

**Minutes**  
**T11.3 FC-NVME ad hoc work group regular meeting**  
**7 February, 2018 – 2:30PM-6:00PM CST**  
**Ft. Worth, TX, USA**

The FC-NVME ad hoc work group of the Fibre Channel Protocol (T11.3) Task Group held a regular meeting at Ft. Worth, TX on 7 February, 2018, hosted by FCIA. Attendance was 13 people from 8 organizations and is tabulated at the end of this document.

Roger Hathorn (IBM) (rhathorn@us.ibm.com) took minutes. Please report any corrections by email at [fc\\_protocol@standards.incits.org](mailto:fc_protocol@standards.incits.org)

## **1 Opening Remarks**

### ***Introductions***

Chairperson Craig Carlson (QLogic) opened the regular meeting on Wednesday, 7 February, 2018 at 2:00 PM CDT and led a round of introductions and thanked the host (DCS) for organizing this week's events.

## **2 Meeting Policy**

### ***2.1 Attendance and Membership***

The chair explained that attendance is recorded electronically at <https://standards.incits.org/apps/org/workgroup/t11>, 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.

### ***2.2 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](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.

## **2.3 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>

## **3.0 Approval of Agenda**

An agenda for the FC-NVME ad hoc work group regular meeting 7 February, 2018 was posted as T11/2018-00045-v0000.

*Patty Driever (IBM) moved and David Peterson (Broadcom) seconded to accept T11/2017-00045-v0000 as amended as the agenda for this regular meeting. Approved by acclamation.*

## **4.0 Past Business**

### **4.1 Review of Minutes**

*Patty Driever (IBM) moved and David Peterson (Broadcom) seconded to accept the following documents as the official minutes for the regular meeting on 06 December, 2017 and the indicated interim conference calls. Approved by acclamation.*

[T11-2018-00034-v000.pdf](#)

FC-NVMe-2 Ad Hoc working group conference call Minutes for Jan 31, 2018

[T11-2018-00011-v000.pdf](#)

FC-NVMe-2 Ad Hoc working group conference call Minutes for Jan 16, 2018

[T11-2017-00418-v000.pdf](#)

FC-NVMe-2 Ad Hoc working group meeting Minutes for December 6 2017

## **4.2 Review of Old Action Items**

### **Action items carried forward from prior meetings:**

18-0131-01: James Smart to update text proposal for disconnection interlock rules and post as T11/2017-00419-v003. – complete.

### **New action items from this meeting:**

18-0207-01: AI: James to post T11/2017-00419-v0004

18-0207-02: AI: Editor to incorporate T11/2017-00419-v0004 and post a new revision of the FC-NVMe-2 draft.

18-0207-03: David Peterson to post T11-2018- 00040-v001 – completed during the meeting.

18-0207-04: Editor to incorporate T11-2018- 00040-v001 into the next revision of FC-NVMe-2.

18-0207-05: Craig Carlson to propose text for FC-NVMe-2 requirements for Keep Alive

### **Completed action items from prior meetings:**

18-0116-01: James Smart to update text proposal for disconnection interlock rules and post as T11/2017-00419-v001. See v002. – Complete

17-1205-02: James Smart to prepare a text proposal for covering the results of the discussion around disconnection interlock rules – Complete. See T11/2017-00419-v000.

17-1205-01: Chair to schedule interim conference call to review a text proposal (not yet available) around disconnection interlock. - Complete

For action items prior to 12/05/2017, see prior minutes of the 12/06/2017 regular meeting.

## **5. Old business**

### **5.1 T11/2017-00419-v0003 Association Termination (James Smart, Broadcom)**

James stepped through this proposal for association termination rules that was reviewed and updated during the interim conference calls. Only minor modifications were made.

**Motion:** James Smart (Broadcom) moved and Patty Driever (IBM) seconded to incorporate T11/2017-00419-v003, as modified, into FC-NVMe-2. – passed by acclamation.

There was discussion on whether to create an FC-NVMe amendment containing this text. Since we will have a revision of FC-NVMe-2 that is equivalent to FC-NVMe plus this

change, this may not be necessary. If Broadcom thinks still wishes to create an amendment, James will bring in a project proposal in April.

## **5.2 T11-2018- 00040-v000 Admin Command determinism (Peterson, Broadcom)**

David presented the new CMD IU field that adds 4-bits to CMD IU that identify the command set type and indication that it is an admin command. 3 of the bits contain the CSS from NVME express that identifies the command set (only one command set is identified today, but more are expected to come).

The group did not take kindly to his naming the field the “kind” field and it was renamed to category (CAT). Value definitions were shored up and this part of the proposal was accepted.

**Motion:** David Peterson (Broadcom) moved and Jason Rusch (Viavi) seconded to incorporate slide 4 of T11-2018- 00040-v000, as modified into the next revision of FC-NVMe-2.

– Motion passed by acclamation.

There was also a desire to represent the queue ID in the connection identifier. Some methods were discussed but nothing was decided. A method is required for a target to specify that the format of the connection ID includes the queue ID. More to come.

## **6. Scheduled business**

### **6.1 NVMe Queueing Bharadwaj (Cisco) (T11-2018-00031-v000)**

Harsha presented this comprehensive proposal on updates to various standards that will be required to support the proposal to match the fabric QoS capabilities with that proposed by NVMe for queue priorities including both Strict Priority (SP) and Weighted Round Robin (WRR) capabilities. The changes to FC-NVMe-2 normative text are minimal (just update how the Priority/CS\_CTL field may be used). The proposal contains a long informative annex that needs some further work and agreement before being accepted.

### **6.2 NVMe Keep Alive Bharadwaj (Cisco) (T11-2018-00042-v000)**

This proposal documents the need for FC-NVMe-2 to specify its requirements on the use of NVMe Keep Alive as required by base NVMe. The end result of the discussion is that the spec should specify that keep alive is required and specify the min and max time values. Craig Carlson (QLogic) was tasked with preparing a text proposal.

### **6.3 Error Recovery Carlson (QLogic)**

(T11-2018-00044-v000)

The last text proposal for sequence level error recovery was 16-459v1. Craig stated that QLogic proposes moving ahead with that proposal to turn it into normative text and that QLogic does not support changing base ABTS behavior in FC-FS-5.

## **7. *Unscheduled business***

### **7.1 NVMe-2 Sequence Level Error Recovery (Baldwin, Broadcom) (T11-2018-00047-v000)**

David presented a proposal for sequence level retransmission using new IUs (Flush Check, and Sequence Retransmission) that are sent on the same exchange as the one being recovered. In general, the approach was welcomed.

The proposal is to define these as IUs that use TYPE code 08 (FCP) so that they can be used by both FCP and FC-NVMe. However, they break the rules of Sequence Initiative and have some issues when the Flush Check is received on an exchange that is not open at the target. It was strongly suggested that these recovery mechanisms be implemented in FC-FS-6, rather than in FC-NVMe-2.

### **7.2 NVMe Keep Alive Requirements (Hathorn, IBM) (T11-2018-00046-v0000)**

This contained the same request as item 6.2, that FC-NVMe-2 state the requirements for keep alive usage.

## **8 Project Schedule**

A project schedule was discussed and results follow.

<b>Milestone</b>	<b>Expected Date</b>
Last technical input	August, 2018
T11 Letter Ballot	December, 2018
Forward to INCITS	June, 2019

## **9 Review of Action Items**

See 4.2, Review of Old Action Items.

## **10 Meeting Schedule**

The chair will request 4 hours at the T11 plenary week for FC-NVMe-2 in Deerfield Beach, April 02, 2018. There will be no interim conference calls.

## 11 Attendance Check and Adjournment

Company 	Name	Role
Broadcom Limited	David Baldwin	Member
Broadcom Limited	David Peterson	Member
Broadcom Limited	James Smart	Member
Broadcom Limited	Steven Wilson	Member
Cisco Systems Inc	Harsha Bharadwaj	Member
Cisco Systems Inc	J Metz	Member
Dell Inc	Alan Rajapa	Member
Fujitsu America Inc	Mark Malcolm	Member
Hewlett Packard Enterprise	Barry Maskas	Member
IBM Corporation	Patty Driever	Member
IBM Corporation	Roger Hathorn	Member
QLogic Corporation	Craig Carlson	Group Chair
Viavi Solutions Inc	Jason Rusch	Member

*Patty Driever (IBM) moved and Craig Carlson (QLogic) seconded to adjourn. Approved by acclamation.*

The regular meeting was adjourned at 4:00 PM CST on 7 February, 2018.