

**Minutes**  
**T11.3 FC-NVME ad hoc work group regular meeting**  
**8 August, 2017 – 04:30PM-06:30PM and**  
**9 August, 2017 09:00am to 06:00 PM EDT**  
**Providence, RI, USA**

The FC-NVME ad hoc work group of the Fibre Channel Protocol (T11.3) Task Group held a regular meeting at Providence, RI, USA on 9 August, 2017, hosted by HPE. Attendance was 19 people from 12 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 Tuesday, 9 August, 2017 at 02:42 PM EDT and led a round of introductions and thanked the host (HPE) for organizing this week's events.

## **2 Meeting Policy**

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

The chair explained that attendance is recorded electronically at [www.t11.org/att](http://www.t11.org/att), 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 June, 2017 was posted as T11/2017-00245-v000.

***Patty Driever (IBM) moved and David Peterson (Brocade) seconded to accept T11/2017-0245-v0000 as amended as the agenda for this regular meeting. Approved by acclamation.***

## **4.0 Past Business**

### **4.1 Review of Minutes**

***Lou Ricci (Dell EMC)) moved and Fred Night (NetApp) seconded to accept the following document as the official minutes for the regular meeting on 07 June, 2017 and subsequent interim conference calls as noted. . Approved by acclamation.***

T11-2017-00248-v000.pdf

FC-NVMe Ad Hoc Conference Call Minutes for August 3, 2017

T11-2017-00223-v000.pdf

FC-NVMe Ad Hoc Conference Call Minutes for July 18, 2017

T11-2017-00221-v000.pdf

FC-NVMe Ad Hoc Conference Call Minutes for July 13, 2017

T11-2017-00219-v001.pdf

FC-NVMe Ad Hoc Conference Call Minutes for July 11, 2017

T11-2017-00218-v000.pdf

FC-NVMe Ad Hoc Conference Call Minutes for June 27, 2017

T11-2017-00202-v000.pdf

FC-NVMe Ad Hoc working group meeting Minutes for June 7, 2017

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

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

17-0803-01: James Smart to post T11-2017-00228-v001 update for Misc. Action Items Resolutions to resolve all of his open action items. - complete

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

17-0809-01: James Smart to post as T11-2017-00261-v000 for association recovery process.

17-0809-02: David Peterson to post the final comment resolution document T11-2017-00020-v009 and a new revision of the draft (T11-2017-00145-v003, rev 1.18) with all comments resolved.

17-0809-03: Craig to post version T11-2017-00229-v002.

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

0627-04: James to propose text for 11.2 to cover sequence errors detected in both transmit and received directions to resolve comment IBM-r130. - complete

17-0607-04: Dave Peterson (Brocade) to open a letter ballot comment for new code point proposal for SGL type indicating offset length rather than Address/length coming out of NVMe group. – Complete

17-0607-01: Fred Knight (NetApp) to figure out what happened to the transport specific error code definitions in the base NVM Express spec (the codes in table 41 cannot be found in the base spec) and open an ECN, if appropriate. - complete

17-0418-1: Dave Peterson to post T11-2017-00020-0003 with comment resolutions to date. – Complete

16-1207-03: David Peterson to look at fixing RRQ requirements in FC-FS-5 – complete, topic opened in FC-FS-5 on 08/08/17.

17-0329-1: James to propose text regarding implicit vs. explicit termination of associations and connections that either says only one Disconnect NVMe\_LS is sent (either for the association or one of the connections) or a Disconnect NVMe\_LS is sent for all connections and the association. Check that... - We will explicitly terminate the association (scope=0). May need to say do this only once. – See T11-2017-00157-v000.

Item remains open for further discussion. Will be simplified now disconnecting a connection has been removed from the Disconnect LS (06/07/17)

- See T11-2017-00228-v000

17-0329-2: Dave Peterson to provide a proposal for moving discussion of first burst information from other sections (e.g. Data IU Format) to the First Burst section 4.6 to resolve Dell-DB62.

- Complete– discussion in related comment.

17-0418-3; For IBM-r061, the clearing effects table “Power Cycle” changes to Link Offline or Link Failure – folks should review

- complete- discussion in comment

17-0418-2: Craig Carlson to propose text for resolution of IBM-r055 to better explain how in-capsule data is translated into offsets within the CMD IU referencing data within the data series.

- See T11-2017-00227-v000

17-0502: Dave Peterson (Brocade) to evaluate login options for applicability to FC-NVMe and propose text for resolution to IBM-r074.

- Response in comment.

17-0523-01: James Smart (Broadcom) to define error checking and reject codes for Create Association and Create I/O Connection.

- See T11-2017-00228-v000

17-0607-02: James Smart (Broadcom) to provide text describing the limits of the usage of the parameters in the create association and create I/O connection in terms of when a NVMeoF connect command is used for creation of an Admin queue or an I/O queue, respectively, and to describe what corresponding reject reason codes are to be used for the errors that cause certain error status to be returned in a CQE to a connect command. (e.g. instead of using CQE status of X, an NVMeoFC LS\_RJT with reason code Y is sent.)

- See T11-2017-00228-v000

17-0607-03: Craig Carlson (QLogic) to draft an informative annex that explains how byte 0 and byte 1 are used to identify an unsolicited command IU with type code 08 as an NVME CMD IU rather than an FCP\_CMD IU (re: comments ibm-r0120 and r0121). – carry

- See T11-2017-00229-v000

0627-01: Craig update agenda boiler plate to new web site.

- Complete

0627-02: Dave Peterson to figure out what to do about transport specific error codes that were removed from the fabrics spec (removed March 8, 2016).

- Resolution in comment.

0627-03: James to propose text describing the Data IU format for section 9.4 in lieu of a table requested by the Viavi comment from Jason Roushe.

- See T11-2017-00228-v000

0711-01: For IBM-r031, Resolution is to reference NVMe. Dave to research NVMe CQE status codes to ensure there is one that reflects this particular error.

- Resolution in Comment for further discussion.

For action items prior to 04/11/2017, see prior minutes of the 03/28/2017 regular meeting.

## **5. Old business**

### **5.1 T11-2017-00020-v008 Letter Ballot Comment Resolution**

Resolution/Review of technical comments completed through the end of the document at the last interim conference call on 08/03/2017. T11-2017-00020-v008 reflects the resolutions to date.

David Peterson announced that there are only 34 open comments remaining.

Recessed at 5:55pm on 08/08/17

Resumed at 9:00am on 8/09/17

There was an open discussion regarding termination of an association and ordering requirements of the recovery steps (sending ABTS vs Disconnect LS) that are required to ensure that connection IDs and Association IDs can be reused after the recovery. A new ordered association recovery process was created and documented during the meeting and will be posted by James Smart as T11-2017-00261-v000 and incorporated as new section in 4.3.

976 comments have been addressed and comment resolution has completed!

***Motion: David Peterson (Brocade) moved and Barry Maskas (HPE) seconded to approve the T11.3 LB Comment resolution presented in T11-2017-00020-v009 and forward rev 1.18 of FC-NVMe (T11-2017-00145-v003) to T11.3 for further processing.***  
Motion passed 9-0-0.

### **5.2 00216 Admin Command determinism**

Deferred to FC-NVMe-2

### **5.3 T11-2017-00229-v001 Carlson (QLogic) Informative Annex for CMD IU identification**

This proposed annex was modified and accepted as further resolution to IBM-r055.

## **6. Scheduled business**

The scheduled business is the old business.

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

None

## **8 Project Schedule**

<b>Milestone</b>	<b>Expected Date</b>
Last technical input	Dec, 2016
T11 Letter Ballot	April, 2017
Forward to INCITS	June, 2017

## **9 Review of Action Items**


See 4.2, Review of Old Action Items.

## **10 Meeting Schedule**

The chair will request 8 hours at the T11 plenary week in Coeur D’Alene, ID, October 08, 2017.

There will be no interim calls.

## **11 Attendance Check and Adjournment**

<b>Company</b> 	<b>Name</b>	<b>Role</b>
Broadcom Limited	David Baldwin	Member
Broadcom Limited	James Smart	Member
Brocade	Howard Johnson	Member
Brocade	Scott Kipp	Member
Brocade	David Peterson	Member

Brocade	Steven Wilson	Member
Cisco Systems Inc	Mike Blair	Member
Dell Inc	Louis Ricci	Member
Dell Inc	Erik Smith	Member
Fujitsu America Inc	Mark Malcolm	Member
Hewlett Packard Enterprise	Barry Maskas	Member
IBM Corporation	Patty Driever	Member
IBM Corporation	Roger Hathorn	Member
NetApp Inc	Frederick Knight	Member
OFS Optics	Roman Shubochkin	Member
Panduit Corporation	Jose Castro	Member
QLogic Corporation	Craig Carlson	Group Chair
QLogic Corporation	Raul Oteyza	Member
Viavi Solutions Inc	Jason Rusch	Member

***Lou Ricci (Dell) moved and Fred Knight (NetApp) seconded to adjourn. Approved by acclamation.***

The regular meeting was adjourned at 5:18 PM EDT on 9 August, 2017.