X3T9.2/88-148

CAM Committee

Members:					
	Adaptec	Columbia Data	LMS OSD	Miniscribe	Storage Dimensions
	CDC Imprimis	DEST	Maxtor	Quantum	Sytron
	Cipher Data	ENDL	Micropolis	Seagate	Western Digital

November 4, 1988

The first meeting of the SCSI-2 CAM (Common Access Method) Committee was hosted on October 19 at the Sunnyvale Hilton by Seagate. The following attendees were present:

Company	Name	Company	Name
Adaptec	B. Snively	Columbia Data	A. Welsh
	E. Turner		R. Tewell
Ballard Synergy	C. Ballard	Electronic Design	B. Phillips
Bustek	J. Chen	Emulex	M. Aarons
CDC Imprimis	J. Worden	Fujitsu America	G. Chin
CFCL	R. Morin		J. Lee
Cipher Data	D. Davies	Hewlett Packard	J. Dunning
	A. Giorgiou	Iomega	L. Holmstrom
	K. Kelly	Laserdrive	A. Ebright
	L. Payne	LMS OSD	P. Boulay
Maxtor	D. Banerje	Optotech	T. Putnam
	F. Hannon	Quantum	J. McGrath
	H. Meyer	Seagate	R. Perry
	B. Mortensen		J. Rubino
	J. Safire		M. Robinson
Maxtor/SDI	L. Robinson		D. Weber
Microport Systems	G. Tollkahn	Skillstech	S. Kilsdonk
Miniscribe	J. Mangan	SMS	J. Ellerbach
Mitsubishi	J. Hamada	Sony	L. Lamers
Mitsumi Tech	K. Westphal	Sytron	M. Evans
NCR	D. Skinner	Western Digital	B. Bonner

The purpose of the first meeting was to gather information, set the goals, and define the environment in which the SCSI-2 CAM Committee is to operate. The principles of operation for the SCSI-2 CAM Committee are very similar to those which proved successful for the ESDI Steering Committee. There are three levels of participation:

- Attending the meetings is open to all, and any attendee can participate in discussions.
- The minutes and copies of material which are discussed during meetings are distributed only to those who sign up to receive documentation. The fee for document distribution is $200 ($300 for overseas).
- The individuals representing companies which are members of the SCSI-2 CAM Committee receive a set of documentation and are entitled to vote on issues that arise during the meetings. In rare cases, where it is felt that all member companies should have a vote, they will be balloted by mail. The fee to become a member is $2,000.

Material presented at SCSI-2 CAM Committee meetings becomes public domain. There will be no restrictions on the distribution of material presented at committee meetings.

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Members: Adaptec, CDC Imprimis, Cipher Data, Columbia Data, DEST, ENDL, LMS OSD, Maxtor, Micropolis, Miniscribe, Quantum, Seagate, Storage Dimensions, Sytron, Western Digital

The sites of SCSI-2 CAM Committee meetings will rotate based on which member companies volunteer to host the meetings. There will be no attempt made to force alternating between East and West coast locations, or between Northern and Southern California. In the event that more than one company volunteers to host a meeting, the members will choose between the alternatives.

The funds received by ENDL to manage the committee are placed in escrow, and drawn against as expenses are incurred. A full accounting of receipts and disbursements is provided to member companies on a regular basis.

The primary objective is to define a de facto set of services which will simplify the integration of SCSI, and widen the market for SCSI products. The more limited the task we set as a committee, the more likely will be specifications that enhance interoperability and plug compatibility.

Another objective is to submit the completed document(s) to ANSI to become standards. There are several ways in which this may be accomplished: one may work through the existing committee structures or petition ANSI directly for the document(s) to be printed as standard(s). The process to be used will be decided upon when we know better what it is that we have to offer to ANSI.

Presentations were made by:

Jim Rubino	Seagate	Bruce Bonner	Western Digital
Ron Perry	Seagate	Rick Tewell	Columbia Data
Kim Kelly	Cipher	Larry Holmstrom	Iomega
Jim McGrath	Quantum	Rich Morin	CFCL

Jim Rubino put into perspective why Seagate had begun development on the SAM (SCSI Access Module), and handed over to Ron Perry to give an overview of what had been implemented (see S1-S2).

Booting is handled outside the SCSI model by ROM on the HBA. The total memory requirement is approximately 20K bytes of "C" code, and the simplest way to look upon the SAM is as a set of SCSI macros. Copies of the SAM specification were provided (see S3-S10).

Kim Kelly of Cipher Data added his comments on the benefits of Seagate and Cipher working together to provide common support for disk and tape. Copies of the SCSI-Facto specification were provided (see C1-C75). This is a subset of SCSI-2 as of Rev 2 that defines the baseline functionality needed to support the SAM.

Jim McGrath of Quantum defined his company's interest (see Q1-Q4) as being primarily in the ability to embed SCSI into a drive without there being a physical SCSI bus present. He described some problems of this environment, with references to the PC AT bus in particular. Jim believes the greatest benefit of the CAM will come from a "severe pruning of SCSI functionality in order to meet the goal of a precise, simple, software interface."

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Bruce Bonner of Western Digital described SCSI as inherently incompatible with operating systems. Manufacturers are faced with a three dimensional Rubik's Cube of devices, busses and operating systems (see W1-W2). SCSI should be irrelevant to the discussion on CAM insofar as the operating system is concerned, especially if the goal is to be compatible with any ISV (Independent Software Vendor) products.

Rick Tewell of Columbia Data Systems provided more detail. He described Columbia's SDLPI (Standard Device Layer Protocol Interface) as "register driven, real mode, single thread" for MS DOS on the device side and structure driven, protected mode, multi-thread" to the operating system. Disk partitioning has been designed so that a single device can host multiple operating systems, each with its own unique characteristics.

The software implementation of SDLPI is under exclusive license to Western Digital at this time. This means it cannot be licensed by others unless Western Digital is involved. The 10/17 copy of the SDLPI was released to the CAM Committee for general distribution (see CD1-CD16).

Larry Holmstrom of Iomega described the OAD (Open Architecture Driver) which has been developed. A kernel has to be written for each operating system, and a common library of tables is used for adapters and devices.

The interface to the operating system and the IOCTL are public interfaces, but the configuration tables mapped for third party attachment are licensed. Iomega plans to recover its development costs by charging royalties on all products sold that operate with the Iomega driver/tables. There is a third-party interface to support cacheing, encryption and other functions directly outside the scope of typical I/O.

Licensing fees and Non Recurring Engineering expenses are applied as necessary. There is no intent to open the interfaces at this time. None of the material Larry presented was provided as hard copy in time for this mailing.

Rich Morin of Canta Forda Computer Labs described the concept he has been working with that he describes as "SCSI glue" (see CF1-CF5). The glue is oriented towards SCSI devices not normally supported by the kernel but which are needed by applications, and can support multiple SCSI host bus adapters in one system.

Larry Lamers of Sony noted that SCSI has more functions than the operating system, and the CAM Committee must choose between standardizing on function or on structure. Columbia and Iomega offer a choice between register driven and structure driven logic, the two are incompatible.

Bob Snively of Adaptec pointed out that the wrong attendees appeared to be present, as everyone had the problem of attaching to systems. Participation

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is needed by those who are the source of the attachment problems, such as the BIOS writers and system integrators.

The following list of generic functional requirements was discussed:

- Layered interface
- Arbitrary packets
- Host bus independent
- Logical level interface
- Hardware bus independent
- Host processor independent
- Operating System independent
- Allow abstract device actions
- Be able to hide SCSI-specifics
- Multiple I/O buses on same system
- Bidirectional (multiple hosts on same bus)
- Both user and kernel mode access to SCSI peripherals
- Allow fully general devices (to not preclude oddball peripherals)

Given the wide variety of backgrounds present, some common ground has to be established to base decisions upon. A number of volunteers came forward:

- Rick Tewell will have a primer on how DOS and Unix initiate I/O requests.
- Mike Evans (Sytron) is going to define what an ISV wants from the CAM.
- Jim McGrath is going to focus on the small system needs.
- Bob Snively volunteered a paper of general interest.

The goal is to complete a preliminary specification by June, 89. With two different layers of software interfacing to work on (one oriented to the SCSI/HBA and the other to the operating system), this is aggressive.

The next meeting will be hosted by Cipher Data in San Diego on December 7 at 9:00 a.m. The ANSI meetings are also being hosted by Cipher Data all week. X3T9.2, which is responsible for SCSI-2, is meeting the previous two days.

This is peak season in San Diego and I strongly recommend that you make your reservations at the Hyatt Islandia NOW! Call 800-228-9000 and be sure to mention ANSI/Cipher.

Yours sincerely,

I. Dal Allan
Chairman

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