

**T10/02-098r0**

**Project Proposal  
for a new  
INCITS Standard**

**Serial Attached SCSI  
(SAS)**

**May 2, 2002**

## **1. Source of Proposed Project**

**1.1 Title:** Serial Attached SCSI.

**1.2 Date Submitted:** May 2, 2002.

**1.3 Proposing Group:** T10.

## **2. Process Description for the Proposed Project**

**2.1 Project Type:** D - Development.

**2.2 Type of Document:** Standard.

**2.3 Definitions of Concepts and Special Terms:** none.

**2.4 Expected Relationship with Approved Reference Models, Frameworks, Architectures, etc.**

None, it is expected that this standard will be used in closed systems.

**2.5 Recommended INCITS Development Technical Committee:** T10.

### **2.6 Anticipated Frequency and Duration of Meetings**

Technical Committee T10 meets on a regularly scheduled basis (see <http://www.t10.org> for the current meeting schedule). Specific task ad hoc groups are called as required between the regular meetings but their results are not binding.

**2.7 Target Date for Initial Public Review (Milestone 4):** December 2003.

**2.8 Estimated Useful Life of Standard or Technical Report:** 5 Years.

### **3. Business Case for Developing the Proposed Standard or Technical Report**

#### **3.1 Description**

The Serial Attached SCSI is a new physical transport for SCSI intended to focus on new configurations that traditionally use the parallel SCSI transport. It will use serial point-to-point links. Expanders may be used to fan out to multiple devices. A goal of this project is to facilitate the development of systems that can include either Serial Attached SCSI devices or Serial ATA devices.

The following items should be considered for inclusion in Serial Attached SCSI:

- 1) define the physical interconnect to support multiple transfer rates (e.g., 1.5 Gbit/sec, 3.0 Gbit/sec);
- 2) define the layers to support attaching Serial ATA devices to multi-mode Serial Attached SCSI / Serial ATA systems;
- 3) define key expander interoperability features (address assignment, contention resolution, etc.);
- 4) define a SAM-compliant protocol layer to support multiple SCSI initiators and multiple SCSI targets;
- 5) other capabilities that may fit within the general application scope of this project.

#### **3.2 Existing Practice and the Need for a Standard**

Current enterprise class storage devices typically use either the parallel SCSI interface (SPI-n) for configurations of up to 15 devices or Fibre Channel for much larger configurations. As the signaling rates increase, the electrical limitations of the parallel SCSI multi-drop bus are becoming more problematic. A low-cost serial point-to-point topology with inexpensive expander devices is necessary to support the market currently addressed by parallel SCSI.

#### **3.3 Implementation Impacts of the Proposed Standard**

##### **3.3.1 Development Costs**

Members of T10 will provide the necessary resources. The T10 members will host the required meetings for development, provide for the necessary lab experiments, and provide the Technical Editor for the project.

##### **3.3.2 Impact on Existing or Potential Markets**

This proposed project is intended to preserve as much as practical of the parallel SCSI software investment as the physical interface migrates from a parallel multi-drop bus to a serial point-to-point switched architecture.

##### **3.3.3 Costs and Methods for Conformity Assessment**

The committee will consider the results of testing as may be available to the committee through the voluntary efforts of the various participants in T10. With this method all costs are borne by the organizations of the various participants and have for the most part been mainly an adjunct of their normal development costs.

##### **3.3.4 Return on Investment**

ROI information is considered proprietary data by the member organizations, but members have stated that the ROI is expected to be large.

#### **3.4 Legal Considerations**

##### **3.4.1 Patent Assertions**

Calls will be made to identify assertions of patent rights in accordance with the relevant INCITS, ANSI, and ISO/IEC policies and procedures.

##### **3.4.2 Dissemination of the Standard or Technical Report**

Drafts of this document will be disseminated electronically. Dissemination of the final standard will be restricted, as the document becomes property of INCITS, ANSI, and/or ISO/IEC.

## 4. Related Standards Activities

### 4.1 Existing Standards:

<b>ID Number</b>	<b>Title</b>
X3.270:1996	SCSI-3 Architecture Model (SAM)
X3.301-1997	SCSI-3 Primary Commands (SPC)

### 4.2 Related Standards Activity

<b>ID Number</b>	<b>Title</b>
T10/1157-D	SCSI Architecture Model - 2 (SAM-2)
T10/1236-D	SCSI Primary Commands - 2 (SPC-2)
T10/1416-D	SCSI Primary Commands - 3 (SPC-3)

### 4.3 Corresponding ISO projects

<b>ID Number</b>	<b>Title</b>
ISO/IEC 14776	Multipart SCSI standard
ISO/IEC 14776-411	SCSI-3 Architecture Model (SAM)
ISO/IEC 14776-311	SCSI-3 Primary Commands (SPC)

### 4.4 Recommendations for Close Liaison

Technical Committee T13.