

Minutes

T11.3 FC-FS-6 ad hoc work group regular meeting 07 December 2020 – 03:00PM – 05:00PM CDT Virtual Conference

The FC-FS-6 ad hoc work group of the Fibre Channel Protocol (T11.3) Task Group held a regular meeting via virtual conferencing using the Zoom platform on 07 December 2020, hosted by Marvell. Attendance was 17 people from 10 organizations and is tabulated at the end of this document.

Minutes were taken by Patty Driever (IBM) (pgd@us.ibm.com). Corrections may be requested either before the subsequent meeting by email to pgd@us.ibm.com or at the subsequent meeting in person.

1 Opening remarks & Introductions

Chairperson Dave Peterson (Broadcom) opened the regular meeting Monday, 07 December 2020 at 02:40 PM CDT. He thanked our host organization, Marvell, for setting up the Zoom meeting and led a round of introductions.

1.1 Attendance and Membership

The chair explained that attendance is recorded electronically at www.incits.org and explained the procedure. 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). The chair stated that all persons present are considered members of this meeting and may vote on questions, limited to one vote per company present. He advised that although T11 does not limit participation in the activities of its work groups to representatives of T11 member organizations, it requires nonmembers to identify themselves as such. Nonmembers that expect they may participate in the activities of T11 regularly were encouraged to become members.

1.2 Code of Conduct

The chair referenced the INCITS Code of Conduct and suggested everyone become familiar with its content. It can be found on the INCITS website at the following link:
https://standards.incits.org/apps/group_public/document.php?document_id=124850&wg_abbrev=eb

It will be reviewed at the plenary meetings later this week, and then subsequently in all Ad Hoc meetings as well.

1.3 Patents

The chair indicated that among the rules and policies under which this working group operates are the ANSI intellectual property policies as specified in pages 1-3 of http://www.incits.org/pat_slides.pdf. He displayed these pages without comment or explanation, and directed that questions about the policy should be referred to the questioner's legal counsel or the ANSI General Counsel.

1.4 Antitrust

The chair 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. As examples, there should never be discussion of the following topics at any INCITS or INCITS subgroup meeting:

- Any company's prices or pricing policies;
- Specific R&D, sales and marketing plans;
- Any company's confidential product, product development or production strategies;
- Whether certain suppliers or customers will be served;
- Prices paid to input sources; or
- Complaints about individual firms or other actions that might tend to hinder a competitor in any market.

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>.

2 Approval of Agenda

An agenda for the FC-FS-6 ad hoc work group regular meeting 07 December 2020 has been posted as T11-2020-00254-v000.

Howard Johnson (Broadcom) moved and Roger Hathorn (IBM) seconded to accept T11-2020-00254-v000 as the agenda for this regular meeting. Approved unanimously.

3 Review of Past Business

3.1 Review of Minutes

Minutes for the FC-FS-6 ad hoc work group regular meeting 05 October 2020 have been posted as T11/2020-00225-v000.

Howard Johnson (Broadcom) moved and Roger Hathorn (IBM) seconded to accept T11/2020-00225-v000 as the minutes of the FC-FS-6 ad hoc work group meeting on 05 October 2020. Approved unanimously.

3.2 Review of Old Action Items

Action Items Carried Forward:

- | | |
|----------------|--|
| 1910-01 | Editor to remove Annex J and any references to it from the next draft version of FC-FS-6 (CARRY) |
| 1910-02 | Dave Peterson to work with Howard Johnson on best means to craft diagrams to ensure they can be incorporated by the editor using FrameMaker (CARRY) |
| 2008-01 | Editor to incorporate changes noted in 2020-00167-v000 (to mark as obsolete two well-known addresses) (CARRY) |

New Action Items Identified Last Meeting:

None

4 Old Business

4.1 Another Beautiful Day in the Neighborhood (2020-00011-v005 and 2020-00012-v005) Howard Johnson (Broadcom)

Howard reviewed the minor modifications he made after the last session. A few editorial changes and a few clarifications in a couple of the diagrams.

Howard Johnson (Broadcom) made a motion to incorporate T11-2020-00011-v005, ‘Congestion Signal Informative Annex Text’ into FC-FS-6. Motion seconded by Barry Maskas (HPE). Motion passed unanimously.

4.2 Single Lane 128GFC (2020-00210-v002) Oteyza (Marvell)

Raul reminded us that the topic of which FEC to use for single lane 128 GFC has been discussed previously. Decision has been made to support two different FEC modes: interleave Reed Solomon and single mode Reed Solomon. Which option to be used will be determined during link speed negotiation.

Raul looked at IEEE 802.3ck to see if we could leverage some of the text contained in there for what we’re doing in FC. Turns out we can use parts of it, but not all of it. It describes a multi-lane implementation whereas FC is describing a single lane implementation.

Use of Bit-interleave and symbol forwarding are unique to FC, so Raul reviewed via text and block diagrams what he added to describe how and where these functions are used with the two FEC modes.

Craig raised the concern that Raul included pseudo-code in the text that might not be understandable by everyone, so Raul should give more thought to how best to define the process used for how bit streams are calculated for bit interleaving and symbol forwarding.

Raul also reviewed the format of the Transmitter Training signal. Table 16 shows the Training Frame control field, which is where it is indicated which mode each side of the link supports. Based on that plus priority of the modes the selection will be made. There was discussion that changing from one mode to another when issues are encountered may not work as planned. This will be revisited in PI as well as the joint T11.2/T11.3 meeting.

4.3 Target Credit Stall – A Proposal” – TOV Definition (2020-00004-v007) Johnson (Broadcom)

Howard resumed this discussion from prior meetings, including looking at the name ‘Frame Forwarding Timeout Value’, which had some concerns, including that it sounded like something that applied only to Fx_ports and not also Nx_ports. He’s now proposing we call it ‘Buffer Management Timeout Value’ (B_M_TOV) and provided a new definition for it. It’s used for managing buffers that contain a frame and the frame occupies the buffer for a long period of time. He also proposed a suitable range for this timeout value.

Barry Maskas suggested that ‘the buffer should be freed’ is an incomplete description of what needs to occur (such as credit also being returned). Howard will look for a clause to point to that covers these behaviors. The name of ‘Buffer Occupancy Timeout Value’ was suggested, but there’s no concept in FC-FS of what ‘buffer occupancy’ means. Also what does a frame being ‘discontinued’ mean? Suggested changing to ‘discarded’. Should the name be ‘Buffer Discard TOV’?

Roger pointed out that endpoints need to ensure that they can comply with the specified timeout value ranges.

5.0 New Business

5.1 FC-PM: Add Reference and FC-4 TYPE Code Value (2020-00268-v000) Peterson (Broadcom)

Dave presented a proposal to define a new FC-4 TYPE value for FC-PM. Pretty straightforward.

Roger Hathorn (IBM) moved to incorporate T11-2020-00268-v000 into FC-FS-6. Seconded by Dave Peterson (Broadcom). Motion passed unanimously.

6 Unscheduled Business

5.1 End-to-end Encryption CRC (2020-00275-v000) Smart (Broadcom)

James reviewed the proposal Marvell introduced last meeting cycle (T10-2020-00223-v000) about a means to provide CRC protection for the data as it goes through the encryption engine.

James had several questions about the proposal which he documented in this presentation. First question was why was the 16-bit T10 DIF CRC used when it is deemed not as secure as it could be. FC-NVMe uses 32-bit CRC. Craig indicated that one reason for the 16-bit choice was that going beyond 16 bits for this field impacts the max payload size that can be used. (Side Note: It isn’t really T10 DIF CRC, but simply uses the T10 DIF algorithm to calculate the value.)

James also asked that since AES-GCM does not require 16-byte increments, is the proposal requiring 16-byte increments as shown in the pictures? The answer was ‘No’, the 16-byte alignment is an example, based on using a 16 byte ICV.

James also wanted to verify that the pad length does include CRC (and it does).

James suggested there are other ways to protect the engines without changing the standard. Craig stated that the intent of his proposal was to change things that are only managed at the physical layer and to not require upper protocol layers to be involved (e. g. if the CRC placement were to change the size of the payload)

James suggested that if we're changing the standard we might also want to include things like adding the offset of the payload so things like optional headers can be in cleartext (e.g. VM header). This would provide a definition that makes it negotiable where the encrypted data starts. Craig emphasized that his proposal does not change how encryption is done...it simply adds CRC into the pad field. It was suggested James bring in a new proposal to include other desired things (such as allowing optional headers to remain in the clear).

7 Project Schedule

Milestone	Expected Date
Last technical input	TBD
T11 Letter Ballot	TBD
Forward to INCITS	TBD

Once the physical layer work progresses, we will have a better sense of how to set realistic dates for this.

8 Review of Action Items

Action Items Carried Forward:

- 1910-01** Editor to remove Annex J and any references to it from the next draft version of FC-FS-6.
- 1910-02** Dave Peterson to work with Howard Johnson on best means to craft diagrams to ensure they can be incorporated by the editor using FrameMaker.
- 2008-01** Editor to incorporate changes noted in 2020-00167-v000 (to mark as obsoleted two well-known addresses)

New Action Items:

- 1912-01** Editor to incorporate Dave's FC-4 TYPE proposal (T11-2020-00268-v000) into FC-FS-6.
- 1912-02** Editor to incorporate Howard's proposal T11-2020-00011-v005, 'Congestion Signal Informative Annex Text' into FC-FS-6.

9 Meeting Schedule

9.1 Next Plenary Week

Request 3 hours for FC-FS-6 at the virtual T11 plenary week 01 February – 04 February 2021.

10 Adjournment

Roger Hathorn (IBM) moved and Howard Johnson (Broadcom) seconded to adjourn. Approved unanimously.

The regular meeting was adjourned at 05:46 PM CDT on 07 December 2020.

11 Attendance

Organization **Representative** **T11.3 Member Company**

AMPHENOL CORP	Michael Klempa	Y
BROADCOM LIMITED	Howard Johnson	Y
BROADCOM LIMITED	Mark Jones	Y
BROADCOM LIMITED	David Peterson	Y
BROADCOM LIMITED	James Smart	Y
BROADCOM LIMITED	Anil Veerabhadrapa	Y
BROADCOM LIMITED	Steven Wilson	Y
CISCO SYSTEMS INC	Mike Blair	Y
CISCO SYSTEMS INC	Ed Mazurek	Y
DELL INC	Vinay Sawal	Y
HEWLETT PACKARD ENTERPRISE	Barry Maskas	Y
IBM	Patty Driever	Y
IBM	Roger Hathorn	Y
MARVELL SEMICONDUCTOR	Craig W. Carlson	Y
MARVELL SEMICONDUCTOR	Raul Oteyza	Y
NETAPP INC	Frederick Knight	Y
TELEDYNE LECROY CORPORATION	Henry Poelstra	Y
VIAVI SOLUTIONS INC	Jason Rusch	Y