

FC-SW-4 PROJECT PROPOSAL

1. Source of the Proposed Project

1.1 Title: Switch Fabric - Generation 4

1.2 Date: December 11, 2003

1.3 Proposer: Technical Committee T11, 58 members also INCITS members

2. Process Description for the Proposed Project

2.1 Project Type: D - Development within INCITS T11

2.2 Type of Document: Standard

2.3 Definitions of Concepts and Special Terms

Fabric - an entity that interconnects various Nx_Ports attached to it, and is capable of routing frames using information contained in the FC-2 frame header.

Fabric Element -The smallest unit of a Fabric that meets the definition of a Fabric. From the point of view of an attached Nx_Port, a Fabric consisting of multiple Fabric Elements is indistinguishable from a Fabric consisting of a single Fabric Element.

Switch - A type of Fabric Element.

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

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

2.5 Recommended INCITS Development Technical Committee: T11

2.6 Anticipated Frequency and Duration of Meetings

Technical Committee T11 meets bimonthly. Specific ad hoc groups are called as may be required for one to three days between the regular meetings but their results are not binding.

2.7 Target Date for Initial Public Review (Milestone 4): October 2005

2.8 Estimated Useful Life of Standard or Technical Report

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

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

3.1 Description

FC-SW-4 describes the requirements for an interconnecting Fabric consisting of multiple Fabric Switch elements to support the ANSI/INCITS Fibre Channel - Framing and Signaling (FC-FS) and ANSI/INCITS Fibre Channel - Physical Interface (FC-PI) standards.

3.2 Existing Practice and the Need for a Standard

The FC-SW Standard addressed the basic functions necessary to interconnect Fibre Channel switches and distribute Domain IDs. These functions included the exchange of link parameters, exchange of fabric parameters, selection of a Principal Switch, and distribution of Domain IDs from the Principal Switch. This work was completed in 1998.

Development of the second generation Fibre Channel Switch Fabric standard began in 1997 and was completed in 2001. The FC-SW-2 project addressed path selection protocols, distributed services, and zoning. This included Fabric Shortest Path First (FSPF) path selection, Name Server distribution, Management server distribution, and zone exchange and merge protocols. This standard facilitated the wide distribution of heterogeneous fabrics that have common path selection protocols, and mechanism for distributed services. FC-SW-2 was a complete replacement for FC-SW.

Development of the third generation Fibre Channel Switch Standard began in 2001 and will be completed in late 2003 or early 2004. The FC-SW-3 project addressed broadcast, enhanced zoning, link incident reporting, inter-switch communication for the Fabric Services, and provided additional details for the Port and Fabric initialization state machines

and FSPF. FC-SW-3 is a complete replacement for FC-SW-2.

Today switches which implement the protocols developed in FC-SW-3 are being deployed. There are additional operational and management functions that need to be defined to allow more flexible and interoperable Fibre Channel Switch Fabric deployment. Examples of these functions are:

- 1) FSPF-Backbone;
- 2) Scalability enhancements;
- 3) Fabric expansion support;
- 4) Inter-Switch communication for server support and notifications;
- 5) Fabric time-out values;
- 6) Virtual channel support;
- 7) Enhanced commit service;
- 8) Security support (e.g., Zoning);
- 9) Fabric diagnostics and error isolation;
- 10) Enhanced Fabric services (e.g., time services);
- 11) other technical content identified during the development of this standard.

An FC-SW-4 standard will allow for the adoption of these necessary functions.

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 Technical Committee members. No significant development costs are anticipated.

3.3.2 Impact on Existing or Potential Markets

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.

3.3.3 Costs and Methods for Conformity Assessment

The committee will consider the results of FC-SW-4 testing as may be available to the committee through the voluntary efforts of the various 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

The return on investment for this development is expected to be high, due to the commonality of effort directed to a singular method of providing the services covered by the proposed Standard.

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 not aware of any patent assertions that may be made.

3.4.2 Dissemination of the Standard or Technical Report

Drafts of this document will be disseminated electronically. The Standard will be disseminated in accordance with ANSI and INCITS procedures.

4. Related Standards Activities

4.1 Existing Standards

ANSI/INCITS 352-2001, Fibre Channel Physical Interface (FC-PI)

ANSI X3.230-1994, Fibre Channel Physical and Signaling Interface (FC-PH)

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

ANSI X3.303-1998, Fibre Channel Physical and Signaling Interface - 3 (FC-PH-3)

ANSI/INCITS 355-2001, Fibre Channel Switch Fabric Second Generation (FC-SW-2)

ANSI/INCITS 348-2000, Fibre Channel Generic Services - Third Generation (FC-GS-3)

ANSI/INCITS 372-2003, Fibre Channel Backbone (FC-BB-2)

ANSI/INCITS 357-2001, Fibre Channel Virtual Interface - (FC-VI)

ANSI/INCITS 356:2001, Fibre Channel Audio Visual - (FC-AV)

4.2 Related Standards Activity

Project 1506-D, Fibre Channel Physical Interface - Second Generation (FC-PI-2)

Project 1508-D, Fibre Channel Switch Fabric - Third Generation (FC-SW-3)

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

Project 1639-D, Fibre Channel Backbone - Second Generation (FC-BB-3)

Project 1505-D, Fibre Channel Generic Services - Fourth Generation (FC-GS-4)

4.3 Recommendations for Close Liaison

IETF

5. Units of Measurement used in the Standard

Not Measurement Sensitive