

## Fibre Channel Analysis – i5/iSeries

Fibre Channel is a scalable, high-performance interconnect standard that enables fast transfer of data between workstations, shared storage, peripherals and host systems. At up to speeds of 2 Gigabits per second this data transfer technology combines the attributes of a data channel with the attributes of a network. Fibre Channel is capable of supporting multiple protocols and a variety of topologies, making it the most versatile data transfer technology available. Fibre Channel combines storage I/O channels with networking to create a high-bandwidth networking technology suited for today's expanding data needs.

This StorFacts™ Report analyzes current i5/iSeries Fibre Channel adapters. Features discussed include the following:

1. Tape/Disk Adapter - FC0646
2. Tape Adapter – FC2765, FC5704, FC5761
3. Disk Adapter – FC2766, FC2787, FC5760



For more information – <http://www.gstinc.com/store/Fibre-C439.aspx>



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## Fibre Overview

The information explosion and the need for high-performance communications for server-to-storage and server-to-server networking have been the focus of much attention for this new millennium. Performance improvements in storage, processors, and workstations, along with the move to distributed architectures such as client/server, have spawned increasingly data-intensive and high-speed networking applications. The interconnect between these systems and their input/output devices demands a new level of performance in reliability, speed, and distance. Fibre Channel, a highly-reliable, one and two gigabit interconnect technology (the fastest interface on this planet) allows concurrent communications among workstations, mainframes, servers, data storage systems, and other peripherals using SCSI, IP and a wide range of other protocols to meet the needs of the data center.

### Why Fibre Channel?

Fibre Channel is the solution for IT professionals who need reliable, cost-effective information storage and delivery at blazing speeds. With development started in 1988 and ANSI standard approval in 1994, Fibre Channel is the mature, safe solution for one and two gigabit communications.

Today's data explosion presents unprecedented challenges incorporating a wide range of application requirements such as database and file management, transaction processing, data warehousing, imaging, integrated audio/video, networked storage, real-time computing, collaborative projects and CAD/CAE. Fibre Channel is simply the easiest, most reliable solution for information storage and retrieval.

Fibre Channel, a powerful ANSI standard, economically and practically meets the challenge with these advantages:

- Price Performance Leadership - Fibre Channel delivers cost-effective solutions for storage and networks delivering attractive return on investment (ROI).
- Solutions Leadership - Fibre Channel is the defacto standard for implementing Storage Area Networks (SANs) and provides versatile connectivity with scalable performance.
- Reliable - Fibre Channel, a most reliable form of communications, provides a variety of quality of service choices and sustains an enterprise with assured information delivery.



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## Why Fibre Channel....

- Gigabit Bandwidth Now – Both 1 and 2 gigabit solutions are in place today! Solutions are backward compatible and offer customers the highest bandwidth network interface technology in the industry.
- Multiple Topologies - Dedicated point-to-point, shared loops, and scaled switched topologies meet application requirements. This offers the customer the ability to develop a storage network with configuration choices at a range of price points, levels of scalability, and availability.
- Multiple Protocols - Fibre Channel delivers data. SCSI, IP, VI, ESCON and other storage and networking protocols to meet the customer needs for storage connectivity, cluster computing and network interconnect.
- Scalable - From single point-to-point gigabit links to integrated enterprises with hundreds of servers, Fibre Channel delivers unmatched performance and configuration flexibility.
- Congestion Free - Fibre Channel's credit-based flow control delivers data as fast as the destination buffer is able to receive it in order to meet high throughput data transfers. This facilitates applications like backup, restore, remote replication and other business continuance enabling capabilities.
- High Efficiency - Real price performance is directly correlated to the efficiency of the technology. Fibre Channel has very little transmission overhead. Most important, the Fibre Channel protocol is specifically designed for highly efficient operation using hardware accelerated implementations.

Information management is a key competitive factor for organizations, and Fibre Channel enhances IT departments' ability to access and protect it more efficiently.

- High-performance storage consolidation
- Centralized management of server and storage assets
- Large data bases, data warehouses, and data marts
- Storage backup systems and recovery with LAN-free and Serverless techniques
- SAN implementations with robust storage management virtualization, hierarchical storage management (HSM), and storage resource management
- Network Attached Storage (NAS) and Storage Area Networking (SAN) integration
- High-performance workgroups, data centers, and remote network implementations
- Campus backbones and wide area network deployments
- Edge networks for data replication and scalable



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**0646**

**Direct Attach-5716**

#0646 is ordered when the function of a FC5716 is required but this card will be controlled by a Linux or AIX operating system.

Cards controlled by a Linux or AIX operating system do not use/require PCI IOPs.

Direct attach cards are only supported in Linux or AIX LPAR partitions.

- Attributes provided: Fibre Channel device attachment
- Attributes required: PCI slot and #0140 and (#0142 or #0145)

**2765**

**PCI Fibre Channel Tape Ctrl**

#2765 provides Fibre Channel attachment capability for external tape devices. The #2765 supports point-to-point, arbitrated loop, and Switch Fabric topologies. Each #2765 is shipped with a wrap connector (PN#05N6767).

#0371 - LC-SC Adapter Kit (50um) can be ordered, both on initial and field upgrades. This optional kit is used to attach SC-type fibre (50 micron) cables to a #2765. This kit contains a 2m LC-ST cable and ST-SC adapter for 50 micron fiber.

#0372 - LC-SC Adapter Kit (62.5um) can be ordered, both on initial and field upgrades. This optional kit is used to attach SC-type fibre (62.5 micron) cables to a #2765. This kit contains a 2m LC-ST cable and ST-SC adapter for 62.5 micron fiber.

An optics cleaning kit and instruction sheet are included when a #2765/#2766 is ordered. Customers must supply all Fibre Channel cables for this controller.

**2766**

**PCI Fibre Channel Disk Ctrl**

#2766 provides Fibre Channel attachment capability for external disk devices. The #2766 supports point-to-point, arbitrated loop, and Switch Fabric topologies. Each FC2766 is shipped with a wrap connector (PN#05N6767).

**2787**

**PCI-X Fibre Chan Disk Ctr**

Provides Fibre Channel attachment for external disk devices. #2787 supports point-to-point and arbitrated loop topologies and has an LC type cable connector. Each #2787 is shipped with a wrap connector (P/N 05N6767). This feature supports 64bit, 133MHz PCI-X bus speeds. #0626 is a Linux direct attach version of this adapter.

One of the following adapter kits is required when connecting SC type cables to the #2787:

- #0371 -- LC-SC Adapter Kit (50um) can be ordered, both on initial, model upgrades, and simple MES orders. This optional kit is used to attach SC-type 50 micron fiber cables to a #2787. This kit contains a 2m LC-ST cable and ST-SC adapter for 50 micron fibre cables.
- #0372 - LC-SC Adapter Kit (62.5um) can be ordered, both on initial, model upgrades, and simple MES orders. This optional kit is used to attach SC-type 62.5 micron fiber cables to a #2787. This kit contains a 2m LC-ST cable and ST-SC adapter for 62.5 micron fibre cables.

An optics cleaning kit and instruction sheet is shipped with the #2787. The customer must supply all Fibre Channel cables for this controller.

- Attributes provided: Fiber attachment of external DASD
- Attributes required: One PCI slot



**5704**

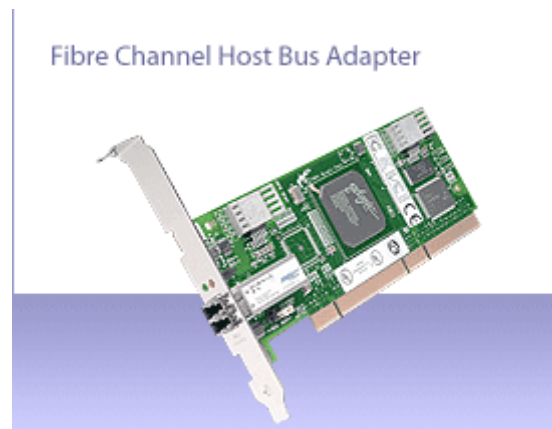
**PCI-X Fibre Chan Tape Ctrlr**

Provides Fibre Channel attachment for external tape devices. #5704 supports point-to-point and arbitrated loop topologies and has an LC-type cable connector. Each #5704 is shipped with a wrap connector (P/N 05N6767).

The following adapter kits are required when connecting SC type cables to the #5704:

- #0371 -- LC-SC Adapter Kit (50um) can be ordered, both on initial, model upgrades, and simple MES orders. This optional kit is used to attach SC-type 50 micron fiber cables to a #5704. This kit contains a 2m LC-ST cable and ST-SC adapter for 50 micron fiber cables.
- #0372 -- LC-SC Adapter Kit (62.5um) can be ordered, both on initial, model upgrades, and simple MES orders. This optional kit is used to attach SC-type 62.5 micron fiber cables to a #5704. This kit contains a 2m LC-ST cable and ST-SC adapter for 62.5 micron fiber cables.

An optics cleaning kit (P/N 46G6844) and instruction sheet (P/N 21P6238, SY27-2604) is shipped with the #5704. The customer supplies all Fibre Channel cables for this controller.





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**5760**

**PCI-X Fibre Chan Disk Ctrl**

Provides a 4Gbps Single Port Fibre Channel PCI-X 2.0 Adapter which attaches external DASD devices. #5760 is a 64-bit address/data, short form factor PCI-X adapter with an LC type external fiber connector that provides single initiator capability over an optical fiber link or loop. With the use of appropriate optical fiber cabling, this adapter provides the capability for a network of high-speed local and remote located storage.

The #5760 will auto-negotiate for the highest data rate between adapter and an attaching device at 1Gbps, 2Gbps or 4Gbps of which the device or switch is capable. Distances of up to 500 meters running at 1Gbps data rate and up to 300 meters running at 2Gbps data rate and 4Gbps data rate up to 150 meters are supported between the adapter and an attaching device or switch. When used with IBM supported Fibre Channel storage switches supporting long-wave optics, distances of up to 10 kilometers are capable running at either 1Gbps or 2Gbps or 4Gbps data rates.

The #5760 can be used to attach devices either directly, or by means of Fibre Channel Switches. If attaching a device or switch with a SC type fiber connector, use of a #0371 LC-SC Adapter Kit (50um) or a #0372 LC-SC Adapter Kit (62.5um) is required.

The #5760 requires a PCI IOP.

Refer to the following IBM storage subsystem Web page for additional supported server attachment information for IBM devices.

[http://www.ibm.com/servers/storage/product/products\\_iseriess.html](http://www.ibm.com/servers/storage/product/products_iseriess.html)

Consult with your IBM representative or Business Partner for additional information relative to any third party attachment.

- Attributes provided: One Port Fibre Channel Adapter which attaches External DASD
- Attributes required: One empty PCI-X 1.0 / 2.0 slot and a PCI IOP



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**5761**

**PCI-X Fibre Chan Tape Ctlr**

Provides a 4Gbps Single Port Fibre Channel PCI-X 2.0 Adapter which attaches external tape devices. #5761 is a 64-bit address/data, short form factor PCI-X adapter with an LC type external fiber connector that provides single initiator capability over an optical fiber link or loop. With the use of appropriate optical fiber cabling, this adapter provides the capability for a network of high-speed local and remote located storage.

The #5761 will auto-negotiate for the highest data rate between adapter and an attaching device at 1Gbps, 2Gbps or 4Gbps of which the device or switch is capable. Distances of up to 500 meters running at 1Gbps data rate and up to 300 meters running at 2Gbps data rate and 4Gbps data rate up to 150 meters are supported between the adapter and an attaching device or switch. When used with IBM supported Fibre Channel storage switches supporting long-wave optics, distances of up to 10 kilometers are capable running at either 1Gbps or 2Gbps or 4Gbps data rates.

The #5761 can be used to attach devices either directly, or by means of Fibre Channel Switches. If attaching a device or switch with a SC type fiber connector, use of a #0371 LC-SC Adapter Kit (50um) or a #0372 LC-SC Adapter Kit (62.5um) is required.

Features #5761 and #5758 are physically the same card, but have different feature numbers that denote to IBM configurator tools whether or not an IOP is required.

Refer to the following IBM storage subsystem Web page for additional supported server attachment information for IBM devices.

[http://www.ibm.com/servers/storage/product/products\\_iseriess.html](http://www.ibm.com/servers/storage/product/products_iseriess.html)

Consult with your IBM representative or Business Partner for additional information relative to any third party attachment.

- Attributes provided: One Port Fibre Channel Adapter which attaches External Tape Devices
- Attributes required: One empty PCI-X 1.0 / 2.0 slot and a PCI IOP