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To: T10 Committee (SCSI)

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Subject: Names, Addresses, Identifiers, Oh my!

1 Overview

There needs to be a clear understanding of what SCSI identifiers, addresses and names are and how those relate to the objects defined in SAM-2 and the different protocol standards. This proposal does that.

2 Terms

2.0.1 address: Synonymous with identifier (see 2.0.2)

2.0.2 identifier: A representation of an object. Is only guaranteed to be unique within a SCSI domain and it may change.

2.0.3 name: A label of an object that is world wide unique and should never change. The term name, world wide name (WWN), and world wide identification (WWID) are interchangeable. A name is a subset of an identifier.

3 SCSI objects

The following is a list of SCSI objects.

       a) initiator port (was initiator device)
       b) target port (was target device)
       c) logical unit
       d) initiator device (new)
       e) target device (new)

4 SCSI object and nexus relationship

The I_T_L_Q nexus defines the routing for tasks and task management functions and the identification of tasks. It is important to define the relationship between the nexus elements and the SCSI objects.

Table 1 - Nexus element to SCSI object relationship

Nexus element	SCSI object	Use
I	Initiator port	Routing and task identification information
T	Target port	Routing and task identification information
L	Logical unit	Routing and task identification information
Q	Task	Task identification information

5 Identifiers and names

SAM-2 defines identifiers for several, but not all, SCSI objects, however, it does not define any names for those SCSI objects. Up to now all names have been defined in the command standards or the protocol standards. This is causing confusion.

Table 2 - Object size and support requirements

Object	Identifier (note 1)		Name (note 2)	
	Size	**Protocol Support**	**Size/Format**	**Protocol Support**
Initiator port	8 bytes (max)	mandatory	?	optional
Target port	8 bytes (max)	mandatory	implementation specific (note 3)	optional
Logical unit	8 bytes (max)	mandatory	implementation specific (note 3)	mandatory
Initiator device	not defined	not defined	?	optional
Target device	not defined	not defined	?	optional
Note: 1-As defined in the current version of SAM-2 2-There are no names currently defined in SAM-2 3-Reported in VPD page 83h identifier.				

Table 3 - Object identifier size requirements vs protocol

Object	Identifier			
	SPI-4	FCP-2	SRP	iSCSI
Initiator port	4 bits (note 1)	3 bytes	16 bytes	?
Target port	4 bits (note 1)	3 bytes	8 bytes	?
Logical unit	6 bits (data group transfers) 8 bytes (max) (packetized transfers)	8 bytes (max)	8 bytes (max)	8 bytes (max)
Initiator device	not defined	not defined	not defined	?
Target device	not defined	not defined	not defined	?
Note: 1-SPI uses 2 bytes but is limited to one port identifier per bit, therefore, the maximum number of SCSI ports is 16.				

Table 4 - Object name size requirements vs protocol

Object	Name			
	SPI-4	FCP-2	SRP	iSCSI
Initiator port	none	8 bytes (FC port WWID)	16 bytes (EUI 64 + 8 byte extension) (note 2)	?
Target port	none	8 bytes (FC port WWID)	8 byte (EUI 64)	?
Logical unit	implementation specific (note 1)	8 or 16 byte (FC WWID (note 1)	implementation specific (note 1)	implementation specific (note 1)
Initiator device	none	not defined	not defined	?
Target device	none	not defined	not defined	?
Note: 1-Reported in VPD page 83h identifier 2 -Required to be worldwide unique and recommend to be EUI 64 + 8 byte extension				

6 SCSI Command usage

There are operations defined within SPC that depend on the device server knowing identifier and/or name information. These include:

a) reservations
b) persistent reservations;
c) access controls;
d) extended copy; and
e) 3rd party XOR.

Each of those operations has different requirements in the amount of information needed about the identifier and/or name. In addition which object is used varies depending on the operation.

Table 5 - Reservation

Protocol	Logical Unit's view of the I_T Nexus					
	Initiator port		Target port			
			Initial (note 3)		Third Party Target port	
	Identifier	Name	Identifier	Name	Identifier	Name
SPI-4	Used	Not used	Used	Not Used	Used	Not Used
FCP-2	Used	Used (note 1)	Used	Not Used	Used	Not Used
SRP	Used (note 2)	Used (note 2)	Used (note 2)	Used (note 2)	?	?
iSCSI	?	?	?	?	?	?

Note:
1-Only used at login to set the identifier to previous value.
2-The Identifier and Name are the same value.
3-The target port that receives RESERVE command.

Table 6 - Persistent Reservations

Protocol	Logical Unit's view of the I_T Nexus			
	Initiator port		Target port	
	Identifier	Name	Identifier	Name
SPI-4	Used	Not used	Used	Not Used
FCP-2	Used	Used (note 1)	Used	Not Used
SRP	Used (note 2)	Used (note 2)	Used (note 2)	Used (note 2)
iSCSI	?	?	?	?
Note: 1-Only used at login to set the identifier to previous value. 2-The Identifier and Name are the same value				

Table 7 - Access Controls

Protocol	Logical Unit's view of the I_T Nexus (TransportID)				AccessID
	Initiator port		Target port		
			Initial		
	Identifier	Name	Identifier	Name	
SPI-4	Used	Not Used	Not Used	Not Used	Used
FCP-2	Used (note 1)	Used	Not Used	Not Used	Used
SRP	Used (note 2)	Used (note 2)	Not Used	Not Used	Used
iSCSI	?	?	Not Used	Not Used	Used
Note: 1-Not specified in parameter data determined using name 2-The Identifier and Name are the same value					

Table 8 - Extended copy

Protocol	Logical Unit's view of the extended copy operation					
	Initiator port		Target port			
			Initial target port		Copy target port (note 1)	
	Identifier	Name	Identifier	Name	Identifier	Name
SPI-4	Not Used	Not Used	Not Used	Not Used	Used	Not Used
FCP-2	Not Used	Not Used	Not Used	Not Used	Used	Used
SRP	Not Used	Not Used	Not Used	Not Used	Used	Used
iSCSI	Not Used	Not Used	Not Used	Not Used	?	Used
Note: 1-The descriptor type of the extended copy operation determines which is used.						

Table 9 - 3rd party XOR (XPWRITE)

Protocol	Logical Unit's view of the I_T nexus					
	Initiator port		Target port			
			Initial target port		XOR target port (note 2)	
	Identifier	Name	Identifier	Name	Identifier	Name
SPI-4	Not Used	Not Used	Not Used	Not Used	Used	Not Used
FCP-2	Not Used	Not Used	Not Used	Not Used	Used (note 1)	Not Used
SRP	Not Used	Not Used	Not Used	Not Used	?	?
iSCSI	Not Used	Not Used	Not Used	Not Used	?	?
Note: 1-Only used if on private loops because there is only one byte available for the identifier. 2-There is an option for having larger than 1 byte target port identifiers but it is not defined						