IBM

4767 PCIe Cryptographic Coprocessor Installation Manual

> **Note**
>
> Before using this information and the product it supports, read the information in "Safety and environmental notices" on page ix and in "Notices" on page 13. Also read *IBM Systems Environmental Notices and User Guide*, Z125-5823, and *IBM Systems Safety Notices*, G229-9054.

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Safety and environmental notices

Pay close attention to these safety and environmental notices, to ensure safe handling and disposal of the IBM 4767-002 PCIe Cryptographic Coprocessor and its batteries.

Safety notices

For safety information in your national language, refer to the *IBM Systems Safety Notices*, G229-9054, included in the publications package shipped with the product. Safety notices may be printed throughout this guide. **DANGER** notices warn you of conditions or procedures that can result in death or severe personal injury. **CAUTION** notices warn you of conditions or procedures that can cause personal injury that is neither lethal nor extremely hazardous. **Attention** notices warn you of conditions or procedures that can cause damage to machines, equipment, or programs.

The following **DANGER** notices appear in this manual:

Table 1. Danger Notices

Danger Notice D005
DANGER: When working on or around the system, observe the following precautions: Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard: • If IBM supplied a power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product. • Do not open or service any power supply assembly. • Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm. • The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. • Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate. • Connect any equipment that will be attached to this product to properly wired outlets. • 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. • Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected. • Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements. • Do not continue with the inspection if any unsafe conditions are present. • 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 procedures when installing, moving, or opening covers on this product or attached devices. To disconnect: 1. Turn off everything (unless instructed otherwise). 2. Remove the power cords from the outlets. 3. Remove the signal cables from the connectors. 4. Remove all cables from the devices. To connect: 1. Turn off everything (unless instructed otherwise). 2. Attach all cables to the devices. 3. Attach the signal cables to the connectors. 4. Attach the power cords to the outlets. 5. Turn on the devices. • Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

The following **CAUTION** notices appear in this manual:

Table 2. Caution Notices

Caution Notice C002
CAUTION: Only trained service personnel may replace this battery. The battery contains lithium. To avoid possible explosion, do not burn or charge the battery. **Do not: Throw or immerse into water, heat to more than 100°C (212°F), repair or disassemble. (C002)**

World trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, safety information documentation is included in the publications package (such as in printed documentation, on DVD, or as part of the product) shipped with the product. The documentation contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information documentation. You should also refer to the safety information documentation any time you do not clearly understand any safety information in the U.S. English publications. Replacement or additional copies of safety information documentation can be obtained by calling the IBM Hotline at 1-800-300-8751.

Environmental notices

For environmental information in your national language, refer to the *IBM Systems Environmental Notices and User Guide*, Z125-5823, available from the IBM Knowledge Center found at: http://www.ibm.com/support/knowledgecenter.

Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found at: *http://www.ibm.com/ibm/environment/products/index.shtml* (C1).

Esta unidad debe reciclarse o desecharse de acuerdo con lo establecido en la normativa nacional o local aplicable. IBM® a los propietarios de equipos de tecnología de la información (TI) que reciclen responsablemente sus equipos cuando éstrecomiendaos ya no les sean útiles. IBM dispone de una serie de programas y servicios de devolución de productos en varios países, a fin de ayudar a los propietarios de equipos a reciclar sus productos de TI. Se puede encontrar información sobre las ofertas de reciclado de productos de IBM en el sitio web de IBM: *http://www.ibm.com/ibm/environment/products/index.shtml*. (C1.1)
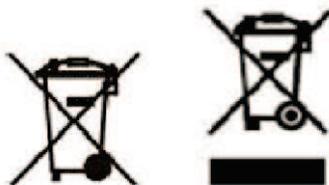
Notice: These marks on Products apply to countries within the European Union (EU), Buenos Aires Province, Iceland, India, Nigeria, Norway, and other jurisdictions requiring this symbol and corresponding product take-back programs. (C2)

Appliances are labeled in accordance with European Union Directives 2002/96/EC and 2012/19/EU concerning waste electrical and electronic equipment (WEEE), Iceland Regulation Number 1104 on Electrical and Electronic Equipment Waste and

Norway Regulations on the Recovery and Treatment of Waste. These requirements determine the framework for the return and recycling of used appliances as applicable throughout these countries. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end-of-life per the requirements. (C3)

In accordance with the European Waste Electrical and Electronic Equipment (WEEE) Directive, Norway Regulations on the Recovery and Treatment of Waste, and other legal requirements in jurisdictions requiring the above product mark or an electrical and electronic equipment (EEE) take-back program, EEE is to be collected separately and to be reused, recycled, or recovered at end-of-life. Users of EEE with the above WEEE marking must not dispose of end-of-life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative. (C4)

For the European Union:

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

L'étiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

Battery return program

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to the Product stewardship website at *http://www.ibm.com/ibm/environment/products/index.shtml* or contact your local waste disposal facility.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

In Taiwan, the following applies:

Please recycle batteries

廢電池請回收

For the European Union:

Notice: This mark applies only to countries within the European Union (EU) and Norway.

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

バッテリーあるいはバッテリー用のパッケージには、EU 諸国に対する廃電気電子機器指令 2006/66/EC のラベルが貼られています。この指令は、バッテリーと蓄電池、および廃棄バッテリーと蓄電池に関するものです。この指令は、使用済みバッテリーと蓄電池の回収とリサイクルの骨子を定めているもので、EU 諸国にわたって適用されます。このラベルは、使用済みになったときに指令に従って適正な処理をする必要があることを知らせるために種々のバッテリーに貼られています。

Les batteries ou emballages pour batteries sont étiquetés conformément aux directives européennes 2006/66/EC, norme relative aux batteries et accumulateurs en usage et aux batteries et accumulateurs usés. Les directives déterminent la marche à suivre en vigueur dans l'Union Européenne pour le retour et le recyclage des batteries et accumulateurs usés. Cette étiquette est appliquée sur diverses batteries pour indiquer que la batterie ne doit pas être mise au rebut mais plutôt récupérée en fin de cycle de vie selon cette norme.

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling and treatment of batteries and accumulators. Customer

participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local IBM representative.

For California:

Perchlorate Material - special handling may apply.

See *http://www.dtsc.ca.gov/hazardouswaste/perchlorate*.

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials. This product, part or both may include a lithium manganese dioxide battery which contains a perchlorate substance.

About this document

This manual is written for personnel installing the IBM 4767-002 PCIe Cryptographic Coprocessor hardware. The coprocessor is a hardware security module (HSM).

How this manual is organized

This manual is organized as follows:

- "Safety and environmental notices" on page ix describes important general safety and environmental information.
- Chapter 1, "Introduction," on page 1, describes the contents of the coprocessor packages; shipping, handling, and storage considerations; and requirements and specifications of the IBM 4767-002 PCIe Cryptographic Coprocessor.
- Chapter 2, "Installing the coprocessor," on page 5, describes the procedure to physically install the IBM 4767-002 PCIe Cryptographic Coprocessor.
- Chapter 3, "Replacing coprocessor batteries," on page 7, describes the way to replace the batteries on the IBM 4767-002 PCIe Cryptographic Coprocessor.
- Chapter 4, "Transporting a coprocessor," on page 11 provides guidance for shipping or traveling with the IBM 4767-002 PCIe Cryptographic Coprocessor.
- "Notices" on page 13 contains notices for various countries, trademark information, and information about the product warranty extended by IBM.

A glossary and an index complete the manual.

Where to find more information

Visit the IBM product website at *http://www.ibm.com/security/cryptocards* to obtain IBM 4767-related publications. This and other publications are available as Adobe PDF files that you can read and print with the Adobe Acrobat Reader.

Before installing a coprocessor, check the **Approved x86 servers** list on the IBM product website for the approved server list:

http://www.ibm.com/security/cryptocards

Click on the **HSM 4767** link in the left sidebar, then click on the **Approved x86 servers** link in the left sidebar.

Chapter 1. Introduction

This section details the contents of the IBM 4767-002 PCIe Cryptographic Coprocessor package, special considerations for handling and storage, and coprocessor requirements and specifications.

The coprocessor uses dedicated hardware to process cryptographic keys, certificates, and bulk data. These cryptographic functions are performed within a tamper-resistant module that is validated to the Federal Information Processing Standard (FIPS) PUB 140-2 Level 4, as established by the National Institute of Standards and Technology. This is a standard of detecting and responding to unauthorized attempts at physical access and security compromise due to environmental conditions such as voltage and temperature.

Before installing a coprocessor, check the IBM product website for the list of IBM-approved x86 servers. Refer to "Where to find more information" on page xv.

You can install the coprocessor, a standard height, half-length PCIe adapter card, only in an IBM-approved x86 server. Refer to "Where to find more information" on page xv.

Contents of the coprocessor package

Your IBM 4767-002 PCIe Cryptographic Coprocessor coprocessor package includes the following items:

- The IBM 4767-002 PCIe Cryptographic Coprocessor
- *IBM License Agreement for Machine Code (Contains Form Z125-5468-06)*, SC28-6872-03 (multi-language)
- *IBM License Agreement for Machine Code Addendum for Cryptography (Contains Form Z125-8449-01)*, GC27-2635-00 (multi-language)
- *IBM Systems Safety Notices*, G299-9054-08
- *IBM 4767 and 4765 PCIe Cryptographic Coprocessor Statement of Limited Warranty - Warranty Information flyer*, SC23-6884-01
- Notice to Users of the IBM 4767-002 PCIe Cryptographic Coprocessor, PN 01EL550.

If any item is missing or damaged, contact your local IBM representative.

Special considerations for handling and storage

Each coprocessor is shipped from the factory with a certified device key. This electronic key, which is stored in the card's battery-backed protected memory, digitally signs test messages to confirm that the coprocessor is genuine and that no tampering has occurred.

Note: If any of the secure module's tamper sensors is triggered by tampering or accident, the coprocessor erases (zeroizes) all data in the protected memory, destroying the device key. This renders the coprocessor permanently inoperable, and there is no recovery from this situation.

The coprocessor cannot operate without the device key. To protect the key, follow these temperature and battery guidelines:

Storage

It is recommended that an uninstalled coprocessor be kept in its original protective packaging material. Save this packaging material for future use, especially if the coprocessor must be transported to another location.

Temperature

Do not expose the coprocessor to temperatures outside the limits in Table 3 on page 3.

Batteries

Do not remove battery power from the coprocessor. Data in the protected memory is lost (zeroized) when battery power is removed, rendering the coprocessor permanently inoperable. For information about replacing the batteries without erasing the protected memory, see Chapter 3, "Replacing coprocessor batteries," on page 7.

Requirements and specifications

The requirements and specification for the coprocessor consist of the necessary hardware and software, environmental requirements, and physical characteristics.

Hardware requirement

The coprocessor must be installed in a select x86 server from the list of IBM-approved x86 servers. See notes below. No additional hardware or cabling is required.

Notes:
1. The full speed USB 2.0 Type A connector is for development use only. It is not intended for customer use.
2. The two RJ45 connectors are blocked. They are not intended for customer use.

Software requirement

The coprocessor requires support software, for example, the IBM 4767 CCA Support Program, for both the host machine and for its internal firmware. Operating system support is determined by the support software. This publication does not discuss the installation of support software. For information about the latest software features available, visit the product website at:

http://www.ibm.com/security/cryptocards

Power requirements

The power requirements for the IBM 4767-002 PCIe Cryptographic Coprocessor are:

- +12 volt PCIe domain: 20.13 watts maximum
- +3.3 volt PCIe domain: 3.31 watts maximum (including USB external load)
- On-board batteries: batteries dead less than 2.4 volts; low-battery warning less than 2.75 volts

Environmental specifications

The environmental specifications for the IBM 4767-002 PCIe Cryptographic Coprocessor are shown in Table 3.

Table 3. Operating, storage, and shipping environmental specifications

	Operating environment	Storage environment	Shipping environment
Temperature	+10°C - +35°C (+50°F - +95°F)	+1°C - +60°C (+33.8°F - +140°F)	-34°C - +60°C (-29.2°F - +140°F)
Relative humidity	8 - 80%	5 - 80%	5 - 100%
Wet bulb	< +27.0°C (+80.6°F)	< +29.0°C (+84.2°F)	< +29.0°C (+84.2°F)
Pressure (minimum)	700 mbar (maximum altitude 10 000 feet)	700 mbar	550 mbar

Physical dimensions

- The coprocessor is a standard height, half-length PCIe adapter card
- 4.376 inches by 6.6 inches (111.15 mm by 167.65 mm).

Chapter 2. Installing the coprocessor

This section describes installing the IBM 4767-002 PCIe Cryptographic Coprocessor.

About this task

Note that on a Microsoft Windows operating system, it is necessary to install the CCA support software before installing a coprocessor. Other supported operating systems do not require this, but is recommended.

To install the coprocessor into the host computer, follow these steps:

Procedure

1. Locate your computer's instructions for installing expansion cards. Throughout this procedure, follow the safety instructions in that manual.
2. Turn OFF the computer and all attached devices.
3. Disconnect all cables, including the power cable. Refer to danger notice D005 in Table 1 on page x.
4. Choose a PCIe expansion slot able to accommodate a standard short-type adapter card.
5. If the expansion slot has an individual cover, remove any bracket-holding screw and the cover.

   Attention: Electrostatic discharge (ESD) can damage the card and its components. Wear an ESD wrist-strap while handling and installing the card, or take the following precautions:
   - Limit your movements; this helps prevent static electricity from building up around you.
   - Prevent others from touching the card or other components.
   - Before removing the card from the electrostatic discharge (ESD) barrier bag, touch the bag to an unpainted metal surface on your computer and hold it there for at least two seconds.
   - Handle the card by its edges only. Do not touch exposed circuitry and components.
6. Remove the cryptographic coprocessor from its ESD barrier bag. Do not discard the bag. It can be used again whenever the coprocessor is removed from the server.
7. Verify that the jumpers on the card are positioned correctly. See Figure 1 on page 6 and Table 4 on page 6.
8. Insert the coprocessor into the slot; be sure that the card is fully seated.
9. If possible, install a bracket-holding screw. Some server models have a row of screws available inside the machine for this purpose.
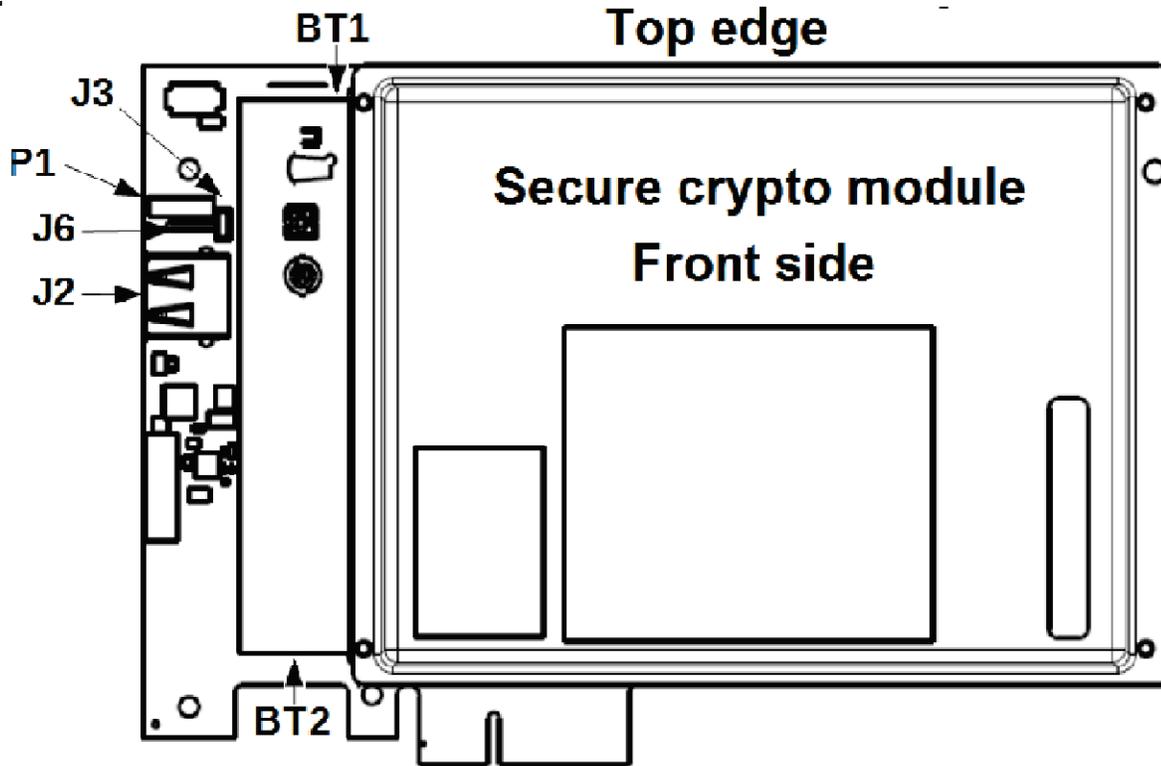
Figure 1. Jumpers on the IBM 4767-002 PCIe Cryptographic Coprocessor (front side)

Table 4. Jumpers on the IBM 4767-002 PCIe Cryptographic Coprocessor

Jumper	Number of PINS	Name of jumper	Position when shipped
BT1	N/A	Battery holder	Shipped with two batteries installed.
J2	4	USB Standard-A (Type A) connector	N/A
J3	2	External intrusion latch disable	Shipped with jumper (Berg connector) installed.
J6	2	Battery disconnect wire	Shipped with jumper (wire loop) installed (cut wire to permanently zeroize card).
P1	3 (keyed)	Temporary-battery tray connector	Shipped without jumper installed (use to plug in battery-replacement tray).

Note: *Shipped with jumper installed* means that the PINS are connected.

10. Replace the host computer's cover.
11. Reconnect the power cable and any other cables that you disconnected.
12. Turn the computer ON. The cryptographic coprocessor runs its power-on self-test (POST).

What to do next

You have completed the procedure for the physical installation of the PCIe cryptographic coprocessor. Refer to the support software documentation for information about initializing and using the coprocessor.

Chapter 3. Replacing coprocessor batteries

This section describes the way to replace the batteries on the coprocessor.

Before you begin

Two lithium batteries mounted on the IBM 4767-002 PCIe Cryptographic Coprocessor supply power to the card's components, including protected memory. Your support software or application software can query the coprocessor to determine whether the batteries need to be replaced.

When shipped from the factory, the protected memory contains a certified device key. If your coprocessor has been initialized by support software, the protected memory contains secret data, including a master cryptographic key, user profiles, and user passwords.

Attention: If you remove either of the two batteries without first backing up the power by connecting a battery tray with a fresh battery in it, the data in protected memory can be lost. This renders the coprocessor permanently inoperable. The battery-replacement kit for the coprocessor provides the battery tray required to provide backup power while you replace the batteries. The kit also includes two replacement batteries. Refer to Table 5.

Table 5. Part numbers for battery-replacement kits

FRU PN	Description	Contents
45D5803	Battery-replacement kit	• Two replacement batteries • One battery tray with connecting wires • One battery-attention label

To order the kit, contact your local IBM System z® representative. Only trained service personnel may replace the battery.

To replace the on-board batteries, complete the following steps:

Procedure

1. Before handling coprocessor batteries, refer to the caution notice (C002) in Table 2 on page x.
2. To replace the coprocessor batteries, first have on hand the following:
   - Two replacement batteries (VARTA CR 2/3 AA lithium manganese dioxide 3V are required)
   - One required battery tray with connecting wires
   - One replacement battery attention label
   - A small screwdriver or similar object with a blunt tip

   Refer to Table 5 for ordering a battery-replacement kit.

   Note: Failure to use the required backup battery tray along with a fresh and tested battery can render the coprocessor permanently inoperable and result in permanent loss of critical data. The battery in the tray while attached to the coprocessor provides backup power while replacing coprocessor batteries.

3. Check that the two replacement batteries are fresh. Each battery has a date-of-manufacture code stamped on it in the format *wwyy*, where *ww* is the 2-digit week, and *yy* is the 2-digit year. The expected shelf life is in excess of 7 years. Fresh new batteries can be expected to last 3 years in a powered off coprocessor and 5-7 years in a continually powered on coprocessor.

4. Test the replacement batteries to ensure that they are good. The nominal voltage is 3V.

5. Turn OFF the computer and all attached devices.

6. For your safety, observe the precautions listed in the danger notice (D005) in Table 1 on page x.

7. Disconnect all cables, including any power cables.

8. Remove the cryptographic coprocessor from the PCIe bus slot in the host computer.

   Attention: Electrostatic discharge (ESD) can damage the card and its components. Wear an ESD wrist-strap while handling and installing the card, or take the following precautions:

   • Limit your movements; this helps prevent static electricity building up around you.

   • Prevent others from touching the card or other components.

   • Handle the card by its edges only. Do not touch exposed circuitry and components.

9. Insert one of the replacement batteries into the battery tray. The batteries are flat top and not button top. This means that the positive (+) electrode is on the flat end of the battery, while the negative (-) electrode is on the raised (button) end. Align the flat end (+) of the battery with the "+" on the battery tray (the end of the battery tray with the red wire).

10. Refer to Figure 1 on page 6 for the location on the coprocessor of the P1 connector. Place the plug attached to the battery tray wires onto the P1 connector. The connector has three PINs configured in such a way (keyed) so as to ensure that the plug from the battery tray can only be plugged onto the connector with correct polarity.

    Attention: Any loss of sufficient power causes data stored in the card's protected memory to be zeroized and renders the coprocessor permanently inoperable. For security reasons, there is no recovery from this damage. To protect against such a loss, ensure that the battery tray contains a fresh battery that has been tested to be good, and is attached to the P1 connector. One good battery is sufficient to power the coprocessor.

11. Peel off the battery attention label from the battery holders on the card. A replacement label is included in the battery-replacement kit.

12. Take note of the position of the flat end (+) of both batteries mounted in the coprocessor before proceeding. This will help to correctly install the new batteries.

13. Refer to Figure 1 on page 6. Working on a non-conductive surface, remove the battery from the top socket of the battery holder, located at the BT1 position of the coprocessor. You can eject the battery by turning the coprocessor over and inserting a small blunt object such as a screwdriver through the hole provided. The hole is covered by plastic tape to protect exposed circuitry. Carefully peel back the tape enough to expose the hole, then eject the battery and replace the tape.

14. Refer to Figure 2 on page 9. Install the fresh and tested battery (not the one in the temporary-battery tray) with the flat end of the battery (+) positioned at the outside end of the top socket of the battery holder, and the button end of

the battery (-) positioned at the middle of the battery holder. This newly installed battery provides sufficient power to the coprocessor.
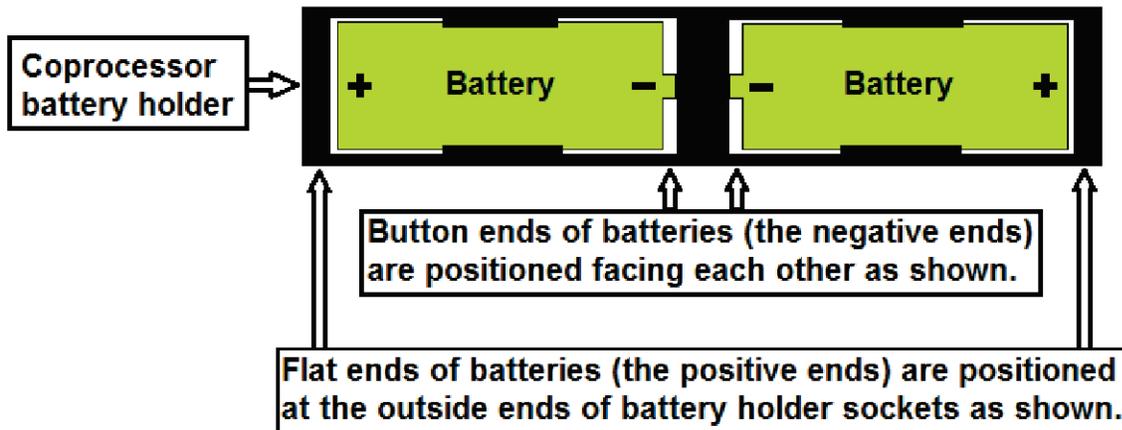

Figure 2. Battery holder

15. Unplug the battery tray from the P1 connector. Remove the battery from the tray for use in the next step.
16. Remove the remaining old battery from the bottom socket of the battery holder, and install the new battery with the flat end of the battery (+) positioned at the outside end of the bottom socket of the battery holder, and the button end of the battery (-) positioned at the middle of the battery holder.
17. Apply the battery-attention label from the kit onto the battery holder on the card.
18. Reinsert the coprocessor into the PCIe bus slot. Be sure that the card is fully seated. Replace the bracket-holding screw as needed.
19. Replace the host computer's cover.
20. Reconnect any power cables, and any other cables that were previously disconnected.
21. Turn the computer ON. The coprocessor runs its power-on self-test (POST).
22. The batteries contain lithium. Recycle or dispose of the old batteries as required by local law. See Battery return program.

Results

You have completed the procedure for replacing the PCIe cryptographic coprocessor batteries.

Chapter 4. Transporting a coprocessor

This section provides guidelines to follow when it becomes necessary to travel with or ship an IBM 4767-002 PCIe Cryptographic Coprocessor. This chapter addresses protecting the coprocessor from physical damage. It also touches on some export and import considerations. This chapter does not attempt to address issues with data security.

About this task

The guidelines provided below are meant to assist you in properly transporting your coprocessor. Following these guidelines does not guarantee that your coprocessor or the data that it contains will arrive unharmed. You are ultimately responsible for taking whatever measures are necessary to adequately protect your coprocessor and its data. At a minimum, the coprocessor must be maintained within the environmental specifications shown in Table 3 on page 3.

Note: There is no X-ray tamper sensor on the coprocessor.

Handling the coprocessor

Electrostatic discharge (ESD) can damage the coprocessor and its components. Wear an ESD wrist-strap while handling the coprocessor, or take the following precautions:

Procedure
* Limit your movements; this helps prevent static electricity from building up around you.
* Prevent others from touching the card or other components.
* Before removing the coprocessor from the ESD barrier bag, touch the bag to an unpainted metal surface on your computer and hold it there for at least two seconds.
* Handle the coprocessor by its edges only. Do not touch exposed circuitry and components.

Traveling with a coprocessor

Whenever traveling with a coprocessor, keep it in the ESD barrier bag that the coprocessor was shipped in, or a bag with similar properties. Ensure that the bag has not been damaged and is in good condition.

Procedure
* Use enough cushioning and packing materials as deemed necessary to protect the coprocessor. Consider these forces, expected or otherwise:
  – Vibration
  – A hard knock or blow
  – A crushing load
  – Bending or flexing
  – A piercing object

- If the coprocessor could be subject to extreme hot or cold temperatures, such as when it is in the cargo hold of an airplane or left in a parked vehicle, it is recommended that it be packed as if you were shipping a coprocessor. See Shipping a coprocessor.

Traveling internationally with a coprocessor

International transport of a cryptographic coprocessor requires special consideration of applicable export laws, regulations, and controls. For example, the export of a cryptographic coprocessor to certain countries might be restricted. When hand carrying a coprocessor, consider taking with you proof-of-purchase documents to protect against duty assessment. When shipping a coprocessor, there might be a Customs declaration form that must be completed. Any existing company policies should be considered as well.

Shipping a coprocessor

When shipping a coprocessor, it is recommended that it be packed and shipped using the original package materials. These materials include a cardboard box, pieces of foam, bags of isothermal gel, a bag containing a dessicant, and an electrostatic discharge barrier bag. Before using the bags of isothermal gel, keep them at room temperature for a reasonable amount of time.

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This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

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- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM-authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareeil numérique de la classe B respecte est conforme à la norme NMB-003 du Canada.

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Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:

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Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse B.

Glossary

This glossary includes some terms and definitions from the *IBM Dictionary of Computing*, New York: McGraw Hill, 1994. This glossary also includes some terms and definitions from:

- The *American National Standard Dictionary for Information Systems*, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies may be purchased from the American National Standards Institute, 11 West 42 Street, New York, New York 10036. Definitions are identified by the symbol (A) following the definition.

- The *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC1/SC1). Definitions of published parts of this vocabulary are identified by the symbol (I) following the definition; definitions taken from draft international standards, committee drafts, and working papers being developed by ISO/IEC JTC1/SC1 are identified by the symbol (T) after the definition, indicating that final agreement has not yet been reached among the participating National Bodies of SC1.

A

American National Standards Institute (ANSI)
> An organization consisting of producers, consumers, and general interest groups that establishes the procedures by which accredited organizations create and maintain voluntary industry standards in the United States. (A)

B

bus   In a processor, a physical facility along which data is transferred.

C

card   An electronic circuit board that is plugged into a slot in a system unit. A plug-in circuit assembly.

coprocessor
> A supplementary processor that performs operations in conjunction with another processor. A microprocessor on an expansion card that extends the address range of the processor in the host system or adds specialized instructions to handle a particular category of operations; for example, an I/O coprocessor, math coprocessor, or networking coprocessor.

cryptography
> The transformation of data to conceal its meaning. In computer security, the principles, means and methods used to so transform data.

E

EEPROM
> See *electrically erasable programmable read-only memory*.

electrostatic discharge (ESD)
> An undesirable discharge of static electricity that can damage equipment and degrade electrical circuitry.

electrically erasable programmable read-only memory (EEPROM)
> A type of memory chip that can retain its contents without consistent electrical power. Unlike the PROM, which can be programmed only once, the EEPROM can be erased electrically. Because it can only be

reprogrammed a limited number of times before it wears out, it is appropriate for storing small amounts of data that are changed infrequently.

expansion card

A circuit board that a user can install in an expansion slot to add memory or special features to a computer. Synonym for *card*.

expansion slot

One of several receptacles available inside a computer, into which a user can install an expansion card.

F

feature

Part of an IBM product able to be ordered separately.

Federal Communications Commission (FCC)

A board of commissioners, appointed by the President under the Communications Act of 1934, having the power to regulate all interstate and foreign communications in the United States that are transmitted by wire or radio.

Federal Information Processing Standard (FIPS)

A standard published by the US National Institute of Science and Technology.

FIPS   See *Federal Information Processing Standard*.

I

interface

A shared boundary between two functional units, defined by functional characteristics, signal characteristics, or other characteristics, as appropriate. The concept includes the specification of the connection of two devices having different functions. (T) Hardware, software, or both, that links systems, programs, and devices.

International Organization for Standardization (ISO)

An organization of national standards bodies established to promote the development of standards to facilitate the international exchange of goods and services, and to develop cooperation in intellectual, scientific, technological, and economic activity.

J

jumper

A wire that joins two unconnected circuits.

K

key   In computer security, a sequence of symbols used with an algorithm to encipher or decipher data.

P

power-on self-test (POST)

A series of diagnostic tests that are run automatically by a device when the power is turned on.

S

security

For computers, the protection of data, system operations, and devices from accidental or intentional ruin, damage, or exposure.

Numerics

4765   IBM 4767-002 PCIe Cryptographic Coprocessor.

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