

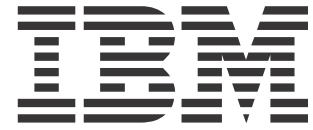
IBM Flex System CN4052 2-port and CN4058S 8-port  
10Gb Virtual Fabric Adapters



# User's Guide



IBM Flex System CN4052 2-port and CN4058S 8-port  
10Gb Virtual Fabric Adapters



# User's Guide

**Note:**

Before using this information and the product it supports, read the general information in Appendix B, "Notices," on page 17, the *Safety Information* and *Environmental Notices and User Guide* documents on the *IBM Notices for Network Devices CD*, and the *Warranty Information* document that comes with the product.

**First Edition, December 2014**

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# Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 **Safety Information** (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

Youq mwngz yungh canjbinj neix gaxgonq, itdingh aeu doeg aen canjbinj soengq cungj vahgangj ancien siusik.

مەزكۇر مەھسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

ཐོན་རྒྱུ་འདི་བདེ་སྤྱོད་མ་གྲས་ཤིང་། རྒྱུ་ལྷི་ཡིད་གཟབ་བྱ་འདྲ་མིན་ཡིད་པའི་འོད་ཟེར་བཏུ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

සුරැකුම්  
අනුප්පාදන  
පිටපත  
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පිටපත  
පිටපත

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### Important:

Each caution and danger statement in this document is labeled with a number. This number is used to cross reference an English-language caution or danger statement with translated versions of the caution or danger statement in the *Safety Information* document.

For example, if a caution statement is labeled "Statement 1," translations for that caution statement are in the *Safety Information* document under "Statement 1."

Be sure to read all caution and danger statements in this document before you perform the procedures. Read any additional safety information that comes with the server or optional device before you install the device.

This device is intended for use with UL Listed IBM devices.

### Statement 1:



### DANGER

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

**To avoid a shock hazard:**

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.

**To Connect:**

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

**To Disconnect:**

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.



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# Chapter 1. IBM Flex System CN4052 2-port and CN4058S 8-port 10Gb Virtual Fabric Adapters

The IBM Flex System™ CN4052 2-port and CN4058S 8-port 10Gb Virtual Fabric Adapters are converged network adapters (CNAs) that are designed for use in IBM X-Architecture® compute nodes.

This *User's Guide* contains information and instructions for installing the adapters, updating the firmware, and solving problems. See the documentation that came with your IBM Flex System compute node for information on how to physically install the adapters. Return to this *User's Guide* for information and instructions needed to complete the functional installation.

For information about the types of compatible devices available for IBM products, contact your IBM marketing representative or authorized reseller. For a list of supported optional devices, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

## Related documentation

This *User's Guide* contains setup and installation instructions for these adapters and general information about the adapters, including how to configure, update, and troubleshoot the adapters, and how to get help.

In addition to this document, the following documentation is available:

- *IBM Flex System compute node User's Guides*  
These documents contain the hardware installation instructions for the adapters.
- *IBM Flex System Enterprise Chassis Installation and Service Guide*.  
This document contains information about setting up, configuring, and troubleshooting the IBM Flex System Enterprise Chassis and its components.
- *IBM Flex System Chassis Management Module Command-Line Interface Reference Guide*  
This document explains how to use the Chassis Management Module command-line interface (CLI) to directly access management functions. The command-line interface also provides access to the text-console command prompt on each compute node through a Serial over LAN (SOL) connection.
- *IBM Flex System Chassis Management Module User's Guide*  
This document explains how to use the Chassis Management Module user interface to manage chassis components.
- *IBM Flex System Manager System Management Guide*  
This document explains how to use the IBM Flex System Manager user interface to manage chassis components.
- *Environmental Notices and User Guide*  
This document is provided on the IBM Notices for Network Devices CD, and it contains translated environmental notices.

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- *Safety Information*

This document is provided on the IBM Notices for Network Devices CD, and it contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the Safety Information document.

For the most up-to-date product documentation for all of your IBM Flex System products, go to the IBM Flex System Information Center at <http://pic.dhe.ibm.com/infocenter/flexsys/information/index.jsp>.

## Notices and statements in this document

The caution and danger statements in this document are also in the multilingual *Safety Information* document, which is provided on the *IBM Notices for Network Device* CD. Each statement is numbered for reference to the corresponding statement in your language in the *Safety Information* document.

The following notices and statements are used in this document:

- **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 potential 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.

---

## Features and specifications

The IBM Flex System CN4052 2-port and CN4058S 8-port 10Gb Virtual Fabric Adapters have the following features and specifications:

- The eight-port 10GB Virtual Fabric adapter with two operational mode choices:
  - Eight-port Physical Mode, pNIC, Multichannel disabled, or
  - The default Virtual NIC Mode, vNIC, Multichannel enabled; vNIC mode provides four vNICs per physical port for a total of 32 vNICs.
- The two-port 10GB Virtual Fabric adapter with two operational mode choices:
  - Two-port Physical Mode, pNIC, Multichannel disabled, or
  - The default Virtual NIC Mode, vNIC, Multichannel enabled; vNIC mode provides eight vNICs per physical port for a total of 16 vNICs.
- Establishing active links in vNIC mode requires some configuration on the connecting I/O modules. Until configured, the vNIC links will be in a Link Down state.
- The adapter supports three options for vNIC linking:
  - VNIC1, IBM Virtual Fabric Mode, which is the default option.
  - VNIC2, Switch Independent Mode, which can be selected in Setup. Each 10Gb physical port supports either four vNIC devices (IBM Flex System CN4058S 8-port 10Gb Virtual Fabric Adapter) or eight vNIC devices (IBM Flex System CN4052 2-port 10Gb Virtual Fabric Adapter).
  - Unified Fabric Protocol Mode, which can be selected in Setup.
- The following is a list of the features the adapter supports.
  - Link Auto negotiation 10 Gb/1 Gb Full duplex
  - Agentless hardware management support
  - Virtual Ethernet Bridging (VEB)
  - Quantized Congestion Notification (QCN) – part of Data Center Bridging (DCB) standards. QCN provides end-to-end congestion notification for Layer 2 networks. QCN is defined in the IEEE 802.1Qau standard.
  - IBM Distributed Overlay Virtual Ethernet (DOVE) Offload support. DOVE allows an abstraction of the physical network infrastructure from hypervisor hosts. It allows network changes to be made in software.
  - Physical ports
    - ◆ Eight 10Gb ports each supporting one FCoE or iSCSI device and up to four vNIC devices (IBM Flex System CN4058S 8-port 10Gb Virtual Fabric Adapter)
    - ◆ Two 10Gb ports each supporting one FCoE or iSCSI device and up to eight vNIC devices (IBM Flex System CN4052 2-port 10Gb Virtual Fabric Adapter)
  - Low latency RoCE protocol support (only on Windows systems)
  - Bus-mastering support
  - Direct memory access (DMA) support

- 
- Uses standard Emulex® SLI drivers
  - Interoperates with existing FC SAN infrastructures – switches, arrays, SRM tools (including Emulex utilities), SAN practices, and so forth
  - Unified Ethernet-to-FC SAN connectivity provided by an FCoE switch
  - Provides 10 Gb MAC features such as MSI-X support, jumbo frames (9k bytes) support, VLAN tagging (802.1Q, PER priority pause/priority flow control), and advanced packet filtering
  - No host operating system changes are required. NIC and adapter functionality (including device management, utilities, and so forth) are transparent to the host operating system.
  - NIC failover support
  - Integrated Open Fabric Manager (IOFM) support
  - Preboot Execution Environment, UEFI and Legacy PXE
  - WoL (Wake on LAN) on all ports
  - TCP/IP offload support
  - CEE/FCoE and iSCSI hardware offload support
  - CIM support for FSM, IBM Director, IBM ToolsCenter, and Denali
  - SRIOV support
  - iSCSI or FCoE capabilities may be enabled via FoD (IBM Feature on Demand)
  - Onboard thermal monitoring and control
  - LED fault light support
  - Compliance with U.S. and international safety and emissions standards
  - The IBM Flex System CN4058S 8-port 10Gb Virtual Fabric Adapter is constructed with two four-port NICs, Network Interface Controllers, or ASICs. The four ports of each ASIC connect in parallel to one I/O Module bay, one ASIC to I/O bay 1 and the other ASIC to I/O bay 2.
    - If the adapter is installed in I/O expansion connector 1 of the compute node, the I/O bays are 1 and 2.
    - If the adapter is installed in the I/O expansion connector of the compute node, the I/O bays are 3 and 4.
    - The adapter is manufactured with 32 burned in MAC addresses.
  - The IBM Flex System CN4052 2-port 10Gb Virtual Fabric Adapter is constructed with a single two-port NIC. The adapter is manufactured with 16 burned in MAC addresses.
  - If an adapter is in pNIC mode without storage configured, each port uses two MAC addresses. One MAC address is used for normal Ethernet traffic, while a second MAC address is used for LLDP traffic. If the adapter is put into vNIC mode, or if storage is enabled, then more than two MAC addresses will be used on each port.
  - When enabled via FoD, the iSCSI or FCoE operations are supported on the second vNIC of each physical port, or in Physical pNIC mode the functions are across all eight ports.

- 
- Separate NIC, iSCSI, and FCoE drivers are provided to support all configurations.
  - A full complement of Emulex OneCommand™ Manager tools and applications are available to support the operation of this adapter.



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## Chapter 2. Installing the adapters

This chapter provides information and instructions for installing and configuring the adapters. See the documentation that came with the IBM compute node to install the adapter in the compute node; then, return to this *User's Guide* for the information and instructions needed to complete the installation.

### Installing device drivers

For device driver installation instructions, refer to the following operating system-specific documentation:

#### Windows drivers

Windows Server 2012      <http://www.emulex.com/downloads/oem-qualified/ibm/vfafc-software-kits/>  
NIC Teaming                <http://www.emulex.com/downloads/oem-qualified/ibm/vfafc-software-kits/>

#### Linux drivers

SLES 11 SPx                <http://www.emulex.com/downloads/oem-qualified/ibm/vfafc-software-kits/>  
SLES 12                    <http://www.emulex.com/downloads/oem-qualified/ibm/vfafc-software-kits/>  
RHEL 6.x                    <http://www.emulex.com/downloads/oem-qualified/ibm/vfafc-software-kits/>  
RHEL 7.x                    <http://www.emulex.com/downloads/oem-qualified/ibm/vfafc-software-kits/>

**Note:** On systems running RHEL 6.4 or later, when upgrading or downgrading from the proprietary be2iscsi driver to the open be2iscsi driver, you must install the Dracut-network RPM package, and pass the netroot command parameter into Dracut to build the initramfs image.

#### VMware drivers

ESXi 5.x                    <http://www.emulex.com/downloads/oem-qualified/ibm/vfafc-software-kits/>

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## Managing the adapters

Adapter management information is provided in the following application and utilities documentation:

- *OneCommand™ Manager Application User Manual*  
(<http://www.emulex.com/downloads/oem-qualified/ibm/vfafc-software-kits/>)
- *Elxflash Offline/Online Utilities User Manual*  
(<http://www.emulex.com/downloads/oem-qualified/ibm/vfafc-software-kits/>)

Boot from SAN information is provided in the *Boot for NIC, iSCSI, and FCoE Protocols User Manual*

(<http://www.emulex.com/downloads/oem-qualified/ibm/vfafc-software-kits/>).



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## Chapter 3. Updating the firmware

This chapter contains information and instructions for updating the adapter firmware.

### Determining the adapter firmware level

For information on determining the adapter firmware level, refer to the following application and utilities documentation:

- *OneCommand™ Manager Application User Manual*  
(<http://www.emulex.com/downloads/oem-qualified/ibm/vfadc-software-kits/>)
- *Elxflash Offline/Online Utilities User Manual*  
(<http://www.emulex.com/downloads/oem-qualified/ibm/vfadc-software-kits/>)

### Obtaining the latest level of adapter firmware

To obtain the latest level of IBM-supported adapter firmware:

1. Go to the IBM section of the Emulex website at  
<http://www.emulex.com/downloads/oem-qualified/ibm/vfadc-software-kits/>
2. Click the appropriate adapter.
3. Locate the download icon for the firmware and click it.

### Upgrading the adapter firmware

For information on upgrading the adapter firmware, refer to the following application and utilities documentation:

- *OneCommand™ Manager Application User Manual*  
(<http://www.emulex.com/downloads/oem-qualified/ibm/vfadc-software-kits/>)
- *Elxflash Offline/Online Utilities User Manual*  
(<http://www.emulex.com/downloads/oem-qualified/ibm/vfadc-software-kits/>)



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## Chapter 4. Solving problems

If you cannot locate and correct a problem by using the information in this section, see Appendix A, “Getting help and technical assistance,” on page 13.

### Running POST

To ensure that they are fully operational, the adapters process a series of tests during power-up or a restart (power-on self-test, or POST). These tests take approximately one minute to complete. The management module reads the test results and displays them for you. During normal operation, these tests are completed without error. However, if an adapter fails POST, the system-error LED on the chassis is lit.

### Parts listing

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit (CRU):** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty, see the *Warranty Information* document.

The replaceable components in the following table are Tier 1 CRUs. If other components require replacement, see the documentation that came with those devices for instructions.

Table 4-1

| Part  | CRU number (Tier 1) |
|---|---------------------|
| IBM Flex System CN4052 10Gb Virtual Fabric Adapter  | 00JY803             |
| IBM Flex System CN4058S 10Gb Virtual Fabric Adapter | 94Y5163             |



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# Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your system, and whom to call for service, if it is necessary.

## Before you call

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.
- Go to the IBM support website at <http://www.ibm.com/supportportal/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

## Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, 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. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/supportportal/> and follow the instructions.

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## Getting help and information from the World Wide Web

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your system, and whom to call for service, if it is necessary.

### Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems. For information about which products are supported by Support Line in your country or region, see <http://www.ibm.com/services/supline/products/>.

For more information about Support Line and other IBM services, see <http://www.ibm.com/services/>, or see <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

### Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to <http://www.ibm.com/partnerworld/> and click **Find Business Partners** on the right side of the page. For IBM support telephone numbers, see <http://www.ibm.com/planetwide/>. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

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## IBM Taiwan product service

台灣 IBM 產品服務聯絡方式：  
台灣國際商業機器股份有限公司  
台北市松仁路 7 號 3 樓  
電話：0800-016-888

IBM Taiwan product service contact information:

IBM Taiwan Corporation  
3F, No 7, Song Ren Rd.  
Taipei, Taiwan  
Telephone: 0800-016-888





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## Appendix B. Notices

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UNIX is a registered trademark of The Open Group in the United States and other countries.

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## Important notes

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

IBM makes no representation or warranties regarding non-IBM products and services that are ServerProven<sup>®</sup>, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

This product is not intended to be connected directly or indirectly by any means whatsoever to interfaces of public telecommunications networks, nor is it intended to be used in a public services network.

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# Electronic emission notices

## Federal Communications Commission (FCC) statement

**Note:** 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 own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the 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 Class A emission compliance statement

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

## Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

## Australia and New Zealand Class A statement

**Attention:** This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

**Attention:** This is an EN 55022 Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Responsible manufacturer:

International Business Machines Corp.  
New Orchard Road  
Armonk, New York 10504  
914-499-1900

European Community contact

IBM Deutschland GmbH  
Technical Regulations, Department M372  
IBM-Allee 1, 71139 Ehningen, Germany  
Telephone: +497032152941  
Email: lugi@de.ibm.com

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## Germany Class A statement

Deutschsprachiger EU Hinweis:

### Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden: "Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

### Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

### Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:

International Business Machines Corp.  
New Orchard Road  
Armonk, New York 10504  
914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland GmbH  
Technical Regulations, Department M372  
IBM-Allee 1, 71139 Ehningen, Germany  
Telephone:+497032152941  
Email:lugi@de.ibm.com

### Generelle Informationen:

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

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## Japan VCCI Class A statement

この装置は、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。 VCCI-A

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case the user may be required to take corrective actions.

## Japan Electronics and Information Technology Industries Association (JEITA) statement

高調波ガイドライン適合品

Japanese Electronics and Information Technology Industries Association (JEITA)  
Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)

## Korea Communications Commission (KCC) statement

이 기기는 업무용(A급)으로 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

This is electromagneticwave compatibility equipment for business (TypeA). Sellers and users need to pay attention to it. This is for any areas other than home.

## Russia Electromagnetic Interference (EMI) Class A statement

ВНИМАНИЕ! Настоящее изделие относится к классу А. В жилых помещениях оно может создавать радиопомехи, для снижения которых необходимы дополнительные меры

## People's Republic of China Class A electronic emission statement

中华人民共和国“A类”警告声明

声明  
此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

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## Taiwan Class A compliance statement

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。









IBM Part Number: 47C9181