

EFM Common Topology Relationships

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EFM: A Closed System

- At extreme edge of service network
- Services do not have to feed through to, be managed by or be direct layer 1 clients of networks beyond this L1 architecture & environment.
- 802.3 PHY layer signaling only - P802.3ah
- OAM overhead is inband to PHY and Out of Band to link level data (not part of Ethernet frame stream).

Today – 802.3 is Peer to Peer

- Full duplex point to point is a peer-to-peer environment at PHY signal level...
- Symmetrical bandwidth uplink (OLT to ONU) and downlink (ONU to OLT)
- EFM Point to Point can not be peer to peer for OAM functionality (Master/Slave)
- EFM Point to Multi-point cannot be peer to peer (Master/Slave or Client/Server)

P802.3ah P-2-P Has To Be Master/Slave

- Head end system (OLT) controls performance monitoring and administration of all tail end systems (ONT) regardless of topology
- OLT functions to link service provider OAM functionality to customer premise equipment
- OLT functions to link all CPE remote functionality to service provider Operations Services Systems (OSS)
- Applies to copper media as well as optical media

P-2-MP Option 1: Master/Slave

- Master (OLT) directly controls the uplink bandwidth from slave (ONU)
- Grant signal propagation delay in OAM signal from master to slave – may consume a significant portion of the time available for uplink traffic (guard band)
- Inexpensive – does not require complex timing and synchronization functionality
- Dynamic reallocation of uplink bandwidth between multiple slaves (round-robin or poll-mode)
- Work well in Fiber to the Home service environments where required uplink bandwidth is much lower than downlink services bandwidth and cost is a major factor

P-2-MP Option 2: Client/Server

- Server (OLT) assigns time slot to clients
- Each client (ONT) uses assigned time slot as needed
- Fixed assignable bandwidth (functions similar to existing TDM Private Line)
- Stranded bandwidth when not used by individual clients
- Expensive – requires complex ranging and timing synchronization functionality
- Would work well in a Multi-Tenant Business services environment where uplink and downlink bandwidth is symmetrical and ONT cost is less of a factor

EFM is Service Edge Technology

- P802.3ah technology will be at the extreme edge of any service provider infrastructure
- The service head end system will always be the master of the customer premise equipment regardless of uplink bandwidth service type
- The CPE acts as the service demarcation for what ever service/s are provided
- The physical link is the most basic common manageable facility for all services