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**Subject:** **Proposed solution for Automatic Clear of ACA**

SAM Revision 15 indicates in section 6.1.2, page 45 that, "All logical units shall implement support for at least one of the ACA bit values and may support both values." This proposal describes a protocol and proposes wording to include that wording in SAM and SPC.

The assumptions of this proposal are:
  a) The proposal should be compatible with SCSI-2 initiators and targets.
  b) The proposal should allow each command to be marked as to whether or not a Check Condition for that command will establish an Automatic Contingent Allegiance (ACA) condition.

The control objects used by this protocol are described in the following table.

| Object name | Location | Description, relevant values |
|---|---|---|
| ANSI-approved Version | INQUIRY data, byte 2, bits 2-0 | Specified in SPC<br>        Indicates implemented version<br>2h = SCSI-2 compliant<br>3h = SCSI-3 compliant |
| Normal ACA Supported | INQUIRY data, location tbd | Specified in SPC<br>        Indicates Normal ACA supported by target<br>0b = ACA Autoclear only<br>1b = Normal ACA or ACA Autoclear |
| Normal ACA | CDB Control Field, bit 3 | Specified in SAM<br>        Indicates Normal ACA required if<br>                CHECK CONDITION occurs<br>0b = ACA Autoclear if check<br>1b = Normal ACA if check |

The following behaviors are expected of targets when they indicate the following combinations of bits.

| | Normal ACA Supported = 0 | Normal ACA Supported = 1 |
|---|---|---|
| ANSI-approved Version = SCSI-2 | SCSI-2 Contingent Allegiance | Not allowed |
| ANSI-approved Version = SCSI-3 | Only Normal ACA = 0 allowed:<br>    Autoclear if check | For Normal ACA = 0:<br>    Autoclear if check<br>For Normal ACA = 1:<br>    Normal ACA if check |

If the target identifies itself as a SCSI-2 target, it cannot identify itself as supporting normal ACA.  SCSI-2 devices support Contingent Allegiance or Extended Contingent Allegiance as defined in the SCSI-2 standard.

If the target identifies itself as a SCSI-3 target, it can identify itself as supporting autoclear only or as supporting both normal ACA and autoclear.

If a SCSI-3 target supports autoclear only, the initiator shall not transmit commands that contain the Normal ACA bit set to the Normal ACA (1) state.  If a command with the Normal ACA bit is transmitted to a target, the target will indicate with a CHECK CONDITION that the control field is invalid.

If a SCSI-3 target supports autoclear only, any command that ends with a CHECK CONDITION or COMMAND TERMINATED status establishes an Automatic Contingent Allegiance condition.  If the link protocol for that target performs autosense, the ACA condition is cleared automatically upon completion of the autosense operation.  If the link protocol for that target does not perform autosense, the ACA condition is cleared according to the rules for SCSI-2 Contingent Allegiance.

If a SCSI-3 target supports both normal ACA and autoclear, the behavior of the target when a CHECK CONDITION or COMMAND TERMINATED status occurs depends upon the state of the Normal ACA bit in the CDB of the failing command.  If the Normal ACA bit is set to zero, the target establishes an ACA condition.  If the link protocol for that target performs autosense, the ACA condition is cleared automatically upon completion of the autosense operation.  If the link protocol for that target does not perform autosense, the ACA condition is cleared according to the rules for SCSI-2 Contingent Allegiance.  If the Normal ACA bit is set to one, the target establishes an ACA condition.  The ACA condition remains until cleared according to the rules specified in SAM, section 6.6.1.2.

To specify this behavior in the standards, the following words must be modified and added to the referenced standards.

Changes required for SPC:

The ANSI-approved Version field is already correctly described in section 7.5.1, Table 22, and associated text.

The following text is proposed to be added to section 7.5.1.  The Normal ACA Supported bit should be added to the proper field in the INQUIRY data format chart, probably at bit 4 of byte 7.  An appropriate abbreviation is NormACA.  The text would then be added after the text describing the RelAddr bit.

> The Normal ACA Supported bit (NormACA) of one indicates that the device server supports both the Normal ACA and the ACA Autoclear function.  A NormACA bit of zero indicates that the device server does not support Normal ACA, but does support the ACA Autoclear function.

Changes required for SAM:

All sections:

The bit presently named "ACA" is renamed "Normal ACA" or "NACA" at all referenced locations.

Section 6.1.2:

The following text is removed:

> All logical units shall implement support for at least one of the ACA bit values and may support both values.

and replaced with the following text:

> All logical units shall implement support for the Normal ACA value of zero and may support the Normal ACA value of one.  The ability to support a Normal ACA value of one is indicated in standard INQUIRY data.

Sections 6.6.1, 6.6.1.1 are unchanged.

Section 6.6.1.2:

The following text in paragraph 3 is deleted:

> If the logical unit accepts a value of zero for the ACA bit

The first sentence will then read:

> If the NACA bit is set to zero in the CDB control byte of the faulting command, then the SCSI-2 rules for clearing auto contingent allegiance condition shall apply.

No other changes should be required.