

Accredited Standards Committee^{*}
INCITS, Information Technology

Doc. Number: 06-588v0
Date: 08/07/06
Project: FC-BaseT
Reply to: Claudio DeSanti
Dean Wallace

TO: MEMBERSHIP of T11.2
FROM: Dean Wallace, secretary
SUBJECT: Draft minutes from FC-BaseT WG Ad Hoc meeting

AGENDA

- | | | |
|-----|--|-------------------|
| 1. | Opening remarks and introductions | DeSanti (Cisco) |
| 2. | Meeting Policies | DeSanti (Cisco) |
| 3. | Administrivia | |
| 4. | Review of old FC-BaseT action items | Wallace (QLogic) |
| 5. | Scheduled FC-BaseT business | |
| 5.1 | FC-BaseT Startup Issues
06-565v0 | DeSanti (Cisco) |
| 5.2 | Proposed FC-BaseT Startup Procedure
06-566v0 | DeSanti (Cisco) |
| 5.3 | Proposal on cable length estimation for FC-BaseT
06-564v0 | Healey (Agere) |
| 5.4 | FC-BaseT PHY Control - Presentation
06-573v0 | Powell (Broadcom) |
| 5.5 | FC-BaseT PHY Control - Text
06-574v0 | Powell (Broadcom) |
| 5.6 | Review of the draft
06-057v3 | DeSanti (Cisco) |
| 6. | Unscheduled FC-BaseT business | |
| 7. | Review of FC-BaseT action items | Wallace (QLogic) |
| 8. | Next meeting schedule | DeSanti (Cisco) |
| 9. | Adjournment | |

^{*} Operating under the procedures of the American National Standards Institute. INCITS SECRETARIAT, Information Technology Industry Council (ITI), 1250 Eye street NW, Suite 200, Washington DC, 20005-3922, Email: incits@itic.org Telephone 202-737-8888, FAX 202-638-4922

RESULTS OF MEETING

1. Opening remarks and introductions

Chairperson Claudio DeSanti led the meeting. He started the meeting at 9:05am, thanked McDATA for hosting the meeting and lead a round of introductions.

2. Meeting Policies

2.1 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).

2.2 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

2.3 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 charperson's responsibility to terminate the meeting. The INCITS Antitrust Guidelines are available at <http://www.incits.org/inatrust.htm>

3. Administrivia

Claudio DeSanti moved to approve the agenda as written, Bob Kembel seconded. Motion approved by acclamation. Claudio DeSanti moved to approve the minutes of the past two meetings, documents 06-486v0 and 06-495v0, Bob Kembel seconded. Motion approved by acclamation.

4. Review of old FC-BaseT action items

AI-19: Claudio DeSanti to address copyright approval from IEEE-SA.
Closed. IEEE-SA stated that no copyright approval is needed.

AI-21: Carl Murray to prepare a proposal on how to perform cable length estimation.
Closed by 05-564v0.

5. Scheduled FC-BaseT business

5.1 FC-BaseT Startup Issues, 06-565v0, Claudio DeSanti

Problem statement for FC-BaseT PHY startup: a simple PHY is desired but the current start-up sequence does not seem simple.

A first issue is relative to host speed determination. Two ways have been proposed, through the host configuration register and by sensing the host maximum speed. Do two ways really need to be defined? The FCIA expressed a clear desire to use FC-BaseT in fixed configuration only (i.e., not SFPs). Claudio proposed to keep only the configuration register option, because this simplifies the specification. This does not preclude vendors to sense the host speeds. The room was okay with this proposal.

An additional issue is RX_LOS support. RX_LOS support is optional in FC-PI-2. However support for RX_LOS is easy for FC-BaseT and simplifies the interaction with the host. Claudio proposed to make RX_LOS support mandatory for FC-BaseT PHYs. The group accepted the proposal

Cable length estimation issue. It is commonly implemented by 1000Base-T devices and required in 10GBase-T for power back-off. It is also required in FC-BaseT for two reasons, to deal with different reaches at different speeds and to configure power back-off. FC-BaseT supports different reaches at different speeds. Reviewed the supported FC-BaseT Cable reach at various speeds. Requirement: the cable length estimation needs to be performed before advertising the supported speeds. The three steps are: determine host speeds capability, estimate the cable length, advertise the remaining speed capability to the other PHY. The higher speed in the intersection is selected as the link operating speed. Requirement to guarantee interoperability: support for 100 meter reach at the 1Gb speed with Schläfli lattice coding is mandatory. The group agreed with these requirements.

Proposed FC-BaseT auto negotiation. Three sixteen bit pages (base page plus two unformatted pages). One unformatted page specifies the supported speeds and encodings.

Link qualification: transmit Idles2 for one second and if received with no errors, Idle3 is transmitted. Reception of Idle3 completes link qualification. If errors are detected, link qualification is repeated up to three times. The target BER is 10^{-15} . Transmitting for one second is not enough to verify the BER. Current 1000Base-T PHYs achieve a much better BER than the specified 10^{-10} over 100 meter of cable. A BER of 10^{-10} and 10^{-15} is likely to not be detected by the link qualification process, the host must deal with it. Claudio proposed to not perform link qualification and let the host to always deal with link errors, if any. A long discussion occurred on how the PMA training procedure may be used to provide some indication of the link quality to the host. PMA training computes the cable SNR. The group agreed to make the computed SNR available to the host.

FC speed negotiation has to converge to the selected link operating speed on the host side. Claudio proposed to transmit Ordered Sets only to the other PHY and to always send to the host what is received from the cable. The group agreed with this proposal.

With these modifications the original nine steps start-up procedure was simplified to six steps.

5.2 Proposed FC-BaseT Startup Procedure, 06-566v0, Claudio DeSanti

Claudio reviewed the document 06-566v0, documenting what he previously presented.

5.3 Proposal on cable length estimation for FC-BaseT, 06-564v0, Adam Healey

Adam reviewed the basic assumptions for cable length estimation. The primary purpose of cable length estimation is to configure power back-off. Claudio re-iterated that FC-BaseT needs this feature also to support different reaches at different speeds, Adam agreed. FC-BaseT will use 802.3 auto-negotiation on dimension A cable pairs 2 and 3. Unlike Ethernet, cable length estimation will be explicitly accommodated in the FC-BaseT standard. The proposal outlines that the remote PHY is also engaged in FC-BaseT auto-negotiation by detecting the FC-BaseT code in the base page selector field sent by the remote PHY. Master-Slave role determination is needed before to estimate the cable length. The Master does the delay calculation and reports it back to the Slave via an additional page. The slave only does clock loopback. The round trip cable delay is the metric communicated in the last Next Page. We need to agree on a cable delay to length equation. The proposed system is very simple and requires minimal additional hardware to be implemented.

Action: Terry Cobb to bring in some cable delay numbers.

To accommodate the requirement that cable length estimation needs to be performed before advertising the speed capabilities, Claudio proposed to perform Auto-Negotiation by exchanging first the base page, indicating FC-BaseT support, then the Master-Slave unformatted page, to determine the PHY roles, then the cable length unformatted page, to allow the Master to report the estimated length to the Slave, and only then the speed capabilities unformatted page, reporting the speeds each PHY is capable to support with the estimated cable length. The group agreed with this proposed pages exchange.

5.4 FC-BaseT PHY Control - Presentation, 06-573v0, Scott Powell

Scott presented how PMA training should be performed. This is the process of bringing a link from a powered down state to a state that carries data. There are several states in the PHY control. When auto-negotiation completes both transmitters are silent for at least 1ms. The Master transitions to TRAINING immediately. The training sequence in this state is PAM-2. The next state is PCS Test. This test is using PAM-8 data. In 10Gbase-T this test runs at least 1ms. The PHY control state diagram was reviewed and agreed by the group. The modifications needed to support RX_LOS and the reporting of the cable SNR are straightforward.

5.5 FC-BaseT PHY Control - Text, 06-574v0, Scott Powell

Scott reviewed the document 06-574v0, documenting what he previously presented.

5.6 Review of the draft, 06-057v3, Claudio DeSanti

The group discussed if the document was ready for letter ballot now. Claudio reviewed the complete document, and it was agreed that with the addition of what was agreed at the meeting the document was ready for letter ballot.

Action: Adam Healey, Scott Powell and Claudio DeSanti to update 06-566v0 to 06-566v1 incorporating the agreements of today's discussion.

Claudio moved to ask a letter ballot on document 06-057v4 (i.e., 06-057v3 updated with 06-566v1), Ali Ghiasi seconded. The motion carried with 8 yes, 0 no, and 7 abstaining.

The FC-BaseT working group recommends to T11.2 and T11.3 to recommend to T11 to conduct a letter ballot on document 06-057v4.

6. Unscheduled FC-BaseT business

None.

7. Review of FC-BaseT action items

AI-22: Terry Cobb to bring in some cable delay numbers.

AI-23: Adam Healey, Scott Powell and Claudio DeSanti to update 06-566v0 to 06-566v1 incorporating the agreements of today's discussion.

8. Next meeting schedule

Going to letter ballot, no conference calls will be requested. The next meeting is in the first week of August in Oklahoma City, OK. We will ask four to eight hours, possibly on Monday morning.

9. Motion to adjourn

Frank Barber moved to adjourn at 12:15pm, Al Krammer seconded. Motion approved by acclamation.

10. Attendance

The following 22 people attended this meeting:

Company	Name
AGERE SYSTEMS	Adam Healey
BROADCOM	Ali Ghiasi
BROADCOM	Scott Powell
CISCO SYSTEMS, INC.	Claudio DeSanti
ENDL TEXAS	Ralph Weber
ESILICON CORPORATION	Frank Barber
FINISAR	Henry Poelstra
MCDATA	David Peterson
MCDATA	Scott Kipp
MCDATA	Joe Pelissier
NEOPHOTONICS CORP.	Weiqi Li
PMC-SIERRA	Roy Elsbernd
PMC-SIERRA	Brett Clark
QLOGIC	Dean Wallace
QLOGIC	Craig Carlson
SEAGATE TECHNOLOGY	Allen Kramer
SEAGATE TECHNOLOGY	James Coomes
SOLUTION TECHNOLOGY	Robert Kembel
SUN MICROSYSTEMS	Matt Gaffney
SUN MICROSYSTEMS	Michael Roy
SYSTIMAX SOLUTIONS	Terry Cobb
TRUE FOCUS, INC	Horst Truededt