

Changes to Existing Clauses

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IEEE 802.3ae

10 Gigabit Ethernet

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Outline

- Introduction
- Overview of Proposed Changes
- Detailed Review of Proposed Changes
 - Issues
 - Options
 - Implications
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- Summary

Introduction

- To date, no comprehensive proposal has been made to 802.3ae for changing the existing clauses of the standard
- Need to get an agreement in principle on the scope of the changes as the baseline for the first draft

Overview of Proposed Changes

- **“Must Have” --- Needed to support 10 Gigabit Ethernet:**
 - Open Loop Rate Control
 - New References, Definitions, Abbreviations and Interfaces
 - Half/Full Duplex Operation
 - Layer Diagram(s)
- **“Service to Humanity” --- Probably a good idea:**
 - Speed Independence
 - CRC Passing
 - Document Structure
 - MAN/WAN “friendliness”
 - Editorial Stuff

Detailed Review of Proposed Changes

- **Open Loop Rate Control**

- **Implications:**

- **Changes to text in 3 places in Clause 4**
 - **Changes to Pascal in:**
 - **Transmit state variables**
 - **Initialize**
 - **TransmitLinkMgmt**
 - **Deference**
 - **BitTransmitter**

- **New References, Definitions, Abbreviations and Interfaces**

- **Implications:**

- **Changes to text in 1.3, 1.4 and 1.5, as determined by the new clauses**
 - **Add to 1.1.2.2 sections for XGMII, XAUI and SUPI**

Detailed Review of Proposed Changes (continued)

- **Half/Full Duplex Operation**

- **Issues:**

- **10-Gigabit Ethernet will be the first subset of 802.3 that operates in the Full Duplex mode only. This must be accommodated by the standard.**

- **Implications:**

- **Changes to text in 1 place in Clause 1**
 - **Changes to Pascal in:**
 - **Initialize**

Detailed Review of Proposed Changes (continued)

- **Layer Diagram(s)**

- **Issues:**

- The diagrams are too crowded
 - There are too many of them: Clauses 1, 2, 4, 6, 22, 35

- **Options:**

- Continue to maintain all of the above diagrams forever
 - Restructure the document such that clauses that do not have to change otherwise can be frozen

- **Recommendation:**

- Update the diagram in Clause 1 for 10-Gigabit Ethernet
 - Delete the diagrams in Clauses 2, 4 and 6
 - Change the references to diagrams in these clauses to Clause 1
 - Change the diagram in Clause 22 to limit its scope to the MII only
 - Delete the AU1 and the GMII branches
 - This will make this clause consistent with the other clauses of the standard
 - Change the diagram in Clause 35 to limit its scope to the GMII only
 - Delete the AU1 and the MII branches
 - This will make this clause consistent with the other clauses of the standard

Detailed Review of Proposed Changes (continued)

- **Speed Independence**

- **Issue:**

- Make the MAC speed independent
 - Minimize the required changes to the general purpose (speed independent) clauses in future revisions of the standard

- **Implications:**

- Changes to text in 3 places in clauses 1 and 4
 - Changes to Pascal in:
 - Transmit state variables
 - Deference
 - StartRealTimeDelay
 - RealTimeDelay
 - InterFrameSignal

- **Recommendation:**

- Do it!

Detailed Review of Proposed Changes (continued)

■ CRC Passing

■ Issue:

■ Long-standing inconsistency between 802.3 and 802.1:

- The current version of the standard mandates the MAC to generate the CRC for every transmitted frame, and strip the CRC for every received frame
- Many implementations (particularly 802.1 bridges) must pass the CRC to the MAC Client, so that it can be retransmitted intact on a different port, and therefore violate the 802.3 standard

■ 802.3ad (Link Aggregation) tried to fix this problem, but did not finish the job

■ Options: Continue to ignore the problem or fix it once and for all

■ Implications:

■ Changes to text in 13 places in clauses 2, 4, 31 and 31B

■ Changes to Pascal in:

- Common constants and types; Receive variables; Interlayer interfaces
- TransmitFrame; TransmitDataEncap
- ReceiveFrame; ReceiveDataDencap
- CRC32

■ Recommendation: Go for it!

Detailed Review of Proposed Changes (continued)

- **Document Structure**

- **Issue:**

- Clause 22 (MII) contains a section (22.2.4 PHY Management) that has a scope much larger than the rest of this clause
 - Existing GMII PHY parameters; New XGMII PHY parameters; More to come...
 - A lot of the information in this section is out of context with regard to the rest of this clause
 - Ideally, all the PHY Management information should be in one place
 - Many implementations are multi-speed
 - Same device driver is used for multiple PHYs
 - Easier to locate the relevant information

- **Options:**

- Leave everything in place and add the new 802.3ae stuff to Clause 22
 - Leave Clause 22 in peace and create a new PHY Management clause (33) for speeds above 1Gb/s
 - Move section 22.2.4 to a new PHY Management clause (33) and add the new 802.3ae stuff to Clause 33

- **Recommendation: Everything in Clause 33**

Detailed Review of Proposed Changes (continued)

- **MAN/WAN Friendliness**

- **Issue:**

- The current version of the standard is very “LAN specific”
 - This is the first time we are making a conscious attempt to support the WAN

- **Options:**

- May be a good idea to mention this in the standard

- **Implications:**

- Change the first sentence is the overview of the standard in Clause 1
 - In several places replace “LAN” with the more generic term “network”

Detailed Review of Proposed Changes (continued)

- **Editorial Changes**

- **Issues:**

- Editorial cleanup in many places (including Pascal)

- **Recommendation:**

- Do it only in the clauses that require other changes
 - Submit the rest as maintenance requests

Summary

- This proposal contains a summary of all the changes to existing clauses that have been identified so far
- The editor is seeking timely feedback on the presented issues to generate the first draft
- The default will be the editor's recommendations
- More details will be presented during the first draft review