

Approved Minutes
IEEE 802.3 - Backplane Ethernet Study Group
January 12th-13th, 2004
Vancouver, BC, Canada

Prepared by: John D'Ambrosia

(Minutes approved at March 2004 Plenary)

Meeting convened at 8:30am, January 12, 2004.

Agenda / Housekeeping Issues

- Bob Grow requested that Adam Healey be appointed as chair of study group.
- Adam Healey was unanimously elected chair of study group 34 – 0.
- John D'Ambrosia agreed to be recording secretary for meeting at request of Chair.
- Agenda for meeting
 - Determine the following –
 1. Project Authorization Request
 - a. Title
 - b. Scope – The focus: Ethernet as a Fabric
 - c. Purpose
 2. Response to 5 criteria
 - a. Broad market potential
 - b. Compatibility with IEEE Std. 802.3
 - c. Distinct identity
 - d. Technical Feasibility
 - e. Economic Feasibility
 3. Set of Objectives
 - Attendance of study group sessions during interim meetings does not count towards IEEE voting rights. However, attendance of study groups sessions during plenary meetings does count.
 - IEEE rules read to the body by Chair
 - Project schedule discussed
 - See agenda_01_0104 for Possible Timeline
 - Group needs to build consensus for March Plenary Meeting

Presentation #1

Title – “The OIF CEI Project”

By – Mike Lerer / John D'Ambrosia

- Specification is work in progress.
- Technical feasibility not required by OIF, and agreements are voted upon where each member company votes based on its perception.
- The OIF realizes its solution will need to demonstrate technical feasibility.

- Simulation data and test data available.
- Because of potential liaison, concern regarding OIF IP policy expressed.

Presentation #2

Title – “Suggestions PAR & Criteria for Backplane Ethernet Study Group”

By – Mike Lerer

10am

Presentation #3

Title – “Modular Platforms - Market demand & next generation platform and customer requirements”

By – Gopal Hegde

Presentation #4

Title – “Objectives, goals, non-goals, and considerations”

By – Yong Kim

1pm

Presentation #5

Title – “What we learned from XAUI and how to apply it to Ethernet in the Backplane”

By – Ali Ghiasi

Presentation #6

Title – “Channel Performance Insights”

By – John D’Ambrosia

- Return loss including phase needs to be included.
- Material variation needs to be addressed. PWB Material vendors needed to give presentations.
- Variance issues will be complex for open system situations where blades and backplanes come from different vendors.

Presentation #7

Title – “Technical Feasibility of 10GE serial per backplane pair across 40” average grade FR4 and two connectors”

By – Bill Hoppin

3pm

Presentation #8

Title – “UXPi Technical Specification Overview”

By – Tom Palkert

Presentation #9

Title – “Demonstration of 10Gbps Backplane Technical & Economic Feasibility”

By – Brian Seemann

4pm

Adhoc group formed to draft response for 5 Criteria.

January 13, 8:30am

Discussion and Draft of Project Authorization Request

Vote # 1 - Approve following verbiage for Title –
“Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment: Ethernet Operation Over Electrical Backplanes”

Results: Text was accepted by voice vote without objection

Vote # 2 - Approve following verbiage for Scope –
“The scope of this project is to specify additions to and appropriate modifications of IEEE Std 802.3 to specify operation at 1000 Mb/s and 10 Gb/s across an electrical backplane leveraging the existing MAC.”

Results: Text was accepted by voice vote without objection

Vote # 3 - Approve following verbiage for Purpose –
“The purpose of this project is to provide standards based Ethernet interconnection of server and telecommunication blades over a modular platform backplane. Industry trends for LAN, SAN and other applications are migrating to backplane interconnects, and this project will optimize Ethernet operation for backplanes.”

Results: Text was accepted by voice vote without objection

Draft of 5 Criteria Discussion & Motions

Vote # 4 Approve following verbiage for Broad Market Potential

- Ethernet has become widely deployed as a preferred backplane solution. Examples include Modular Servers, Enterprise and Telecom Network Equipment. Quantitative presentations have

been made to the 802.3 BESS indicating significant market opportunities for these applications.

- Rapid growth of network and internet traffic is driving the need for higher performance over backplanes. Currently, IEEE 802.3 does not address this application with a formal standard.
- 156 participants attended the Ethernet Over Backplane call-for-interest, representing at least 33 companies, indicate that they plan to participate in the standardization of Ethernet Over Backplane. This level of commitment indicates that a standard will be developed by a large group of vendors and users.
- A standardized Ethernet interface on blades will maintain the balanced cost for backplane applications.

Results: Text was accepted by voice vote without objection

Discussion on "Compatibility"

- The proposed standard will conform to the 802.3 MAC.
- As was the case in previous 802.3 standards, new physical layer(s) will be defined.
- The proposed standard will conform to the 802.3 MAC Client Interface, which supports 802.2 LLC.
- The proposed standard will conform to the 802.1 Architecture, Management and Interworking.
- The proposed standard will define a set of systems management objects which are compatible with OSI and SNMP system management standards.
- The proposed standard will conform to the requirements of IEEE Std 802-2001.
- Considerable discussion of these issues related back to the Project scope were expressed. Discussion was suspended to permit the body to go back and review the objectives.

1pm

Presentation #10

Title – "Objectives of 10GBASE-T"

By – Brad Booth

- Brad Booth was invited by the BESS chair to give a presentation related to objectives of 10GBASE-T for reference purposes.

Review of Objectives

Vote # 5 - Adopt the following objective:
"Preserve the 802.3/Ethernet frame format at the MAC Client service interface."

Results: Text was accepted by voice vote without objection

Vote # 6 - Adopt the following objective:
“Preserve minimum and maximum frame size of current 802.3 Std.”
Results: Text was accepted by voice vote without objection

The following objectives were discussed and agreed to be revisited.

- “Support full duplex operation only”
- “Support star, dual-star, and full mesh topologies using point-to-point links”
- “Support point-to-point only links with full duplex”
- “Preserve the current 802.3 MAC with no modifications”

Vote # 7 - Adopt the following objective:
“Support existing media independent interfaces”
Results: Text was accepted by voice vote without objection

There was discussion regarding the following “Support a speed of 10.000 Gb/s at the MAC/PLS service interface.” No formal motion was made to accept this as an objective.

Vote # 8 Adopt the following objective:
“Consider auto-negotiation.”
Discussion: Concern regarding this objective since there is no measurable outcome. Wording suggested because while the group felt that negotiation between the 1 and 10Gb/s rates was valuable, it was unclear whether the clause 28, clause 37, or some other autonegotiation scheme would be utilized. Presentations requested for the March meeting to help clarify this objective.
Results: Text was accepted by voice vote without objection

Vote # 9 Adopt the following objective:
“CISPR/FCC Class A.”
Results: Text was accepted by voice vote without objection

Rate and Reach Discussion

- Three initial proposals regarding rate and reach were given-
 - Proposal #1 –Single PHY that achieves the following -
 - Rate - 1 Gb/s and / or 10 Gb/s

- Distance – Total 40”
- Connectors – 4
- Single Lane
- FR-4 or better
- Proposal #2 – single PHY that achieves the following -
 - Rate - 1 Gb/s and / or 10 Gb/s
 - Distance – Total 36”
 - Connectors – 2
 - Lanes - ?
 - FR-4 or better
- Proposal #3 single PHY that achieves the following -
 - Rate – 10 Gb/s
 - Distance – Total 40”
 - Connectors – 2
 - Lanes - 2
 - FR-4 or better

Straw Poll #1

Description: Define minimum number of connectors: two or four

Results:
Two - 19
Four – 15

Straw Poll #2

Description: Define minimum total interconnect distance: 36 inches or 40 inches.

Results:
36 Inches - 5
40 Inches – 33

Straw Poll #3

Description: Define number of lanes for 10Gb/s operation: one, two, both

Results:
One - 18
Two – 4
Both – 12

Vote # 10 - Adopt the following objective:
“Support operation over a single lane across 2 connectors over copper traces on FR-4. “

Discussion - The group agreed that the definition of “lane” is per definition provided for XAUI, which defines a lane as a single differential pair in each direction.

Results: Text was accepted by voice vote without objection

Vote # 11 - Adopt the following objective:
“Define a single lane 1 Gb/s PHY that would support links consistent with lengths up to at least 40 inches of FR-4.”

Discussion - The wording was chosen so that “up to at least” implies operation from 0 to 40 inches.

Results: Text was accepted by voice vote without objection

Vote # 12 Adopt the following objective:
“Define a single lane 10 Gb/s PHY that would support links consistent with lengths up to at least 40 inches of FR-4.”

Results: Text was accepted by voice vote without objection

Vote # 13 Adopt the following objective:
“Define a dual lane 10 Gb/s PHY that would support operation across 2 connectors over copper traces on FR-4 with lengths up to at least 40 inches.”

Results: Opposition during voice vote and subsequent count was

Yes – 5

No – 17

Abstain - 12

Text was not accepted.

Discussion - Presentations needed in March to address PCS and Remote Fault

Vote # 14 - Adopt the following objective:
“Support BER of 10^{-12} ”

Results: Opposition during voice vote and subsequent count was:

Yes – 32

No – 3

Abstain - 1

Text was accepted.

Continuation of Draft Response to 5 Criteria

Vote # 15 - Approve following verbiage for “Compatibility with IEEE Std. 802.3”

- The proposed standard will conform to the 802.3 MAC, and therefore will be consistent with 802.1D, 802.1Q, and relevant portions of 802.1f.

- As was the case in previous 802.3 standards, new physical layers will be defined.

- The proposed standard will conform to the 802.3 MAC Client Interface, which supports 802.2 LLC.
- The proposed standard will conform to the 802.1 Architecture, Management and Interworking.
- The proposed standard will define a set of systems management objects which are compatible with OSI and SNMP system management standards.
- The proposed standard will conform to the requirements of IEEE Std 802-2001.

Results: Text was accepted by voice vote without objection

Vote # 16 Approve following verbiage for “Distinct Identity

- The current 802.3 specification does not explicitly cover backplane transmission. XAUI is for chip-to-chip applications. 10GBASE-CX4 is for box-to-box (cabling) applications. 1000BASE-X has no electrical specification, and 1000BASE-CX is specified for coaxial cable.
- The standard will define a single PHY for each speed of operation.
- The specification will be done in a format consistent with the IEEE document requirements thus making it easy for implementers to understand and design to.
- The proposed specification will use copper media similar to other high speed networking technologies (Fibre Channel, IB4X) but does so with the IEEE 802.3 MAC as the over-riding layer which will result in higher compatibility and lower cost for Ethernet systems.

Results: Text was accepted by voice vote without objection

Vote # 17 - Approve following verbiage for “Technical Feasibility”

- Ethernet MAC and interfaces are being used in backplane applications today.
- Technical presentations, given to BESG, have demonstrated the feasibility of using copper backplane topologies at data rates up to 10 Gb/s per lane using available technologies. Other organizations are developing specifications for backplane applications for similar data rates.
- The principle of extending higher speeds to copper media has been well established by previous work within 802.3. The Backplane Ethernet work will build on this experience.
- Vendors of higher speed components are building reliable products which operate at data rates up to 10 Gb/s per lane on backplanes, and meet worldwide regulatory and operational requirements.

Results: Text was accepted by voice vote without objection

- Vote # 18 -** Approve following verbiage for “Economic Feasibility”
- The component costs will benefit from cost reduction associated with Moore’s Law. Further integration of functionality will reduce cost.
 - Costs for backplanes based on available materials and components are well known and reasonable.
 - Ethernet backplane standardization will increase deployment and diversity of supply base to further reduce cost.
 - Ethernet IP re-use will lower implementation cost.
 - System design, installation and maintenance costs are minimized by utilizing Ethernet system architecture, management, and software.
- Results:** Text was accepted by voice vote without objection

Motion # 1 General Session Motion

Description: The BESG adopt the 5 Criteria as contained within this document.

Motion Type: Technical 75 % required

Moved By: John D’Ambrosia

Seconded By: Schelto Van Doorn

Results:	All Attendees	Y - 32	N - 1	A - 5
	IEEE802.3	Y - 13	N - 0	A - 2

P/F: Motion Passes

Motion # 2 General Session Motion

Description: The BESG forward the PAR, 5 Criteria, and Objectives to 802.3 for consideration at the March Plenary.

Motion Type: Technical 75 % required

Moved By: Brad Booth

Seconded By: John Stonick

Results:	All Attendees	Y - 29	N - 0	A - 3
	IEEE802.3	Y - 15	N - 0	A - 2

P/F: Motion Passes

Announcement made for Plenary in week of March 15 in Orlando, FL.

Bob Grow asked for a sponsor for the May interim meeting.

Meeting adjourned.