

Date: Sept 9, 1999
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 To: T10: SAM

T10,

I've looked at the object relationships defined in chapter 4 of SAM2 in revisions 8 and 11. As far as I can tell, the new SCSI Multi Port Unit defined in revision 11:

1. Adds no new features
 - Construction of multi port units is already defined in revision 8 via the hierarchical addressing model.
2. Moves some functionality from Defined to Vendor Unique
 - In particular, the revision 11 mapping of SMU Logical Unit Numbers to Logical Units is implementation specific and revision 11 relies on a consistent set of LU identifiers to be reported in VPDP 83. This is the right methodology to direct both device driver writers and device providers to implement. However, this will not work with most existing SAM compliant systems. Note that in revision 8, all attached ports see the same LUN address space. Also, through the use of hierarchical devices and using SCC, it is possible for a SAM2.8 compliant implementation to parse arbitrarily complex LUN to LU mappings in a standards defined way.
3. Adds more complexity.
 - Three revision 8 relationships removed in revision 11
 - Thirty three new relationships added in revision 11
 - Six relationships changed between revision 8 and revision 11.

What is the purpose of removing the multi-port model defined in SAM2.8 and replacing it with the SCSI Multi-Port model defined in SAM2.11?

Below is a comparison of object relationships between SAM2.8 and SAM2.11. There are several objects shown here that are inferred from pictures or as a logical consequence of the words in the text. The attempt here is to reflect only the relationships intended in SAM2.8 and SAM2.11. Source is chapter 4 of both documents.

Source Object	Associated with		Target Object
	SAM2.8	SAM2.11	
SCSI Domain	Exactly one	-- same --	Service Delivery Subsystem
	One or more	-- same --	Initiator Device
	One or more	-- same --	Target Device
Service Delivery Subsystem	Zero or one	-- same --	SCSI Domain
	Exactly one	-- same --	Interconnect Subsystem
	Two or more	-- same --	Service Delivery Port
Interconnect Subsystem	Zero or one	-- same --	Service Delivery Subsystem
	One or more	-- same --	Physical Interconnect
	Zero or more	-- same --	Interconnect Subsystem
SCSI Device Identifier	Unique in	-- same --	SCSI Domain
	Zero or one	-- same --	Service Delivery Port
	Zero or more	-- not defined --	SCSI Device Identifier
Service Delivery Port	Zero or more	-- not defined --	Target Identifier
	Zero or more	-- not defined --	Initiator Identifier
	Exactly one	-- same --	SCSI Device
SCSI Device	Zero or one	-- same --	Service Delivery Subsystem
	-- not defined --	Zero or one	SMU Port Identifier
	-- not defined --	Zero or one	SMU Internal Communication Path
SCSI Device	One or more	Exactly one	Service Delivery Port
	One or more	Exactly one	SCSI Domain

Source Object	Associated with		Target Object
	SAM2.8	SAM2.11	
Initiator Device	Is a	-- same --	SCSI Device
	One or more	Exactly one	Initiator Identifier
	Zero or more	-- same --	Application Client
Application Client	Zero or one	-- same --	Initiator Identifier
	Exactly one	-- same --	Initiator Device
	-- not defined --	Zero or one	SMU Initiator Device
Target Device	Is a	-- same --	SCSI Device
	One or more	Exactly one	Target Identifier
	Exactly one	-- same --	Task Manager
Combo Device	One or more	-- same --	Logical Unit
	Exactly one	-- same --	Internal Bus Port
	One or more	-- same --	Bus Identifier
Task Manager	Exactly one	-- same --	Bus Identifier == 0
	Is a	-- same --	Initiator Device
	Is a	-- same --	Target Device
Bus Port	Is a	-- same --	Processing Element
	Exactly one	-- same --	Target Device
	Is a	-- same --	Service Delivery Port
Internal Bus Port	One or more	-- same --	Initiator Identifier
	Zero or more	-- same --	Bus Identifier
	Is a	-- same --	Bus Port
Internal Bus	Exactly One	-- same --	Bus Identifier == Zero
	One or More	-- same --	Target Device
	Exactly One	-- same --	Internal Bus
Initiator Identifier	Is a	-- same --	Interconnect Subsystem
	One or more	-- same --	Internal Bus Port
	One or more	-- same --	Logical Unit Port
64 bit Initiator Identifier	Exactly One	-- same --	Logical Unit Number == 0
	Is a	-- same --	SCSI Device Identifier
	Zero or more	-- same --	Application Client
Target Identifier	Zero or one	-- same --	Initiator Device
	Zero or one	-- same --	Bus Port
	Is a	-- same --	Initiator Identifier
64 bit Target Identifier	Is a	-- same --	SCSI Device Identifier
	Zero or one	-- same --	Target Device
	Zero or more	-- same --	Task Identifier
08 bit Target Identifier	Is a	-- same --	Target Identifier
	Is a	-- same --	Target Identifier
	Is a	-- same --	Target Identifier
06 bit Target Identifier	Is a	-- same --	Target Identifier
	Unique in	-- same --	Target Device
	Zero or more	-- same --	Target Device
Bus Identifier	Zero or one	-- same --	Bus Port
	Is a	-- same --	Bus Identifier
	Is a	-- same --	Bus Identifier
Logical Unit Number	Is a	-- same --	SCSI Device Identifier
	Zero or more	-- same --	Application Client
	Zero or one	-- same --	Logical Unit Port
64 bit Bus Identifier	Zero or one	-- same --	Logical Unit
	Zero or one	-- same --	Bus Port
	Zero or more	-- same --	Task Identifier

Source Object	Associated with		Target Object
	SAM2.8	SAM2.11	
64 bit Logical Unit Number	Is a	-- same --	Logical Unit Number
14 bit Logical Unit Number	Is a	-- same --	Logical Unit Number
08 bit Logical Unit Number	Is a	-- same --	Logical Unit Number
05 bit Logical Unit Number	Is a	-- same --	Logical Unit Number
Task Identifier	Exactly one	-- same --	Target Identifier
	Exactly one	-- same --	Logical Unit Number
	Exactly one	-- same --	Task Attribute
Task Attribute	Is a	-- same --	string
Tagged Task Identifier	Is a	-- same --	Task Identifier
	Exactly one	-- same --	Task Tag
Task Tag	Is a	-- same --	64 bit unsigned integer
Untagged Task Identifier	Is a	-- same --	Task Identifier
	Exactly one	-- same --	Task Attribute == "Simple"
Logical Unit Port	Is a	-- same --	Service Delivery Port
	Exactly one	-- same --	Logical Unit
	Zero or more	-- same --	Logical Unit Number
Logical Unit	Exactly one	-- same --	Device Server
	Exactly one	-- same --	Logical Unit Number
	Exactly one	-- same --	Logical Unit Port
	Zero or more	-- same --	Target Device
	-- not defined --	Zero or one	SMU Target Device
	-- not defined --	Zero or one	SMU Internal Communication Path
SMU Port Identifier	-- not defined --	Is a	Vendor Unique Identifier
	-- not defined --	Unique In	SCSI Multi Port Unit
	-- not defined --	Exactly one	SCSI Multi Port Unit
SCSI Multi Port Unit	-- not defined --	Two or more	SCSI Device
	-- not defined --	Two or more	SMU Port Identifier
	-- not defined --	Exactly one	SMU Internal Communication Path
SMU Initiator Device	-- not defined --	Is a	SCSI Multi Port Unit
	-- not defined --	Zero or more	Application Client
SMU Internal Communication Path	-- not defined --	One or more	Service Delivery Port
	-- not defined --	Exactly one	SCSI Multi Port Unit
	-- not defined --	One or more	Application Client
	-- not defined --	One or more	Logical Unit
SMU Target Device	-- not defined --	Is a	SCSI Multi Port Unit
	-- not defined --	Exactly one	SMU Logical Unit Number == 0
	-- not defined --	Exactly one	SMU Task Manager
	-- not defined --	One or more	Logical Unit
SMU Tagged Task Identifier	-- not defined --	Is a	Tagged Task Identifier
	-- not defined --	Exactly one	SMU Port Identifier
SMU Untagged Task Identifier	-- not defined --	Is a	Untagged Task Identifier
	-- not defined --	Exactly one	SMU Port Identifier
SMU Logical Unit Number	-- not defined --	Is a	Logical Unit Number
	-- not defined --	Unique in	SMU Target Device
	-- not defined --	Zero or one	Logical Unit
SMU Task Manager	-- not defined --	Is a	Processing Element
	-- not defined --	Exactly one	SMU Target Device
SMU Combo Device	-- not defined --	Is a	SMU Initiator Device
	-- not defined --	Is a	SMU Target Device