

**FC-BB-5 Ad Hoc Group Meeting Report  
Lake Mary, FL, 5-6<sup>th</sup> December 2007 (07-768v0)**

**1. Introductions**

The FC-BB-5 Ad Hoc group met on Wednesday, 5<sup>th</sup> and Thursday 6<sup>th</sup> December, 2007 in Lake Mary, FL. The meeting was facilitated by Craig Carlson (QLogic).

Craig informed the meeting that Dick DiPasquale (Alcatel-Lucent) has tendered his resignation as chair of the FC-BB-5 Ad Hoc group. Dick's hard work was very much appreciated by all and a vote of thanks was made in the usual way.

Craig reviewed the INCITS anti-trust and patent policy guidelines under which the group operates and reminded attendees that patents are discussed only in the T11.3 and T11 plenaries.

Attendance (electronic): 53 representatives from 30 companies as shown in Annex 1.

Craig noted the full agenda and the requested presentation time of about 12 hours for 8.5 hours of meeting time.

A number of contributions were uploaded with no advance notice. Craig informed that in future, contributions must be posted before the day of the meeting.

The agenda (07-737v0) was reviewed and amended and approved by acclamation.

The minutes of the meetings held on 10<sup>th</sup> October, 2007 in Coeur d'Alene, ID (07-643) and 9<sup>th</sup> November, 2007 in Las Vegas, NV (07-665v0) were reviewed and approved. Bob Nixon moved, Graham Copley seconded; approved by acclamation.

**2. Old Action Items**

1. Action: David Black to work with John Hufferd to further analyze scenario 1 given in contribution 07-558v1. Done; see 07-655 and 07-656.

**3. Scheduled Business**

Contribution 07-682 (Finisar) presented details of the Xgig Trace Viewer functional capabilities which include multiprotocol decodes, trace display, quick searches and protocol analysis. Example traces are included. Future releases plan to support IEEE 802.1Qau and other recent enhancements to Ethernet, including FCoE.

Pat Thaler (chair of Congestion Management Group) informed that 802.1Qau is for Congestion Management rather than the Pause mechanism (being developed in IEEE

802.3) and also that at the Atlanta meeting in November, a motion to authorize the 802.Qau task group to draft a PAR for Priority-based Flow Control was passed. A vote on this PAR is expected at the March IEEE 802.1 Plenary meeting.

Contributions 07-683v1 (EMC) and 07-738 (EMC and HP) were presented together. These contributions provided an updated analysis of the Fabric Crosstalk issue and prevention of forwarding loops. Proposes the addition of 4-bit fields in the FCoE header to define a FCoE frame source port type. Concludes that:

- a) both addressing formats can be made to work (no potentially fatal design flaw visible in either format)
- b) Mapped Addresses need to spell out MAC prefix details
- c) Server Provided Addresses need FCoE header bits to avoid endless failure scenarios (i.e., 'Whac-A-Mole' design approach is not robust)
- d) ACLs are still a major problem for both address formats: MAC duplication causes and prevention need additional attention and Automatic switch ACL deployment and update is a requirement.

Contribution 07-736 (IBM, HP, Broadcom) focuses on the issue of the volume of MAC addresses in the context of network-provided addressing. Discussion ensued on the true scale of the volume of MAC addresses generated and whether it is truly an 'explosion' in the number of addresses. David Black called the Two Week Rule because of the sensitivity of the motions included in the contribution. Craig clarified any documents that are to be voted on must be provided at least 2 weeks before the start of a meeting. This is a Standing Rule: which applies if someone calls it. Further discussion of the subject topic is in order.

Contribution 07-547v2 (Nuova Systems) discusses and compares addressing and high availability (i.e., redundancy schemes) for SAN and LAN. Concludes that LAN bonding cannot be used for Fibre Channel and that LAN and SAN must use different MAC addresses. Furthermore, that the mapped address scheme supports existing LAN and SAN redundancy models

Contribution 07-693 (Nuova Systems) presents information, with an essentially generic perspective, on virtualization and virtualization fundamentals. Three areas are analyzed;

- a) FCoE and Virtualization, b) Storage models and FCoE (including VM-based storage) and c) FCoE and Virtualization in support of Mapped MAC addresses. Concludes that:
  - a) Virtualization has increased the number of MAC addresses in the network and will continue to do so irrespective of FCoE
  - b) is a plausible future solution for the VM-based model
  - c) Mapped addresses do work with virtualization and products already exist.

Contribution 07-694 (Nuova Systems) explores the concepts, characteristics and functional requirements of FCoE Ethernet Transit Switches. The goal being, a robust, interoperable transit Ethernet switch solution. The evolutionary analysis is based upon the fundamentals/specifications beyond IEEE 802.1 and 802.3. Lossless Ethernet is assumed and Data integrity solutions, filtering requirements, and management are explored. Concludes that:

- a) ULP awareness is part of modern Ethernet switches
- b) Mapped MAC addresses work in a dynamic data integrity solution
- c) Transit switch functions can be implemented with many existing 10GE switches.
- d) FC-BB-5 should consider requirements for transit Ethernet switches.

Contribution 07-748 (Broadcom) presents considerations on FCoE MAC addressing, in particular, complexity of Switch and NIC, scalability, security, provisioning and virtualization. Switch side SPMA in the context of IEEE 802.1Q is also included. The contribution called for mandatory support for SPMA (Server Provided MAC Addressing). It was pointed out that Ethernet switch behaviour is not standardized, for example, in the dynamic handling of ACLs. A question was raised concerning the use of VLANs to provide security.

Contribution 07-690v0 (Brocade) is a follow on from an earlier contribution 07-656 and provides clarification concerning the use of SPMA and includes further detailed examination of ACLs required for SPMA environments and overall requirements. Also included is an introductory review of previous material relating to SPMA and extends this beyond the starting the premise of T11 wrt ESs jumbo frames and Pause. The contribution analyzes several aspects as follows:

- a) General topologies
- b) Hypervisors
- c) ACLs and summary thereof
- d) FCoE HBAs
- e) Comparison of static (server-provided or “burnt in”) and dynamic (fabric-provided) addressing
- f) further considerations on VMware
- g) summary of s/w FCoE
- g) security concerns

Brocade reminded the meeting that the starting premise of the work on FCoE was the assumption of jumbo frames and lossless Ethernet. Future extensions to this are not ruled out, for example, dynamic ACLs on static MAC addressing can be entertained.

Contribution 07-689v1 (Brocade) presents considerations on duplicate MAC addresses, how they may arise and how they may be detected and dealt with. Duplicate MAC addresses in the context of VMware and VLANs, and guidelines for Network Administrators are also covered. The contribution poses the question of whether T11’s FCoE protocols can be useful in the detection of duplicate MAC addresses.

Contribution 07-691v0 (Brocade) presents considerations and analysis of data integrity failures but investigates only those data integrity failures associated with the Fibre Channel and FCoE transmission paths. Data integrity failures are defined. It is assumed that FCF have burned-in MAC addresses and other assumptions made are shown. Several failure scenarios are given, analyzed, conclusions drawn and best practices recommended. Further analysis is invited.

Contribution 07-715v1 (Cisco) started with a clarification that with mapped addresses, deep frame inspection is not required to snoop FLOGI, FDISC and the associated accept messages. The contribution is in two major parts. Part 1 is a response to contribution T11/07-656 and attempts to clarify related issues. It compares the ACL approaches for SPMA and mapped and concludes with a comparison table of the various characteristics between the two MAC addressing schemes. It proposes that ACLs enable FCoE to provide equivalent functionality to the FC and also the necessity of being able to deploy FCoE on a wide variety of deployed Ethernet switches. Other aspects covered include:

- a) some thoughts on 802.1x
- b) rogue hosts
- c) static configuration
- d) automatic configuration

Part 2 proposes an enhancement to the ACL scheme for Mapped Addresses which:

- a) increases the use of standardized functionality; e.g., learning
- b) decreases the complexity of the ACLs and
- c) enables implementation on a greater number of existing switches from multiple vendors.

The contribution concludes that SPMA results in much larger equipment changeout requirements.

Due to lack of time, the following contributions were deferred to the next meeting: 07-692, 07-714 and 07-688.

The need for an interim meeting was discussed given that 12 hours were requested against 8.5hours of meeting time. Given the Christmas break the sense of the meeting was that an interim was not desirable.

#### **4. Unscheduled Business**

None.

#### **5. Action Items**

A1. Craig to request 10 hours at the February 2008 meeting.

## 6. Work Plan

Progress FCoE work.

## 7. Next Meetings

The next T11 meeting will be in Austin, TX, Wednesday and possibly Thursday 6<sup>th</sup> & 7<sup>th</sup> February, 2008. Note: the meeting could well start on the Wednesday morning – please check the meeting map.

## 8. Adjournment

Meeting adjourned at 11:53 am.

## Annex 1

<b>Company</b>	<b>Attendee</b>
BROADCOM	Pat Thaler
BROADCOM	Uri Elzur
BROCADE	David Peterson
BROCADE	Glenn Wenig
BROCADE	Robert Snively
BROCADE	Scott Kipp
BROCADE	Steven L. Wilson
BROCADE	Suresh Vobbilisetty
CISCO	Joe Pelissier
CISCO SYSTEMS	Bill Lulofs
CISCO SYSTEMS	Claudio DeSanti
EMC David Black	EMC David Black
EMC	Erik Smith
EMC	Stuart Miniman
EMC CORPORATION	Mark Lippitt
EMULEX	Bob Nixon
EMULEX	Parag Bhide
EMULEX	William R. Martin
ENDL TEXAS	Ralph Weber
FINISAR	Dominic Coupal
FINISAR CORPORATION	Joy Jiang
FUJITSU COMPUTER PRODUCTS OF AMERICA	Mike Fitzpatrick
HEWLETT PACKARD	Don Fraser
HITACHI DATA SYSTEMS	Eric Hibbard
HITACHI GLOBAL STORAGE TECHNOLOGIES	Dan Colegrove
IBM	Roger Hathorn
IBM	Scott Carlson

INTEL CORPORATION	Gary Tsao
INTERNATIONAL BUSINESS MACHINES	Dan Eisenhower
LAMPREYNETWORKS	Barry B. Reinhold
LSI	Tom Hammond-Doel
LSI CORP.	John Lohmeyer
MELLANOX TECHNOLOGIES	Diego Crupnicoff
NEOSCALE SYSTEMS INC.	Landon Noll
NETWORK APPLIANCE	Frederick Knight
NORTEL NETWORKS	Graham Copley
NUOVA SYSTEMS	Ed Bugnion
NUOVA SYSTEMS	Silvano Gai
NUOVA SYSTEMS, INC	James Rivers
PANDUIT CORPORATION	Robert Elliott
PMC-SIERRA	Brian L'Ecuyer
PMC-SIERRA	Niels Reimers
QLOGIC	Ed McGlaughlin
QLOGIC	Skip Jones
QLOGIC CORP.	Craig W. Carlson
SERVERENGINES	Bipul Parua
SOLUTION TECHNOLOGY	David Deming
SUN MICROSYSTEMS	Matt Gaffney
SUN MICROSYSTEMS	Michael Roy
SYMANTEC	Roger Cummings
TRUE FOCUS, INC	Horst Truedtedt
VMWARE	Lawrence Lamers
VMWARE, INC.	Scott Davis