

## Flex System FC5022 2-port 16Gb FC Adapter Product Guide (withdrawn product)

The network architecture on the Flex System™ platform has been specifically designed to address network challenges, giving you a very scalable way to integrate, optimize and automate your data center. The Flex System FC5022 2-port 16Gb FC Adapter enables high-speed access for compute nodes to an external storage area network (SAN). This adapter is based on Brocade architecture, and offers end-to-end 16 Gb connectivity to SAN. It can auto-negotiate, and also work at 8 Gb and 4 Gb speeds. It has enhanced features like N\_Port trunking and N\_Port ID Virtualization (NPIV) as well as boot-from-the-SAN with automatic LUN discovery and end-to-end Server Application Optimization (SAO).

Figure 1 shows the Flex System FC5022 2-port 16Gb FC Adapter.



Figure 1. Flex System FC5022 2-port 16Gb FC Adapter

### Did you know?

The FC5022 adapter is designed to work best with the Flex System FC5022 16Gb SAN Scalable Switch and together, these deliver considerable value by simplifying the deployment of server and SAN resources, reducing infrastructure and operational costs, and maximizing server and SAN reliability, availability, and resiliency.

Even with an 8 Gb Fibre Channel SAN fabric, having 16 Gb adapters and switches in the Flex System means that you can eliminate any oversubscription from the SAN fabric to maximize application throughput. Having 16 Gb adapters and switches also offers future investment protection by enabling the density of virtual machines (VMs) to be increased on a compute node and by providing performance head room to support demanding solid-state drive storage technologies.

## Part number information

Table 1 shows the part number to order this card.

Table 1. Part number and feature code for ordering

Description	Part number	Feature code (x-config)
Flex System FC5022 2-port 16Gb FC Adapter	88Y6370	A1BP

The part number includes the following items:

- One Flex System FC5022 2-port 16Gb FC Adapter
- A documentation CD containing the adapter user's guide
- The *Important Notices* document

## Features

The Flex System FC5022 2-port 16Gb FC Adapter has the following features:

- 16 Gbps Fibre Channel
  - Utilize 16 Gbps bandwidth to eliminate internal oversubscription
  - Investment protection with the latest Fibre Channel technologies
  - Reduce the number of ISL external switch ports, optics, cables and power
- Over 500,000 IOPS per port -- maximizes transaction performance and density of VMs per compute node
- Achieves performance of 330,000 IOPS for email exchange and 205,000 IOPS for SQL Database
- Boot from SAN allows the automation SAN Boot LUN discovery to simplify boot from SAN and reduce image management complexity
- Brocade Server Application Optimization (SAO) provides Quality of Service (QoS) levels assignable to VM applications
- Direct I/O enables native (direct) I/O performance by allowing VMs to bypass the hypervisor and communicate directly with the adapter
- Brocade Network Advisor simplifies and unifies the management of Brocade adapter, SAN, and LAN resources through a single pane-of-glass
- LUN Masking, an Initiator-based LUN masking for storage traffic isolation
- N\_Port Id Virtualization (NPIV) allows multiple host initiator N\_Ports to share a single physical N\_Port, dramatically reducing SAN hardware requirements
- Target Rate Limiting (TRL) throttles data traffic when accessing slower speed storage targets to avoid back pressure problems
- Unified driver across all Brocade-based Lenovo adapter products with automated version synchronization capability
- RoHS-6 compliant

## Supported servers

The following table lists the Flex System compute nodes that support the FC5022 2-port 16Gb FC Adapter.

Table 2. Supported servers

Description	Part number	x220 (7906)	x222 (7916)	x240 (8737, E5-2600)	x240 (8737, E5-2600 v2)	x240 (7162)	x240 M5 (9532)	x440 (7917)	x440 (7167)	x280 / x480 / x880 X6 (7903)	x280 / x480 / x880 X6 (7196)
Flex System FC5022 2-port 16Gb FC Adapter	88Y6370	Y	N	Y	Y	N	Y	Y	N	Y	Y

See the ServerProven® website for the latest information about the expansion cards that are supported by each blade server type:

<http://www.lenovo.com/us/en/serverproven/flexsystem.shtml>

I/O adapter cards are installed in the slot in supported servers, such as the x240, as highlighted in the following figure.

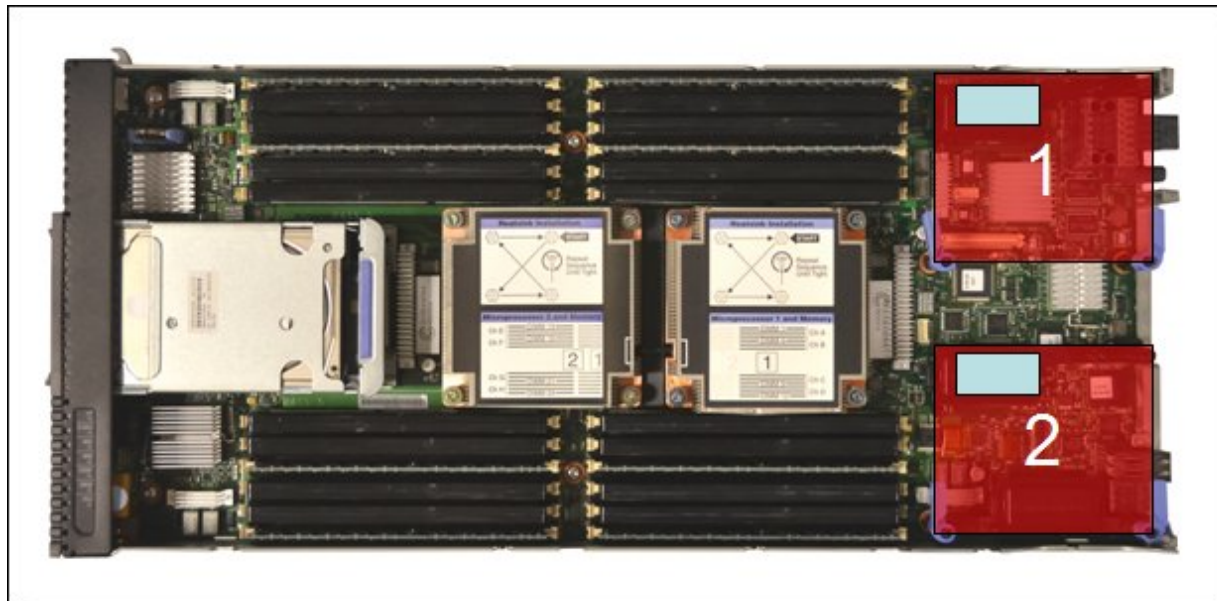


Figure 2. Location of the I/O adapter slots in the Flex System x240 Compute Node

## Supported I/O modules

The FC5022 2-port 16Gb FC Adapter supports the I/O modules listed in the following table. One or two compatible switches must be installed in the corresponding I/O bays in the chassis. Installing two switches means that both ports of the adapter are enabled.

Table 3. I/O modules supported with the FC5022 2-port 16Gb FC Adapter

Description	Part number	Support the FC5022 adapter
Flex System FC3171 8Gb SAN Switch	69Y1930	No
Flex System FC3171 8Gb SAN Pass-thru	69Y1934	No
Flex System FC5022 16Gb SAN Scalable Switch	88Y6374	Yes
Flex System FC5022 24-port 16Gb SAN Scalable Switch	00Y3324	Yes
Flex System FC5022 24-port 16Gb ESB SAN Scalable Switch	90Y9356	Yes

The following table shows the connections between adapters installed in the compute nodes and the switch bays in the chassis.

Table 4. Adapter to I/O bay correspondence

I/O adapter slot in the server	Port on the adapter	Corresponding I/O module bay in the chassis
Slot 1	Port 1	Module bay 1
	Port 2	Module bay 2
Slot 2	Port 1	Module bay 3
	Port 2	Module bay 4

The connections between the adapters installed in the compute nodes and the switch bays in the chassis are shown diagrammatically in the following figure.

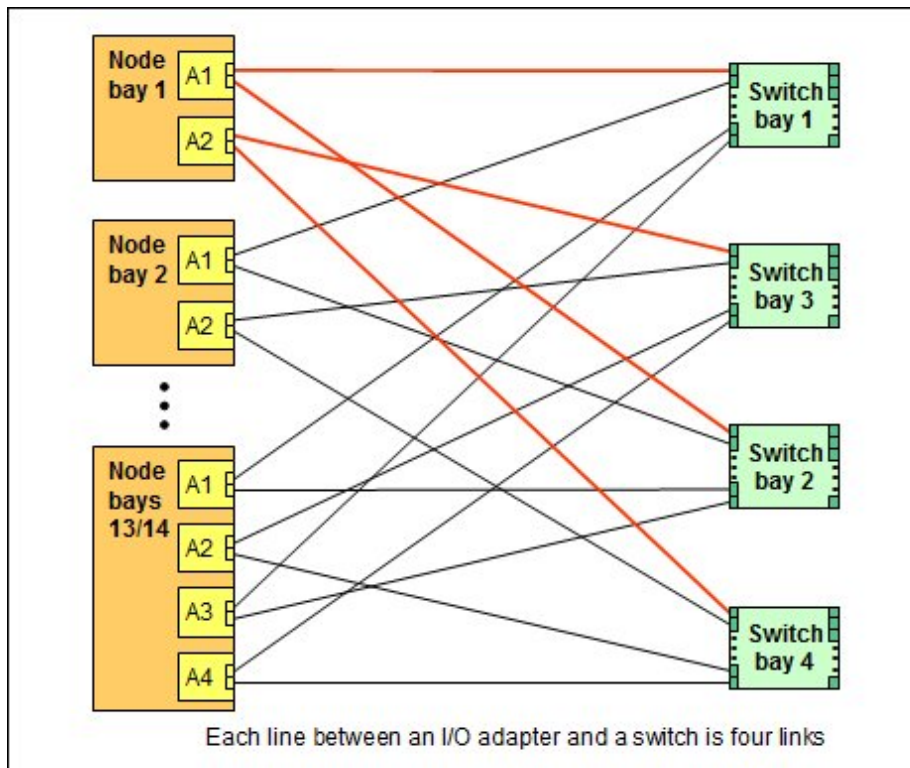


Figure 3. Logical layout of the interconnects between I/O adapters and I/O modules

## Supported operating systems

The FC5022 2-port 16Gb FC Adapter supports the following 64-bit operating systems:

- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Red Hat Enterprise Linux 5 Server with Xen x64 Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- Red Hat Enterprise Linux 6 Server x64 Edition
- Red Hat Enterprise Linux 7
- SUSE LINUX Enterprise Server 10 for AMD64/EM64T
- SUSE LINUX Enterprise Server 10 with Xen for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- VMware ESX 4.1
- VMware ESXi 4.1
- VMware vSphere 5.0 (ESXi)
- VMware vSphere 5.1 (ESXi)
- VMware vSphere 5.5 (ESXi)

See the OS Interoperability Guide for the latest information about the specific versions and service packs that are supported: <http://lenovopress.com/osig>

## Regulatory compliance

The adapter conforms to the following standards:

- United States FCC 47 CFR Part 15, Subpart B, ANSI C63.4 (2003), Class A
- United States UL 60950-1, Second Edition
- IEC/EN 60950-1, Second Edition
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1-03
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22:2006, Class A
- IEC 60950-1(CB Certificate and CB Test Report)
- Taiwan BSMI CNS13438, Class A
- Korea KN22, Class A; KN24
- Russia/GOST ME01, IEC-60950-1, GOST R 51318.22-99, GOST R 51318.24-99, GOST R 51317.3.2-2006, GOST R 51317.3.3-99
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A

## Physical specifications

The dimensions and weight of the adapter are as follows:

- Width: 100 mm (3.9 in.)
- Depth: 80 mm (3.1 in.)
- Weight: 13 g (0.3 lb)

Shipping dimensions and weight (approximate):

- Height: 58 mm (2.3 in.)
- Width: 229 mm (9.0 in.)
- Depth: 208 mm (8.2 in.)
- Weight: 0.4 kg (0.89 lb)

## Popular configurations

The FC5022 2-port 16Gb FC Adapter can be used in various configurations. The following figure shows the I/O installed in an I/O adapter slot 2 of the x240, which in turn is installed in the chassis. The chassis is connected to an IBM V7000. The RAID functionality is provided by the external storage system.

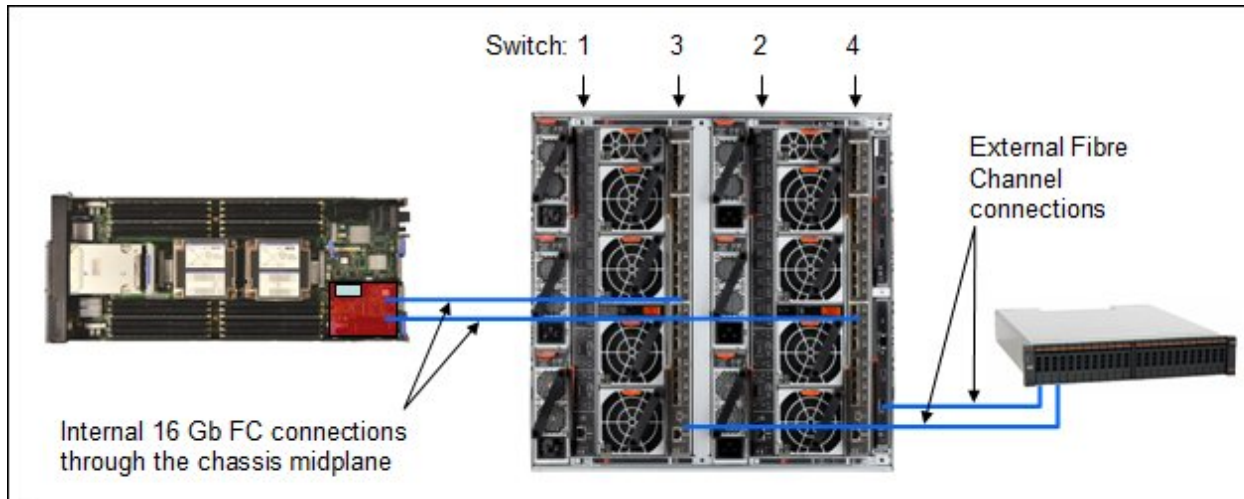


Figure 4. Example configuration

The following table lists the parts that are used in the configuration.

Table 5. Components used when connecting the FC5022 2-port 16Gb FC Adapter to external disk storage

Part number/machine type	Description	Quantity
8737	Flex System x240 Compute Node or other supported server	1 to 14
88Y6370	FC5022 2-port 16Gb FC Adapter	1 per server
8721-A1x	Flex System Enterprise Chassis	1
90Y9356	Flex System FC5022 24-port 16Gb ESB SAN Scalable Switch	1 or 2
88Y6393	Brocade 16Gb SFP+ Optical Transceiver	1 per FC cable
39M5698	1m LC-LC Fiber Channel Cable	1 for each V7000 connection
2076-124	System Storage V7000	1

This configuration also requires additional V7000 features, such as drives and software licenses. These are not listed in the table.

## Related publications

For more information, see the following resources:

- Flex System Information Center (User's Guides for servers and options)  
<http://publib.boulder.ibm.com/infocenter/flexsys/information>
- *Flex System Interoperability Guide*  
<http://lenovopress.com/fsig>
- *Flex System Products and Technology by Lenovo*, SG24-8255  
<http://lenovopress.com/sg248255>
- System x and Cluster Solutions configurator (x-config)  
<https://lsc.lenovo.com/products/hardware/configurator/worldwide/bhui/asit/>
- ServerProven for Flex System  
<http://www.lenovo.com/us/en/serverproven/flexsystem.shtml>

## Related product families

Product families related to this document are the following:

- [Blade Storage Adapters](#)



## Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.  
1009 Think Place - Building One  
Morrisville, NC 27560  
U.S.A.  
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

© Copyright Lenovo 2021. All rights reserved.

This document, TIPS0891, was created or updated on June 26, 2015.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:  
<http://lenovopress.com/TIPS0891>
- Send your comments in an e-mail to:  
[comments@lenovopress.com](mailto:comments@lenovopress.com)

This document is available online at <http://lenovopress.com/TIPS0891>.

## Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at <https://www.lenovo.com/us/en/legal/copytrade/>.

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®

Flex System

ServerProven®

System x®

The following terms are trademarks of other companies:

Linux® is the trademark of Linus Torvalds in the U.S. and other countries.

Microsoft®, Windows Server®, and Windows® are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.