



Global Distributed Storage Engineering
Citigroup Architecture & Technology Engineering

Cisco MDS FCIP v1.0

GDSE-07015-PS

Project Scope

1.0

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1. Version Control

Version	Date	Author	Reviewed	Comments
0.1	2-April-07	Scott Torgerson	Parul Jain, Kevin Hobaugh, Jason Maker - Cisco	Peer Review
0.5	2- April-07	Scott Torgerson	Global Stakeholders	RFC
1.0	9-July-07	Scott Torgerson	Global Stakeholders	Production Release

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3. Contact

Please address any comments or questions regarding the information contained in this document via email to the “*GT Global Distributed Storage Engineering” distribution list or alternatively to gdse@citigroup.com.

4. Latest Versions

It is recommended that the latest version of the document be used from the GDSE website <http://engineering.ti.citigroup.net/gdse>. Newer versions may include certification on additional platforms, or comments on issues discovered after deployment.

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6. Introduction

The Cisco MDS 9000's with the Multi-protocol Service Modules (MPSM) provides Citigroup the ability to extend SAN traffic to virtually any distance and any number of sites across the existing Citigroup IP infrastructure. The Cisco MDS 9000 Multi-protocol Services Modules extend the reach of Fibre Channel SANs by using Fibre Channel over IP (FCIP). This provides new opportunities for Citigroup to implement secure enterprise-wide SAN strategies that are stable, interoperable, and scalable.

For phase I of this project the 14/2 Multi-protocol Services Module will be certified for all Citigroup approved Cisco MDS 9000 directors and switches. The 14/2 MPSM provides the following functionality.

- Gigabit Ethernet line-rate performance for FCIP
- Full support of value added MDS 9000 Fibre Channel features such as Virtual SANs (VSAN), Inter VSAN routing, port bindings, High availability Port Channeling and VSAN Trunking TE_Port functionality.
- Write Acceleration to improve synchronous and asynchronous disk write (data replication) performance over long distances.
- Tape Acceleration to improve tape read/write performance over long distances.

Using Cisco FCIP Citigroup can connect local SANs to remote SANs in other locations across any geographical distance. Once connected the following project types could possibly take advantage of Cisco MDS FCIP.

- Asynchronous Data Replication (SRDF/A)
- Host initiator to remote pooled storage (Data Migrations)
- Remote Tape Vaulting

7. Project Scope

This project will occur in (3) phases with this being phase I. The 3 phases are based on product releases and will occur with the following hardware releases from Cisco Corporation.

- Phase I – Certification of the 14/2 MPSM.
- Phase II – Additional certification of the new 18/4 MPSM.
- Phase III – Additional certification of the Cisco MDS 9222i switch.

For this phase of the project the following items will be in scope. These items will be tested, certified, and have a documented configuration delivered.

- 14/2 Multi-Protocol Service Module for Citigroup certified MDS 9000 products.
- Hardware based compression and encryption.
- FCIP TCP Optimization.
- Inter VSAN Routing
- Port Channels
- Write Acceleration
- Port Tracking
- Jumbo Frames¹

For further details on the phased implementation of this project refer to the [Project Road Map](#) section of this document.

¹ Currently Jumbo Frames are not supported on Citigroup Networks. An attempt will be made to get them supported by Citigroup Global Network Engineering on any dedicated FCIP networks.

7.1 Cisco MDS FCIP SAN WAN Extensions Project Road Map

Implementation Schedule by feature functionality	N (This Project) Phase I	N+1 Phase II	N+2 Phase III
GDSE version	1.0	2.0	3.0
GDSE Project ETA	Q2 2007	Q4 2007	Q1 2008
SAN OS version	3.1.2	3.2.X	4.X or TBD
Fabric Manager Version	3.1.2	3.2.X	4.X or TBD
Device Manager Version	3.1.2	3.2.X	4.X or TBD
Performance Manager	3.1.2	3.2.X	4.X or TBD
Hardware Functionality			
Compression & Encryption	✓	✓	✓
14/2 MPSM	✓	✓	✓
18/4 MPSM ²		✓	✓
MDS 9222i			✓
Security			
ICQ Process ³	N/A	N/A	✓
Standard Build	N/A	N/A	✓
Software Functionality			
FCIP TCP/IP Optimization ⁴	✓	✓	✓
Inter VSAN Routing ⁵	✓	✓	✓
TE Ports/E-Port Trunking	✓	✓	✓
Write Acceleration	✓	✓	✓
Port Tracking	✓	✓	✓
FCIP QOS	✓	✓	✓
Jumbo Frames	TBD	TBD	TBD
Interoperability with McData Fabrics.		✓	✓
Tape Read/Write Acceleration		TBD	TBD

² The Cisco 18/4 MPSM and MDS 9222i products have not been released at this time. These products will be certified in future phases of this project.

³ Since the MPSM cards are components of the Cisco MDS and the 9222i is an MDS, the components of this project will not go through the ICQ or standard build process. Instead it will be covered by the Cisco MDS FC Switch ICQ and Standard Build.

⁴ TCP/IP Optimization will include best practices for tuning the Rate Limiting, RTT, Jumbo frames, and SACK parameters.

⁵ Inter VSAN Routing will be required when connecting two fabrics that have any duplicate domain IDs. A best practice will be determined on if Inter VSAN Routing will be used when connecting fabrics without duplicate domain IDs.

8. Project Classification

This project is classified as “a2: Recertify” under the WTS Project Management System. The project ID associated with this project is **WE #4906**.

9. Project Deliverables

This project will result in the creation and of the following documents:

- **GDSE-07015-PS** – Cisco MDS FCIP SAN WAN Extensions v1.0 Project Scope (***This Document***)
- **GDSE-07015-SG** – Cisco MDS FCIP SAN WAN Extensions v1.0 Solutions Guide
- **GDSE-07015-RN** – Cisco MDS FCIP SAN Extensions v1.0 Release Notes
- **Cisco Product Matrix** – Update or create this on the GDSE website

10. Project Prerequisites

A test environment will need to be created that can be used to test basic functionality of the Cisco MDS FCIP 14/2 Multi Protocol Services Modules (MPSM). Basic functionality tests will include tests such as configuration, basic operations, and path failures. A more complex test environment will be needed to load test the 14/2 MPSM. The environment used for testing load should include a real network between the FCIP connections. In order to test load Citigroup may need to make use of the Cisco Lab Environments in North Carolina.

The following test equipment will need to be borrowed, procured, or provided by Cisco Corporation in order for Citigroup to perform functional testing in the SAN Lab.

- 14/2 Multi-Protocol Services Module
- 18/4 Multi-Protocol Services Module (Project Phase II)
- Cisco MDS 92222i (Project Phase III)