Backplane Ethernet
Call-For-Interest

Agenda and General Information

IEEE 802.3 Working Group
Albuquerque, NM
November 11, 2003
Agenda

• Welcome and Introductions
• Overview and Objectives
• Market Requirements
• Technical Focus
• The Other Critters
• Call for Interest
• Future Work and Next Meeting
• Reflector and Web
Objectives of the CFI

- Stimulate interest and discussion
- Introduce the subject of Ethernet over backplanes
- Gauge the level of interest in the subject
  - If sufficient interest, ask for a Study Group
- Key question to be answered:
  Should we request at the 802.3 closing session to authorize the formation of a Study Group to develop a standards project proposal (PAR and 5 Criteria) for “Backplane Ethernet”?

- NOT creating a PAR and 5 Criteria tonight
- NOT writing a standard tonight
What is Backplane Ethernet

- Ethernet as a Fabric
- Use existing portions of the Ethernet standard to develop solutions for the Backplane market
- Not a chassis or connector specification
- Not a material or mechanical specification
- Primarily focus on the 802.3 Physical Layer
  - Electrical specification
  - Channel model specification
**Broad Market Potential**

- **Market trend is to increased density thanks to Moore’s Law**
  - Cable plant becomes the biggest barrier for increased density
  - Trend toward modular in datacom and telecom markets
- **The backplane or fabric is still an Ethernet network**
  - The Ethernet network has just moved inside the box
  - Advanced TCA (aTCA) adopted Ethernet as one of its fabrics (PICMG 3.1)
- **Evolving Ethernet price-performance erodes advantages of other interconnect solutions**
Modular Server Growth Trends

- 20% of Total Available Market (TAM) in ’06
- Cumulative Annual Growth Rate (CAGR) of 135%
- Modular market trends
  - “aTCA to be a $3.7B market by 2007”, RHK Inc.
  - “The WW market for blades will explode to $3.78B by 2006”, Yankee Group

Source: IDC, June 13 2002
Presentations

- Ulf Jönsson, Ericsson; “A Telecom View on ‘Ethernet in the Back-plane’”
- Petre Popescu, Quake; “Backplane Ethernet Call for Interest”
Standards and Industry Initiatives

- IEEE 802.3
  - Link management capabilities in 802.3ae (LF/RF)
  - XAUI capabilities enhanced in 802.3ak
- PICMG 3.1 (aTCA over Ethernet)
- OIF
  - 6+ and 11+ Gb/s for chip-to-chip and board-to-board
  - Also working with ISTO
- UXPi or XFI
  - 10 Gb/s serial links

- Number of different organizations and standards with no common source of reference
  - 802.3 should fill the void
Issues

• Efforts outside 802.3
  – OIF looking to specify faster interfaces for use in optical interconnects and backplanes
    • SERDES focus, not system focus
  – PICMG has developed an Ethernet flavor for aTCA
    • PICMG 3.1 borrowed from 802.3ae with minor tweaks
    • Will rely on 802.3 for future enhancements

• 802.3 has focused on the network, not fabric
  – Specifications not written for the backplane environment
    • Often interpreted for use in that environment
  – Lack of fabric-specific capabilities
  – Order of magnitude granularity creates large technology steps
How 802.3 Can Help

- Ethernet is a favored choice in high volume, low cost Enterprise systems
  - Ubiquity with TCP/IP
  - Implied Ethernet cost structure
  - Longevity and expandability
  - Blade/backplane system is micro-network

- Designers using Ethernet in backplane environments today
  - Standards set common functionality & environmental expectations
  - Promotes interoperability

- Take Ethernet beyond its traditional environment
  - Resolve backplane specific issues
  - Develop ability to use Ethernet within a fabric
Technical Focus

• System environment
  – Electrical, EMI and power
  – Channel model to provide easy migration path

• Speed
  – 1000BASE-X and XAUI have no shared negotiation capability
    • Clause 37 is for optics
    • Clause 28 is for copper, but not spec’ed for backplanes

• Challenges are technically feasible
  – Create a specification that binds all the concepts together
  – Reference existing technologies or standards
Possible Future Work

• **Speed**
  – Increasing data rate per lane
  – Lane aggregation

• **Layer 2 enhancements**
  – Priority based flow control for traffic types (IPC, SAN, LAN, Comm)
  – Fail-over or automatic protection switching

• **Other?**
  – Good topic for a Study Group to consider
The Critters

- Broad Market Potential & Technical Feasibility as mentioned
- Distinct Identity
  - There is no 802 standard for Backplane Ethernet
    - ‘Nuff said?
- Compatibility
  - Make use of existing 802.3 standard
    - Enhance or add to specification only where necessary
  - No changes to the MAC Client
  - Compatible with 802.1, 802.2
  - Keep it Ethernet!
- Economic Feasibility
  - Makes use of existing cost structures
  - Leverage existing implementations and contain interface options
Why Now?

- CX4 is almost done
  - Need a new project for the SerDes vendors ;-)  
- Ethernet is moving beyond the traditional network environment
  - Modular systems
  - Ethernet being used as a fabric
- Multiple vendors are working on backplane solutions
  - Ensure solutions are Ethernet compatible
  - Merge efforts to standardize solutions within 802.3
  - Focus market volume with and 802.3 standard
- Ethernet is evolutionary, not revolutionary
To Quote Bruce Tolley…

- We Are Not In Oz Any More
- We need to support Enterprise customers and data center applications
- We need to lower the cost of the solution
Backplane Ethernet CFI

Next Steps
Call-For-Interest

• Should we request at this meeting to authorize the formation of a Study Group to develop a standards project proposal (PAR and 5 Criteria) for “Backplane Ethernet”?

Y: 93  N: 0  A: 63
Participation

- I would participate in the “Backplane Ethernet” Study Group in IEEE 802.3.
  
  Tally: 41

- My company would support participation in the “Backplane Ethernet” Study Group in IEEE 802.3
  
  Tally: 33
SG & TF Overlap

- Of those wanting to participate in Backplane Ethernet, how many are participating in EFM?
  
  Tally: 6

- Of those wanting to participate in Backplane Ethernet, how many are participating in 10GBASE-T?
  
  Tally: 11
Future Work & Next Meeting

- Ask 802.3 to form a Backplane Ethernet SG on Thursday
- 802 SEC informed of Backplane Ethernet SG on Thursday
- Request 802.3 approval for initial SG meeting, recommending:
  - Week of January 12th
  - Vancouver, BC, Canada
  - Hosted by IEEE 802
- Target date for 802.3 PAR approval: March 2004
Reflector and Web

- No email reflector yet
- If an 802.3 Study Group is formed, we’ll create an email reflector by December 1\textsuperscript{st} at stds-802-3-blade@ieee.org

- No web page yet
- If an 802.3 Study Group is formed, we’ll create a web page by December 1\textsuperscript{st} at http://www.ieee802.org/3/blade

- Announcement will be sent to stds-802-3@ieee.org
Thanks!