

**Project Proposal
for a
New INCITS Standard**

**Fibre Channel SATA Tunnelling Protocol
(FC-SATA)**

1 Source of the Proposed Project

1.1 Title

Fibre Channel SATA Tunnelling Protocol (FC-SATA)

1.2 Date Submitted

9 June 2005

1.3 Proposer(s)

INCITS Technical Committee T11

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

T11

2.6 Anticipated Frequency and Duration of Meetings

Technical Committee T11 meets on a regularly scheduled basis (see <http://www.t11.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)

April 2007

2.8 Estimated Useful Life of Standard or Technical Report

10 years

3 Business Case for Developing the Proposed Standard or Technical Report

3.1 Description

This proposal recommends that a standard be developed to specify a new application protocol mapping to Fibre Channel (i.e., an FC-4). The new FC-4 would enable use of Fibre Channel topologies to attach Serial ATA devices to ATA host systems. The Serial ATA interface is defined in the ATA/ATAPI-7 set of standards (INCITS 397:2005). The proposed standard would specify:

- a) Efficient transport of Serial ATA commands and responses over any Fibre Channel topology;
- b) Communication of necessary Serial ATA interface conditions over any Fibre Channel topology;
- c) Coordinated shared use of Serial ATA devices by multiple host systems on any Fibre Channel topology;
- d) Discovery of Serial ATA devices attached to any Fibre Channel topology;
- e) Concurrent operation with other Fibre Channel FC-4s in the same Fibre Channel topology; and
- f) Other capabilities that may fit within the scope of this project.

The proposed standard would require no changes to existing Serial ATA standards and no changes to existing Fibre Channel standards other than nominal changes necessary for addition of a new FC-4. The proposed standard would be suitable for implementation in infrastructure attachment devices, so that existing Serial ATA and Fibre Channel products may be incorporated in systems that take advantage of the proposed standard.

3.2 Existing Practice and the Need for a Standard

Fibre Channel is the dominant interconnect technology for high capacity, high reliability storage systems, including both Storage Area Networks and Storage System internal networks. Fibre Channel storage systems today are based on Fibre Channel Protocol (FCP), an application protocol that is carried over Fibre Channel. FCP is a robust protocol for transport of SCSI commands from SCSI initiators to SCSI targets.

Serial ATA is a newly standardized interface that extends the ATA storage interface to higher performance while retaining much of the low cost of ATA. ATA is the dominant interface technology for low cost storage, and Serial ATA is widely expected to inherit that position.

Some of the characteristics of Serial ATA limit its applicability to large storage systems, particularly that it is a point to point interface (i.e., one device attaches to one host system) and its distance capability is limited. The recent INCITS/T10 standard Serial Access SCSI (SAS) includes a Serial ATA Tunnelling Protocol (STP) that allows attachment of multiple Serial ATA devices to multiple hosts, but is incompatible with the widely installed Fibre Channel technology, so it requires a complete replacement of the interconnect infrastructure of a storage system design or implementation in order to use it.

The standard proposed here would resolve these issues by enabling attachment of existing and future standard Serial ATA devices to existing and future ATA internal host interfaces, via existing and future standard Fibre Channel infrastructure.

3.3 Implementation Impacts of the Proposed Standard

3.3.1 Development Costs

This standard will be developed through the voluntary and cooperative efforts of T11 Task Committee members. No significant development costs are anticipated.

3.3.2 Impact on Existing or Potential Markets

The proposed standard will enable synergistic application of existing and conceived products in the Serial ATA and Fibre Channel technologies. The applications of this standard include new components that may be added to currently installed storage systems, increasing their value and extending their useful lifetime. It is expected to lead to lower cost and higher reliability storage systems than are practical without it, particularly with respect to tiered storage system designs. These advantages are expected to increase the market for both Fibre Channel and Serial ATA technology.

3.3.3 Costs and Methods for Conformity Assessment

The committee will consider the results of testing provided to the committee through the voluntary efforts of the participants in T11. 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, as the proposed technology heavily relies on unmodified implementations of existing standards and may require only narrowly targeted new development.

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. T11 is aware of patent assertions that have been made and letters indicating compliance with INCITS policies have been received by T11.

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 the property of INCITS, ANSI, or ISO/IEC.

4 Related Standards Activities

4.1 Existing Standards and Technical Reports

ANSI INCITS 397:2005, *AT Attachment with Packet Interface-7 (ATA/ATAPI-7)*

ANSI INCITS 352-2002, *Fibre Channel - Physical Interface (FC-PI)*

ANSI INCITS 404-2005, *Fibre Channel - Physical Interface (FC-PI-2)*

ANSI INCITS 332-1999, *Fibre Channel - Arbitrated Loop (FC-AL-2)*

ANSI INCITS 373-2003, *Fibre Channel - Framing and Signaling Interface (FC-FS)*

ANSI INCITS 387-2004, *Fibre Channel - Generic Services - 4 (FC-GS-4)*

4.2 Related Standards Activity

Project 1699-D, *AT Attachment-8 - ATA/ATAPI Command set (ATA8-ACS)*

Project 1697-D, *AT Attachment-8 - Serial Transport (ATA8-ST)*

Project 1625-D, *Fibre Channel - Physical Interface - 3 (FC-PI-3)*

Project 1647-D, *Fibre Channel - Physical Interface - 4 (FC-PI-4)*

Project 1619-D, *Fibre Channel - Framing and Signaling - 2 (FC-FS-2)*

Project 1620-D, *Fibre Channel - Link Services (FC-LS)*

Project 1677-D, *Fibre Channel - Generic Services - 5 (FC-GS-5)*

4.3 Recommendations for Close Liaison

INCITS Technical Committee T13

5 Units of Measurement used in the Standard

The International System of Units (SI) units shall be used.