

Cisco MDS 9000 Mainframe Package for the Cisco MDS 9710 Multilayer Director

Product Overview

The Cisco® MDS 9000 Mainframe Package for the Cisco MDS 9710 Multilayer Director enables the use of Cisco's new flagship Fibre Channel product in IBM System z data centers. The Cisco MDS 9710 brings a new level of reliability and resilience to the data center while at the same time providing access to the higher speeds needed for tomorrow's applications. By combining the features of the new Cisco MDS 9710 with Cisco's robust FICON feature set, the package provides a best-in-class solution for the IBM System z data center.

Cisco MDS 9710 Features

The Cisco MDS 9710 provides the following hardware and software features:

- **Industry highest performance:** With up to 384 line-rate 16-Gbps FICON and Fibre Channel ports, the Cisco MDS 9710 has the raw bandwidth to handle the highest performance requirements for your data center. The Cisco MDS 9710 continues the heritage of the Cisco MDS 9500 Series Multilayer Directors by using an arbitrated cross-bar switch architecture that helps ensure the consistent and predictably fast switching times essential for the I/O requirements of the IBM System z. All ports support 4/8/16-Gbps, 2/4/8-Gbps, or 10-Gbps connections in either long-wave or short-wave mode depending on the optics used.
- **Ultra-high availability:** The Cisco MDS 9710 provides outstanding availability and reliability. The Cisco MDS 9710 is the industry's first director-class switch to enable redundancy on all major components, including the fabric card. It provides grid redundancy on the power supply and 1+1 redundant supervisors. Users can add fabric cards to enable N+1 or even N+N fabric redundancy. The Cisco MDS 9710 combines nondisruptive software upgrades, stateful process restart and failover, and full redundancy of all major components for best-in-class availability.
- **Investment protection:** The Cisco MDS 9500 Series of FICON and Fibre Channel directors has been supported for more than 10 years throughout an evolution in speed, technology, and feature enhancements, consistently providing broad compatibility with older hardware generations. The Cisco MDS 9710 is defining a new baseline for the next generation of FICON, Fibre Channel, and Fibre Channel over Ethernet (FCoE) solutions. With this in mind, the initial fabric cards provide twice the bandwidth needed for the 48-port 16-Gbps line card. Today, this capability allows increased fault tolerance for fabric failures, and it also facilitates transparent evolution to faster technologies as they become available. Similarly, the power subsystem today not only provides grid-level protection but also incorporates sufficient power for future enhancements.

- **Robust management:** In addition to the IBM FICON Control Unit Port (CUP) management capabilities specific to IBM System z built into the product (discussed later in this document), the Cisco MDS 9710 has a robust combination of Cisco Data Center Network Manager (DCNM) SAN and Cisco Device Manager available for FICON management. Cisco DCNM SAN provides fabric-level views and control of the FICON fabric along with time-saving wizards to simplify configuration. Cisco Device Manager provides a highly FICON-centric view for each switch individually, greatly simplifying the configuration and daily management of the FICON infrastructure.
- **Switch cascading:** Switch cascading supports a topology for FICON devices wherein ISLs can be used between a host and an I/O device. Thus, switch cascading facilitates creation of mainframe storage networks consisting of multiple switches.

Cisco MDS 9000 Mainframe Package Features

The Cisco MDS 9000 Mainframe Package on the Cisco MDS 9710 provides the following features:

- **Virtual SANs (VSANs):** Like logical partitions (LPARs) on IBM System z, VSANs provide hardware-based partitioning of a single physical infrastructure into multiple logical SANs. VSANs provide isolation of traffic, segregation of management, and management of fault domains. VSANs can be used to separate production environments from test or development environments, FICON from Fibre Channel Protocol (FCP) applications, or even disk storage from tape storage. This separation can be achieved without compromising scalability, availability, manageability, and network security. Cisco FICON directors support up to eight FICON VSANs, each with its own CUP device.
- **Dynamic port number assignment:** All FICON port numbers are virtualized in the Cisco MDS 9710, allowing any port address to be allocated on any port within the FICON VSAN using the full defined range of 0x00-0xFD. When multiple FICON VSANs are used for workload segregation, ports for each VSAN can be allocated on a per-port basis with no restrictions regarding line-card allocation or use of duplicate port numbers.
- **FICON CUP:** Implementation of the FICON control device (CUP) in the Cisco MDS 9710 enables in-band management of the director from IBM System z servers. The CUP device also provides IBM Resource Management Facility (RMF) Type 74 Subtype 7 records to IBM System z, thus allowing host performance management software (such as IBM RMF) to create FICON director activity reports in time synchronization with the rest of the system reports. The FICON VSAN also allocates special logical FICON port numbers for Fibre Channel over IP (FCIP) links and PortChannels so that performance of these special link types can be tracked at the IBM System z level.
- **FICON cascaded directors:** Director cascading supports a topology for FICON devices in which Inter-Switch Links (ISLs) can be used between IBM System z and I/O devices. Cisco's fabric binding feature, which is required for cascaded FICON, allows only preauthorized directors to participate in the FICON fabric, thus helping ensure high integrity for Cisco FICON fabrics. Although more complex FICON topologies will technically work, IBM supports only single-ISL configurations except in certain specific channel extension applications. For more information about the topologies that IBM System z supports, see the IBM Qualification Letters at <http://www.cisco.com/go/ficon>. The Cisco MDS 9710 is fully interoperable with dense wavelength-division multiplexing (DWDM) solutions in addition to offering 8- and 10-Gbps extended-reach optics to facilitate metropolitan-area applications.

- **Enhanced ISL aggregation:** The Cisco MDS 9710, as well as all earlier FICON-capable directors, allows exploitation of the no-cost PortChannel feature. PortChannels are virtual interfaces that consist of multiple physical ISLs. PortChannels have two valuable attributes:
 - The member links can span any available ports on the installed line cards, with no port group or application-specific integrated circuit (ASIC) limitations.
 - The length of the member links of a PortChannel can be of different.

Given these two attributes, PortChannels are an excellent mechanism for interconnecting metropolitan-area data centers with disparate-length site-to-site links. This flexibility also provides high availability by reducing the size of failure domains.

- **Lossless in-order delivery:** When you use PortChannels for cascaded FICON VSANs, member links of the PortChannel can be nondisruptively disabled or enabled. In fact, new links can even be added to or removed from an active PortChannel without IBM System z experiencing a single error.

Software Release

The Cisco MDS 9000 Mainframe Package for the Cisco MDS 9710 was first supported in Cisco NX-OS Software Release 6.2(5a).

License Information

The Cisco MDS 9000 Mainframe Package is licensed per director for all the ports in the director. For cascaded FICON environments, all directors in the FICON VSAN must have a mainframe package.

Ordering Information

Table 1 provides ordering information for the Cisco MDS 9000 Mainframe Package for the Cisco MDS 9710.

Table 1. Ordering Information

Part Number	Description
M97FIC1K9	MDS 9700 Mainframe Package License for one MDS 9700 switch
M97FIC1K9=	MDS 9700 Mainframe Package License for one MDS 9700 switch Spare
L-M97FIC1K9=	E-Delivery MDS 9700 Mainframe Package License for one MDS 9700 switch Spare

For More Information

For more information about the Cisco MDS 9700, visit <http://www.cisco.com/go/storage> or contact your local account representative.

For more information about Cisco MDS FICON solutions, visit <http://www.cisco.com/go/ficon>.




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