

802.3ah Link OAM

IEEE 802.3ah remote management is tailored to deliver services to small and medium sized businesses. IEEE 802.3ah Link OAM was developed by the IEEE as a standard for detecting link failures on the first hop, point-to-point physical Ethernet links. Often referred to as “Ethernet in the First Mile” (EFM) describes that any Ethernet device that has IEEE 802.3ah capabilities can learn each others OAM capabilities via a ‘Discovery’ mechanism performed either at the MAC or IP address level. IEEE 802.3ah in addition to discovery capabilities, incorporates Remote Fault Detection, which allows one end-point device to inform the other in both bidirectional and unidirectional links that a link failure has been detected. Once the failure is detected, it can set a device in a loopback mode that will clear when it recovers. An example of IEEE 802.3ah fault detection is Dying Gasp. A Dying Gasp condition occurs if there is an interruption in the end-point’s power source. Prior to the device power failure, there is enough power reserved for a Dying Gasp alert to be sent to the network operator’s network management system. This helps a service provider identify and isolate the end-point device that has experienced a power failure. IEEE 802.3ah also includes Remote Monitoring capabilities. This allows network operators to collect real-time and historical near and far-end link performance statistics similar to those found in SONET/SDH networks.

Although IEEE 802.3ah can provide valuable information to network operators on critical events, IEEE 802.3ah does not provide a method or mechanism for repairing faults as they occur. Moreover, because of the wide range in equipment capabilities, fault isolation may require a network operator to establish conditions and traffic for that specific fault condition. An example of such a generated traffic packet is an IEEE 802.3ah Loopback Message (LBM) packet, which is designed to address and isolate performance issues on specific links within a service provider’s network.

Features

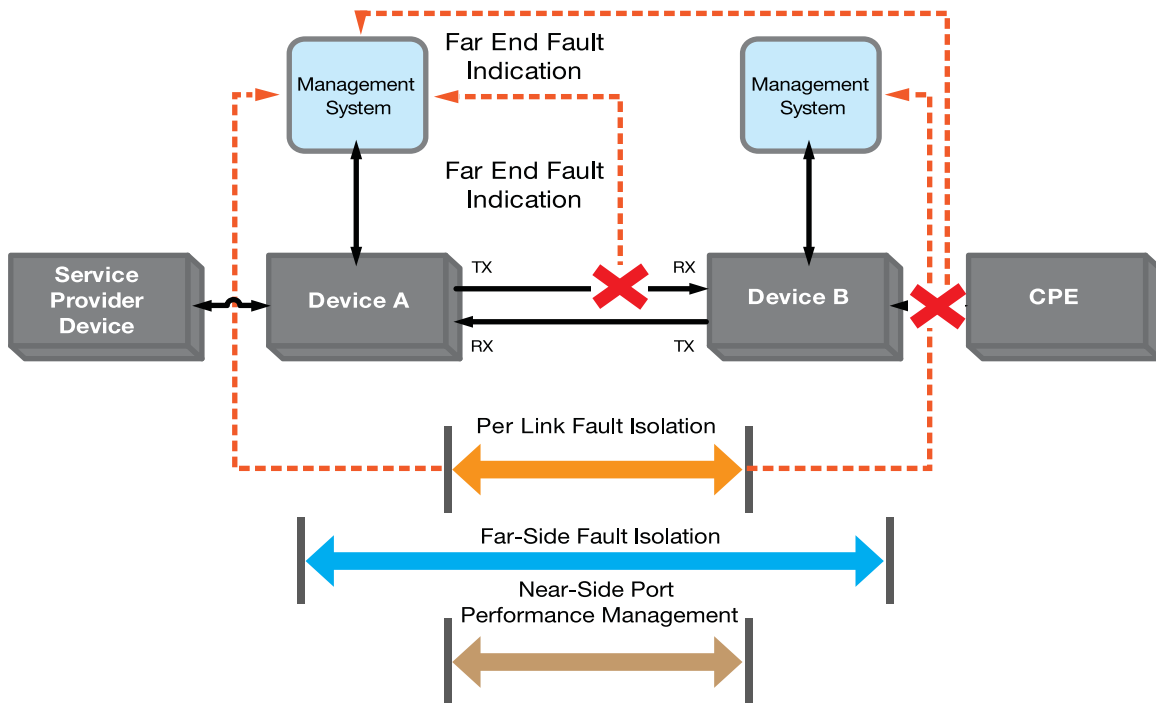
- Discovery
- Far End Fault (FEF)
- Dying Gasp
- Fault Isolation
- Per Link Fault Isolation
- Critical Events
- Local Loopback
- Remote Loopback

Application

Link OAM users generally have very basic SLA requirements and will tend to use IEEE 802.3ah in isolating faults efficiently and quickly. Link OAM devices need to be used at both the service provider’s point of presence and at the customer premise (CPE) for effective link reporting.



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Additional Capabilities

Link OAM also has another option that does not require the deployment of IEEE 802.3ah to receive all of the reportable information. In this option, management reporting is done through the IP address of the NID. This means that rather than a book-end IEEE 802.3ah type deployment—an operator can simply connect the fiber coming from an Access

Node switch to a remote NID and manage all of the features and capabilities of the NID, through an individual IP address that is assigned by the operator carrier. This set-up provides an operator with increased visibility beyond IEEE 802.3ah reporting and does not require both items in the link to have IEEE 802.3ah capability.