

T11/98-146v0

Project Proposal

For a New

NCITS Standard

FIBRE CHANNEL

FRAMING AND SIGNALING INTERFACE

(FC-FS)

April 23, 1998

1 IDENTIFICATION OF PROPOSED PROJECT

1.1 TITLE: Fibre Channel Framing and Signaling Interface (FC-FS)

1.2 PROPOSER: T11

1.3 DATE SUBMITTED: April 23, 1998

1.4 PROJECT TYPE: D - Development done within NCITS TC.

2 JUSTIFICATION OF PROPOSED STANDARD

2.1 NEEDS:

It is now ten years since work began on the definition of the serial, fibre-optic interface definition would eventually come to be known as Fibre Channel. Since 1988 a total of twenty-six standards projects have been approved to define aspects of the Fibre Channel interface and interconnection scheme, as well as the methods of transport of both existing and new protocols.

The initial Fibre Channel standards project (Project 755-D) defined both a general structure for Fibre Channel and a set of concepts. The structure included both a modular architecture for an interface and models of a small number of interconnection topologies including a general fabric functional model. The document also included a set of requirements for all aspects of the interface. These include multiple physical variant definitions each with media, connector and transceiver requirements, a coding scheme definition, and a rich lowest-level protocol definition. Thus the document which was approved (X3.230:1994, FC-PH) contained over 400 pages.

Since then, the topologies and the modular interface architecture defined for Fibre Channel have been exploited in a number of ways. Enhanced interface definitions have also produced, including

physical variant definitions which use new transceiver technologies and additional media types to provide greater data rates over longer distances. A second generation interface standard (FC-PH-2) has been approved as X3.297:1996, and a third generation standard (FC-PH-3) is in the process of approval. The modular architecture has the considerable advantage of allowing the subsequent generations to be defined as 'delta' documents from the original without having to include all of the previous material. FC-PH-2 and FC-PH-3 have been structured as delta documents.

Taken together, the three FC-PH documents described above include in excess of twenty different physical variant definitions, six classes of service, a significant number of link services, and several common services. However only a minority of those variant, class and service definitions have appeared in actual Fibre Channel implementations. In particular "Profiles" of the standards have identified small subsets of the definitions as suitable for specific markets.

In addition, as Fibre Channel products become more widely deployed in the marketplace, additional applications have been discovered with characteristics which differ from those for which the existing FC Classes of Service were designed. It is desired therefore to investigate extensions to the existing FC functionality to better serve these requirements.

However to create another 'delta' FC-PH-x document would create a document set which is too unwieldy for general use, and which may well result in interoperability problems.

Therefore it is proposed to produce a single document which incorporates all of the Classes of Service, Link Services, Common Services and associated definitions which of interest for current and future implementations as of 1998, and which includes new service definitions appearing in this document for the first time. Such a document is the subject of this project proposal.

2.2 RECOMMENDED SCOPE OF STANDARD:

This proposal recommends the development of a Fibre Channel Framing and Signaling Interface (FC-FS) standard. Included within the recommended scope of this project are:

- 1) The consolidation of the relevant sections (framing and signaling) from FC-PH, FC-PH-2, and FC-PH-3 and associated errata, annexes and amendments into a single encompassing document.
- 2) The deletion or obsoleting of outdated functions and features from those documents.
- 3) The inclusion of additional link services in support of new functions defined by the FC family of documents.
- 4) The inclusion of improvements and clarifications to the definitions of existing services as dictated by experience with existing implementations;
- 5) Other capabilities which will improve the performance of existing FC products and fit those products for new applications.

2.3 EXISTING PRACTICE IN AREA OF PROPOSED STANDARD:

There are existing implementations of the Fibre Channel suite of standards.

2.4 EXPECTED STABILITY OF PROPOSED STANDARD WITH RESPECT TO CURRENT AND POTENTIAL TECHNOLOGICAL ADVANCES:

The architecture of Fibre Channel, as defined in FC-PH, is based around a functional model of an interconnection fabric and a flexible definition of an interface. Because the interface definition clearly separates the coding and protocol aspects of the interface from the transceiver definition, it has proven to be straightforward in the successor standards to FC-PH to adopt additional service definitions as they are needed for new applications.

As such, the definitions produced by this project are expected to be stable and long-lived.

3 DESCRIPTION OF PROPOSED PROJECT

3.1 TYPE OF DOCUMENT (STANDARD OR TECHNICAL REPORT): Standard

3.2 DEFINITION OF CONCEPTS AND SPECIAL TERMS: None

3.3 EXPECTED RELATIONSHIP WITH APPROVED NCITS REFERENCE MODELS:

All Fibre Channel standards are intended for use in closed systems.

3.4 RECOMMENDED PROGRAM OF WORK:

(1) Solicit participation by the present Fibre Channel participants through T11 procedures and new participants through press releases. Invite comments by end-user organizations and invite proposals from Fibre Channel development organizations and other organizations that may have interest in this proposed standard.

(2) Investigate existing standards and standards projects to determine their applicability to the development effort, and establish liaisons with other standards committees as appropriate.

(3) Prepare a draft standard based on proposals submitted and other information gathered during the investigations.

(4) Test the standard through the voluntary and cooperative efforts of T11 Task Group members.

(5) Submit the draft proposed standard to NCITS for further processing.

3.5 RESOURCES - INDIVIDUALS AND ORGANIZATIONS COMPETENT IN SUBJECT MATTER:

The current membership of T11 consists of representatives from all parts of the computer industry including semiconductor chip manufacturers, computer system manufacturers and Government agencies. Members of T11 have expressed their desire to participate and cooperate in the development of this proposed standard.

There are sufficient resources to complete the definition of this standard without delaying work on other standards.

3.6 RECOMMENDED NCITS DEVELOPMENT TECHNICAL COMMITTEE:

It is recommended that this project be assigned to TC T11, in order that the project be coordinated with work on other Fibre Channel standards.

3.7 ANTICIPATED FREQUENCY AND DURATION OF MEETINGS:

This project will make use of the regularly-scheduled bimonthly T11 plenary meetings. Informal Working Groups will be organized on an ad-hoc basis to discuss specific subjects where appropriate.

3.8 TARGET DATE FOR INITIAL PUBLIC REVIEW (MILESTONE 4):

October 1998.

3.9 ESTIMATED USEFUL LIFE OF STANDARD:

It is anticipated that this standard will have a useful life of over 10 years.

4 IMPLEMENTATION IMPACTS

4.1 IMPACT ON EXISTING USER PRACTICES AND INVESTMENTS:

The proposed standard will provide a migration path complementary to existing practices and investments in basic Fibre Channel services. It will provide a means to leverage user investments in those services to new application areas.

It is likely that isolated adverse effects would occur in any case through non-standard evolution or revolution.

4.2 IMPACT ON SUPPLIER PRODUCTS AND SUPPORT:

The proposed standard will provide an upward growth path that complements and enhances existing supplier products and support schemes. The proposed standard will result in expanded applications for existing and conceived products in both the channel and network markets. It is likely that isolated adverse effects would occur in any case through non-standard evolution or revolution.

4.3 TECHNIQUES AND COSTS FOR COMPLIANCE VERIFICATION:

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.

4.4 LEGAL CONSIDERATIONS: None known

5 CLOSELY RELATED STANDARDS ACTIVITIES

5.1 EXISTING STANDARDS:

(1) X3.230:1994, Fibre Channel Physical and Signaling Interface (FC-PH), with amendment X3.230/AM1:1996;

(2) X3.272:1996, Fibre Channel - Arbitrated Loop (FC-AL);

(3) X3.297:1997, Fibre Channel - Physical and Signaling Interface - 2 (FC-PH-2).

5.2 NCITS STANDARDS DEVELOPMENT PROJECTS:

(1) Project 901-D for Fibre Channel - Physical and Signaling Interface -3 (NCITS 303:199x, FC-PH-3), which has completed a first Public Review;

(2) Project 1133-D for Fibre Channel - Second Generation Arbitrated Loop (FC-AL-2), which is in development in T11.3;

5.3 NCITS STUDY GROUPS: None

5.4 OTHER RELATED DOMESTIC STANDARDS DEVELOPMENT PROJECTS:

None

5.5 ISO/IEC JTC 1 STANDARDS DEVELOPMENT PROJECTS:

The Fibre Channel standards are to be submitted as project requests to ISO JTC1/SC25. International Fibre Channel standards are in the ISO/IEC 14165-xxx series.

5.6 OTHER RELATED INTERNATIONAL STANDARDS DEVELOPMENT PROJECTS: None

5.7 RECOMMENDATIONS FOR COORDINATING LIAISON: None

5.8 RECOMMENDATIONS FOR CLOSE LIAISON: None