

OAM Scope and Requirements

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Disclaimer

All requirements, criteria, and concepts are blatantly stolen from a review of the requirements and OAM presentations over the past 3 meeting cycles.

Purpose

To better define the functional and operational requirements of OAM within the EFM objectives so that various implementation proposals can progress forward on common functionality.

What is OAM to EFM?

We have 3 documented objectives:

- Remote Loopback
- Link Monitoring
- Remote Failure Indication

To continue to make progress, we need to

1. Better define these objectives.
2. Define the operational requirements.

What is Loopback?

Functional Requirements

- a) PHY layer loopback?
- b) MAC loopback?
- c) Ping loopback?

Control Requirements

- a) Local control (obvious)
- b) Remote control?
 - What level of security is required?
- c) Timed exit?
- d) Reliable reset operation?
- e) Operation over asymmetric links?

Loopback Requirements

- Symmetric EFM PHYs should support a PHY level loopback.
- EFM OAM must support a “ping” test when a frame is sent to destination and the destination echoes the packet contents back to the source.
- All loopback functions must be controllable both locally and remotely.
- EFM OAM must include safeguards to prevent infinite a station staying in loopback indefinitely (e.g., timers, reliable reset, etc.)

What is Link Monitoring?

Link Monitoring Requirements?

- a) Specific counters?
 - txBytes, rxBytes?
 - FCS errors, CVs?
 - BER, FER?
 - TxPower (optics)?
 - Counter reset?
 - Others?
- b) Generic MIB read access?
- c) Generic MIB write access (mgmt)?

What is Link Monitoring?

- d) Alarms (unsolicited messages)?
 - a) Last gasp?
 - a) What are causes? User extendible?
 - b) Unsolicited statistics?
 - c) Environmental?
 - a) Power, temperature?
 - d) Threshold alarms?
 - How to configure?

Link Monitoring Requirements

- EFM OAM must support read access to an arbitrary set of variables defined by 802.3.
- The method of must be extensible to variables defined outside 802.3 as well.
- Setting/writing variables is NOT a requirement (no link management).
- EFM OAM must support generic event notification procedures with an extensible event set.
- One of the initially defined events must be a diagnostic last gasp. An initial set of diagnostic capabilities for this event must also be defined.

What is Remote Failure Indication?

- Current 802.3 behavior is to turn off transmit interface if receive is down.
 - PHY Layer LoS indicator?
 - MAC Layer LoS indicator?
 - What diagnostics to include?
 - No signal?
 - No sync?
 - Other end of link vs far-side of CPE?
 - See 10GE specification for RFI possible definitions and examples

RFI Requirements

- EFM PHYs should support a PHY level RFI for the local link with diagnostics.
- Signaling failure of remote links (e.g. the links on the customer side of the CPE) is not a requirement of EFM OAM.

Other OAM Functions?

- Subscriber management
- Station management
- Link management
- Control communications channel
(available to upper layers)
- Objectives applied to remote link
(customer facing interfaces of CPE)

Other Functional Reqts

- EFM OAM must provide a general control communications mechanism for EFM OAM purposes, and that can be made available to higher layer management applications.
- Other organizations and/or vendors may use this communications channel to add additional OAM functionality.
- EFM OAM must support both peer-to-peer and master-slave models.
- Everything we do must fall under the 802.3 umbrella (I.e. a single link).

Major Contention

- What are allowable effects of OAM on the link, especially in terms of user data traffic vs OAM on the wire?