

To: Members of X3T10
 From: Charles Monia - SAM Technical Editor
 Subject: Definition of Mandatory and Optional Features in SAM (X3T10/94-172R0)

There has understandably, been some uncertainty about how requirements and options defined in one standard may affect others.

The purpose of this proposal is to resolve this issue by defining the precedence, scope and relationships between optional and mandatory features than span SCSI-3 standards and implementations. This document, as approved by the X3T10 membership, will be the basis for a detailed proposal containing exact textual changes to SAM.

Observations:

1. In SCSI, an option is some feature that need not be supported for an implementation to claim compliance with a standard. If supported, the feature must be implemented in accordance with the standard.
2. Features are supported by standards and implementations. A standard supports a feature by specifying how the feature shall be implemented. An implementation supports a feature if the feature is implemented in accordance with the standard.
3. Certain features apply across classes of SCSI standards. For instance, even though command queuing may be thought of as a logical unit option, the feature is unavailable to a device driver unless the protocol standards and protocol implementations support it.
4. Features may apply to standards in different ways. SAM must specify for each class of standard or implementation whether or not an applicable feature is an option or requirement. That is, SAM may specify that a feature is optional for a logical unit but mandatory for the protocol implementation. SAM can also delegate such control to another standard.
5. SAM must define each class of standard and the precedence for resolving conflicts among classes of standards.

Given the above, I propose that text be added to SAM specifying the following:

1. A conflict between standards shall be resolved according to the following precedence:

SAM
 SPC
 Other command standards
 Protocol standards
 Interconnect standards

A subsidiary standard is one which is lower in precedence than a referenced standard. A controlling standard is higher in precedence than a referenced standard.

2. A standard supports a feature if the standard specifies how the feature is to be implemented.
3. A standard requires a feature if it supports the feature and requires that the feature be implemented and required by all

subsidiary standards.

4. A standard shall require all mandatory features defined by a controlling standard (obvious but probably needs to be said).
5. Unless otherwise specified in the controlling standard, a subsidiary standard shall support all options specified in a controlling standard.

An SCSI-3 standard shall define the scope of requirements and options using language based on that shown below.

1. "shall" -- Identifies a mandatory feature to be supported by an implementation subject to the standard and by required by all subsidiary standards.
2. "...a logical unit shall support..." implies that the feature shall also be required by the protocol and interconnect standards.
3. "...is a protocol option..." -- identifies a feature which may be optionally supported by a protocol standard. The protocol standard may also specify whether or not the feature shall be implemented.
4. "...shall be required by a protocol standard..." or "...a protocol standard shall require..." -- identifies a feature that shall be supported by all protocol standards and protocol implementations.
5. "...is a logical unit option..." -- identifies a feature that may be optionally supported by a logical unit. Support by a protocol standard is mandatory. A protocol standard may or may not impose the requirement on implementations and subsidiary standards.
6. "...a protocol standard shall support..." -- Indicates that the feature shall be supported by the protocol standard. The protocol standard shall specify whether or not the feature shall be required by implementations and subsidiary standards.

For an option supported by the logical unit but not by the protocol implementation, the protocol standard may require a logical unit to indicate that the option is unsupported. Alternatively, the initiator's service delivery port may provide some way for an application client to determine which logical unit options are unsupported by the protocol layer.

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