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T11 Network Address Authority (NAA) Naming Format for iSCSI Node Names

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Abstract

Internet Small Computer Systems Interface (iSCSI) is a SCSI transport protocol that maps the SCSI family of protocols onto TCP/IP. This document defines an additional iSCSI node name type format to enable use of the "Network Address Authority" (NAA) worldwide naming format defined by the InterNational Committee for Information Technology Standards (INCITS) T11 - Fibre Channel (FC) protocols and used by Serial Attached SCSI (SAS). This document updates RFC 3720.

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1. Introduction

This document discusses the motivation for adding an NAA type format as an iSCSI node naming format and defines this format in accordance with the iSCSI naming conventions [RFC3720]. Defining this format will enable SCSI storage devices containing both iSCSI ports and SAS ports to use the same NAA-based SCSI device name.

2. Background

A number of networked transports currently provide port abstractions to the SCSI protocol. These transports all incorporate some form of world-wide unique name construction format. The following table summarizes the current protocols and their naming formats.

SCSI Transport Protocol	Naming Format		
	EUI-64	NAA	IQN
iSCSI (Internet SCSI)	X		X
FCP (Fibre Channel)		X	
SAS (Serial Attached SCSI)		X	
SRP (for InfiniBand)	X		

The INCITS T11 Framing and Signaling Specification [FC-FS] defines a format called the Network Address Authority (NAA) format for constructing worldwide unique identifiers that use various identifier registration authorities. This identifier format is used by the Fibre Channel and SAS SCSI transport protocols. As most existing networked SCSI ports today are either FC or SAS, the NAA format is the most commonly used identifier format for SCSI transports.

3. Motivation

If iSCSI included a naming format that allowed direct representation of an NAA-format name, it would facilitate construction of a target device name that translates easily across multiple namespaces for a SCSI storage device containing ports served by different transports.

This document defines an NAA type iSCSI naming format so that one NAA identifier can be assigned as the basis for the SCSI device name for a SCSI target with both SAS ports and iSCSI ports.

INCITS T10 SCSI has defined a string format SCSI target device name in [SPC3] that is reported in the VPD page 83 device identifier page. [SAM3] specifies that a SCSI device shall have no more than one (i.e., zero or one) SCSI device name in the SCSI name string format regardless of the number of SCSI transport protocols supported by the SCSI device. Adding the INCITS T11-defined NAA format as a defined type for iSCSI device names would make the iSCSI device naming format more consistent across all current SCSI networked transports that define an NAA format SCSI device name. This would facilitate the creation of SCSI device names that are transport-independent. It would also contribute to the creation of SCSI Logical Unit (LU) names based on this SCSI device name.

4. iSCSI NAA Name Structure

This document defines an additional iSCSI name type:

type "naa." - the remainder of the string is an INCITS T11 defined Network Address Authority identifier in ASCII-encoded hexadecimal.

4.1. Type "naa." - Network Address Authority

[FC-FS] defines a format for constructing globally unique identifiers, referred to as the Network Address Authority (NAA) format.

The iSCSI NAA naming format is "naa.", followed by an NAA identifier represented in ASCII-encoded hexadecimal digits.

An example of an iSCSI name with a 64-bit NAA value follows:

```
Type  NAA identifier (ASCII-encoded hexadecimal)
+--++--------------+
|  ||              |

naa.52004567BA64678D
```

An example of an iSCSI name with a 128-bit NAA value follows:

```
Type  NAA identifier (ASCII-encoded hexadecimal)
+--++--------------------------------+
|  ||                                |

naa.62004567BA64678D0123456789ABCDEF
```

The iSCSI NAA naming format might be used in an implementation when the infrastructure for generating NAA worldwide unique names is already in place because the device contains both SAS and iSCSI SCSI ports.

The NAA identifier formatted in an ASCII-hexadecimal representation has a maximum size of 32 characters (128 bit NAA format). As a result, there is no issue with this naming format exceeding the maximum size for iSCSI node names.

5. Terminology

5.1. IQN

iSCSI qualified name, an identifier format defined by the iSCSI protocol [RFC3720].

5.2. SRP

SCSI RDMA Protocol. SRP defines a SCSI protocol mapping onto the InfiniBand (tm) Architecture and/or functionally similar cluster protocols [SRP].

5.3. SAS

Serial Attached SCSI. The Serial Attached SCSI (SAS) standard contains both a physical layer compatible with Serial ATA, and protocols for transporting SCSI commands to SAS devices and ATA commands to SATA devices [SAS].

5.4. NAA

Network Address Authority, a naming format defined by the INCITS T11 Fibre Channel protocols [FC-FS].

5.5. InfiniBand

An I/O architecture originally intended to replace PCI and to address high performance server interconnectivity [IB].

5.6. INCITS

INCITS stands for InterNational Committee of Information Technology Standards. The INCITS has a broad standardization scope within the field of Information and Communications Technologies (ICT), encompassing storage, processing, transfer, display, management, organization, and retrieval of information. INCITS serves as ANSI's Technical Advisory Group for the ISO/IEC Joint Technical Committee 1 (JTC 1). See http://www.incits.org.

5.7. T10

A technical committee within INCITS that develops standards and technical reports on I/O interfaces, particularly the series of SCSI (Small Computer Systems Interface) standards. See http://www.t10.org.

5.8. T11

A technical committee within INCITS responsible for standards development in the areas of Intelligent Peripheral Interface (IPI), High-Performance Parallel Interface (HIPPI) and Fibre Channel (FC). See http://www.t11.org.

6. Security Considerations

This iSCSI naming format does not introduce any new security concerns for the iSCSI protocol beyond those of the other iSCSI naming formats. Please refer to [RFC3720], Section 8, for information on the security considerations for the iSCSI protocol.

7. References

7.1. Normative References

[RFC3720] Satran, J., Meth, K., Sapuntzakis, C., Chadalapaka, M., and E. Zeidner, "Internet Small Computer Systems Interface (iSCSI)", RFC 3720, April 2004.

[FC-FS] INCITS 373-2003, Fibre Channel Framing and Signaling Interface (FC-FS).

7.2. Informative References

[SPC3] T10/1416-D, SCSI Primary Commands - 3 (SPC-3).

[SAM3] T10/1561-D, SCSI Architecture Model - 3 (SAM-3).

[IB] InfiniBand{tm} Architecture Specification, Vol. 1, Rel. 1.0.a, InfiniBand Trade Association (http://www.infinibandta.org).

[SRP] INCITS 365-2002, SCSI RDMA Protocol (SRP).

[SAS] INCITS 376-2003, Serial Attached SCSI (SAS).

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