To: T10 Technical Committee
From: Jim Hatfield, Seagate (James.C.Hatfield@seagate.com)
Date: Feb. 15, 2007
Subject: SAT2 Translation of SECURITY PROTOCOL IN/OUT

Revision History
Revision 0 (Feb. 14, 2007) First revision

Related Documents
1) Project: 1711-D Rev: 09 (sat-r09.pdf)
2) SPC-4

Overview
The SECURITY PROTOCOL IN and SECURITY PROTOCOL OUT commands were designed to be as similar as possible to the ATA 'TRUSTED SEND' and 'TRUSTED RECEIVE' commands. This document specifies the translation between the SCSI and the ATA forms

Suggested Changes

Add to Clause 8
8.AA. SECURITY PROTOCOL OUT command
8.BB. SECURITY PROTOCOL OUT command

8.AA SECURITY PROTOCOL IN command

8.AA.1 SECURITY PROTOCOL IN command translation

The SECURITY PROTOCOL IN command shall be translated to either the ATA TRUSTED RECEIVE command or to the ATA TRUSTED RECEIVE DMA commands

Table 1 - SECURITY PROTOCOL IN CDB

Bit Byte	7	6	5	4	3	2	1	0
0	Operation code (A2h)							
1	Security Protocol							
2	Security Protocol Specific							
3								
4	INC512	Reserved						
5	Reserved							
6	Allocation Length							
7								
8								
9								
10	Reserved							
11	Control							

Table 2 - ATA TRUSTED RECEIVE Command Inputs

Word	Name	Description
00h	Feature	Bit Description 15:8 Reserved 7:0 Security_Protocol
01h	Count	Bit Description 15:8 Reserved 7:0 Transfer_Length (7:0)
02h-04h	LBA	Bit Description 47:24 Reserved 23:8 SP_Specific 7:0 Transfer_Length (15:8)
05h	Device	Bit Description 15 Obsolete 14 Shall be set to one 13 Obsolete 12 Transport Dependent - See 11:8 Reserved
	Command	7:0 5Ch

Table 3 - ATA TRUSTED RECEIVE DMA Command Inputs

Word	Name	Description
00h	Feature	Bit Description 15:8 Reserved 7:0 Security_Protocol
01h	Count	Bit Description 15:8 Reserved 7:0 Transfer_Length (7:0)
02h-04h	LBA	Bit Description 47:24 Reserved 23:8 SP_Specific 7:0 Transfer_Length (15:8)
05h	Device	Bit Description 15 Obsolete 14 Shall be set to one 13 Obsolete 12 Transport Dependent - See 11:8 Reserved
	Command	7:0 5Dh

8.BB.1.1 Opcode translation
The ATA Command field shall be set to either 5Ch or 5Dh.

8.BB.1.2 Security Protocol translation
The SCSI Security Protocol field shall be copied to the ATA Security_Protocol field.

8.BB.1.3 Security Protocol Specific translation
The SCSI Security Protocol Specific field shall be copied to the ATA SP_Specific field.

8.BB.1.4 Allocation Length translation
If the 512 increment (INC_512) bit is set to one:

a) if the Allocation Length is greater than FFFFh, then the device server shall return CHECK CONDITION, with sense code XXXXX

b) otherwise, the ATA Transfer_Length field shall be set to ALLOCATION LENGTH (15:0).

If the 512 increment (INC_512) bit is set to zero:

a) if the Allocation Length is greater than FFFE00h, then the device server shall return CHECK CONDITION, with sense code XXXXX

b) otherwise, the ATA Transfer_Length field shall be translated from bytes to a number of padded 512-byte units from the result of the following calculation:

ATA Transfer_Length(15:0) = ((Allocation Length + 1) / 512)

8.AA.2 SECURITY PROTOCOL IN data translation

The data transferred from the ATA device shall be translated as follows:

If the 512 increment (INC_512) bit is set to one, then the data shall be transferred to the SCSI initiator unmodified.

If the 512 increment (INC_512) bit is set to zero, then the data shall be transferred to the SCSI initiator unmodified, up to the specified Allocation Length number of bytes. Truncation may occur.

The device server shall complete the command with GOOD status as soon as the data transfer is complete.

8.BB SECURITY PROTOCOL OUT command

8.BB.1 SECURITY PROTOCOL OUT command translation

The SECURITY PROTOCOL OUT command shall be translated to either the ATA TRUSTED SEND command or to the ATA TRUSTED SEND DMA commands

Table 4 - SECURITY PROTOCOL OUT CDB

Bit Byte	7	6	5	4	3	2	1	0
0	Operation code (B5h)							
1	Security Protocol							
2	MSB	Security Protocol Specific						
3								LSB
4	INC512	Reserved						
5	Reserved							
6	MSB	Transfer Length						
7								
8								
9								LSB
10	Reserved							
11	Control							

Table 5 - ATA TRUSTED SEND Command Inputs

Word	Name	Description
00h	Feature	Bit Description 15:8 Reserved 7:0 Security_Protocol
01h	Count	Bit Description 15:8 Reserved 7:0 Transfer_Length (7:0)
02h-04h	LBA	Bit Description 47:24 Reserved 23:8 SP_Specific 7:0 Transfer_Length (15:8)
05h	Device	Bit Description 15 Obsolete 14 Shall be set to one 13 Obsolete 12 Transport Dependent - See 11:8 Reserved
	Command	7:0 5Eh

Table 6 - ATA TRUSTED SEND DMA Command Inputs

Word	Name	Description
00h	Feature	Bit Description 15:8 Reserved 7:0 Security_Protocol
01h	Count	Bit Description 15:8 Reserved 7:0 Transfer_Length (7:0)
02h-04h	LBA	Bit Description 47:24 Reserved 23:8 SP_Specific 7:0 Transfer_Length (15:8)
05h	Device	Bit Description 15 Obsolete 14 Shall be set to one 13 Obsolete 12 Transport Dependent - See 11:8 Reserved
	Command	7:0 5Fh

8.BB.1.1 Opcode translation
The ATA Command field shall be set to either 5Eh or 5Fh.

8.BB.1.2 Security Protocol translation
The SCSI Security Protocol field shall be copied to the ATA Security_Protocol field.

8.BB.1.3 Security Protocol Specific translation
The SCSI Security Protocol Specific field shall be copied to the ATA SP_Specific field.

8.BB.1.4 Allocation Length translation
If the 512 increment (INC_512) bit is set to one:

c) if the SCSI Transfer Length is greater than FFFFh, then the device server shall return CHECK CONDITION, with sense code XXXXX

d) otherwise, the ATA Transfer_Length field shall be set to ALLOCATION LENGTH (15:0).

If the 512 increment (INC_512) bit is set to zero:

c) if the SCSI Transfer Length is greater than FFFE00h, then the device server shall return CHECK CONDITION, with sense code XXXXX

d) otherwise, the ATA Transfer_Length field shall be translated from bytes to a number of padded 512-byte units from the result of the following calculation:

ATA Transfer_Length(15:0) = ((SCSI Transfer Length + 1) / 512)

8.BB.2 SECURITY PROTOCOL OUT data translation

If the 512 increment (INC_512) bit is set to one, then the data shall be transferred from the SCSI initiator unmodified for Transfer_Length units of 512 bytes.

If the 512 increment (INC_512) bit is set to zero, then the data shall be transferred from the SCSI initiator, up to the specified Transfer_Length number of 512-byte units. Pad bytes shall be appended as needed to meet this requirement. Pad bytes shall have a value of 00h.

The device server shall complete the command with GOOD status as soon as the data transfer is complete.