

National Committee for Information Technology Standards

NCITS Secretariat, Information Technology Industry Council (ITI)
1250 Eye St. NW, Suite 200, Washington, DC 20005
Telephone 202-737-8888; Fax 202-638-4922;
Email: ncits@itic.org

Doc: IT/99-0544 X
Date: November 24, 1999
Project: n/a
Ref. Doc:
Reply to: Deborah J. Donovan
Phone: 202-626-5746
email: ddonovan@itic.org

ACTION REQUESTED: NCITS Members - For Seven-Day Review ending 12/08/99
cc: NCITS Community for Information
Subject: NCITS T11 Approval of a Proposed Project Proposal for a New Standard, 10 Gbps Fibre Channel Physical Layer

Technical Committee T11 has approved a Project Proposal for a New Standard, 10 Gbps Fibre Channel Physical Layer to NCITS for further processing.

In accordance with the TC-empowerment approval procedures approved by NCITS in October 1999 and now included in the NCITS/SD-2, the NCITS Secretariat confirmed the TC approved this project proposal after complying with the meeting requirements listed below or through a 30-day letter ballot.

If the Project Proposal originates within an NCITS Subgroup, voting on the submission of the Project Proposal is conducted in accordance with 4.4; the vote must be included with submission of the Project Proposal.

The Project Proposal must be included on the Draft Agenda for the Subgroup meeting at which action is expected according to 4.3.4

If the Project Proposal is approved, work on the project may begin immediately on the project.

The Chair of the originating Subgroup shall forward to the NCITS Secretariat within three calendar-days the following information:

- 1) The approved Project Proposal

- 2) The next Subgroup meeting information
- 3) Any other supplemental information the Subgroup may wish to provide (i.e., draft press release) for registration of an NCITS project number and web announcement.

Upon receipt of the information package from the Chair of the originating Subgroup, the Secretariat shall electronically notify NCITS members of the approved Project Proposal.

Any two NCITS members may request an appeal of the approved Project Proposal within seven calendar-days.

If there is no appeal of the approved Project Proposal, a project number is assigned and announced by the Secretariat.

If an appeal is made of the approved Project Proposal, the Chair of the originating Subgroup is notified and NCITS voting is conducted according to 4.4.

If the Project Proposal is not approved, the Secretariat so notifies the proposer.

FC-PI-2 PROJECT PROPOSAL

1. Source of the Proposed Project

1.1 10 Gbps Fibre Channel Physical Layer

1.2 October 7, 1999

1.3 Proposer: Technical Committee T11, **nn members also NCITS members**

2. Process Description for the Proposed Project

2.1 Project Type: D - Development within NCITS T11

2.2 Type of Document: Standard

2.3 Definitions of Concepts and Special Terms

10 Gbps - A data/payload rate corresponding to approximately 10,000,000,000 bits per second. Overhead information such as idles, frame delimiters, etc. are transported at the same rate and do not increase data rate requirements. The specific data rate selected for Fibre Channel could leverage the physical layer being developed by other industry efforts (e.g. IEEE 802.3 HSSG, SIO, etc.)

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 NCITS 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): August 2001

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

10G describes the Fiber Channel physical layer for the transport of data at a rate of approximately 10 Gbps.

3.2 Existing Practice and the Need for a Standard

Fibre Channel equipment supporting a data rate of 800 Mbps is currently widely deployed in the industry. FC-PI specifies extended data rates of 1,600 and 3,200 Mbps.

There is a need to standardize extended data rates beyond the 1,600 and 3,200 Mbps data rates specified in FC-PI. Physical layer standards activities related to Fibre Channel are currently addressing a data rate of approximately 10 Gbps for the LAN and MAN application space. It is deemed prudent to leverage those physical layer specifications as the basis for Fibre Channel data transport at approximately 10 Gbps.

10 Gbps data transport represents the current state-of-the-art for LAN, MAN and WAN components. It is deemed prudent to leverage the same technology for SAN applications.

Candidate objectives for this effort include the following:

- (1) Preserve the Fibre Channel Frame Format including Size;
- (2) Support a Data/Payload rate of approximately 10 Gbps;
- (3) Support Media selected from ISO/IEC 11801;
- (4) Provide a family of Physical Layer specifications which support media and corresponding link distances of:
 - (a) short-haul copper ≥ 10 m;

- (b) installed multi-mode fiber >100 m;
- (c) multi-mode fiber >300 m;
- (d) singlemode fiber >2 km;
- (e) singlemode fiber >10 km;
- (f) singlemode fiber >40 km.

(5) Additional requirements discovered in the development of this standard.

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 10G 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 NCITS, 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 NCITS procedures.

4. Related Standards Activities

4.1 Existing Standards

- (1) X3.230-1994, Fibre Channel Physical and Signaling Interface (FC-PH).
- (2) X3.297-1997, Fibre Channel Physical and Signaling Interface - 2 (FC-PH-2).
- (3) NCITS.303-1998, Fibre Channel Physical and Signaling Interface - 3 (FC-PH-3).

4.2 Related Standards Activity

BSR	Number Title	Project
NCITS.XXXXXX	Methodology of Jitter Specification	1230-DT
NCITS 326:199x	Fibre Channel 10 km Cost-Reduced Physical variant	1300-D
NCITS.xxxxxx	Fiber Channel Physical Interface	1306-D
NCITS.xxxxxx	Fibre Channel Framing and Signaling Interface	1331-D
NCITS.xxxxxx	Fibre Channel Backbone	1238-D
NCITS.xxxxxx	Methodology of Jitter Specification 2	1316-DT

4.3 Recommendations for Coordinating Liaison

None.

4.4 Recommendations for Close Liaison

IEEE 802.3.

From: Kumar Malavalli
Sent: Tuesday, November 23, 1999 1:37 PM
To: 'ddonovan@itic.org'
Cc: 'mvago@itic.org'; 'j_stai@qlc.com'; Kari Fields
Subject: FW: Project Proposal for FC-PI-2 (with PDF attachment!)
Importance: High

Accredited Standards Committee* NCITS, Information Technology

Document Number: T11/99-693v0
Date: November 23, 1999
Project Number: n/a
Ref. Doc: T11/99-521v1
Reply to: Kumar Malavalli
Brocade Communication,
1901, Guadalupe Parkway,
San Jose, CA 95131
(408) 487-8156
kumar@brocade.com

<mailto:kumar@brocade.com>

Ms. Deborah Donovan
Coordinator, National Standards Processing
NCITS Secretariat, ITI
1250 Eye Street, Suite 200
Washington, DC 20005-3922

Dear Deborah,

Please find attached a draft Project Proposal for a Fibre Channel Physical Layer 2 (FC-PI-2) in PDF Format. T11 authorized a letter ballot, to submit the draft Project Proposal to NCITS for further processing at its October 7, 1999 Plenary at Ft. Lauderdale, FL. The letter ballot was subsequently issued and closed on November 22, 1999 with approval. The result of the letter ballot is 62 for, 2 opposed and 11 not voting. On November 22, 1999, T11 had 73 members, therefore this vote met the two-thirds rule. The letter ballot and the tally of the results are attached below for your review.

Thank you for your assistance in this matter.

Regards,

Kumar Malavalli
Chair, TC T11

T11 Letter Ballot on FC-PI-2 PP approval

[Submit a Vote](#)

T11/99-650v0

Accredited Standards Committee *

Equivalent to X3 Form 003

NCITS, Information Technology

4/92

NCITS SUBGROUP LETTER BALLOT

Authorised by NCITS Procedures -- Distributed by NCITS Subgroup T11

Ballot Period and Project	
Project:	FC-PI-2
Ballot Period:	30 days
Ballot Closes:	11/22/99
Document referenced in Ballot	
Reference Document Number:	T11/99-521v1
Reference Document Title:	FC-PI-2 Project Proposal
Reference Document Revision:	1
Link to Reference Document File:	PDF ; FM
Subject:	The forwarding of FC-PI-2 Project Proposal to NCITS for further processing
Statement:	T11 authorized a Letter Ballot on FC-PI-2 at its Plenary meeting on 10/07/99 at Ft. Luaderdale, FL.
Question:	Do you approve of forwarding FC-PI-2 Project Proposal to NCITS for further processing ?

American National Standards are developed by the voluntary participation of all parties and with the intention and expectation that standard will be suitable for wide application. Since their use is likewise voluntary, an affirmative vote does not commit an organization or group represented on the committee to the use of the American National Standard under consideration.

If you find that you cannot vote YES and wish to vote NO, please state this and explain the reasons for your position in the space provided or on a separate sheet. ABSTENTIONS are not permitted on technical issues.

* Operating under the procedures of the American National Standards Institute

NCITS Secretariat, Information Technology Industry Council

1250 Eye Street NW, Suite 200, Washington DC 20005-3922

Telephone 202-737-8888 FAX: 202-638-4922 EMail: ncits@itic.nw.dc.us

LETTER BALLOT RESULTS

FC-PI-2 PP approval, closed on 11/22/99

Company	Vote	Rep	Org	UnID
3M	Y	P	3M	
Adaptec	x	x	x	
Alcoa-Fujikura	x	x	x	
Amdahl	Y	P	Amdahl	
AMP	Y	P	AMP	
Amphenol	Y	P	Amphenol	
Ancor	Y	P	Ancor	
Ancot	Y	P	Ancot	
Boeing	Y	P	Boeing	
Brocade	Y	P	Brocade	
Cielo	Y	P	Cielo	
CNT	Y	P	CNT	
Compaq	YC	A	Compaq	
Connectivity Solutions	Y	P	Connectivity Solutions	
Corning	Y	P	Corning	
Crossroads Systems	YC	P	Crossroads Systems	
Cypress	Y	P	Cypress	
Data General/Clariion	Y	P	Data General/Clariion	
DPT	N	P	DPT	
EMC	Y	P	EMC	
EMF Associates	Y	A	EMF Associates	
Emulex	Y	P	Emulex	
Exabyte	Y	P	Exabyte	
FSI	Y	P	FSI	
Fujikura America	Y	P	Fujikura America	
Fujitsu	Y	P	Fujitsu	
Gadzoox	x	x	x	
General Dynamics	Y	P	General Dynamics	
Hitachi America	Y	P	Hitachi America	
Hitachi Cable	Y	A	Hitachi Cable	
HP	Y	P	HP	
IBM	Y	P	IBM	
INFINEON	Y	P	INFINEON	
Interphase	Y	P	Interphase	
JNI	Y	P	JNI	
KnowledgeTek	Y	P	KnowledgeTek	
Lockheed	Y	P	Lockheed	
LSI Logic	Y	P	LSI Logic	
Lucent	Y	A	Lucent	
Madison Cable	Y	P	Madison Cable	
McData	Y	A	McData	
Methode	Y	P	Methode	
Mitre	x	x	x	
Molex	Y	A	Molex	

Mylex	x	x	x
Northrop Grumman	Y	P	Molex
Ophidian Designs	Y	P	x
Orca	Y	P	Northrop Grumman
Panasonic	Y	P	Ophidian Designs
Pathlight	Y	P	Orca
Picolight	x	x	Panasonic
PMR	Y	P	Pathlight
QLogic	YC	P	x
Quantum	Y	P	PMR
Raytheon	x	x	QLogic
Rockwell-Collins	x	x	Quantum
Seagate	Y	P	x
Sequent	x	x	x
SGI	Y	P	Seagate
Smiths Industries	Y	P	x
Solution Technology	Y	P	SGI
SRB	Y	P	Smiths Industries
SSL	Y	P	Solution
ST	Y	P	Technology
StorageTek	Y	P	SRB
Sun Microsystems	Y	P	SSL
Tensolite	Y	P	ST
Texas Instruments	x	x	StorageTek
Transcendata	x	x	Sun Microsystems
TRW	Y	P	Tensolite
Unisys	Y	P	x
US Conec	Y	A	x
Vixel	YC	P	TRW
Western Digital	Y	P	Unisys
Xyratex	N	A	US Conec
			Vixel
			Western Digital
			Xyratex

Key to the above: Y Yes, YC Yes with comments submitted, N No, A Abstain (where permitted), x Did Not Vote

Results:

Y62-N02-DNV11 (4 yes ballots included comments)

Comments:

Comments submitted with Vixel vote, 10/25/99 8:08:02 PM

001 (E) This effort must be focused on ~10 Gbit/sec only.

002 (E) This effort must include tight coordination between T11.2 and T11.3

Comments submitted with Crossroads Systems vote, 10/29/99 10:43:25 AM

(E) The nn for the number of T11 members also members of NCITS should probably be filled in.

Comments submitted with Xyratex vote, 11/9/99 7:09:04 AM

#000(E) Page 1 title

a, The use of FC-PI-2 implies that FC-PI is already out of date.

b, The intent was that this document would focus on 10Gbd.

It should be just that, a single variant project proposal and the title should reflect that.

#001(T) Para 3.2 sub para 4.f

The statement 'Additional requirements as.....' should be qualified by limiting it un-equivocably to those required to implement the 10GBd variant.

This is too important a project to allow it to be possibly delayed by waiting for possible FC-PI late arrivals, or any thing else for that matter.

If and when an FC-PI-2 is required then the 10Gbd variant could be included in it, and the separate 10Gbd standard withdrawn.

Comments submitted with Compaq vote, 11/10/99 4:20:22 PM

#001 (T) Section 3.1

The following items should be added to the list of candidates:

Disk drive physical interface for 10 G operation

Removable small form factor transceivers for 10 G operation

New small form factor copper connector for 10G operation

#002 (T) Section 3.1

The following items should be added to the list of candidates:

Frequency agile optical transceivers for 10 G and lower speeds

#003 (T) Section 3.1

The following items should be added to the list of candidates:

Physical requirements to support a bullet proof port to port negotiation algorithm for speed, port type and other port properties as may be defined.

Comments submitted with QLogic vote, 11/19/99 3:05:09 PM

2.3 "SIO" is now called "Infiniband(tm)"; should be changed or deleted.

3.4 suggest wording used for FC-MI be used here, as modified by NCITS - doc is here:

<http://www.ncits.org/archive/1999/it99315r/it99315r.pdf>

<end>

Comments submitted with DPT vote, 11/22/99 4:45:16 PM

#001 (T) 3.2 (4) (a)

It is not acceptable that copper media may possibly be limited to 10m, even at this data rate. We believe that a distance of 15m is the minimum that will be acceptable in the marketplace.

#002 (T) 3.2 (4) general

Our understanding was originally that this project would be limited to a single physical variant definition (as was FC-10KCR). That is still our preferred approach, given the projected timescales for some of the other project mentioned in 2.3.

#003 (E) 2.3 Definition of Terms

The reference to SIO should be updated to Infiniband, and it should be recognized as a trademark.

#004 (E) 2.3 & 4.4

We are not sure if it is acceptable to indicate close liaison with a IEEE group, but if it is, a more specific group should be identified than 802.3 and the reference should be to a chartered organization and not a study group.

#005 (E) 3.2 (1)

This item should be extended to "No changes to the FC Transmission & Signalling Protocols as defined in X3.230, FC-PH and its successors shall be included in the scope of this project.", and probably relocated to the end of the subsection.

#006 (E)

There is no reference in this document to "parallel fibre" or "parallel electrical media" being acceptable. While

it is too early to judge this issue, we would be more comfortable if a statement to the effect that "parallel media approaches will be considered" was included.

Agenda TC T11 Plenary Meeting #36

December 9, 1999 Reno, NV

1. Opening Remarks and Introductions

2. Approval of the Agenda

3. [Attendance and Membership](#)

- 3.1 Roll call of [members in jeopardy](#) (Non-attendance and letter ballots)
- 3.2 Announcement of [new members and membership list update](#)
- 3.3 [Membership](#) in TC T11 and its sundry TGs

4. Document Distribution

5. Approval of Minutes-[Meeting #35](#)

6. Review of Old Action Items

7. Liaison Reports

- 7.1 [NCITS](#)
- 7.2 TC T10
- 7.3 IEEE
- 7.4 [IETF](#)
- 7.5 [FCIA](#)
- 7.6 [SNIA](#)
- 7.7 SFF
- 7.8 Other liaison reports

8. Review of International Activity

- 8.1 ISO Status report
- 8.2 Other ISO items

9. Review of T11 Project Proposals

- 9.1 SM-LL-V-- Revised project proposal at NCITS for approval

10. [Review of T11 Projects](#)

- 10.1 FC-10KCR-- End T11 letter ballot, forward to NCITS for final approval
- 10.2 FC-AL-2-- Forwarded to NCITS for compliance review
- 10.3 FC-GS-2-- NCITS letter ballot
- 10.4 FC-HSPI-- At T11; T11 letter ballot
- 10.4 FC-MJS-- At NCITS for further processing
- 10.5 FC-PH AM2-- End T11 letter ballot, forward to NCITS for final approval
- 10.6 FC-TAPE-- Forwarded to NCITS for compliance review
- 10.7 FC-VI-- At T11; LB complete; resolved comments
- 10.8 HIPPI6400-SC-- End T11 letter ballot, forward to NCITS for final approval

11. Task Group T11.1 - HIPPI

- 11.1 [Plenary Meeting Report](#)
- 11.2 Actions
 - 11.2.1 Action #1
 - 11.2.2 Action #2
- 11.3 Other Items

12. Task Group T11.2 - Physical Variants

- 12.1 [Plenary Meeting Report](#)
- 12.2 Actions

12.2.1 Action #1

12.2.2 Action #2

12.3 Other Items

13. Task Group T11.3 - Interconnection Schemes

13.1 Plenary Meeting Report

13.2 Actions

13.2.1 Action #1

13.2.2 Action #2

13.3 Other Items

14. Task Group T11.4 - Protocol Mappings

14.1 [Plenary Meeting Report](#)

14.2 Actions

14.2.1 Action #1

14.2.2 Action #2

14.3 Other Items

15. New Business and New Technical Items

15.1 [Technology Road Map](#)

15.2 Other new business

16. Call for Patents

16.1 [Patent Information](#)

17. Administrative Matters

17.1 [Officer appointments](#)

17.2 [FTP and web site](#)

17.3 [Reflectors](#)

17.4 Electronic mailings

17.5 Other matters

18. Future Meeting Schedule

18.1 Plan for February 2000 T11 Plenary week

18.2 Other ad hoc meeting authorizations

18.3 [Future meeting plans](#)

18.4 Request for hosts for 2001

19. Review of Action Items

20. Adjournment