IEEE Backplane Ethernet

A Telecom View

Ericsson Core Networks

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Objectives revisited with a Telecom View

OK !

- Preserve the 802.3 Ethernet frame format at the MAC client service interface.
- Preserve min. and max. frame size of current 802.3 Std.
- Support existing media independent interfaces
- Support operation over a single lane across 2 connectors over copper traces on improved FR-4 links consistent with length up to at least 1m.
  - Define a 1 Gbps PHY
  - Define a 10 Gbps PHY

"improved" FR-4 ?

Yes …

- Consider auto-negotiation.

Discussion !

- Support BER of 10^{-12} or better.
- Meet CISPR/FCC Class A.

Autonegotiation

- Autonegotiation would be useful, but a simple solution is required (complex solution = higher cost, fewer vendors)
- Speed negotiation 1G/10G is desirable
- Lane negotiation: 10G on one 1 lane vs. 40G on 4 lanes would be valuable
- All other negotiations may be performed on a separate maintenance bus (similar to how ATCA does it)

Performance considerations

- Telecom supports data, as well as voice and multimedia
- Telecom Frame Sizes are within current 802.3 Min & Max
  - Normally a traffic mix, with fairly high volumes of small frames
  - Frame transit delay variations (jitter) need to be kept to a minimum
- BER < 10^{-12} is not good enough (FEC would be needed)
  - System should tolerate BER < 10^{-15}
    (≈ on average one error per 30h at 10 Gbps)
  - Backplane is expected to support 10^{-18} in practice
    (but we wouldn't expect to verify this in a lab)

EMC issues

- Telecom has a large number of cabinets on a site
- Class A has to be ensured for the site as a whole
- Class B required for backplane in building practice
- To reduce crosstalk and EMI, negotiation of amplitude and pre-emphasis needs to be implemented on the new PHY
- Spectral content of line code is an important issue

Note: Shielding and encapsulation issues are about “mechanics”, rather than “backplane”.

Layer 2 issues – out of scope

- **Backplane is good, but Layer 2 enhancements are required for Telecom performance on system level!**
- **Redundancy – Resiliency – Failover Mechanisms**
  - ***Would be neat to build these on existing 802.3 and/or 802.1 Standards***
- **Quality of Service assurance**
  - ***Enhanced Flow Control mechanisms required***

Will these issues be considered in the new Congestion Management Study Group or some other new Study Group ?

THANK YOU!

Questions?