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”?

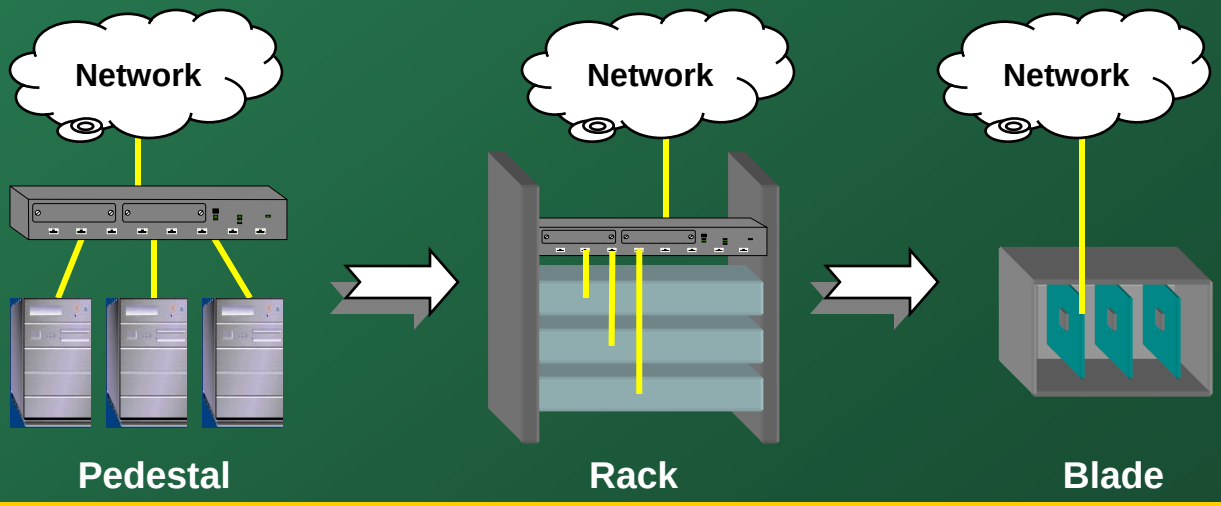
- NOT creating a PAR and 5 Criteria tonight
- NOT writing a standard tonight

What is Backplane Ethernet

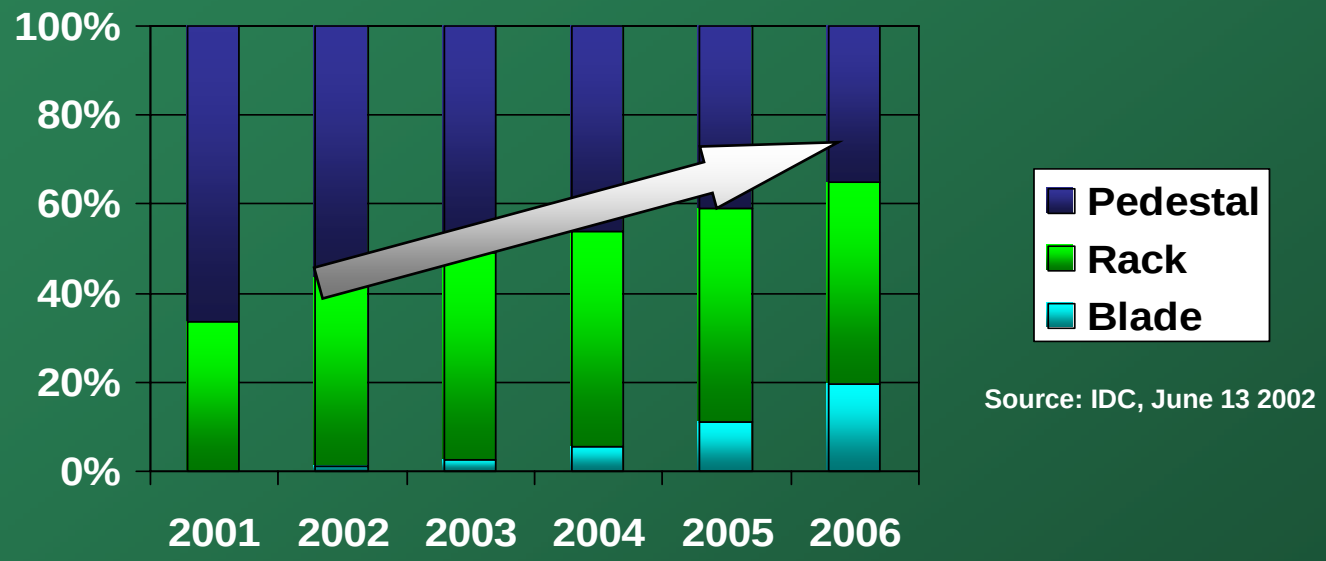
- Ethernet as a Fabric
- Use existing portions of the Ethernet standard to develop solutions for the Backplane market
- Not a chassis or connector specification
- Not a material or mechanical specification
- Primarily focus on the 802.3 Physical Layer
  - Electrical specification
  - Channel model specification

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



Source: IDC, June 13 2002

- 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

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 is 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 a *stds-802-3-blade@ieee.org* email reflector by December 1st

- No web page yet
- If an 802.3 Study Group is formed, we'll create a *http://www.ieee802.org/3/blade* web page by December 1st

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

Thanks!