

Project Proposal For New INCITS Standard

Storage Network Ping Command Line & Application
Programming Interfaces

(SNPing)

1 Source of the Proposed Project

1.1 Title

Storage Network Ping Command Line & Application
Programming Interfaces

1.2 Date

April 6, 2005

1.3 Proposer

INCITS TC T11, with a current membership of 55.

2 Process Description for Proposed Project

2.1 Project Type (Development or Revision)

Type D (Development done within INCITS T11)

2.2 Type of Document

Standard

2.3 Definition of Concepts and Special Terms

None

2.4 Expected Relationship with Approved Reference Models,
Frameworks, Architectures, etc.

All Fibre Channel (FC) standards are intended for use in
closed systems.

2.5 Recommended INCITS Development Technical Committee (Existing
or New)

It is recommended that this project be assigned to TC
T11, in order that the project be coordinated with work
on other FC and storage management standards.

2.6 Anticipated Frequency and Duration of Meetings

This project will make use of the regularly-scheduled bimonthly T11 plenary meetings. Informal meetings will be organized on an ad-hoc basis to discuss specific subjects where appropriate.

2.7 Target Date for T11 Letter Ballot

February 2006

2.8 Estimated Useful Life of Document

It is anticipated that this standard will have a useful life of over 10 years.

3 Business Case for Developing the Proposed Standard or Technical Report

3.1 Description

As Fibre Channel installations have grown in size and complexity, the need for tools to simplify the maintenance, configuration and monitoring of those installations has correspondingly grown. Tools that are analogous to those used in supporting large network configurations have increasingly been requested.

One of the most familiar and powerful tools in the network maintenance engineer's "toolbox" is the command line Ping utility. This utilizes the Internet Control Message Protocol (ICMP) that is supported by every Network Interface Card (NIC) to provide a simple method of testing for the presence of a NIC at a specified address, and measuring the round trip latency to that address. Command line Ping utilities are included with all UNIX operating systems, all Windows Operating Systems since Windows 95, and are available for most other Operating Systems.

A subgroup of the Storage Networking Industry Association (SNIA) Storage Management Interface (SMI-S) activity has also begun to address the performance characterization of a storage network, and concluded that they need an analog of the network Ping tool for that function.

Fibre Channel has incorporated an equivalent of ICMP, called Link Services, since the original FC-PH standard was approved as X3.230:1994. One of the Link service commands is called Echo, and involves sending a single FC frame to an FC port, which then "echoes" the frame back to the sender.

However the Fibre Channel Host Bus Adapter Application Programming Interface (FC-HBA) defined in INCITS 386:2004 did not provide a function by which an application could cause an Echo to be issued by an HBA. This oversight has

been rectified as part of the current SM-HBA project that covers the development of additions and enhancements to FC-HBA to provide a consistent API for both Fibre Channel and Serial-Attached SCSI (SAS) HBAs.

Therefore it is now desired to build on some existing open source work (see 3.2 below) to define both a command line interface and an API for "Storage Network Ping" (SNPing) utility. The command line interface will be designed wherever possible to mimic the network Ping. The intent of this project is to produce interface definitions that are independent of the underlying technology, and provide consistent functionality when used with many types of storage interface.

The following capabilities should be included in the SNIping standard:

- a) Detection and display of all FC HBAs that are compliant with HBA-API version 1 (FC-MI Annex A) or 2 (FC-HBA), or definitions being produced by the current SM-HBA project, in a system and their current characteristics, bindings, and statistics. SNIping shall take advantage of features specific in version 2 and SM-HBA where they are available, but shall not rely on them.
- b) Location of a specific port address in a storage network on the basis of not only its FC identifier (or port address), but other parameters such as worldwide name (WWN), alias, etc. Port addresses and names supported by iSCSI & SAS will also be supported. This capability may involve the use of FC Generic Service functions, and equivalent functions in other technologies.
- c) Display of parameters and configuration of port in a storage network, and measurement of a number of parameters related to that port, including access latency.
- d) Display of parameters and configuration of a SCSI Target, where one resides behind a port.
- e) Other functionality that may be appropriate.

3.2 Existing Practice and the Need for a Standard

A "Fibre Channel Ping" command line utility has already been created and made generally available as "open source" C code. This utility acts as a client of the FC-HBA API. While a most useful tool, the current implementation has a number of significant limitations. It provides only one method of identifying the FC port to be contacted. Because it uses a SCSI Inquiry command, it can only work with FC Ports of SCSI Target devices. The author of this open source code has agreed to allow its command line definition to be used as the starting point

for this project.

Customers are increasingly focused on the "total cost of ownership" of their purchases, and specifically in terms of Fibre Channel products this has lead to a desire to simplify the related configuration an maintenance activities. The interfaces that will be defined by this project will support such a desire, because of their applicability to many types of storage interfaces and their familiarity from being defined to mimic the established interface of a widely-used network utility as much as possible.

3.3 Implementation Impacts of the Proposed Standard

3.3.1 Development Costs

This standard will be developed through the voluntary and cooperative efforts of T11 Technical Committee members. No significant development costs are anticipated.

3.3.2 Impact on Existing or Potential Markets

No standard interface has yet been defined for a configuration and maintenance utility for storage interfaces.

The interfaces defined by this project will allow tools to be created that simplify the maintenance and monitoring of Fibre Channel system and, by mimicry of an existing well-known interface, they will reduce the training costs for such processes.

3.3.3 Costs and Methods for Conformity Assessment

The committee will consider the results of testing provided to the committee through the voluntary efforts of the participants in T11 and related Storage Area Networking industry organizations. With this method all costs are borne by the organizations of the various participants and have for the most part been mainly an adjunct of their normal development costs.

3.3.4 Return on Investment

ROI information is considered proprietary data by the member organizations, but members have stated that the ROI is expected to be large.

3.4 Legal Considerations

3.4.1 Patent Assertions

Calls will be made to identify assertions of patent rights in accordance with the relevant INCITS, ANSI and ISO/IEC policies and procedures. T11 is not aware of any patent assertions that may be made.

3.4.2 Dissemination of the Standard or Technical Report

Drafts of this document will be disseminated electronically. Dissemination of the final standard will be restricted as the document becomes the property of INCITS, ANSI, or ISO/IEC.

4 Related Standards Activities

4.1 Existing Standards

- a) INCITS 386:2004, Host Bus Adapter Application Programming Interface (FC-HBA)
- b) INCITS 388:2004, SNIA Storage Management Interface Specification (SMI-S)
- c) INCITS 373:2003, Fibre Channel Framing and Signaling Interface (FC-FS)
- d) IETF RFC 0792, Internet Control Message Protocol
- e) IETF RFC 2463, Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification

4.2 Related Standards Activity

- a) Project 1620-D, Fibre Channel - Link Services
- b) Project 1695-D, Host Bus Adapter Application Programming Interface (SM-HBA)

4.3 Recommendations for Close Liaison

- a) INCITS Technical Committee T10
- b) IETF Internet & Management Support for Storage (imss) Working Group
- c) Storage Networking Industry Association (SNIA)

5 Units of Measurement used in the Standard

The units of measurement used in the standard shall be the International System of Units (SI).