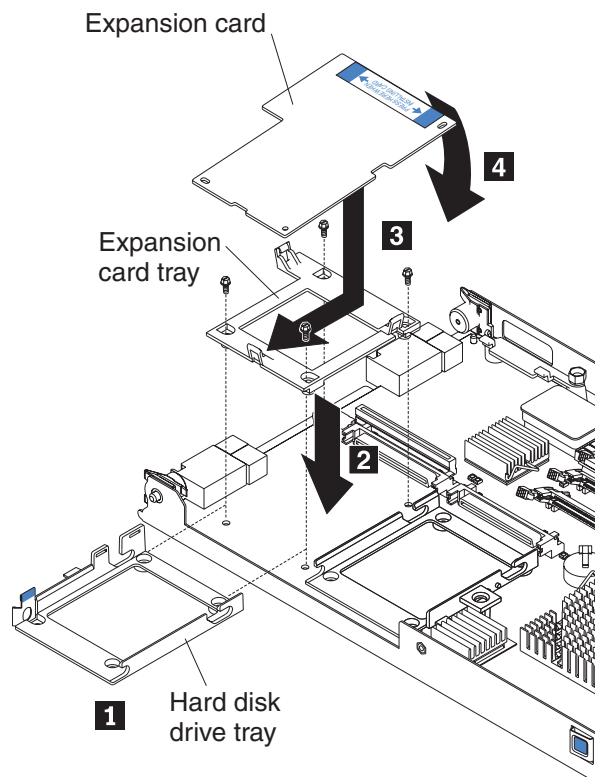
If a SCSI drive is connected to SCSI connector 0 (J94), you must remove it before you can install a standard form-factor expansion card. You cannot have both a drive that is connected to SCSI connector 0 and a standard form-factor expansion card installed into the NovaScale Blade Server.

If the drive that is connected to SCSI connector 0 contains any information you want to keep, back up the information. If the SCSI drive that is installed in SCSI connector 0 is part of a RAID array, delete the SCSI RAID array. When you delete the array, the array configuration information is removed. No data is deleted. After backing up the data and removing the RAID array, see “Removing a SCSI hard disk drive” on page 23 to remove the drive.

Complete the following steps to install a standard form-factor I/O expansion card:

1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. Shut down the operating system, turn off the NovaScale Blade Server, and remove the NovaScale Blade Server from the NovaScale Blade Chassis unit (see “Installing and removing the NovaScale Blade Server from the NovaScale Blade Chassis unit” on page 20 for information).
3. Carefully lay the NovaScale Blade Server on a flat, non-conductive surface.
4. Open the cover (see “Opening the NovaScale Blade Server cover” on page 20 for instructions).
5. If an SCSI drive is in SCSI connector 2, remove the drive and tray (see “Removing a SCSI hard disk drive” on page 23 for instructions) (save the screws that secured the tray to the system board); otherwise, remove the existing rear-board mounting screws (near SCSI connector 2).
6. Install the standard form-factor I/O expansion card:

*Figure 11. Installing a standard form-factor expansion card in the NovaScale Blade Server .*



- a. Install the expansion card tray. Secure the tray to the system board with the screws from the option kit, as shown Figure 11.
- b. Orient the expansion card and slide the notch in the narrow end of the card into the raised hook on the tray; then gently pivot the wide end of the card into the expansion card connectors.

🔗 **NOTE**

For device driver and configuration information to complete the installation of the expansion card, see the documentation for the option.

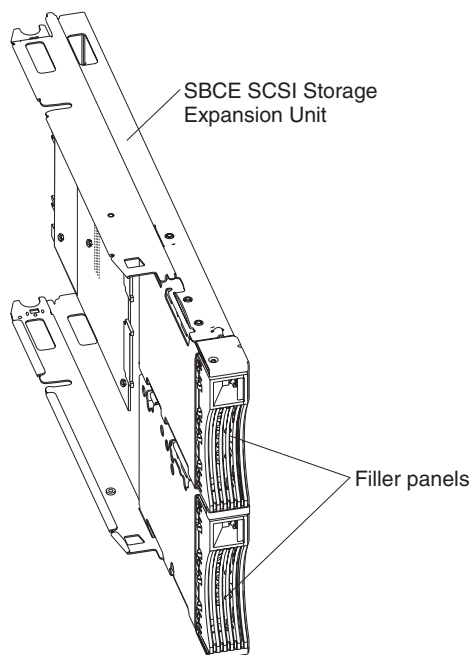
7. If you have other options to install or remove, do so now; otherwise, go to “Completing the installation” on page 42.

## Installing the NovaScale Blade Server SCSI Expansion Module

The NovaScale Blade Server SCSI Expansion Module supports up to two hot-swap SCSI hard disk drives and up to two standard form-factor I/O cards or two small form-factor I/O cards.

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

- Each of the blade bays on the front of the NovaScale Blade Chassis unit has either a NovaScale Blade Server or filler blade installed.
- A removed hot-swap NovaScale Blade Server or filler blade is replaced within 1 minute of removal.
- Each of the SCSI hard disk drive bays on the SCSI storage expansion unit contains either a hot-swap SCSI hard disk drive or a filler panel.



**Attention:** Static electricity can damage electronic devices and your NovaScale Blade Server. To avoid damage, keep static-sensitive devices in their non-conductive 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 damage it.
- While the device is still in its non-conductive package, touch it to an unpainted metal part of the NovaScale Blade Chassis chassis 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 on the NovaScale Blade Server without setting the device down. If it is necessary to set down the device, place it back into its non-conductive package. Do not place the device on your NovaScale Blade Chassis chassis or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

## Installing a SCSI storage expansion unit

To use SCSI hard disk drives with your NovaScale Blade Server, you must install the NovaScale Blade Server SCSI Expansion Module on the NovaScale Blade Server. You will then be able to install two 2.5-inch, hot-swap, SCSI, slim-high hard disk drives in the expansion unit. The SCSI storage expansion unit can contain up to two SCSI controllers that support embedded mirroring (RAID level-1) and embedded mirroring with striping (RAID-1E).

### **NOTE**

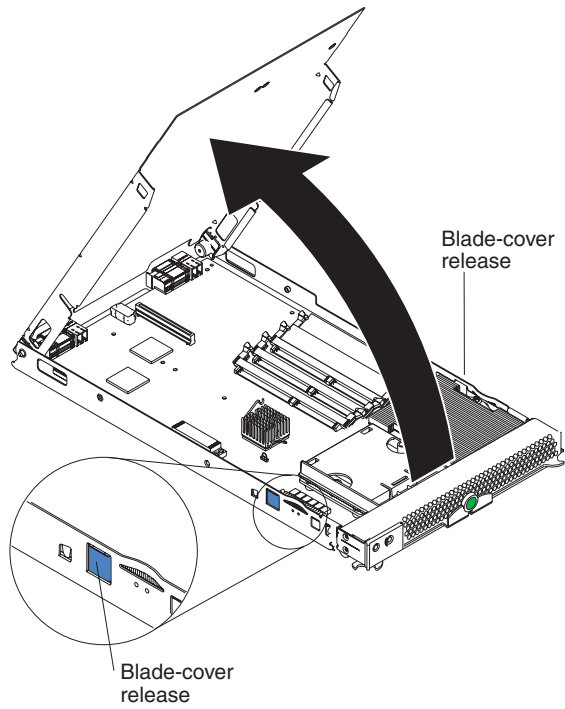
After you install the SCSI storage expansion unit on your NovaScale Blade Server, the NovaScale Blade Server and expansion unit together occupy two blade bays in the NovaScale Blade Chassis unit.

For a list of SCSI hard disk drives supported by your NovaScale Blade Server, contact your Support Representative.

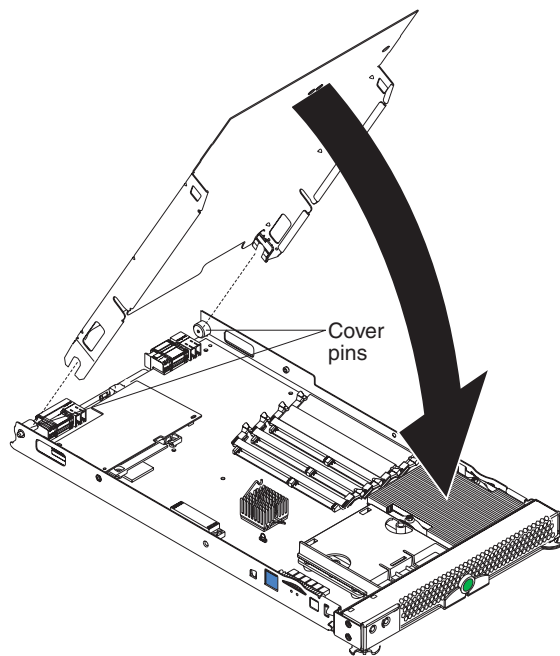
Complete the following steps to install the SCSI storage expansion unit:

1. Review the information in “NovaScale Blade safety and regulatory information” on page iii and “Installation guidelines” on page 19.
2. Shut down the operating system, turn off the NovaScale Blade Server, and remove the NovaScale Blade Server from the NovaScale Blade Chassis unit.
3. Carefully lay the NovaScale Blade Server on a flat, non-conductive surface.

4. Remove the NovaScale Blade Server cover:
  - a. Open the NovaScale Blade Server cover and lift it from the NovaScale Blade Server.



- b. Store the cover in a safe place.
5. Locate the SCSI expansion connector (J132) on the system board and lift the protective film from the connector.



6. Install the SCSI storage expansion unit:
  - a. Touch the non-conductive package that contains the expansion unit to any unpainted metal surface on the NovaScale Blade Chassis chassis or any unpainted metal surface on another grounded rack component. Then remove the expansion unit from the package.
  - b. Orient the expansion unit as shown in the illustration.
  - c. Lower the expansion unit so that the slots at the rear slide down onto the pins at the rear of the NovaScale Blade Server.
  - d. Pivot the expansion unit closed and press it firmly into place until the cover-release latches click. The connector on the expansion unit automatically aligns with and plugs into the SCSI expansion connector (J132) on the system board.

**Statement 21:**



**CAUTION:**

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

7. Insert the combined NovaScale Blade Server and expansion unit into two adjacent bays in the NovaScale Blade Chassis unit.

**NOTE**

When any NovaScale Blade Server or option is in blade bay 7 through 14, power modules must be present in power bays 1, 2, 3, and 4.

8. Turn on the NovaScale Blade Server.
9. If you have not already done so, install the LSI device drivers for your operating system.

With the expansion unit installed on your NovaScale Blade Server, you can install up to two hot-swap SCSI hard disk drives in the expansion unit. Each SCSI device must have a unique SCSI ID. This ID enables the SCSI controller in the expansion unit to identify the device and ensure that different devices on the same SCSI channel do not attempt to transfer data simultaneously. The SCSI IDs for the hard disk drives in the expansion unit are permanent (not configurable). Table 4 lists the SCSI IDs for the hard disk drives that are installed in the expansion unit. See “Installing a SCSI disk drive” on page 36 for instructions for installing hard disk drives.

SCSI hard disk drive 1 is in the top bay in the expansion unit; SCSI hard disk drive 2 is the bottom bay.

*Table 4. SCSI IDs for the hard disk drives in the expansion unit*

Device	SCSI ID
SCSI hard disk drive 1 (NovaScale Blade Server)	0
SCSI hard disk drive 2 (NovaScale Blade Server)	1
SCSI hard disk drive 1 (expansion unit)	2
SCSI hard disk drive 2 (expansion unit)	3

⇒ **NOTE**

You must have two SCSI drives to have a RAID-1 array or three SCSI drives to have a RAID-1E array.

SCSI ID 7 is usually reserved for the SCSI controller; however, this SCSI ID is changeable through the LSI configuration utility.

Use the Configuration/Setup Utility program in the NovaScale Blade Server to enable or disable the SCSI controller in the expansion unit. Use the LSI Logic Configuration Utility program to perform a low-level format on the hard disk drives, set the SCSI device scan order, or set the SCSI ID for the controller. The LSI Logic Configuration Utility program is part of the BIOS code on the SCSI storage expansion unit.

The expansion unit supports RAID-1E, which is an alternative to RAID-10. When the number of SCSI hard disk drives in a RAID-1E is even, the striping pattern is identical to RAID-10. Data for a given file may be written in stripe units to different drives in the array, rather than being written to a single drive. By using multiple drives, the array can provide higher data transfer rates and higher I/O rates when compared to a single large drive.

Embedded mirroring, which is also known as RAID level 1, is used when you have two hot-swap SCSI hard disk drives installed. Each drive is an exact copy of the other. Therefore, if either drive fails, no data is lost. When you replace a failed drive with another, the system automatically creates a mirror copy of the functional hard disk drive on the new hard disk drive.

See “Opening the expansion unit cover” on page 38 for information about starting and using the LSI configuration program.

## Installing a SCSI disk drive

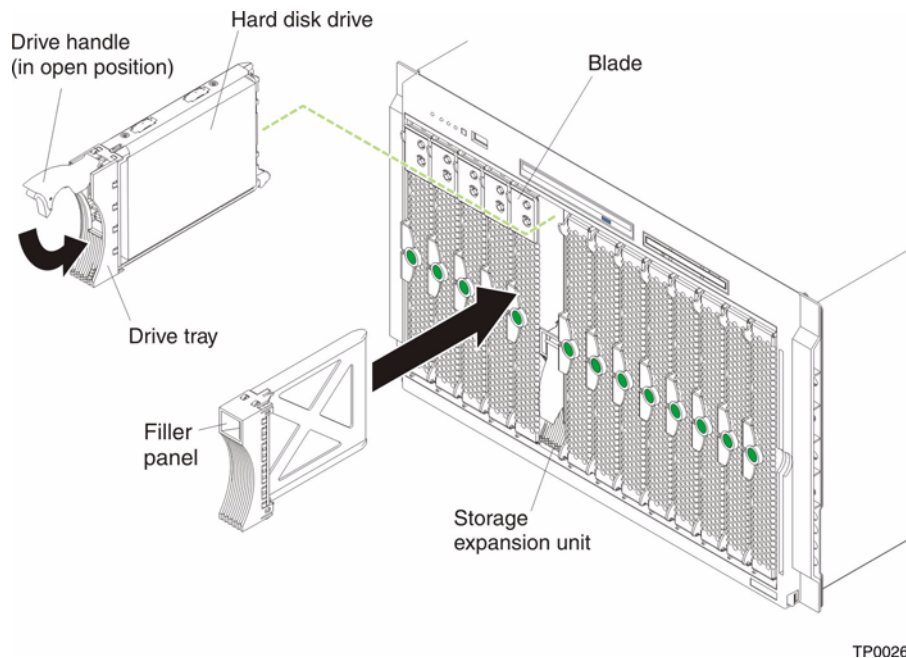
After you have installed the SCSI storage expansion unit on the NovaScale Blade Server, you can install up to two SCSI disk drives in the expansion unit.

If a hot-swap hard disk drive in the expansion unit fails, you can replace it without turning off the NovaScale Blade Server. Therefore, you have the advantage of continuing to operate your NovaScale Blade Server while a hard disk drive in this unit is removed or installed.

Each hot-swap drive has two indicator LEDs. If the amber hard disk drive status LED for a drive is lit continuously, that drive is faulty and must be replaced.

Each hot-swap drive that you plan to install must be mounted in a hot-swap-drive tray. The drive must have a Single Connector Attachment (SCA) connector. Hot-swap-drive trays come with hot-swap drives.

The following illustration shows how to install a SCSI hot-swap hard disk drive.



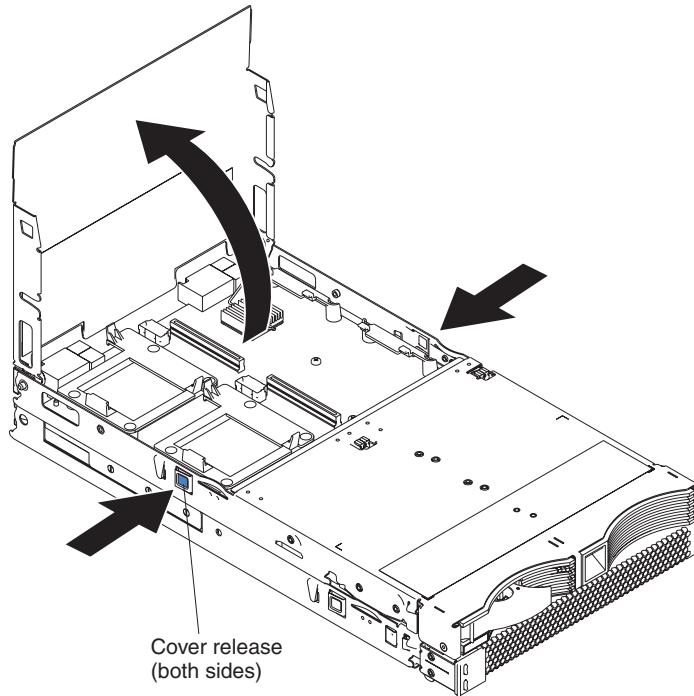
Complete the following steps to install a drive in the expansion unit.

**Attention:** To maintain proper system cooling, do not operate the NovaScale Blade Chassis unit for more than 1 minute without either a drive or a filler panel installed in each expansion unit bay.

1. Review the information in “NovaScale Blade safety and regulatory information” on page iii and “Installation guidelines” on page 19.
2. Remove the filler panel from one of the empty hot-swap bays by inserting your finger into the depression at the top of the filler panel and pulling it away from the expansion unit.
3. Install the hard disk drive:
  - a. Ensure that the tray handle is open (that is, perpendicular to the drive).
  - b. Align the drive assembly with the guide rails in the bay.
  - c. Gently push the drive assembly into the bay until the drive stops.
  - d. Push the tray handle to the closed (locked) position.
  - e. Check the hard disk drive LEDs to verify that the hard disk drive is operating properly.
    - If the amber hard disk drive status LED for a drive is lit continuously, that drive is faulty and must be replaced.
    - If the green hard disk drive activity LED is flashing, the drive is being accessed.

## Opening the expansion unit cover

The following illustration shows how to open the expansion unit cover.



Complete the following steps to open the expansion unit cover:

1. Read the safety information beginning on page “Installation guidelines” on page 19.
2. Carefully lay the expansion unit down on a flat, non-conductive surface, with the cover side up.
3. Press the unit-cover release on each side of the expansion unit and lift the cover open, as shown in the illustration.
4. Lay the cover flat, or lift it from the expansion unit and store for future use.

### Statement 21:



### CAUTION:

**Hazardous energy is present when the NovaScale Blade Server is connected to the power source. Always replace the blade cover before installing the NovaScale Blade Server.**



## Installing an I/O expansion card

You can add optional I/O expansion cards to your expansion unit to give the unit additional connections for communicating on a network.

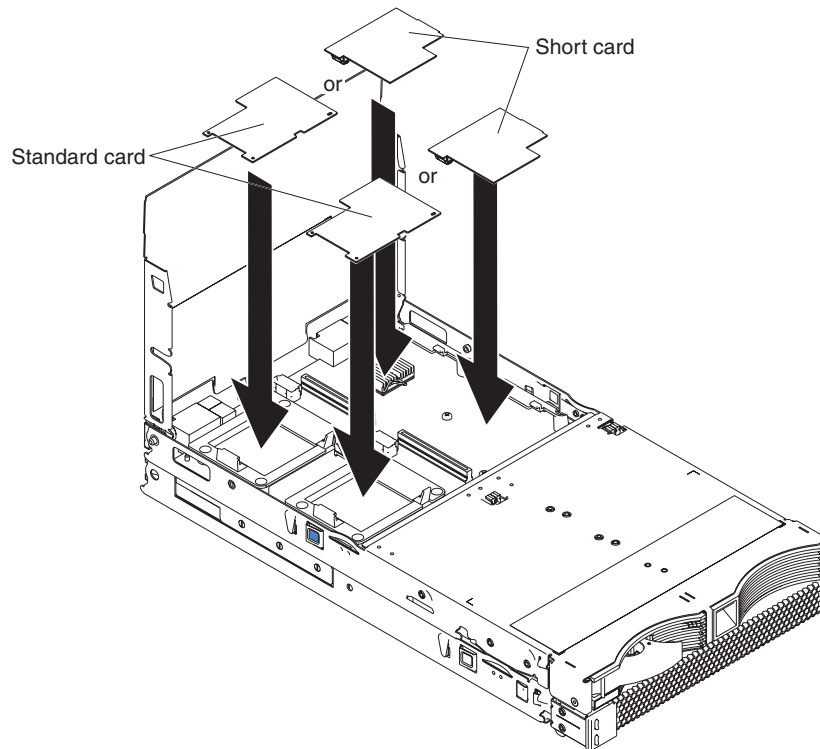
**Attention:** When you add an I/O expansion card, you must make sure that the I/O modules in I/O module bays 3 and 4 on the NovaScale Blade Chassis unit both support the I/O expansion card network-interface type.

The I/O expansion cards that are supported by the expansion unit are a standard form-factor and a small form-factor card. The Fibre Channel expansion card and the Gigabit Ethernet expansion card are available as small form-factor and standard form-factor I/O expansion cards.

Complete the following steps to install an I/O expansion card:

1. Read the safety information beginning on page “NovaScale Blade safety and regulatory information” on page iii and “Installation guidelines” on page 19.
2. Shut down the operating system, turn off the NovaScale Blade Server, and remove the expansion unit from the NovaScale Blade Chassis unit (see “Installing a SCSI storage expansion unit” on page 33).
3. Carefully lay the expansion unit on a flat, non-conductive surface.
4. Open the cover (see “Opening the expansion unit cover” on page 38 for instructions).
5. Install the I/O expansion card:

*Figure 12. Installing an I/O expansion card in the expansion unit.*



- a. Orient the I/O expansion card, as shown in Figure 12.

- b. Slide the notch in the narrow end of the card into the raised hook on the tray; then gently pivot the wide end of the card into the I/O expansion card connectors, as shown in the illustration.

⇒ **NOTE**

For device driver and configuration information to complete the installation of the I/O expansion card, see the documentation for the option.

6. If you have other options to install or remove, do so now.

## Replacing the battery

The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.

If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.

⇒ **NOTE**

After you replace the battery, you must reconfigure your NovaScale Blade Server and reset the system date and time.

**Statement 2:**



 **CAUTION:**

**When replacing the lithium battery, use only 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

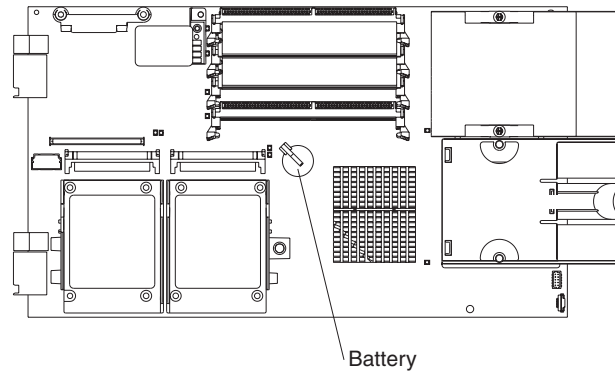
Dispose of the battery as required by local ordinances or regulations.

Complete the following steps to replace the battery:

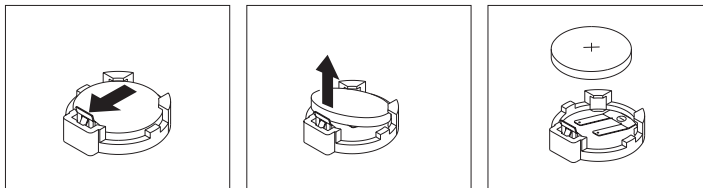
1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. Follow any special handling and installation instructions that came with the battery.
3. Turn off the NovaScale Blade Server and remove it from the NovaScale Blade Chassis unit (see “Installing and removing the NovaScale Blade Server from the NovaScale Blade Chassis unit” on page 20 for instructions).
4. Open the NovaScale Blade Server cover (see “Opening the NovaScale Blade Server cover” on page 20 for instructions).

5. Locate the battery on the system board.

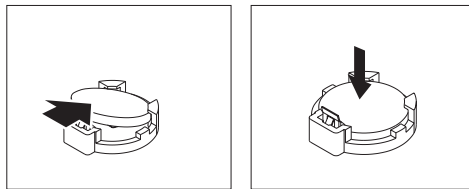
*Figure 13. Battery location.*



6. To remove the battery, use your finger to press down on one side of the battery; Then slide the battery from the socket. The spring mechanism will push the battery out towards you as you slide it from the socket.



7. Insert the new battery:
  - a. Tilt the battery so that you can insert it into the socket.
  - b. As you slide the battery into place, press the battery down into the socket.



8. Close the NovaScale Blade Server cover (see “Closing the NovaScale Blade Server cover” on page 44).

**Statement 21:**



**CAUTION:**

**Hazardous energy is present when the NovaScale Blade Server is connected to the power source. Always replace the blade cover before installing the NovaScale Blade Server.**

9. Reinsert the NovaScale Blade Server into the bay in the NovaScale Blade Chassis unit.
10. Turn on the NovaScale Blade Server.
11. Start the NovaScale Blade Server Configuration/Setup Utility program and set configuration parameters as needed (see “Using the Configuration/Setup Utility program” on page 49 for information).

## Completing the installation

To complete the installation, complete the following tasks. Instructions for each task are in the following sections.

1. Reinstall the NovaScale Blade Server bezel assembly, if you removed it (see “Installing the NovaScale Blade Server bezel assembly”).
2. Close the NovaScale Blade Server cover, unless you installed an expansion unit option (see “Closing the NovaScale Blade Server cover” on page 44).

### Statement 21:



### CAUTION:

**Hazardous energy is present when the NovaScale Blade Server is connected to the power source. Always replace the blade cover before installing the NovaScale Blade Server.**

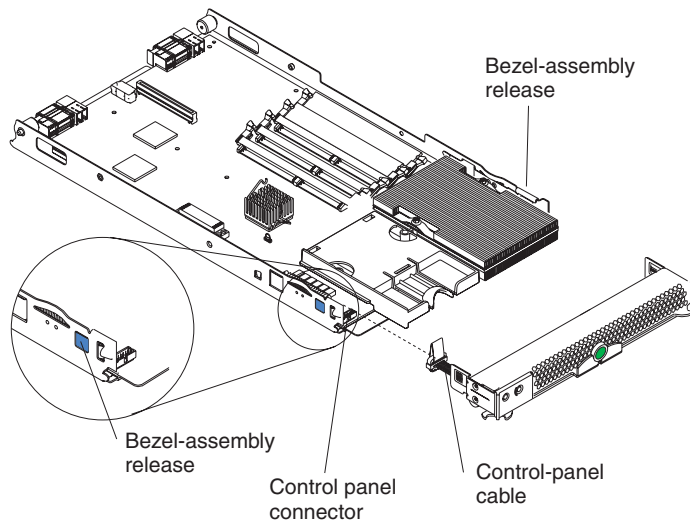
3. Reinstall the NovaScale Blade Server into the NovaScale Blade Chassis unit (see “Installing the NovaScale Blade Server in the NovaScale Blade Chassis unit” on page 45).
4. Turn on the NovaScale Blade Server (see “Turning on the NovaScale Blade Server” on page 11).
5. For certain options, run the NovaScale Blade Server Configuration/Setup Utility program (see “Updating your NovaScale Blade Server configuration” on page 46).

### NOTE

If you have just connected the power cords of your NovaScale Blade Chassis unit to electrical outlets, you must wait until the power-on LED on the NovaScale Blade Server flashes slowly before pressing the power-control button on a NovaScale Blade Server.

## Installing the NovaScale Blade Server bezel assembly

The following illustration shows how to install the bezel assembly on the NovaScale Blade Server.



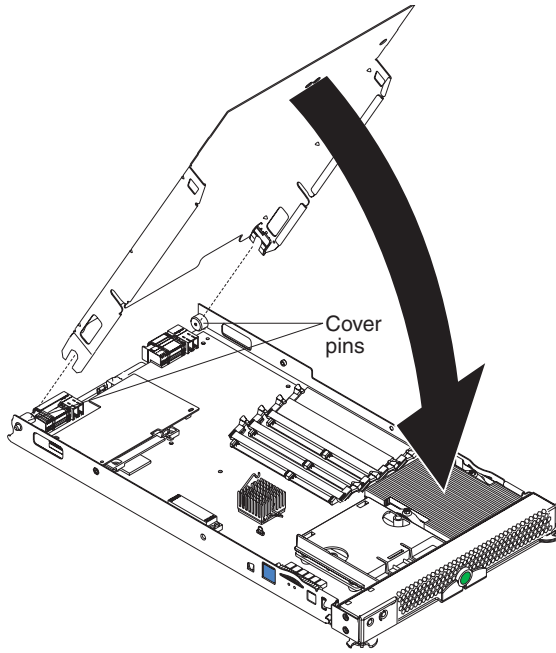
Complete the following steps to install the NovaScale Blade Server bezel assembly:

1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. Connect the control-panel cable to the control-panel connector on the system board.
3. Carefully slide the bezel assembly onto the NovaScale Blade Server, as shown in the illustration, until it clicks into place.

## Closing the NovaScale Blade Server cover

**Important:** The NovaScale Blade Server cannot be inserted into the NovaScale Blade Chassis unit until the cover is installed and closed or an expansion unit is installed. Do not attempt to override this protection.

The following illustration shows how to close the NovaScale Blade Server cover.

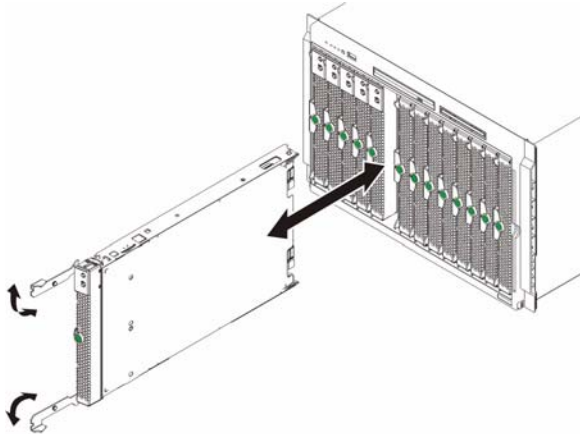


Complete the following steps to close the NovaScale Blade Server cover:

1. Read the safety information beginning on page iii and “Installation guidelines” on page 19.
2. If you removed the blade bezel assembly, replace it now (see “Installing the NovaScale Blade Server bezel assembly” on page 43 for instructions).
3. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the NovaScale Blade Server, as shown in the illustration. Before closing the cover, check that all components are installed and seated correctly and that you have not left loose tools or parts inside the NovaScale Blade Server.
4. Pivot the cover to the closed position, as shown in the illustration, until it clicks into place.

## Installing the NovaScale Blade Server in the NovaScale Blade Chassis unit

The following illustration shows how to install the NovaScale Blade Server into the NovaScale Blade Chassis unit.



TP00213

Complete the following steps to install a NovaScale Blade Server in the NovaScale Blade Chassis unit:

### Statement 21:



### **CAUTION:**

**Hazardous energy is present when the NovaScale Blade Server is connected to the power source. Always replace the blade cover before installing the NovaScale Blade Server.**

1. Read the safety information beginning on page iii and “Installation guidelines” on page 19 through “Handling static-sensitive devices” on page 19.
2. If you have not done so already, install any options that you want, such as SCSI drives or memory, in the NovaScale Blade Server.
3. Select the bay for the NovaScale Blade Server.

### Notes:

- a. If the NovaScale Blade Server has an expansion unit installed on it, the NovaScale Blade Server and expansion option require two adjacent bays.
- b. When any NovaScale Blade Server or option is in either blade bay 7 through 14 in the NovaScale Blade Chassis unit, power modules must be present in all four power bays.
- c. To help ensure proper cooling, performance, and system reliability, make sure that each of the blade bays on the front of the NovaScale Blade Chassis unit has a NovaScale Blade Server, expansion unit, or filler blade installed. Do not operate the system unit without either

a NovaScale Blade Server, expansion unit, or filler blade installed in each blade bay for more than 1 minute for the NovaScale Blade Chassis unit.

4. Make sure that the release levers on the NovaScale Blade Server are in the open position (perpendicular to the NovaScale Blade Server).
5. Slide the NovaScale Blade Server into the bay until it stops. The spring-loaded doors farther back in the bay that cover the bay opening move out of the way as you insert the NovaScale Blade Server.
6. Push the release levers on the front of the NovaScale Blade Server closed.
7. Turn on the NovaScale Blade Server (see “Turning on the NovaScale Blade Server” on page 11 for instructions).
8. Make sure that the power-on LED on the blade control panel is lit continuously, indicating that the NovaScale Blade Server is receiving power and is turned on.
9. (Optional) Write identifying information on one of the user labels that come with the NovaScale Blade Servers and place the label on the NovaScale Blade Chassis unit bezel.

Refer to Figure 2 on page 3 and Figure 3 on page 8 for information about the label placement.

**Important:** Do not place the label on the NovaScale Blade Server or in any way block the ventilation holes on the NovaScale Blade Server.

10. If you have other blades to install, do so now.

**Attention:** If you reinstall a NovaScale Blade Server that you removed, you must install it into the same bay from which you removed it. Some NovaScale Blade Server configuration information and update options are established according to bay number. Reinstalling a NovaScale Blade Server into a different bay from the one from which it was removed could have unintended consequences, and you might have to reconfigure the NovaScale Blade Server.

If this is the initial installation for a NovaScale Blade Server in the NovaScale Blade Chassis unit, you must configure the NovaScale Blade Server with the Configuration/Setup Utility and install the NovaScale Blade Server operating system. See “Updating your NovaScale Blade Server configuration” on page 46 for details.

## Updating your NovaScale Blade Server configuration

When you start your NovaScale Blade Server for the first time after you add or remove an internal option or an external SCSI device (if the storage expansion unit has been installed), a message might be displayed informing you that the configuration has changed. The NovaScale Blade Server Configuration/Setup Utility program automatically starts so that you can save the new configuration information. See “Using the Configuration/Setup Utility program” on page 49 for more information about the Configuration/Setup Utility program.

Some options have device drivers that you must install. See the documentation that comes with the option for information about installing any required device drivers.

Your NovaScale Blade Server comes with one or two processors installed on the system board. If your NovaScale Blade Server comes with two processors, or if your NovaScale Blade Server comes with one processor and you have installed an additional processor, your NovaScale Blade Server can now operate as an SMP server. Therefore, you might have to upgrade your operating system to support SMP. See your operating-system documentation for additional information.



## Input/output connectors and devices

The input/output connectors that are available to the NovaScale Blade Server are supplied by the NovaScale Blade Chassis unit. See the documentation that comes with your NovaScale Blade Chassis unit for information about the input/output connectors.

The NovaScale Blade Server has two selection buttons on the control panel: the CD/diskette/USB select button and the keyboard/mouse/video select button. See “Understanding the control panel and LEDs” on page 13 for information about these buttons and their function.

The Ethernet controllers on your NovaScale Blade Server communicate with the network through the Ethernet-compatible switch modules on the NovaScale Blade Chassis unit. Network signals to and from the NovaScale Blade Server or any expansion cards are automatically routed to a same-network-interface switch module through circuitry in the NovaScale Blade Chassis unit.



## 4 Configuring the NovaScale Blade Server

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The following configuration programs come with your NovaScale Blade Server:

- **Configuration/Setup Utility program**

This is part of the basic input/output system (BIOS) code in your NovaScale Blade Server. Use it to change interrupt request (IRQ) settings, set the date and time, and set passwords. See “Using the Configuration/Setup Utility program” for more information.

- **LSI Logic Configuration Utility program**

The LSI Logic Configuration Utility program is part of the basic input/output system (BIOS) code in the NovaScale Blade Server. Use it to set the device scan order and to set the SCSI controller IDs. See “Using the LSI Logic Configuration Utility program” on page 57 for more information

- **Preboot Execution Environment (PXE) boot agent utility program**

The PXE boot agent utility program is part of the BIOS code in the NovaScale Blade Server. Use it to select the boot protocol and other boot options and to select a power management option. For information about using this utility, see “Using the PXE boot agent utility program” on page 54.

### Using the Configuration/Setup Utility program

This section provides the instructions for starting the Configuration/Setup Utility program and descriptions of the menu choices.

#### Starting the Configuration/Setup Utility program

Complete the following steps to start the Configuration/Setup Utility program:

1. Turn on the NovaScale Blade Server and watch the monitor screen.
2. When the message `Press F1 for Configuration/Setup` appears, press F1.
3. Select the settings to view or change.

#### Configuration/Setup Utility menu choices

The following choices are on the Configuration/Setup Utility main menu. Depending on the version of the BIOS code in your NovaScale Blade Server, some menu choices might differ slightly from these descriptions.

- **System Summary**

Select this choice to display configuration information, including the type, speed, and cache sizes of the processors and the amount of installed memory. When you make configuration changes through other options in the Configuration/Setup Utility program, the changes are reflected in the system summary; you cannot change settings directly in the system summary.

- **Processor Summary**

Select this choice to view information about the processors installed in the NovaScale Blade Server.

— **USB Device Summary**

Select this choice to view information about the USB devices installed in the NovaScale Blade Server

• **System Information**

Select this choice to display information about the NovaScale Blade Server. When you make configuration changes through other options in the Configuration/Setup Utility program, some of those changes are reflected in the system information; you cannot change settings directly in the system information.

— **Product Data**

Select this choice to view the machine type and model of your NovaScale Blade Server, the serial number, and the revision level or issue date of the BIOS and diagnostics code stored in electrically erasable programmable ROM (EEPROM).

• **Devices and I/O Ports**

Select this choice to view or change assignments for devices and input/output (I/O) ports.

You can also enable or disable the integrated SCSI and Ethernet controllers and all standard ports (such as serial and parallel). **Enable** is the default setting for all controllers. If you disable a device, it cannot be configured, and the operating system will not be able to detect it (this is equivalent to disconnecting the device.)

— **Remote Console Redirection**

Select this choice to enable serial over LAN (SOL) and to set remote console communication parameters.

— **Video**

Select this choice to view information about the integrated video controller.

— **System MAC Addresses**

Select this choice to set and view the MAC addresses for the Ethernet controllers on the NovaScale Blade Server.

• **Date and Time**

Select this choice to set the system date and time, in 24-hour format (*hour:minute:second*). This choice is on the full Configuration/Setup Utility main menu only.

• **System Security**

Select this choice to set a power-on password. See “Using passwords” on page 53 for more information about the password.

• **Start Options**

Select this choice to view or change the start options. Changes in the start options take effect when you start the NovaScale Blade Server.

— **Start Sequence Options**

Select this choice to view the startup device sequence that is set for the NovaScale Blade Server.

⇒ **NOTE**

To set the startup sequence, which is the order in which the NovaScale Blade Server checks devices to find a boot record, you must use the management-module Web interface.

You can set keyboard operating characteristics, such as whether the NovaScale Blade Server starts with the keyboard number lock on or off. You can enable the NovaScale Blade Server to run without a diskette drive or keyboard.

You can enable or disable the PXE option for either of the integrated Gigabit Ethernet controllers. The default setting for this menu item is **Planar Ethernet 1**, which enables the PXE option for the first Ethernet controller on the system board.

If you enable the boot fail count, the BIOS default settings will be restored after three consecutive failures to find a boot record.

You can enable a virus-detection test that checks for changes in the boot record when the NovaScale Blade Server starts.

This choice is on the full Configuration/Setup menu only.

- **Advanced Setup**

Select this choice to change settings for advanced hardware features.

**Important:** The NovaScale Blade Server might malfunction if these options are incorrectly configured. Follow the instructions on the screen carefully.

- **Memory Settings**

Select this choice to manually enable a pair of memory DIMMs.

If a memory error is detected during POST or during memory configuration, the NovaScale Blade Server automatically disables the failing pair of memory connectors and continues operating with reduced memory. After the problem is corrected, you must enable the memory connectors. Use the arrow keys to highlight the rows representing the pair that you want to enable; then use the arrow keys to select **Enable**.

To maintain optimum system operation in the event of a memory failure, you can set the **Memory Configuration** for memory **Mirroring** or **Sparing**. Memory mirroring stores duplicate data on two DIMMs to prevent data loss if a DIMM fails. Memory sparing removes the failed memory from the system configuration and activates a Hot Spare Memory pair of DIMMs to replace the failed pair of DIMMs. Before you can enable memory mirroring or sparing, at least two pairs of DIMMs must be installed in the NovaScale Blade Server. These pairs must adhere to the special requirements described in “Installing memory modules” on page 23.

- **CPU Options**

Select this choice to disable the processor cache or to set the processor cache to use the write-back or the write-through method. Write-back caching generally provides better system performance

You can also select this choice to enable or disable hyper-threading and adjust the processor performance settings. If enabled, hyper-threading will only be active if it is supported by the operating system.

- **PCI Bus Control**

Select this choice to view and set interrupts for PCI devices and to configure the master latency timer value for the NovaScale Blade Server.

- **Baseboard Management Controller (BMC) Settings**

Select this choice to enable or disable the Reboot on System NMI option on the menu. If you enable this option, the NovaScale Blade Server will automatically restart 60 seconds after the service processor issues a nonmaskable interrupt (NMI) to the NovaScale Blade

Server. You can also select this choice to enable or disable and set the time-outs for the POST and OS loader watchdog timers and view BMC version information.

- **BMC Network Configuration**

Select this choice to set the network addresses of the BMC.

- **BMC System Event Log**

Select this choice to view and clear BMC event log entries.

- **System Partition Visibility**

Select this choice to specify whether the System Partition is to be visible or hidden.

- **Integrated System Management Processor Settings**

Select this choice to enable or disable the **Reboot on System NMI** option on the menu. If you enable this option, the NovaScale Blade Server will automatically restart 60 seconds after the service processor issues a nonmaskable interrupt (NMI) to the NovaScale Blade Server.

- **Save Settings**

Select this choice to save the changes you have made in the settings.

- **Restore Settings**

Select this choice to cancel the changes you have made in the settings and restore the previous settings.

- **Load Default Settings**

Select this choice to cancel the changes you have made in the settings and restore the factory settings.

- **Exit Setup**

Select this choice to exit from the Configuration/Setup Utility program. If you have not saved the changes you have made in the settings, you are asked whether you want to save the changes or exit without saving them.

## Using passwords

From the **System Security** choice, you can set, change, and delete a power-on password.

If you set a power-on password, you must type the power-on password to complete the system startup and to have access to the full Configuration/Setup Utility menu.

You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the password. Keep a record of your password in a secure place.

If you forget the power-on password, you can regain access to the NovaScale Blade Server through one of the following methods:

- Remove the NovaScale Blade Server battery and then reinstall it (see “Replacing the battery” on page 40).
- Change the position of the power-on password override switch (switch 8 on switch block 2 on the system board) to bypass the power-on password check the next time the NovaScale Blade Server is turned on. You can then start the Configuration/Setup Utility program and change the power-on password. You do not have to move the switch back to the previous position after the password is overridden. See Figure 5 on page 16 for the location of switch block 2.

⇒ **NOTE**

Shut down the operating system, turn off the NovaScale Blade Server, and remove the NovaScale Blade Server from the NovaScale Blade Chassis unit to access the switches.

## Using the PXE boot agent utility program

This program is a built-in, menu-driven configuration utility program that you can use to:

- Select the boot protocol and other boot options
- Select a power-management option

⇒ **NOTE**

The RPL selection for the boot protocol option is not supported for this server.

Complete the following steps to start the PXE boot agent utility program:

1. Turn on the server.
2. When the `Broadcom NetXtreme Boot Agent vX.X.X` prompt appears, press `Ctrl+S`. You have 2 seconds (by default) to press `Ctrl+S` after the prompt appears.

If the PXE setup prompt is not displayed, use the Configuration/Setup Utility program to set the enable Ethernet PXE/DHCP option.

3. Use the arrow keys or press `Enter` to select a choice from the menu.
  - Press `Esc` to return to the previous menu.
  - Press the `F4` key to exit.
4. Follow the instructions on the screen to change the settings of the selected items; then press `Enter`.

## Firmware updates

Bull will periodically provide firmware updates available for your NovaScale Blade Server. Use the following table to determine the methods that you can use to install these firmware updates.

⇒ **Important**

To avoid problems and to maintain proper system performance, always make sure that the NovaScale Blade Server BIOS, service processor, and diagnostic firmware levels are consistent for all NovaScale Blade Servers within the NovaScale Blade Chassis unit.

Firmware	Update diskette	Management-module Web interface	Switch-module Web interface	Switch-module Telnet interface	Deployment Manager by Veritas OpForce™
NovaScale Blade Server BIOS code	Yes	No	No	No	Yes
NovaScale Blade Server diagnostic code	Yes	No	No	No	Yes
NovaScale Blade Server service processor code	Yes	Yes	No	No	Yes



The service processor in your NovaScale Blade Server provides the following features:

- Continuous health monitoring and control
- Configurable notification and alerts
- Event logs that are timestamped, saved in nonvolatile memory, and can be attached to e-mail alerts
- Remote graphics console redirection
- Point-to-point protocol (PPP) support
- Remote power control
- Remote firmware update and access to critical server settings
- Around-the-clock access to the NovaScale Blade Server, even if the server is turned off

At some time, you might have to flash the service processor to apply the latest firmware. Download the latest firmware for your NovaScale Blade Server service processor from the Support Web site. Use the management-module Web interface to flash the service processor. The Web interface is described in the *NovaScale Blade Chassis Management Module: Installation and User's Guide*.

## Configuring the Gigabit Ethernet controllers

Two Ethernet controllers are integrated on the NovaScale Blade Server system board. Each controller provides a 1000-Mbps full-duplex interface for connecting to one of the Ethernet-compatible switch modules in I/O module bays 1 and 2, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN). Each Ethernet controller on the system board is routed to a different switch module in I/O module bay 1 or bay 2. The routing from Ethernet controller to I/O module bay will vary based on NovaScale Blade Server type and the operating system that is installed. See “NovaScale Blade Server Ethernet controller enumeration” on page 56 for information about how to determine the routing from Ethernet controller to I/O module bay for your NovaScale Blade Server.

You do not have to set any jumpers or configure the controllers for the NovaScale Blade Server operating system. However, you must install a device driver to enable the NovaScale Blade Server operating system to address the Ethernet controllers. For device drivers and information about configuring your Ethernet controllers, see the *Broadcom NetXtreme Gigabit Ethernet Software* CD that comes with your NovaScale Blade Server.

Your Ethernet controllers support failover, which provides automatic redundancy for your Ethernet controllers. Without failover, you can have only one Ethernet controller from each server attached to each virtual LAN or subnet. With failover, you can configure more than one Ethernet controller from each server to attach to the same virtual LAN or subnet. Either one of the integrated Ethernet controllers can be configured as the primary Ethernet controller. If you have configured the controllers for failover and the primary link fails, the secondary controller takes over. When the primary link is restored, the Ethernet traffic switches back to the primary Ethernet controller. (See your operating system device driver documentation for information about configuring for failover.)

**Important:** To support failover on the NovaScale Blade Server Ethernet controllers, the Ethernet switch modules in the NovaScale Blade Chassis unit must have identical configurations to each other.

## NovaScale Blade Server Ethernet controller enumeration

The enumeration of the Ethernet controllers in a NovaScale Blade Server is operating-system dependent. You can verify the Ethernet controller designations a NovaScale 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 NovaScale 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 that the ports on the switch module or pass-thru module are enabled (**Switch Tasks > Management > Advanced Switch Management** in the management module Web-based user interface).
3. Enable only one of the Ethernet controllers on the NovaScale Blade Server. Note the designation that the NovaScale Blade Server operating system has for the controller.
4. Ping an external computer on the network connected to the switch module. If you can ping the external computer, the Ethernet controller that you enabled is associated with the switch module in I/O-module bay 1. The other Ethernet controller in the NovaScale Blade Server is associated with the switch module in I/O-module bay 2.

If you have installed an expansion card on a NovaScale 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 this test, using a controller on the expansion card and a compatible switch module or pass-thru module in I/O-module bay 3 or 4.

## Configuring a SCSI RAID array

Configuring an SCSI RAID array applies to a NovaScale Blade Server in which two SCSI hard disk drives are installed. You can also configure a SCSI RAID array when you have a SCSI expansion unit in which SCSI drives are installed. If you installed an expansion unit with SCSI drives installed into it, those drives can become a part of the NovaScale Blade Server RAID array. The expansion unit supports RAID level 1 (embedded mirroring) and RAID level 1E.

Two SCSI hard disk drives in the NovaScale Blade Server can be used to implement and manage RAID level-1 (mirror) arrays. For your NovaScale Blade Server, you must configure the SCSI RAID using the LSI Configuration Utility program.

### ⇒ Important

Depending on your RAID configuration, you must create the RAID array *before* you install the operating system on your NovaScale Blade Server.

## Using the LSI Logic Configuration Utility program

You can use the LSI Logic Configuration Utility to:

- Set the SCSI device scan order
- Set the SCSI ID for the controller

Complete the following steps to start the LSI configuration utility program:

1. Turn on the NovaScale Blade Server (make sure the NovaScale Blade Server is the owner of the keyboard, video, and mouse) and watch the monitor screen.
2. When the <<<Press Ctrl-C to start LSI Configuration Logic Utility>>> prompt appears, press Ctrl-C.
3. Use the arrow keys to select the controller (channel) from the list of adapters; then press Enter.
4. Follow the instructions on the resulting screen to change the settings of the selected items; then press Enter. If you select **Device Properties** and **Mirroring Properties**, additional screens are displayed.



## 5 Solving problems

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This section provides basic troubleshooting information to help you solve some common problems that might occur while setting up your NovaScale Blade Server.

If you cannot locate and correct the problem using the information in this section, see the *NovaScale Blade 2021 Hardware Maintenance Manual and Troubleshooting Guide* on the CD-ROM *NovaScale Blade 2021 Resource CD*.

### Diagnostic tools overview

The following tools are available to help you diagnose and solve hardware-related problems:

- **POST beep codes**

The power-on self-test beep codes indicate the detection of a problem.

- One beep indicates successful completion of POST.
- More than one beep indicates that POST detected a problem. Error messages also appear during startup if POST detects a hardware-configuration problem.

See “POST beep code descriptions” on page 60 and the *NovaScale Blade 2021 Hardware Maintenance Manual and Troubleshooting Guide* on the CD-ROM *NovaScale Blade 2021 Resource CD*.

- **Troubleshooting charts**

These charts list problem symptoms and steps to correct the problems. See the “Troubleshooting charts” on page 63 for more information.

- **Diagnostic programs and error messages**

Real Time Diagnostics tests the major components of your NovaScale Blade Chassis unit, including the management modules, switch modules, CD-ROM drive, diskette drive, and your NovaScale Blade Server, while the server operating system is running.

- ⇒ **NOTE**

See the *NovaScale Blade 2021 Hardware Maintenance Manual and Troubleshooting Guide* on the CD-ROM *NovaScale Blade 2021 Resource CD* for more information.

- **Light Path Diagnostics feature**

Use the Light Path Diagnostics feature to identify system errors quickly. See the “Light path diagnostics” on page 67 for more information.

## POST beep code descriptions

POST emits one beep to signal successful completion. If POST detects a problem during startup, other beep codes might occur. Use the following beep code descriptions to help diagnose and resolve problems that are detected during startup.

⇒ **NOTE**

See “Diagnostics” in the *NovaScale Blade 2021 Hardware Maintenance Manual and Troubleshooting Guide* on the CD-ROM *NovaScale Blade 2021 Resource CD* for more information about the POST beep codes.

**One beep**

Indicates successful completion of POST.

**Repeating long beeps**

Indicates that a memory error has occurred. Make sure that all DIMMs are correctly installed.

**One long beep and two small beeps**

Indicates that a video error has occurred and the BIOS cannot initialize the monitor screen to display additional information.

**Beep codes for specific problems**

Beep codes indicating specific system problems are listed in the following table.


*Table 5. POST beep code descriptions*

Beep code	Descriptions of the POST beep codes
1-1-4	BIOS ROM checksum in-progress or failure. <b>Action:</b> <ol style="list-style-type: none"><li>1. Move the BIOS code page jumper (J12) to pins 2 and 3 to boot from the backup BIOS code page.</li><li>2. Restart the NovaScale Blade Server and flash the BIOS code.</li><li>3. Move the BIOS code page jumper back to pins 1 and 2 and restart the NovaScale Blade Server.</li></ol>
All other beep codes	<ol style="list-style-type: none"><li>1. Make sure that the system memory modules are installed correctly.</li><li>2. Turn off the NovaScale Blade Server; then restart the NovaScale Blade Server.</li></ol>

## POST error messages

The following table provides an abbreviated list of the error messages that might appear during POST. See “Diagnostics” in the *NovaScale Blade 2021 Hardware Maintenance Manual and Troubleshooting Guide* on the CD-ROM *NovaScale Blade 2021 Resource CD* for more information about the POST error messages.

*Table 6. Abbreviated list of POST error messages*

POST message	Failing device or problem found	Suggested action
161	The real-time clock battery has failed.	Replace the battery.
162	A device configuration has changed.	Make sure that your optional devices are turned on and installed correctly.   <b>NOTE</b> If you are unable to start the Configuration/Setup Utility program, view the system event log in the management module.
163	The time of day has not been set.	Set the correct date and time.
289	A failing DIMM was disabled.	Make sure that the memory is correct for your NovaScale Blade Server and that it is installed properly.
301 303	Keyboard and keyboard controller	<ul style="list-style-type: none"> <li>Make sure that the keyboard/mouse/video select button LED on the front of the NovaScale Blade Server is lit, indicating that the NovaScale Blade Server is connected to the shared keyboard.</li> <li>Make sure that the keyboard cable is connected to the NovaScale Blade Chassis unit and nothing is resting on the keyboard keys.</li> </ul>
962	Parallel port configuration error	Start the Configuration/Setup Utility program and make sure that the parallel-port setting is correct.
11xx	Serial port error	Make sure that the serial cable is connected correctly.
1162	Serial port configuration conflict	Start the Configuration/Setup Utility program and make sure that the IRQ and I/O port assignments needed by the serial port are available.
1800	PCI adapter hardware interrupt	Start the Configuration/Setup Utility program and make sure that the interrupt resource settings are correct.
2400 2462	Video controller and memory	<ul style="list-style-type: none"> <li>Make sure that the keyboard/mouse/video select button LED on the front of the NovaScale Blade Server is lit, indicating that the NovaScale Blade Server is connected to the shared monitor.</li> <li>Make sure that the monitor is connected correctly to the NovaScale Blade Chassis unit.</li> </ul>
00019xxx	Processor x is not functioning or failed the built-in test.	Make sure that processor x is installed correctly. If the problem remains, replace processor x.

*Table 6. Abbreviated list of POST error messages (continued)*

POST message	Failing device or problem found	Suggested action
00180xxx	A PCI adapter requested a resource that is not available.	Start the Configuration/Setup Utility program and make sure that the resources needed by the PCI adapter are available.
01295085	The NovaScale Blade Server failed the ECC-checking hardware test.	Have the system board serviced.
012980xx 012981xx	Data for processor x	Download and install the latest level of BIOS code.
01298200	processor speed mismatch	Install processors with identical speeds.
I9990305	POST could not find an operating system.	Install an operating system.



## Troubleshooting charts

The following tables list problem symptoms and suggested solutions. See the *NovaScale Blade 2021 Hardware Maintenance Manual and Troubleshooting Guide* on the CD-ROM *NovaScale Blade 2021 Resource CD* for more detailed troubleshooting charts. If you cannot find the problem in these charts, run the diagnostic programs.

### Memory problems

Symptom	Suggested action
The amount of system memory displayed is less than the amount of physical memory installed.	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>The DIMMs are seated correctly.</li> <li>You have installed the correct type of memory.</li> <li>If you changed the memory, you updated the memory configuration in the Configuration/Setup Utility program.</li> <li>All banks of memory are enabled. The NovaScale Blade Server might have automatically disabled a memory bank when it detected a problem, or a memory bank might have been manually disabled.</li> </ul> <p>Check the POST error log for error message 289:</p> <ul style="list-style-type: none"> <li>If the DIMM was disabled by a system management interrupt (SMI), replace the DIMM.</li> <li>If the DIMMs are not installed in pairs, install DIMMs starting with DIMM 1 and DIMM 2. Make sure there is not an unpopulated DIMM slot in the middle and make sure DIMM 3 and DIMM 4 are installed before DIMM 1 and DIMM 2</li> <li>If the system halts, make sure the DIMMs are installed in dual-ranked pairs. Swap DIMM 3 and DIMM 4 with DIMM 1 and DIMM 2.</li> <li>If the system error indicates an unsupported memory configuration, make sure there is more than one DIMM installed. Install DIMMs in DIMM slots 1 and 2. If this does not correct the error, replace the DIMMs flagged in the management module log and indicated through the Light Path Diagnostics LEDs.</li> <li>If the DIMM was disabled by the user or by POST, run the Configuration/Setup Utility program and enable the DIMM.</li> <li>If this error remains, replace the DIMM.</li> </ul>

### Processor problems

Symptom	Suggested action
The NovaScale Blade Server emits a continuous tone during POST.	<p>The startup (boot) processor is not working properly.</p> <p>Make sure that the startup processor is seated correctly. If it is, replace the startup processor.</p>

## Monitor problems

### ⇒ NOTE

The monitor screen remains blank until it is directed to a NovaScale Blade Server that is powered on; this is normal behavior.

Symptom	Suggested action
The monitor screen goes blank when you direct it to a working NovaScale Blade Server, or it goes blank when you start some application programs in the NovaScale Blade Servers.	<p>Make sure that the monitor cable is connected to the video port on the management module.</p> <p>If you still cannot find the problem, try using the monitor with another NovaScale Blade Server. If the problem persists, see the <i>NovaScale Blade Chassis Hardware Maintenance Manual and Troubleshooting Guide</i> on the <i>NovaScale Blade Chassis Resource CD</i> that came with your NovaScale Blade Chassis unit.</p>
The screen is blank.	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• The keyboard/mouse/video select button LED on the front of the NovaScale Blade Server is lit, indicating that the NovaScale Blade Server is connected to the shared monitor.</li> <li>• The NovaScale Blade Chassis unit power cord is connected to the power module and a working electrical outlet.</li> <li>• The monitor cables are connected properly.</li> <li>• The monitor is turned on and the brightness and contrast controls are adjusted correctly.</li> </ul> <p><b>Important:</b> In some memory configurations, the 3-3-3 beep code might sound during POST followed by a blank display screen. If this occurs and the <b>Boot Fail Count</b> feature in the <b>Start Options</b> of the Configuration/Setup Utility program is enabled (its default setting), you must restart the NovaScale Blade Server three times to force the system BIOS to reset the Configuration settings to the default configuration (memory connector or bank of connectors enabled)</p>
Only the cursor appears.	Make sure that the keyboard, video, and mouse on the NovaScale Blade Chassis unit have not been switched to another NovaScale Blade Server.
The monitor has screen jitter, or the screen image is wavy, unreadable, rolling, or distorted.	<p>If the monitor self-tests show that the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor.</p> <p><b>Attention:</b> Moving a color monitor while it is turned on might cause screen discoloration.</p> <p>Move the device and the monitor at least 300 mm (12 in.) apart, and turn on the monitor.</p> <p>⇒ <b>NOTE</b> To prevent diskette drive read/write errors, make sure the distance between the monitor and diskette drives is at least 75 mm (3 in.).</p>
Wrong characters appear on the screen.	If the wrong language is displayed, update the firmware or operating system with the correct language in the NovaScale Blade Server that has ownership of the monitor.

## Mouse problems

Symptom	Suggested action
The mouse does not work.	<ul style="list-style-type: none"> <li>• Make sure that the keyboard/mouse/video select button LED on the front of the NovaScale Blade Server is lit, indicating that the NovaScale Blade Server is connected to the shared mouse.</li> <li>• Make sure that the mouse cable is securely connected to the management module and that the keyboard and mouse cables are not reversed.</li> <li>• Make sure that the mouse works correctly with other NovaScale Blade Servers.</li> <li>• Make sure that the mouse is recognized as a USB device, not PS/2, by the NovaScale Blade Server. Although the mouse is a PS/2-style device, communication with the mouse is through an internal USB bus in the NovaScale Blade Chassis unit. Some operating systems allow you to select the type of mouse during installation of the operating system. Select USB.</li> </ul>

## Network connection problems

Symptom	Suggested action
One or more NovaScale Blade Servers are unable to communicate with the network.	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• The switch modules for the network interface that you are using are installed in the correct bays and are configured and operating correctly. See the <i>NovaScale Blade Chassis Hardware Maintenance Manual and Troubleshooting Guide</i> on the <i>NovaScale Blade Chassis Resource CD</i> for details.</li> <li>• The settings in the switch module are correct for the NovaScale Blade Server (settings in the switch module are NovaScale Blade Server specific).</li> </ul> <p>If you installed an optional expansion card, make sure that:</p> <ul style="list-style-type: none"> <li>• The option is designed for the NovaScale Blade Server.</li> <li>• You followed the installation instructions that come with the option.</li> <li>• The option is installed correctly.</li> <li>• You have not loosened any other installed options or cables.</li> <li>• You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration.</li> </ul>

## Option problems

Symptom	Suggested action
An option that was just installed does not work.	<p>Make sure that:</p> <ul style="list-style-type: none"> <li>• The option is designed for the NovaScale Blade Server.</li> <li>• You followed the installation instructions that come with the option.</li> <li>• The option is installed correctly.</li> <li>• You have not loosened any other installed options or cables.</li> </ul>
An option that used to work does not work now.	<p>Make sure that all of the option hardware and cable connections are secure. If the option comes with its own test instructions, use those instructions to test the option.</p>

## Power problems

Symptom	Suggested action
The NovaScale Blade Server does not turn on.	<ol style="list-style-type: none"> <li>1. Make sure that:               <ol style="list-style-type: none"> <li>a. The power LED on the front of the NovaScale Blade Chassis unit is lit.</li> <li>b. The LEDs on all the power modules are lit.</li> <li>c. If the NovaScale Blade Server or attached storage expansion unit is in blade bay 7 through 14 in the NovaScale Blade Chassis unit. Ensure power modules are installed in all four power bays.</li> <li>d. The power-on LED on the NovaScale Blade Server control panel is flashing slowly.                   <ul style="list-style-type: none"> <li>• If the power LED is flashing rapidly and continues to do so, the NovaScale Blade Server is not communicating with the management module; reseal the NovaScale Blade Server and go to step 3.</li> <li>• If the power LED is off, either the blade bay is not receiving power, the NovaScale Blade Server is defective, or the LED information panel is loose or defective.</li> </ul> </li> <li>e. Local power control for the NovaScale Blade Server is enabled (use the management-module Web interface to verify), or the NovaScale Blade Server was instructed through the management module to turn on.</li> </ol> </li> <li>2. If you just installed an option in the NovaScale Blade Server, remove it, and restart the NovaScale Blade Server. If the NovaScale Blade Server now turns on, troubleshoot the option (see the documentation that comes with the option for information).</li> <li>3. Try another NovaScale Blade Server in the blade bay; if it works, replace the faulty NovaScale Blade Server.</li> </ol>

## Service processor problems

Symptom	Suggested action
The service processor reports a general monitor failure.	Shut down the operating system and turn off the NovaScale Blade Server; then remove the NovaScale Blade Server from the NovaScale Blade Chassis unit, wait for 30 seconds, reinstall the NovaScale Blade Server in the NovaScale Blade Chassis unit, and restart the NovaScale Blade Server.

## Light path diagnostics

If the system-error LED on the system LED panel on the front or rear of the NovaScale Blade Chassis unit is lit, one or more error LEDs on the NovaScale Blade Chassis unit components might also be lit. These LEDs help identify the cause of the problem.

## Diagnosing problems using Light Path Diagnostics

This section provides the information about using the Light Path Diagnostics to diagnose problems that might arise during installation. To locate the actual component that caused the error, you must locate the lit error LED on that component.

The following steps illustrate how to use the Light Path Diagnostics to diagnose a system error:

1. Shut down the operating system, turn off the NovaScale Blade Server, and remove the NovaScale Blade Server from the NovaScale Blade Chassis unit.
2. Place the NovaScale Blade Server on a flat, non-conductive surface.
3. Remove the cover from the NovaScale Blade Server.
4. Press and hold the Light Path Diagnostics button to relight the LEDs that were lit before you removed the NovaScale Blade Server from the NovaScale Blade Chassis unit. The LEDs will remain lit for as long as you press the button, to a maximum of 25 seconds.

See 'Understanding the control panel and LEDs' on page 13 for information about the control panel buttons and error LEDs. See 'Using Light Path Diagnostics to troubleshoot the system board' on page 17 See Figure 6 on page 17 for the location of the Light Path Diagnostics button and error LEDs, then see Table 7 on page 69 for a description of the settings.

## Light Path Diagnostics LEDs

The following table lists the LEDs on the Light Path Diagnostics panel, the problems they indicate, and actions to take to solve the problems. The following illustration is the Light Path Diagnostics key located on the system board. See Figure 6 on page 17 for more information about locating the Light Path Diagnostics LEDs.



Power is available to relight the Light Path Diagnostics LEDs for a short period of time after the NovaScale Blade Server is removed from the NovaScale Blade Chassis unit. During that time, you can relight the Light Path Diagnostics LEDs for up to 25 seconds or less, depending on the number of LEDs that are lit and the length of time the NovaScale Blade Server is removed from the NovaScale Blade Chassis unit.

## Light Path Diagnostics table

Use Table 7 to help determine the cause of the error and the action you should take.

Power is available to relight the Light Path Diagnostics LEDs for a small period of time after the NovaScale Blade Server is removed from the NovaScale Blade Chassis unit. During that period of time, you can relight the Light Path Diagnostics LEDs for a maximum of 25 seconds (or less, depending on the number of LEDs that are lit and the length of time the NovaScale Blade Server is removed from the NovaScale Blade Chassis unit) by pressing the Light Path Diagnostics button. The Light Path Diagnostics power present LED (CR111) lights when the Light Path Diagnostics button is pressed if power is available to relight the blade-error LEDs. If the Light Path Diagnostics power present LED does not light when the Light Path Diagnostics button is pressed, no power is available to light the blade-error LEDs, and they will be unable to provide any diagnostic information.

Table 7. Light path diagnostics

LED	Problem	Action
None	An error has occurred and cannot be isolated, or the service processor has failed. The error is not represented by a light path diagnostic LED.	Check the system error log in the management module for more information about the error.
DIMM x error	A memory error has occurred.	<p>Replace the failing DIMM, indicated by the lit DIMM failure LED.</p> <p>Multiple DIMM LEDs do not necessarily indicate multiple DIMM failures. If more than one DIMM LED is lit, reseal or replace one DIMM at a time until the error goes away. Check the system error log in the management module for information about the error.</p>
Processor x error	The processor has failed.	Make sure that the processor that is indicated by the lit LED is installed correctly (see “Installing an additional processor” on page 25 for installation instructions).
Temperature error	The system temperature has exceeded a threshold level.	<ul style="list-style-type: none"> <li>Determine whether a blower on the NovaScale Blade Chassis unit has failed. If it has, replace the fan.</li> <li>Make sure that the room temperature is not too high (see “Features and specifications” on page 4 for temperature information).</li> </ul>
System board error	The system board has failed.	Replace the NovaScale Blade Server cover, reinsert the NovaScale Blade Server in the NovaScale Blade Chassis unit, and then restart the server.
NMI error	The system board has failed.	<ol style="list-style-type: none"> <li>Replace the NovaScale Blade Server cover, reinsert the NovaScale Blade Server in the NovaScale Blade Chassis unit, and then restart the server.</li> <li>Check the system error log in the management module for information about the error.</li> </ol>
Processor mismatch	The processors do not match.	Make sure that processors 1 and 2 have the same cache size and type and the same clock speed. Internal and external clock frequencies must be identical.





# A Getting help and technical assistance

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If you need help, technical assistance, or just want more information about NovaScale Blade products, you will find a wide variety of sources available from Bull to assist you. This appendix contains information about where to go for additional information about Bull and NovaScale Blade products, what to do if you experience a problem with your NovaScale 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 come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* on the *Resource CD* that came with your NovaScale Blade Server or NovaScale 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 systems and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes.

## Using the documentation

Information about your NovaScale Blade 2021 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 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. Contact your Support Representative to obtain the latest technical information and download device drivers and updates.

## Getting help and information from Bull

Contact your Bull representative.



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