

To: T10 Technical Committee
From: Rob Elliott, HP (elliott@hp.com)
Date: 15 September 2004
Subject: 04-290r1 SAM-3 SPC-3 SBC-2 SSC-3 SES-2 OSD-2 Condition and event definitions

Revision history

Revision 0 (3 September 2004) First revision

Revision 1 (15 September 2004) Incorporated comments from September CAP WG.

Related documents

sam3r13 - SCSI Architecture Model - 3 revision 13
spc3r20a - SCSI Primary Commands - 3 revision 20a
sbc2r15 - SCSI Block Commands -2 revision 15
ssc3r01b - SCSI Stream Commands - 2 revision 1b
ses2r09 - SCSI Enclosure Services - 2 revision 9
osd-r10 - Object Storage Device revision 10

Overview

The condition and event wording is slightly inconsistent in SAM-3 and the command sets.

Since the command sets only use the condition terms - power on, hard reset, logical unit reset, and I_T nexus loss - they should not define the event terms and defer the condition details to SAM-3.

SAM-3 should clarify its terminology to match.

Suggested changes to SAM-3

[Glossary entries are sorted by functionality for ease of following the proposal.]

[In the glossaries, entries being replaced are in black (old) and [blue underlined \(new\)](#); entries to delete are in ~~red strikethrough.~~)]

3.1.74 power on: A condition resulting from a power on event (see 3.1.75).

[3.1.74 power on: A condition resulting from a power on event in which the SCSI device performs the power on operations described in 6.3.1, SPC-3, and the appropriate command standards.](#)

3.1.39 hard reset: A response to a power on (see 6.3.1) or reset (see 6.3.2) condition in which the SCSI device performs the operations described in 6.3.2.

[3.1.39 hard reset: A condition resulting from a power on condition or a reset event in which the SCSI device performs the hard reset operations described in 6.3.2, SPC-3, and the appropriate command standards.](#)

3.1.61 logical unit reset: A logical unit response to a logical unit reset event in which the logical unit performs the operations described in 6.3.3.

[3.1.61 logical unit reset: A condition resulting from a hard reset condition or a logical unit reset event in which the logical unit performs the logical unit reset operations described in 6.3.3, SPC-3, and the appropriate command standards.](#)

3.1.42 I_T nexus loss: A condition resulting from a hard reset condition (see 6.3.2) in SCSI initiator devices or from delivery of an I_T nexus loss notification indication (see 6.4) in all SCSI devices in which the SCSI device performs the operations described in 6.3.4.

[3.1.42 I_T nexus loss: A condition resulting from a hard reset condition or an I_T nexus loss event in which the SCSI device performs the I_T nexus loss operations described in 6.3.4, SPC-3, and the appropriate command standards.](#)

3.1.75 power on event: Power being applied to a SCSI device, triggering a power on condition (see 3.1.74) in the SCSI device.

[3.1.75 power on event: Power being applied to a SCSI device, resulting in a power on condition as described in 6.3.1.](#)

3.1.86 reset event: A SCSI transport protocol specific event that triggers a hard reset (see 6.3.2).

[3.1.86 reset event: A SCSI transport protocol specific event that results in a hard reset condition as described in 6.3.2.](#)

3.1.62 logical unit reset event: An event that triggers a logical unit reset (see 3.1.61). Logical unit reset events include processing the LOGICAL UNIT RESET task management function (see 7.6) and hard reset (see 6.3.2).

[3.1.62 logical unit reset event: An event that results in a logical unit reset condition as described in 6.3.3.](#)

3.1.43 I_T nexus loss notification: An indication (see 6.4) from the SCSI transport protocol to the SCSI application layer that an I_T nexus no longer exists.

[3.1.43 I_T nexus loss event: A SCSI transport protocol specific event that results in an I_T nexus loss condition as described in 6.3.4.](#)

6.3 Conditions resulting from SCSI events

6.3.1 Power on

Power on is a SCSI device condition resulting from a power on event. When a SCSI device is powered on, it shall cause a hard reset.

The power on condition applies to both SCSI initiator devices and SCSI target devices.

6.3.2 Hard reset

~~A hard reset is~~ [Hard reset is a SCSI device condition resulting from:](#)

- a) ~~A part of the response to~~ a power on condition (see 6.3.1); [or](#)
- b) ~~A response to~~ [a reset event indicated by](#) a Transport Reset event notification (see 6.4); ~~or~~

The definition of reset events and the notification of their detection is SCSI transport protocol specific.

Each SCSI transport protocol standard that defines reset events shall specify a SCSI target port's protocol specific actions in response to reset events. Each SCSI transport protocol standard that defines reset events should specify when those events result in the delivery of a Transport Reset event notification to the SCSI applications layer.

SCSI transport protocols may include reset events that have no SCSI effects (e.g., a Fibre Channel non-initializing loop initialization primitive).

The hard reset condition applies to both SCSI initiator devices and SCSI target devices.

A SCSI target port's response to a hard reset condition shall include a logical unit reset condition (see 6.3.3) for all logical units to which the SCSI target port has access. A hard reset condition shall not affect any other SCSI target ports in the SCSI target device, however, the logical unit reset condition established by a hard reset may affect tasks that are communicating via other SCSI target ports.

Although the task manager response to task management requests is subject to the presence of access restrictions, as managed by ACCESS CONTROL OUT commands (see SPC-3), a hard reset condition shall not be prevented by access controls.

When a SCSI initiator port detects a hard reset condition, it should terminate all its outstanding Execute Command procedure calls with a service response of SERVICE DELIVERY OR TARGET FAILURE. A hard reset condition shall not affect any other SCSI initiator ports in the SCSI initiator device, however, the logical unit reset condition established in a SCSI target device by a hard reset may affect tasks that are communicating via other SCSI initiator ports.

A SCSI port's response to a hard reset condition shall include an I_T nexus loss [condition \(see 6.3.4\)](#) for every I_T nexus associated with that SCSI port.

6.3.3 Logical unit reset

~~A logical unit reset is~~ Logical unit reset is a logical unit condition resulting from:

- a) ~~A part of the response to~~ a hard reset condition (see 6.3.2); or
- b) ~~The response to a logical unit reset event indicating that~~ a LOGICAL UNIT RESET task management request (see 7.6) was processed by the task manager. ~~;~~ ~~or~~

The logical unit reset condition applies only to SCSI target devices.

When responding to a logical unit reset condition, the logical unit shall:

- a) Abort all tasks as described in 5.7;
- b) Clear an ACA condition (see 5.9.2.4), if one is present;
- c) Establish a unit attention condition (see 5.9.7 and 6.2);
- d) Initiate a logical unit reset for all dependent logical units (see 4.14); and
- e) Perform any additional functions required by the applicable command ~~set~~ standards.

6.3.4 I_T nexus loss

~~An I_T nexus loss event notification is delivered by a SCSI port in response to~~ I_T nexus loss is a SCSI device condition resulting from:

- a) A hard reset condition (see 6.3.2); or
- b) an I_T nexus loss event (e.g., logout) indicated by a Nexus Loss event notification (see 6.4).

An I_T nexus loss ~~notification~~ event is an indication from the SCSI transport protocol to the SCSI application layer that an I_T nexus no longer exists. SCSI transport protocols may define I_T nexus loss events.

Each SCSI transport protocol standard that defines I_T nexus loss events should specify when those events result in the delivery of a Nexus Loss event notification to the SCSI applications layer.

The I_T nexus loss condition applies to both SCSI initiator devices and SCSI target devices.

When a SCSI target port detects an I_T nexus loss, a Nexus Loss event notification indication (see 6.4) shall be delivered to each logical unit to which the I_T nexus has access. In response to the resulting I_T nexus loss condition a logical unit shall take the following actions:

- a) Abort all tasks from the SCSI initiator port associated with the I_T nexus as described in 5.7;
- b) Clear an ACA condition (see 5.9.2.4), if one is present for the SCSI initiator port;
- c) Establish an unit attention condition for the SCSI initiator port associated with the I_T nexus (see 5.9.7 and 6.2); and
- d) Perform any additional functions required by the applicable command ~~set~~ standards.

If the logical unit retains state information for the I_T nexus that is lost, its response to the subsequent I_T nexus re-establishment for the logical unit should include establishing a unit attention with an additional sense code of I_T NEXUS LOSS OCCURRED.

If the logical unit does not retain state information for the I_T nexus that is lost, it shall consider the subsequent I_T nexus re-establishment, if any, as the formation of a new I_T nexus for which there is no past history (e.g., establish a unit attention with an additional sense code of POWER ON OCCURRED).

When a SCSI initiator port detects an I_T nexus loss, it should terminate all its outstanding Execute Command procedure calls to the SCSI target port associated with the I_T nexus with a service response of SERVICE DELIVERY OR TARGET FAILURE.

Suggested changes to SPC-3

3.1.76 power on: A condition resulting from a power on event (see 3.1.77).

3.1.76 power on: A condition resulting from the events defined by SAM-3 in which the SCSI device performs the power on operations described in SAM-3, this standard, and the applicable command standards.

~~**3.1.77 power on event:** Power being applied to a SCSI device, triggering a power on condition (see 3.1.76) in the SCSI device.~~

3.1.36 hard reset: A response to a power on or reset condition in which the SCSI device performs the operations described in SAM-3.

[3.1.36 hard reset](#): A condition resulting from the events defined by SAM-3 in which the SCSI device performs the hard reset operations described in SAM-3, this standard, and the applicable command standards.

~~3.1.85 reset event~~: A SCSI transport protocol specific event that triggers a hard reset as described in SAM-3.

3.1.59 logical unit reset: A logical unit response to a logical unit reset event notification in which the logical unit performs the operations described in SAM-3.

[3.1.59 logical unit reset](#): A condition resulting from the events defined by SAM-3 in which the logical unit performs the logical unit reset operations described in SAM-3, this standard, and the applicable command standards.

~~3.1.60 logical unit reset event~~: An event that triggers logical unit reset as described in SAM-3.

3.1.40 I_T nexus loss: A condition resulting from the events defined by SAM-3 in which the SCSI device performs the operations described in SAM-3 and this standard.

[3.1.40 I_T nexus loss](#): A condition resulting from the events defined by SAM-3 in which the SCSI device performs the I_T nexus loss operations described in SAM-3, this standard, and the applicable command standards.

~~3.1.41 I_T nexus loss event~~: A SCSI transport protocol specific event that triggers I_T nexus loss as described in SAM-3.

No changes needed outside the glossary.

Suggested changes to SBC-2, SSC-3, SES-2, and OSD-2

Replace all condition and event glossary entries with these condition entries. Point to the table(s) listing the device type's supported commands (command/opcode/mandatory-optional/reference), often in 5.1.

[3.1.76 power on](#): A condition resulting from the events defined by SAM-3 in which the SCSI device performs the power on operations described in SAM-3, this standard, and other applicable command standards (see table xx in 5.1).

[3.1.36 hard reset](#): A condition resulting from the events defined by SAM-3 in which the SCSI device performs the hard reset operations described in SAM-3, this standard, and other applicable command standards (see table xx in 5.1).

[3.1.59 logical unit reset](#): A condition resulting from the events defined by SAM-3 in which the logical unit performs the logical unit reset operations described in SAM-3, this standard, and other applicable command standards (see table xx in 5.1).

[3.1.40 I_T nexus loss](#): A condition resulting from the events defined by SAM-3 in which the SCSI device performs the I_T nexus loss operations described in SAM-3, this standard, and other applicable command standards (see table xx in 5.1).

Suggested changes to SBC-2

No changes needed outside the glossary.

Suggested changes to SSC-3

Transition All:A0: This transition shall occur when a power-on, logical unit reset, or I_T nexus loss ~~event~~ occurs and the BAML bit is set to zero and the BAM bit is set to zero.

Transition All:E0: This transition shall occur when a power-on, logical unit reset, or I_T nexus loss ~~event~~ occurs and the BAML bit is set to one and the BAM bit is set to one.

Transition All:F0: This transition shall occur when a power-on, logical unit reset, or I_T nexus loss ~~event~~ occurs and the BAML bit is set to one and the BAM bit is set to zero.

Suggested changes to SES-2

The DC OVERVOLTAGE bit is set to one to indicate an overvoltage condition has been detected at the power supply output. The DC OVERVOLTAGE bit is set to zero by setting and clearing the RQST FAIL control bit or by a power on **reset**.

The DC UNDERVOLTAGE bit is set to one to indicate an undervoltage condition has been detected at the power supply output. The DC UNDERVOLTAGE bit is set to zero by setting and clearing the RQST FAIL control bit or by a power on **reset**.

The DC OVERCURRENT bit is set to one to indicate an overcurrent condition has been detected at the power supply output. The DC OVERCURRENT bit is set to zero by setting and clearing the RQST FAIL control bit or by a power on **reset**.

The OVERTMP FAIL (overtemperature failure) bit is set to one to indicate the power supply has detected a temperature higher than a safe operating temperature. The power supply may shut down. The OVERTMP FAIL bit is set to zero by setting and clearing the RQST FAIL control bit or by a power on **reset**.

Suggested changes to OSD-2

3.1.53 volatile cache: Storage that is lost after a power on or ~~reset event~~ [hard reset](#) (see SAM-3) and may be lost after an I_T nexus loss or logical unit reset ~~event~~ (see SAM-3). See 4.11.

- a) Volatile cache – storage is:
 - A) Lost after a power on or ~~reset event~~[hard reset](#) (see SAM-3); and
 - B) May be lost after an I_T nexus loss or logical unit reset ~~event~~ (see SAM-3);and
- b) Stable storage – storage that survives all the events that may result in the loss of data in the volatile cache.

The command shall be terminated with a CHECK CONDITION status, the sense key shall be set to ILLEGAL REQUEST, and the additional sense code shall be set to INVALID FIELD IN PARAMETER LIST if CHANGE MASTER KEY parameter data fails to compare in any of the following ways with the data exchanged in the SEED EXCHANGE step that was most recently processed on this I_T_L nexus since a I_T nexus loss ~~event~~, logical unit reset ~~event~~, or ~~reset event~~ [hard reset](#) (see SAM-3), if any:

The SECURITY TOKEN field contains a value that is unique to the I_T_L nexus that sent the INQUIRY command. The security token shall be random as defined by RFC 1750. An I_T nexus loss ~~event~~, logical unit reset ~~event~~, or ~~reset event~~ [hard reset](#) (see SAM-3) shall cause the security token to change.