## SCSI MIB Liaison Report

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## Agenda

- MIB Team intro
- Requirements Statement
- Review of Object Model
- Latest Developments
- Object Statistics
- Open Issues

#### Team Intro

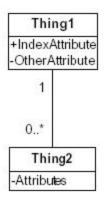
- Lead: Yaron Lederman, Siliquent;
- Editor: Michele Hallak–Stamler, SANRAD;
- MIB Advisor: Keith McCloghrie, Cisco
- iSCSI Advisors: Mark Bakke, Cisco; Marjorie Krueger, HP;
- SCSI Advisor: George Penokie, Tivoli (we hope)
- Troops: Ron Roberts, Adaptec; Satish Mali, Stonefly Networks; Kha-Sin Teow, Brocade; Sajay Selvaraj, Hcl Technologies, myself.

## Requirements Statement

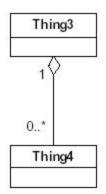
SCSI MIB should enable the representation of SCSI entities and their respective status, including error and performance-monitoring statistics. It should be possible to perform a limited number of configuration modification and diagnostic actions.

This MIB is not required to provide comprehensive configuration capabilities.

#### UML notation

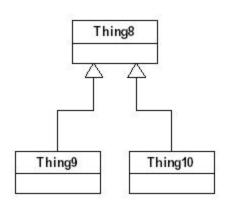


Association - There are zero or more Thing2 instances associated with each Thing1. A Thing2 is associated with exactly one Thing1.

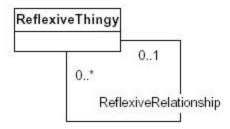


Aggregation - Each Thing3 contains zero or more Thing4 instances. A Thing4 belongs to exactly one Thing3 and cannot exist without a Thing3.

#### **UML** Notation

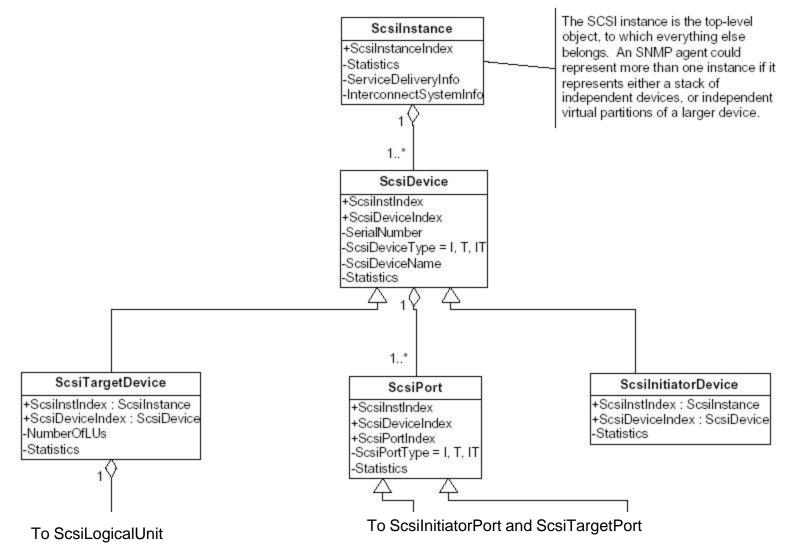


Inheritance (Logical OR) - Each Instance of Thing10 or Thing9 is also a Thing8. A Thing8 must be either a Thing9, a Thing10, or both.



Reflexive Relationship - Each ReflexiveThingy can be related to zero or one "parent" ReflexiveThingy; each ReflexiveThingy can be the parent of zero or more other ReflexiveThingies. This basically specifies a tree structure.

#### Object Model (Top Half)



# Object Model (Bottom Half)

To ScsiTargetDevice To ScsiPort 1..N ScsiLogicalUnit ScsiTargetPort ScsilnitiatorPort -ScsilnstIndex : Scsilnstance +ScsiDeviceIndex : ScsiDevice +ScsilnstIndex : Scsilnstance +ScsilnstIndex : Scsilnstance +ScsiLuIndex +ScsiDeviceIndex : ScsiDevice +ScsiDeviceIndex : ScsiDevice ScsiLuParent +ScsiPortIndex +ScsiPortIndex ScsiLun -InitiatorPortName -TargetPortName -LuName -TargetPortIdentifier -InitiatorPortIdentifier -Vendorld -Statistics -Statistics ☐-ProductId 0..1 -RevisionId -Statistics ScsiLunParent 0..\* 0..\* 0.\* 0..\* ScsiAttachedInitiator ScsiAttachedTarget +ScsilnstIndex +ScsilnstIndex ScsiLun +ScsiDeviceIndex +ScsiDeviceIndex ScsilnstIndex : Scsilnstance +ScsiPortIndex +ScsiPortIndex +ScsiDeviceIndex : ScsiDevice +ScsiAttIntrIndex +ScsiAttTgtIndex +ScsiLuIndex : ScsiLogicalUnit -ScsiAttIntrName -ScsiAttTgtName +ScsiLunIndex -ScsiAttTgtldentifier -ScsiAttIntrIdentifier ScsiLun -Statistics Statistics 0..4 This association allows For logical units ScsiLuldentifier dependent LUNs (page 38) to be with more than +ScsilnstIndex modeled. If ScsiLuParent is 0, one LUN, one of +ScsiDeviceIndex the LU belongs directly to the these entries +ScsiLunIndex target. If non-zero, it is the exists for each +ScsiLuldIndex Lulndex of the parent LU within additional LUN. -ScsiLuldCodeSet = binary, ascii the target to which it belongs. -ScsiLuldAssociation = device, port

-ScsiLuldType -ScsiLuldValue

## Object Model

- ScsiInstance allows agent to represent more than one independent device
  - Supports different implementation boundaries between MIB agents and devices
- Note that in this model ScsiInitiator refers to a "local" Initiator, not the remote one connected to ScsiTarget
  - That's modeled by ScsiAttached Initiator object

#### Latest Updates

- Suggestion that ScsiLogicalDevice to have:
  - ScsiAttachedInitiator object (0..N) aggregation to collect per-initiator statistics

#### Suggested Device Statistics

#### • Initial list:

- number of scsi target ports
- number of scsi initiator ports
- count of commands
- count of good status returns
- count of aborts sent by initiator
- count of commands completed with check condition
- count of aborts made by the device server
- count of resets
- count of illegal requests
- count of I/O process terminations by the target
- count of Recover Buffered Data commands
- What have we missed??

## Suggested Port Statistics

#### • Initial list:

- Read transfer rate
- Write transfer rate
- Number of packets/frames transmitted by this port
- Number of packets/frames received by this port
- Count of octet/bytes transmitted by this port
- Octets or bytes received by this port
- Number of bytes/octets received with wrong parity
- What else would be useful??

#### Open Issues

- Number of identifiers per Logical Unit? Is 4 enough?
- Do we need per initiator statistics in a ScsiLogicalUnit??
- How many Device Names are there per (Initiator or Target) Device??
  - And in a device that is both an Initiator and a Target are the Device Names identical?

#### Open Issues

- Should there be support for resetting SCSI Initiator elements?
- What should this MIB include about:
  - SCSI Domain?
  - Service Delivery Subsystem?
  - Interconnect?

#### Summary

- The object model is not yet finalized
- Appropriate statistics are still be identified
- Feedback from T10 on both aspects is requested at this time
  - And is anything else being missed ????