



Cisco Qualification NX-OS 4.2(1b) with VSM & Sun StorageTek configurations

Version 1.0

**FICON Systems
Implementations**

**Sun Mainframe Customer
Emulation Test (MCET) lab**



Copyright © 2009 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, U.S.A. All rights reserved.

Sun Microsystems, Inc. has intellectual property rights relating to technology embodied in the product that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the U.S. patents listed at <http://www.sun.com/patents> and one or more additional patents or pending patent applications in the U.S. and in other countries.

THIS PRODUCT CONTAINS CONFIDENTIAL INFORMATION AND TRADE SECRETS OF SUN MICROSYSTEMS, INC. USE, DISCLOSURE OR REPRODUCTION IS PROHIBITED WITHOUT THE PRIOR EXPRESS WRITTEN PERMISSION OF SUN MICROSYSTEMS, INC.

Use is subject to license terms. This distribution may include materials developed by third parties. This distribution may include materials developed by third parties. Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California.

UNIX is a registered trademark in the U.S. and in other countries, exclusively licensed through X/Open Company, Ladson, Sun Microsystems, the Sun logo; Solaris, Sun StorageTek Crypto Key Management Station, StorageTek and StorageTek are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and other countries.

Products covered by and information contained in this service manual are controlled by U.S. Export Control laws and may be subject to the export or import laws in other countries. Nuclear, missile, chemical biological weapons or nuclear maritime end uses or end users, whether direct or indirect, are strictly prohibited. Export or re-export to countries subject to U.S. embargo or to entities identified on U.S. export exclusion lists, including, but not limited to, the denied persons and specially designated nationals lists is strictly prohibited. Use of any spare or replacement CPUs is limited to repair or one-for-one replacement of CPUs in products exported in compliance with U.S. export laws. Use of CPUs as product upgrades unless authorized by the U.S. Government is strictly prohibited.

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

Copyright © 2009 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, Etats-Unis. Tous droits réservés.

Sun Microsystems, Inc. détient les droits de propriété intellectuels relatifs à la technologie incorporée dans le produit qui est décrit dans ce document. En particulier, et ce sans limitation, ces droits de propriété intellectuelle peuvent inclure un ou plus des brevets américains listés à l'adresse <http://www.sun.com/patents> et un ou les brevets supplémentaires ou les applications de brevet en attente aux Etats - Unis et dans les autres pays.

CE PRODUIT CONTIENT DES INFORMATIONS CONFIDENTIELLES ET DES SECRETS COMMERCIAUX DE SUN MICROSYSTEMS, INC. SON UTILISATION, SA DIVULGATION ET SA REPRODUCTION SONT INTERDITES SANS L' AUTORISATION EXPRESSE, ECRITE ET PREALABLE DE SUN MICROSYSTEMS, INC.

L'utilisation est soumise aux termes de la Licence. Cette distribution peut comprendre des composants développés par des tierces parties. Cette distribution peut comprendre des composants développés par des tierces parties. Des parties de ce produit pourront être dérivées des systèmes Berkeley BSD licenciés par l'Université de Californie.

UNIX est une marque déposée aux Etats-Unis et dans d'autres pays et licenciée exclusivement par X/Open Company, Ltd. Sun, Sun Microsystems, le logo Sun, Solaris, Sun StorageTek Crypto Key Management Station, StorageTek et StorageTek sont des marques de fabrique ou des marques déposées de Sun Microsystems, Inc. aux Etats-Unis et dans d'autres pays.

Ce produit est soumis à la législation américaine en matière de contrôle des exportations et peut être soumis à la réglementation en vigueur dans d'autres pays dans le domaine des exportations et importations. Les utilisations, ou utilisateurs finaux, pour des armes nucléaires, des missiles, des armes biologiques et chimiques ou du nucléaire maritime, directement ou indirectement, sont strictement interdites. Les exportations ou reexportations vers les pays sous embargo américain, ou vers des entités figurant sur les listes d'exclusion d'exportation américaines, y compris, mais de manière non exhaustive, la liste de personnes qui font objet d'un ordre de ne pas participer, d'une façon directe ou indirecte, aux exportations des produits ou des services qui sont régis par la législation américaine en matière de contrôle des exportations et la liste de ressortissants spécifiquement désignés, sont rigoureusement interdites. L'utilisation de pièces détachées ou d'unités centrales de remplacement est limitée aux réparations ou à l'échange standard d'unités centrales pour les produits exportés, conformément à la législation américaine en matière d'exportation. Sauf autorisation par les autorités des Etats-Unis, l'utilisation d'unités centrales pour procéder à des mises à jour de produits est rigoureusement interdite.

LA DOCUMENTATION EST FOURNIE "EN L'ETAT" ET TOUTES AUTRES CONDITIONS, DECLARATIONS ET GARANTIES EXPRESSES OU TACITES SONT FORMELLEMENT EXCLUES, DANS LA MESURE AUTORISEE PAR LA LOI APPLICABLE, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE A LA QUALITE MARCHANDE, A L'APTITUDE A UNE UTILISATION PARTICULIERE OU A L'ABSENCE DE CONTREFACON.

Contents	Contents
.....	3
Change History	4
Audience	4
Related Publications	4
Introduction	5
Overview	5
Product and Software	5
Configurations Tested	6
Test process and results	7
Error Injection Testing	7
Limitations	7
Status	8
Definitions	8
Issues opened	8
Qualification date	8

Change History

Document Description	
Document owner	Dennis Frederickson Sun Microsystems Inc. Malcolm MacAskill Sun Microsystems Inc. Mike Blair Cisco Systems Inc.

Revision	Date	Description
V1.0		Initial draft
V2.0	12/07/2009	Final

Audience

This documentation is intended for Sun and Cisco personnel and partners who are interested in learning more about the Sun Storage VSM FICON solutions with Cisco products.

Related Publications

Introduction

The purpose of this document is to provide certification information to personnel that would use this as proof of configuration acceptance. The following information will include examples of configurations with all equipment identified. Test reports will be provided if necessary but the overall status will be provided. This document is not intended to be a standalone document. It should be used with the associated documentation to implement a VSM-Cluster configuration with Cisco switches/directors.

Overview

Cisco 18+4 and 14+2 line cards are the hardware portion of the Cisco channel extension solution for the 9222i and 95xx series switches. Cisco code version 4.2(1b) was tested for interoperability with the devices and microcode described in this document.

Product and Software

Equipment used in the test configurations.

Host Mainframe: IBM Z10 with FICON Express4 channels. Host OS: z/OS 1.10

Application Software: IEBDG, IEBGENER, DFSMS/DSS Backup/Restore, FDR Backup/Restore, SyncSort and DFSort

Library/VSM Control Software: NCS/VTCS 6.2

Sun Microsystems VSM4 firmware versions D02.08.xx, D02.09.xx with VCF2 Cards.

Sun Microsystems VSM5 firmware versions D02.08.xx D02.09.xx with VCF4 Cards.

Cisco 95xx: **v4.2(1b)**

Sun Microsystems 8500 Silo tape libraries with the following tape drives.

Sun 9840B: Firmware level 1_43_306

Sun 9840C: Firmware level 1_44_509

Sun 9840D: Firmware level 1_44_709

Sun 9940B: Firmware level 1_43_406

Sun T10000A: Firmware level 1_44_106

Sun T10000B: Firmware level 1_44_206

GigE WAN interfaces Connected through Anue Network Distance Emulator providing distances up to 4800 kilometers. Distances emulated were 200km to 4800km

No performance measurements were taken. Because the VTSS can have switches located in-front (between mainframe and VTSS), in back (between VTSS and RTDs) and on a CLINK (between two VTSS), there are many possible configurations.

Configurations Tested

Example configurations may not map exactly to every customer configuration. This is used to identify what would benefit most customers and understanding the testing of these general types of configurations.

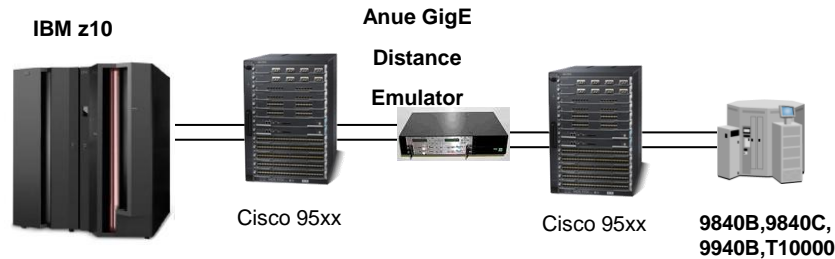


Figure 1 – Native tape CHPID

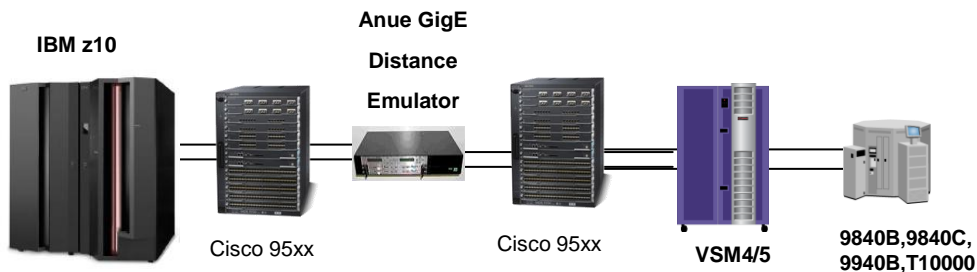


Figure 2 – VSM Front End CHPID

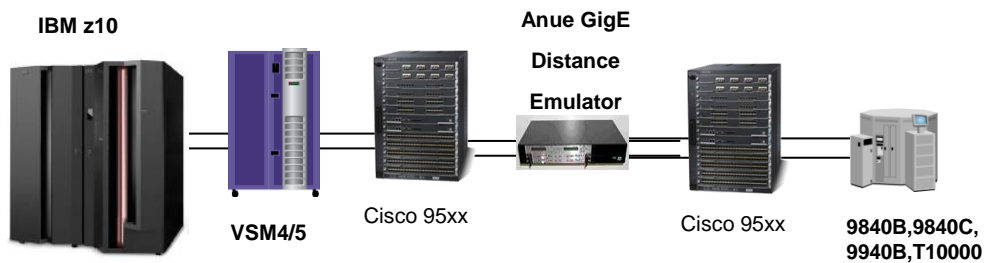


Figure 3 – VSM Back End RTD

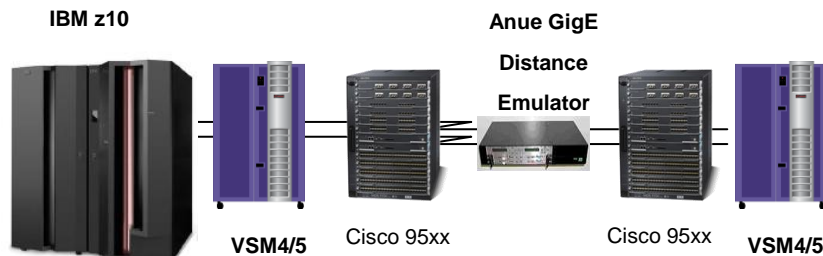


Figure 4 VSM Clink

Test process and results

The Cisco 95xx was tested on the “front-end” of the VSM5 and VSM4, the “back-end” (RTD communication) of the VSM5 and VSM4, as a method of extending clustering CLINKs between a VSM5 and VSM4, and as a method of extending direct attach native tape drives. The GigE ports on the 95xx were routed through an Anue Network Emulator to simulate the network latency.

Testing consisted of mainframe jobs that read and write to VTDs (Virtual Tape Drives) or native drives using IEBDG and IEBGENER, DFSMS/DSS Backup/Restore, FDR Backup/Restore, SyncSort and DFSort. Total run time for testing was 72 hours for each configuration tested.

Error Injection Testing

In addition, error injection testing was performed by disconnecting cables, GigE links, forcing Check-0 errors on the VSM5 and VSM4, and disabling switch ports, to test error recovery of the solution. No abnormalities were found. Expected results were seen after each disruption. After reestablishing connectivity, all connections recovered as expected

Limitations

Testing is limited to interoperability testing, meaning the testing of whether hardware and software interoperate without error under normal usage and under the errors injected as described.

What is not covered are:

- **Performance** testing (whether performance would be acceptable under all circumstances)
Acceptable performance is a subjective judgment, and also highly dependent on the particular customer needs.
- **Suitability** testing (whether the tested configuration are suitable for a particular customer)
The VSM solution can be configured in many different ways, and because of this the best suited solution for a particular customer may not be any of the configurations tested.
- **Network error injection** testing (whether real life network errors would cause problems)
The MCET test lab does not have the resources nor the expertise to test injection of errors into the communications network between switches. It is left to the switch vendor to do such testing.

No performance measurements were taken. Because the VTSS can have switches located in-front (between mainframe and VTSS), in back (between VTSS and RTDs) and on a CLINK (between two VTSSes), there are many possible configurations.

Status

Pass

Definitions

“Front-end” means Z10 Host CHPID to VSM VCF card.

“Back-end” means VSM VCF card to a Real Tape Drive (RTD).

“CLINK” means VSM VCF card to VSM VCF card (Cluster).

“Native tape” means that the physical tape drives are run directly from the mainframe channel

Issues opened

6884130 - Cisco core dump running VSM front end channels. This problem was encountered on an earlier build of v4.2(1x) code and was resolved and verified as fixed with v4.2(1b).

Qualification date

Qualified by: Malcolm MacAskill

Lab: Mainframe Customer Emulation Test (MCET)

Date: November 9th, 2009