

Summary of T10 Activities to ISO/IEC SC 25 / WG 4

John Lohmeyer, Chair T10 Technical Committee
May 5, 2004

Last year, T10 finished the parallel SCSI standards development with the publication of SPI-5, PIP, and SSM-2.

T10 has developed Serial Attached SCSI (SAS) as the replacement for parallel SCSI. SAS uses a drive connector that is compatible with the Serial Attached ATA (SATA) drive connector. Subsystem vendors can develop products that use either kind of disk drive: SATA for cost-sensitive applications and SAS for enterprise-class applications that need the highest reliability and highest performance storage devices available.

The SAS architecture uses serial point-to-point links with circuit switches (called expanders) to provide fan-out to a large number of storage devices. The SAS expanders are relatively inexpensive because they do not attempt to store and forward packets. Instead, a full-duplex connection is established between the source device and destination device; then packets are routed through the connection with minimal FIFO buffering.

SAS supports 1.5 Mbit/sec and 3.0 Mbit/sec signaling rates. Multiple connections between two devices may be simultaneously used to increase throughput. These are called wide links.

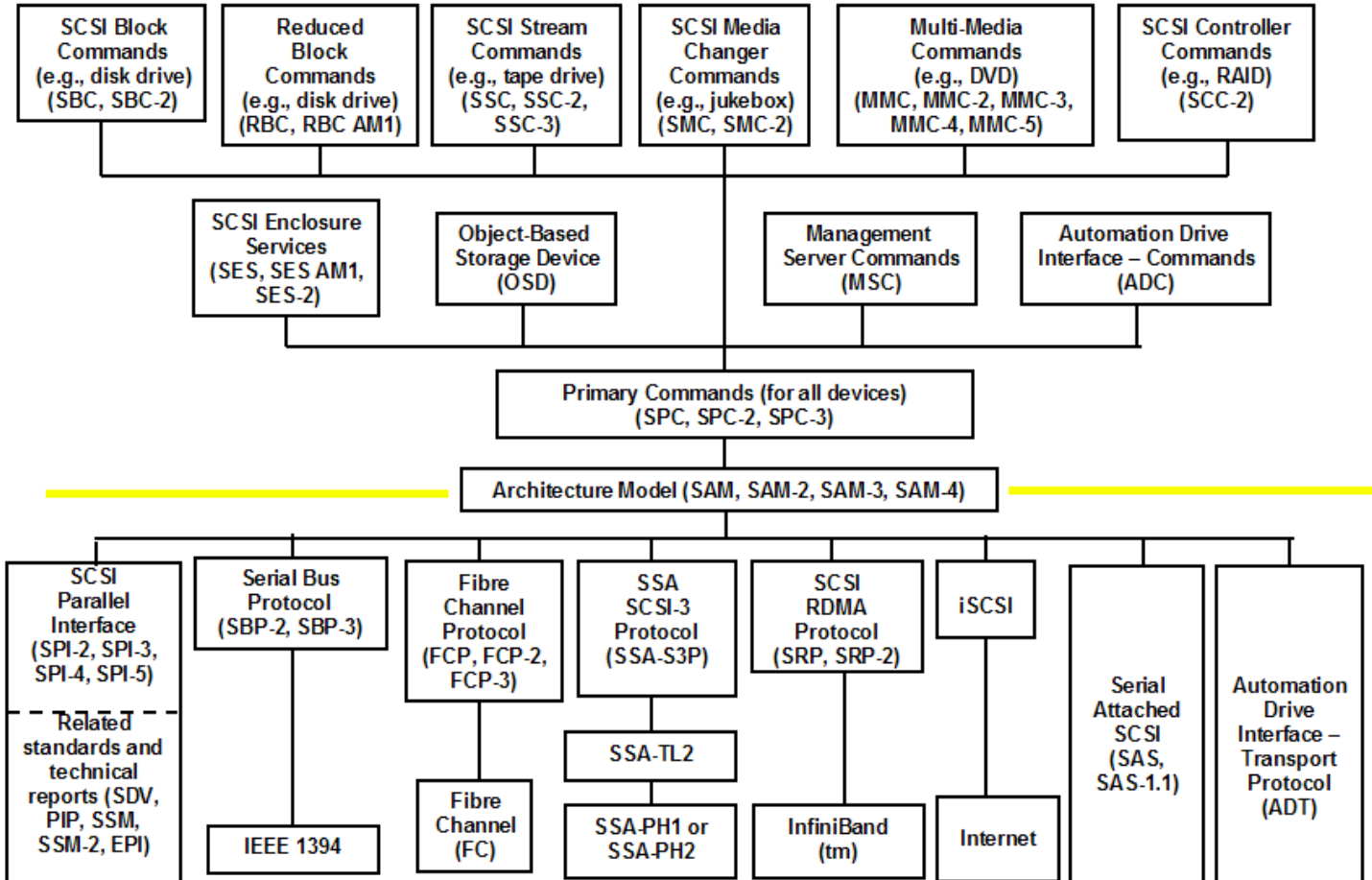
The first generation SAS standard was published by ANSI in November 2003. SAS-1.1 is in development and will include transport-layer retries, additional connector options, and other features the participants deem necessary. It is not expected that any speed increases will be incorporated.

SAS is NOT intended to compete with Fibre Channel nor iSCSI. While SAS can support thousands of devices, it is intended for applications that require at most 10s of meters of distance, typically called "attached storage".

T10 also spends significant effort on the SCSI architecture, protocols, and command sets. Figure 1 shows the relationship of these standards. With the exception of IEEE 1394, Fibre Channel, InfiniBand (tm), iSCSI, and the Internet, all of the standards shown are assigned to T10. A detailed status summary is included, below.

NOTE:

T10 has recently submitted ATA/ATAPI-7 as a new work item proposal. While T10 submitted this NWIP, the actual work on ATA/ATAPI-7 in the US is assigned to the T13 Technical Committee. Since T13 has no other international projects, it was easier to submit this project through T10. ATA/ATAPI-7 includes Volume 3, which documents a Serial Transport Protocol known as Serial ATA (or SATA).



SCSI Standards Architecture

(See <http://www.t10.org> for the latest SCSI Standards Architecture diagram and the latest project status summary.)

T10 Technical Committee Project Status Summary
(See the abbreviation key at the end)

Proj Name	BSR Number	Proj Number	Status	Next Action	Target Date	Dist. in Mailing	Rev.	PL/Editor
P R O J E C T P R O P O S A L S								
D E V E L O P M E N T								
FCP-3		1560-D	in development	to INCITS	Nov 04	2004_3	03a	David Peterson
MMC-5		1675-D	in development	to INCITS	Nov 05			Bill McFerrin
SAM-4		1683-D	in development	to INCITS	Nov 06			George Penokie
SBC-2		1417-D	in development	to INCITS	Nov 04	2004_2	13	Rob Elliott
SES-2		1559-D	in development	to INCITS	Nov 04	2004_3	07	Rob Elliott
MSC		1528-D	in development	to INCITS	Nov 04			George Penokie
SPC-3		1416-D	in development	to INCITS	Mar 04	2004_3	18	Ralph Weber
SRP-2		1524-D	in development	to INCITS	Jul 04	2003_4	00a	Cris Simpson
SSC-3		1611-D	in development	to INCITS	Nov 04	2004_3	00	Dave Peterson
SAS-1.1		1601-D	in development	to INCITS	Dec 04	2004_2	04	Rob Elliott
T 1 0 A P P R O V A L								
ADC		1558-D	T10 Aprv1	res LB cmnts	May 04	2003_5	06	Suhler / Wideman
ADT		1557-D	at T10 LB	close T10 LB	26 Apr 04	2004_3	11	Suhler / Entzel
MMC-4		1545-D	at T10 LB	close T10 LB	23 Apr 04	2004_2	03	Bill McFerrin
OSD		1355-D	at T10 LB	close T10 LB	24 Mar 04	2004_2	09	Ralph Weber
SAM-3		1561-D	at T10 LB	close T10 LB	21 Apr 04	2004_2	13	Ralph Weber
I N C I T S A P P R O V A L								
SMC-2	INCITS.382	1383-D	At INCITS	INCITS aprv1	Apr 04	2004_1	07	Erich Oetting
SBP-3	INCITS.375	1467-D	At INCITS LB	close LB	29 Apr 04	2003_5	05	Peter Johansson
P U B L I C A T I O N								
P U B L I S H E D								
SCSI3 FCP	X3.269	0993-M	X3.269:1996 [R2001]	5yr review	2006	1995_3	12	Bob Snively
MMC-2	NCITS.333	1228-M	NCITS.33:2000	5 yr review	2005	1999_4	11a	McFerrin / Roberts
MMC-3	NCITS.360	1363-D	NCITS.360:2002	5 yr review	2007	2001_6	10g	Bill McFerrin
RBC	NCITS.330	1240-M	NCITS.330:2000	5 yr review	2005	1999_4	10a	McLean / Roberts
RBC AM1	INCITS. 330/AM1	1240-M	INCITS.330-2000/ AM1-2003	5 yr review	2008	2003_3	01	Ron Roberts
SAM-2	INCITS.366	1157-D	INCITS.366:2003	5 yr review	2008	2002_5	24	Ralph Weber
SCC-2	NCITS.318	1225-M	NCITS.318:1998	5 yr review	2003	1997_5	04	George Penokie
SDV	INCITS/TR- 28	1378-DT	INCITS/TR-28:2002	5 yr review	2007	2001_6	08b	Lohmeyer / Gibbons
SES	NCITS.305	1212-M	NCITS.305:1998	5yr review	2003	1998_1	08b	Bob Snively
SES AM1	NCITS.305/ AM1	1212-M	NCITS.305:1998/ AM1:2000	5 yr review	2005	2000_4	01	Rob Elliott
EPI		1143-TR	NCITS TR-23:1998	5 yr review	2003	1998_4	16	Bill Ham
FCP-2	NCITS.350	1144-D	INCITS.350:2003	5 yr review	2008	2002_6	08	Dave Peterson
SPI-2	X3.302	1142-M	X3.302:1998	5 yr review	2003	1998_3	20b	Ham/Penokie
SPI-3	NCITS.336	1302-M	NCITS.336:2000	5 yr review	2005	2000_3	14	George Penokie
SPI-4	INCITS.362	1365-D	INCITS.362:2002	5 yr review	2007	2002_3	10	George Penokie
SPI-5	INCITS.367	1525-D	INCITS.367:2003	5 yr review	2008	2003_1	06	George Penokie
PIP	INCITS.368	1439-D	INCITS.368:2003	5 yr review	2008	2003_1	04	Zane Daggett / Bill Ham
SPC-2	NCITS.351	1236-D	NCITS.351:2001	5 yr review	2006	2001_4	20	Ralph Weber
SRP	INCITS.365	1415-D	INCITS.365:2002	5 yr review	2007	2002_4	16a	Cris Simpson
SSM	INCITS/TR- 29	1414-DT	INCITS/TR-29:2002	5 yr review	2007	2001_6	05	Larry Barnes
SSM-2	INCITS.369	1514-D	INCITS.369:2003	5 yr review	2008	2003_1	05a	Aloisi / Manildi
SSC-2	INCITS.380	1434-D	INCITS.380:2003	5yr review	2008	2003_4	09	Dave Peterson
S2TIB1		0375-T	Pub by Global	(none)		1995_1	E	George Penokie
S2TIB2		0375-T	Pub by Global	(none)		1995_1	E	
SCSI CAM	X3.232	0792-M	X3.232:1996 [R2001]	5yr review	2006	1995_3	12b	Bill Dallas
SCSI3 SAM	X3.270	0994-M	X3.270:1996	5yr review	2006	1995_4	18	Charles Monia

				[R2001]						
SCSI3	SBC	NCITS.306	0996-M	NCITS.306:1998	5 yr review	2003	1997_6	08c	open	
SCSI3	GPP	TR-16	0991-TR	X3/TR-16-1997	5 yr review	2002	1995_2	09	Gary Stephens	
SCSI3	SMC	NCITS.314	0999-M	NCITS.314:1998	5 yr review	2003	1998_1	10a	Erich Oetting	
SCSI3	MMC	X3.304	1048-M	X3.304:1997	5 yr review	2002	1997_3	10a	Ron Roberts	
SCSI3	SPC	X3.301	0995-M	X3.301:1997	5 yr review	2007	1997_2	11a	Ralph Weber	
				[R2002]						
SCSI3	SSC	NCITS.335	0997-M	NCITS.335:2000	5 yr review	2005	2000_1	22	Dave Peterson	
SAS		INCITS.376	1562-D	INCITS.376:2003	5yr review	2008	2003_4	05	Rob Elliott	
SBP-2		NCITS.325	1155-M	NCITS.325:1998	5 yr review	2003	1998_2	04	McLean/Johansson	
SCSI-2		X3.131	0375-M	X3.131:1994[1999]	5 yr review	2004		10L	Larry Lamers	
SSA-PH1		X3.293	1145-M	X3.293:1996	5yr review	2006	1996_4	09c	Ham/Scheible	
				[R2001]						
SSA-PH2		NCITS.307	1146-M	NCITS.307:1997	5 yr review	2007	1997_2	05b	Ham/Scheible	
				[R2002]						
SSA-S2P		X3.294	1121-M	X3.294:1996	5yr review	2006	1996_4	07b	John Scheible	
				[R2001]						
SSA-S3P		NCITS.309	1051-M	NCITS.309:1998	5 yr review	2007	1997_2	05b	John Scheible	
				[R2002]						
SSA-TL1		X3.295	0989-M	X3.295:1996	5yr review	2006	1996_4	10b	John Scheible	
				[R2001]						
SSA-TL2		NCITS.308	1147-M	NCITS.308:1997	5 yr review	2007	1997_2	05b	John Scheible	
				[R2002]						
SMD-E		X3.91	0053-M	X3.91M:1987	5 yr review	2007			open	
				[R2002]						

T10 Technical Committee Project Status Summary Abbreviation Key:

X3	=	Obsolete name for INCITS	comp	=	completion	cur	=	current
NCITS	=	Obsolete name for INCITS	res	=	resolve/resolving	rev	=	revision
INCITS	=	InterNational Committee for Information Technology Standards	LB	=	Letter Ballot	#	=	number
OMC	=	Operational Management Committee	pub	=	published	ng	=	negative
BSR	=	Board of Standards Review (of ANSI)	aprvl	=	approval	prep	=	preparation
WG4	=	Working Group 4 of ISO/IEC JTC 1/SC 25	apr	=	approve	cmnts	=	comments
ISO	=	International Standards Organization	dev	=	development	prj	=	project
MgtRev	=	INCITS management review	SD3	=	Project Proposal	fwd	=	forward
1PR	=	1st Public Review	T10	=	T10 Technical Committee	doc	=	document
2PR	=	2nd Public Review	.1	=	T10.1 Task Group (obsolete)	TG	=	Task Group
TBD	=	To Be Determined	CD	=	Committee Draft (ISO)	rec	=	recommend
			DIS	=	Draft International Stnd	reaf	=	reaffirm
			NP	=	New Project	w/dw	=	withdraw
			IS	=	International Standard	rvis	=	revise
			A/I	=	ANSI/ISO/IEC (joint standard)			