201.3.8 MultiG+100MBASE-T1/V1 operations, administration, and maintenance (OAM)

The MultiG+100MBASE-T1/V1 PCS level operations, administration, and maintenance (OAM) provides an optional mechanism useful for monitoring link operation such as exchanging PHY link health status and message exchange. When OAM is implemented, behavior is defined in 149.3.9, including the state diagrams in Figure 149–24 and Figure 149–25.

The OAM frame data is carried in the OAM 10-bit field described in 201.3.2.2.13 for HS_PATH.

OAM involves both HS_PATH and LS_PATH. The 10-bit symbols are inserted one at a time into the OAM field in each Reed Solomon frame in the HS_PATH and LS_PATH.

201.3.8.1 Definitions

The definitions for OAM are as defined in 149.3.9.1 for OAM frame, OAM symbol, OAM message, and OAM status.

OAM field: A 10-bit field in each RS-FEC frame reserved for the OAM symbol as described in 201.3.2.2.14.

201.3.8.2 Functional specifications

MultiG+100MBASE-T1/V1 OAM functions are the same as those defined for a MultiGBASE-T1 PHY in 149.3.9.2 with the exception that the MultiG+100MBASE-T1/V1 OAM frame structure, PHY health, and PHY health indicator are defined in 201.3.8.2.1.

201.3.8.2.1 MultiG+100MBASE-T1/V1 OAM frame structure

The MultiG+100MBASE-T1/V1 OAM frame structure is defined in 149.3.9.2.1 with the removal of Low Power Idle operation.

Each OAM frame is made up of 16 OAM symbols. Each of the first 14 symbols is made up of one octet of data, one framing bit, and one reserved bit. The last 2 symbols are the Reed-Solomon (16,14) parity symbols.

One OAM symbol is placed in the 10-bit OAM field in each PHY frame during normal power operation in the data mode. The sixteen OAM symbols are consecutively inserted into sixteen consecutive PHY frames. Once the sixteen symbols of the current OAM frame are inserted, the sixteen symbols of the next OAM frame are inserted. This process is continuous without any break in the insertion of OAM symbols.

When the PCS frame is operating in interleaved mode of 2x or 4x, the first symbol (OAM<0>) shall be inserted in the first RS frame in the superframe so that the full OAM frame can be packed into eight superframes in the 2x interleaved mode, and into four superframes in the 4x interleaved mode.

Bit 0 of each OAM symbol is the first bit transmitted in the 10-bit OAM field. Symbol 0 is the first symbol transmitted in each OAM frame.

The OAM frame boundary can be found at the receiver by looking at bit D8. The boundary is a 0 followed by thirteen 1's followed by two don't care.

If OAM is not implemented then the 10-bit OAM field shall be set to all 0's. If the link partner does not implement OAM, the 10-bit OAM field will remain static.

201.3.8.2.2 PHY health

The PHY Health (SNR<1:0>) is indicated in OAM<0><1:0>.

This status is set by the PHY to indicate the status of the receiver. The definitions of good, marginal, and when to request retrain are implementation dependent.

00: PHY link is failing and will drop link and relink within 2 ms to 4 ms after the end of the current OAM frame

01: Reserved

10: PHY SNR is marginal

11: PHY SNR is good

201.3.8.2.3 PHY health indicator

The PHY current health is sent to the link partner on a per OAM frame basis using the SNR<1:0> bits as described in 201.3.8.2.2. It lets the link partner have an early indication of potential problems that can cause the PHY to drop link or have high error rates.

201.3.8.3 State diagram variable to OAM register mapping

See 149.3.9.3.

201.3.8.4 Detailed functions and state diagrams

See 149.3.9.4.

201.4.8 100M+MultiGBASE-T1/V1 operations, administration, and maintenance (OAM)

The 100M+MultiGBASE-T1/V1 PCS level operations, administration, and maintenance (OAM) provides an optional mechanism useful for monitoring link operation such as exchanging PHY link health status and message exchange. When OAM is implemented, behavior is defined in 201.3.8.