

Date: July 03, 2003

To: T10 Committee (SCSI)

From: George Penokie (IBM/Tivoli)

Subject: SAS: Notify primitive issues

## **1 Overview**

The following are all issues relating to the NOTIFY primitive that need to be addressed in either SAS or SAS 1.1. My preference is SAS since it is going to have to go through another public review.

### **1.1 SAS Target NOTIFY Detection**

SAS currently has no statement or requirement for a target to detect the Notify primitive. This could lead to inter-operability problems if the device sending the Notify assumes the target will detect every Notify transmitted. It is impossible to guarantee the detection of a single primitive as it could be morphed in transmission causing a disparity error.

I would recommend the following be placed in section 7.2.5.9 NOTIFY:

[SAS target devices are not required to detect every transmitted NOTIFY.](#)

### **1.2 NOTIFY Detected vs. NOTIFY Received**

Section 10.2.8.1.7.2 Transition SA\_PC\_5:Active\_Wait to SA\_PC\_1:Active should be changed from:

This transition shall occur if:

- a) a NOTIFY (ENABLE SPINUP) is received; or
- b) the SAS device does not consume additional power as a result of the transition to SA\_PC\_1:Active.

to:

This transition shall occur if:

- a) a NOTIFY (ENABLE SPINUP) is ~~received~~ **detected**; or
- b) the SAS device does not consume additional power as a result of the transition to SA\_PC\_1:Active.

The term 'received' implies that any NOTIFY received will cause the transition to occur. This is may not be the case if the NOTIFY gets tossed out for elasticity reason. The term 'detected' is more accurate in this case.

### **1.3 START/STOP UNIT IMMED bit**

Add to section 10.2.8 the following sentence:

[For transitions based on receipt of a START STOP UNIT command, if the IMMED bit is set to one the command may complete with GOOD status before any operation that occurs as a result of the value in the POWER CONDITIONS field completes.](#)

Section 10.2.8.1.7.5 Transition SA\_PC\_5:Active\_Wait to SA\_PC\_6:Idle\_Wait should be changed from

This transition shall occur if:

- a) a START STOP UNIT command with the POWER CONDITION field set to IDLE is received;
- b) a START STOP UNIT command with the POWER CONDITION field set to FORCE\_IDLE\_0 is received; or
- c) the Power Condition mode page idle condition timer expires.

For transitions based on a START STOP UNIT command, the command shall not complete with GOOD status until this state machine reaches the SA\_PC\_2:Idle state.

to:

This transition shall occur if:

- a) a START STOP UNIT command with the POWER CONDITION field set to IDLE is received;
- b) a START STOP UNIT command with the POWER CONDITION field set to FORCE\_IDLE\_0 is received; or
- c) the Power Condition mode page idle condition timer expires.

For transitions based on a START STOP UNIT command, if the IMMED bit is set to zero, the command shall not complete with GOOD status until this state machine reaches the SA\_PC\_2:Idle state.

This same change needs to be made in sections:

Section 10.2.8.1.5.3 Transition SA\_PC\_3:Standby to SA\_PC\_5:Active\_Wait

For transitions based on a START STOP UNIT command, if the IMMED bit is set to zero, the command shall not complete with GOOD status until this state machine reaches the SA\_PC\_1:Active state.

Section 10.2.8.1.5.4 Transition SA\_PC\_3:Standby to SA\_PC\_6:Idle\_Wait

For transitions based on a START STOP UNIT command, if the IMMED bit is set to zero, the command shall not complete with GOOD status until this state machine reaches the SA\_PC\_2:Idle state.

Section 10.2.8.1.6.3 Transition SA\_PC\_4:Stopped to SA\_PC\_5:Active\_Wait

If the IMMED bit is set to zero, the START STOP UNIT command shall not complete with GOOD status until this state machine reaches the SA\_PC\_1:Active state.

Section 10.2.8.1.6.4 Transition SA\_PC\_4:Stopped to SA\_PC\_6:Idle\_Wait

If the IMMED bit is set to zero, the START STOP UNIT command shall not complete with GOOD status until this state machine reaches the SA\_PC\_2:Idle state.

Section 10.2.8.1.8.5 Transition SA\_PC\_6:Idle\_Wait to SA\_PC\_5:Active\_Wait

For transitions based on a START STOP UNIT command, if the IMMED bit is set to zero, the command shall not complete with GOOD status until this state machine reaches the SA\_PC\_1:Active state.

This change makes it clear that the waiting for NOTIFY should do nothing except delay the spinup until the NOTIFY is received.