October 6, 1998

To: Geoff Thompson
Chair IEEE 802.3
cc: Howard Frazier
Chair IEEE 802.3z

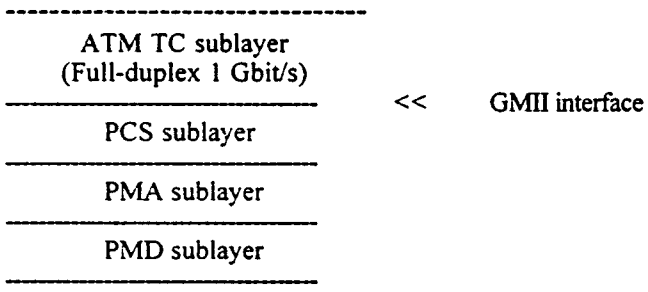
Subject: Operation of IEEE 802.3z GMII interface to continuous octet flow at 1 Gbit/s

Reference: Draft IEEE 802.3z/D5.0 - May 1998

It has been proposed that the Gigabit ATM specification developed within the ATM Forum Physical Layer group shall consist in a ATM cell-based TC (Transmission Convergence) sublayer as defined in BTD-PHY-CELL-01.00 and a physical sublayer as defined in the IEEE P802.3z/D5.0 Gigabit Ethernet specification.

The Gigabit ATM specification we are developing is intended for point to point physical connection. The physical medium is not shared. The target ATM cell rate in each direction of transmission is 1 Gbit/s.

The proposed ATM TC sublayer shall interface with the GMII interface, as defined in clause 35 of IEEE P802.3z. The reference model we are considering is shown below:




From our understanding the GMII interface is defined to operate as a framed-based interface, and it is not clear if this interface can support a continuous gigabit cell/octet flow for point to point connection. The continuous octet flow comes from the fact that the ATM TC sublayer generates a continuous stream of cells; each cell has a fixed length of 53 octets. In the egress direction each cell is immediately followed by another cell, in respect with the transmit clock; there is no idle time between cells. Similarly, in the ingress direction, the ATM TC sublayer is expecting to receive a continuous octet flow from which ATM cells boundaries are recovered (by using the HEC checking).

Our intention is to interface to the ATM TC sublayer with the GMII interface, and we have the following questions:

1) Egress direction

1.1 Can the GMII interface support a continuous octet flow at 1 Gbit/s?

1.2 How should the GMII TX_EN signal be asserted? Shall the TX_EN signal be asserted at the beginning of each new ATM cell?

1.3 If the GMII can not support a continuous octet flow at 1 Gbit/s, can it support a continuous octet flow at lower bit rate?

1.4 Frame delimitation by the PCS sublayer seems to generate some overhead on the link, especially for start of frame indication. Does this overhead have an impact on the maximum data/octet rate that can be sustained by the GMII interface? If yes, what is the bit rate?

2) Ingress direction

2.1 Is the GMII interface capable of providing a continuous octet flow on RXD<7 :0> signal in respect to RX_CLK? Note that the validity of data provided on RXD<7 :0> is not an issue as the cells boundaries are recovered and checked continuously by the ATM TC sublayer before the cells are passed to the ATM layer.

2.2 In the case of a continuous octet flow received from the transmitter, can the GMII interface sustain a continuous 1 Gbit/s rate in the ingress direction, or would it be a lower bit rate? If yes, what is the bit rate?

3) GMII signals

3.1 For the purpose of our application, is it correct that GMII TX_ER signal shall not be asserted as there is no need to generate an extend error indication?

3.2 For the purpose of our application, is it correct that GMII RX_ER, COL and CRS signals shall not be interpreted?

4) Operation under transmission error.

4.1 In case of link failure, can the ATM TC still send data octets on the GMII interface, even if these octets are corrupted?

4.2 In case of link failure, can the ATM TC still read data octets on the GMII interface, even if these octets are corrupted?

We would appreciate if 802.3 would clarify whether the GMII can support these requirements.

Thank you for your cooperation.

Sincerely,

Greg Ratta
Chairman, The ATM Forum Technical Committee