RMII Issues and Considerations:

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IBM, 30Oct'97
and modified by committee, 31Oct'97

Requirement - Do not sacrifice schedule for RMII requirements. Therefore:

1. **Define changes that must be made by RMII PHY implementers to support Token Ring**
2. **Be able to proceed with Station and Port designs without having to wait for a response from RMII PHY implementers (beyond 10/31/97)**

Note: The likelihood of having Token Ring requirements accepted by RMII PHY implementers is dependent on

(a) Ease of folding changes into Ethernet RMII design.

(b) Belief that Token Ring Switch implementers will utilize the design.

(c) Belief that High Speed Token Ring will be successful.

(d) Ability to fit redesign of RMII into their development schedules.

Implementation may be embraced now, a year from now, or never. If implemented it will be usable and will allow us to take advantage of Ethernet cost curves. Whether or not it is implemented it doesn't change our standard or development schedule. (We can have an annex whether or not there are early implementers.)

Issue	Requirements
1	**Programmable auto-negotiation selector field**
	We need an auto-negotiation code point for token ring. Implication is the Auto-Negotiation field cannot be hard wired, but must be settable depending on whether Ethernet or Token Ring is being used.
2	**Token Ring enable bit**
	Is this bit separate from the Auto-Negotiation code point? - Yes!
3	**Larger Elastic Buffer (40 bits)**
	Token Ring requires a large Elastic Buffer (about 40 bits is required to handle an 18.2k frame). Implementers can do the calculations to determine what buffer size they need, but the 40 bit number is assumed to be a close estimate of your likely resulting calculation. The assumed crystal stability is 100 ppm (+/- 50 ppm). **Note that support of this larger buffer will require the ability to switch**

Issue	Requirements
	modes between Token Ring and Ethernet operation since the resulting additional delay using the large buffer size for Ethernet would cause an intolerable reduction of the allowable maximum length of the Ethernet LAN.
4	**CRS_DV is DV only**
	Carrier Sense Function (CRS) is not used by Token Ring. **For Token Ring to work with RMII this requirement is key! We require the CRS_DV line to act precisely like the RX_DV line in the MII. Ethernet will require a different mode. Getting this capability eliminates our problem determining start of frame.** **We also use RX_DV to determine when the frame ends.**
5	**Don't trash rest of frame after code violation detection**
	(Our requirement is: to not trash any RXD bits)

Issue	Requirements
6	**Add TX_ERR. If not, support another Mechanism to do TX_ER (such as out-of-band RMII signal).** **History: 4 Options presented:** 1. **Request support for TX_ER Pin** **This option may not be accepted by the PHY manufacturers** 2. **Proposed setting a bit only in ET (RTP Mtg)** **This option was rejected at the RTP meeting as being too unreliable,** 3. **Set the FCS invalid, and setting an "E" bit in ET.** **This option works with both MII and RMII but is very inelegant.** 4. **30Oct, group suggested using TX_EN line with a newly defined value for the TXD bits to signal the receiver that this is an abort.** **Recapping Option 3:** • **Set a bit in the ET defined as the "E" bit indicating that the receiving station will not count this frame as a frame in error.** • **Corrupt the FCS and guarantee corruption.** **Can be implemented whether or not option 4 is used**

New Issue

Issue	Requirements
7	**Scrambler Reset Timer change is needed for both the MII and the RMII.**
	We need to point out that the standard must be implemented using the high end range for that reset timer to deal with our largest frames. Informative words should be inserted into the standard stating the appropriate range of values for this timer setting to allow for transmission of 18.2k frames.