

Accredited Standards Committee^{*}
INCITS, Information Technology

Doc. Number: 05-846v0
Date: 12/05/05
Project: FC-BaseT
Reply to: Claudio DeSanti
Rich Ramos

TO: MEMBERSHIP of T11.2

FROM: Claudio DeSanti, Chair
Rich Ramos, minutes taker

SUBJECT: Draft minutes from FC-BaseT WG meeting

AGENDA

- | | | |
|-----|-----------------------------------------------------------------------------------------------------|-------------------|
| 1. | Opening remarks and introductions | DeSanti (Cisco) |
| 2. | Administrivia | |
| 2.1 | Approval of this agenda | All |
| 2.2 | Approval of minutes
(05-788v0) | All |
| 3. | Meeting Policies | DeSanti (Cisco) |
| 4. | Review of old FC-BaseT action items | Ramos (Xyratex) |
| 5. | Scheduled FC-BaseT business | |
| 5.1 | FC-BaseT Code Modulation
05-800v0 | DeSanti (Cisco) |
| 5.2 | Improved FC-BaseT PHY Proposal
05-812v0 | Powell (Broadcom) |
| 5.3 | Link Startup and Use of FC Compliant E-FIFO in FC-BaseT
05-798v0 | Ghiasi (Broadcom) |
| 5.4 | Motion to request IEEE to allocate an Auto-Negotiation
Selector Field value to identify FC-BaseT | All |
| 6. | Unscheduled FC-BaseT business | |
| 6.1 | Proposed naming for FC-BaseT FC variants | Van Doorn (Intel) |
| 7. | Review of FC-BaseT action items | Ramos (Xyratex) |
| 8. | Next meeting schedule | DeSanti (Cisco) |
| 9. | Adjournment | |

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RESULTS OF MEETING

1. Opening remarks and introductions

Chairperson Claudio DeSanti led the meeting. He started the meeting at 4:20 PM. He thanked our host company, Northrop Grumman, and led a round of introductions. This is the first official working group meeting (since changing from a study group).

2. Administrivia

The agenda (05-814v1) was approved with no one objecting to the agenda. The minutes (05-788v0) were approved with no modifications.

3. Meeting Policies

3.1 Attendance and Membership

Claudio DeSanti stated that all persons present are considered members of this meeting and may vote on questions, limited to one vote per company present. Attendance at this meeting does not count toward attendance at the plenaries of T11 and its task groups (i.e., being here will not get you out or keep you out of membership jeopardy).

3.2 Patents

Claudio DeSanti indicated that among the rules and policies under which this working group operates are the INCITS patent policies. He requested persons wishing to make statements or ask questions relevant to this policy not to do so at this work group meeting, but instead to do so at the T11.3 or T11 plenary meeting. The INCITS patent policies are specified in subclause 8.4 of RD-1, "Policies and Guidelines", available at http://www.incits.org/sd9_rev1c.htm#p8-4

3.3 Antitrust

Claudio DeSanti indicated that among the rules and policies under which this working group operates are the INCITS Antitrust Guidelines. Any member of the meeting is responsible for objecting if he believes discussion in the meeting violates those guidelines. If such discussion is not immediately terminated, it is the chairperson's responsibility to terminate the meeting. The INCITS Antitrust Guidelines are available at <http://www.incits.org/inatrust.htm>

4. Review of old FC-BaseT action items

- AI-1:** Schelto Van Doorn (Intel) to request IEEE an auto-negotiation selector field value to identify FC-BaseT. (Carryover, pending discussion on item 5.4)
- AI-2:** Scott Powell (Broadcom) to verify that the FC speed negotiation is compatible with the FC-BaseT algorithm. (Closed by 05-798v0)
- AI-3:** Scott Powell (Broadcom) to generate a proposal for how to validate PAM-10 mapping and generate special characters. (Closed by 05-812v0)
- AI-4:** Schelto Van Doorn (Intel) to ask Brad Booth is we need a variant identification to use 10GBase-T with Fibre Channel. (Closed by item 6.1)
- AI-5:** Claudio DeSanti (Cisco) to add an item to the T11 plenary agenda addressing action item AI1. (Closed, pending discussion on item 5.4)
- AI-6:** Ali Ghiasi (Broadcom) to further discuss the elasticity FIFO at the next FC-BaseT meeting. (Closed by 05-812v0)

5. Scheduled FC-BaseT business

5.1 FC-BaseT Code Modulation, 05-800v0, Claudio DeSanti

Claudio presented the results of an investigation to define an optimal FC-BaseT coding, investigation conducted with Gottfried Ungerboeck and Scott Powell. The study determined that 4D PAM-8 Schlaefi lattice coding with a simple 32/33 transcoding is simpler and has more optimal properties than Trellis coding with PAM-10 or PAM-5 modulation for FC-BaseT. An improved transcoding with CRC was discussed and preferred over the simple one. Claudio recommended the group to adopt the presented coding scheme as baseline for FC-BaseT. Action: Claudio to formalize presentation 05-800v0 into proposal.

5.2 Improved FC-BaseT PHY Proposal, 05-812v0, Scott Powell

Scott presented an improved PHY proposal based on the simplified Schlaefi coding presented by Claudio. Trellis coding may be still supported as an option. The Schlaefi coding allows a simplified receiver implementation, feasible at 4G in current process technology (0.13um). The simplified PHY still allows very good cable reaches with a BER= 10^{-15} : 100m at 1G, 70m at 2G, 40m at 4G. The power requirements are also nice: <1W at 2G, <1.5W at 4G. Discussion on BER: 10^{-12} vs. 10^{-15} . Although FC standards require a 10^{-12} BER, current implementations have a much better BER. 10^{-15} has been used as a design parameter for this reason.

Action: Scott to provide a cable reach table for BER= 10^{-12} for comparison.

Action: Scott to formalize presentation 05-812v0 into proposal.

5.3 Link Startup and Use of FC Compliant E-FIFO in FC-BaseT, 05-798v0, Ali Ghiasi

Ali presented how to use currently available FC Elasticity FIFOs to solve the clocking issues of FC-BaseT. He also shown how the FC speed negotiation algorithm and the IEEE auto-negotiation procedure may be combined together to provide compatibility with both worlds.

Action: Ali & Hossein to formalize speed negotiation & auto negotiation by next meeting.
Action: Ali to formalize E-FIFOs in text form for standard.

5.4 Motion to request IEEE to allocate an Auto-Negotiation Selector Field value to identify FC-BaseT

Claudio moved to recommend T11 to request IEEE to allocate an Auto-Negotiation Selector Field value to identify FC-BaseT. Seconded by Hossein Hashemi. Approved unanimously.

6. Unscheduled FC-BaseT business

6.1 Proposed naming for FC-BaseT FC variants, Schelto Van Doorn

Schelto proposed the addition of few acronyms to the FC-PI-x terminology to designate the FC-BaseT FC variants.

- TP would identify Twisted Pair
- P8 would identify PAM-8 encoding

The resulting naming would be:

- 1GFC-BaseT: 100-TP-P8-S
- 2GFC-BaseT: 200-TP-P8-S
- 4GFC-BaseT: 400-TP-P8-S

7. Review of FC-BaseT action items

AI-1: Schelto to request IEEE an auto-negotiation selector field value to identify FC-BaseT.

AI-7: Claudio to formalize presentation 05-800v0 into proposal.

AI-8: Scott to provide a cable reach table for $BER=10^{-12}$ for comparison.

AI-9: Scott to formalize presentation 05-812v0 into proposal.

AI-10: Ali & Hossein to formalize speed negotiation & auto negotiation by next meeting.

AI-11: Ali to formalize E-FIFOs in text form for standard.

8. Next meeting schedule

Request 3 hours or more at the next T11 Plenary.

Ali Ghiasi volunteered to host an interim meeting in the Bay Area, on January 19th.

9. Motion to adjourn

Motion to adjourn by Schelto.

Adjourned at 7:11 PM

10. Attendance

The following 19 people attended this meeting:

Company	Name
AGERE SYSTEMS	Adam Healey
AVAGO TECHNOLOGIES	Roy Elsbernd
BROADCOM	Kevin Brown
BROADCOM	Ali Ghiasi
BROADCOM	Scott Powell
CISCO SYSTEMS	Claudio DeSanti
EMC	Gregory McSorley
EMULEX	Hossein Hashemi
IBM POUGHKEEPSIE	Robert Dugan
INTEL CORPORATION	Schelto Van Doorn
INTEL CORPORATION	Uday Poosarla
LSI LOGIC	John Lohmeyer
MARVELL	David Geddes
MCDATA	Scott Kipp
MCDATA	Joe Pelissier
NEXANS INC.	Phil Radics
SAMSUNG ELECTRONIS	Hitoshi Okamura
SOLARFLARE	Brett McClellan
XYRATEX	Rich Ramos