IEEE 1904.2 UMT

Representative Use Cases

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Use Cases in this Presentation

- Management Station Transmitting OAM
- Management Station Receiving OAM
- SIEPON OAM over UMT to discover OLT
- SIEPON OAM over UMT to discover 10G EPON ONU
- SIEPON OAM over UMT to perform capabilities exchange and manage ONU

Management Station Transmit and Receive OAM

Use Case – Management Station Transmit OAM

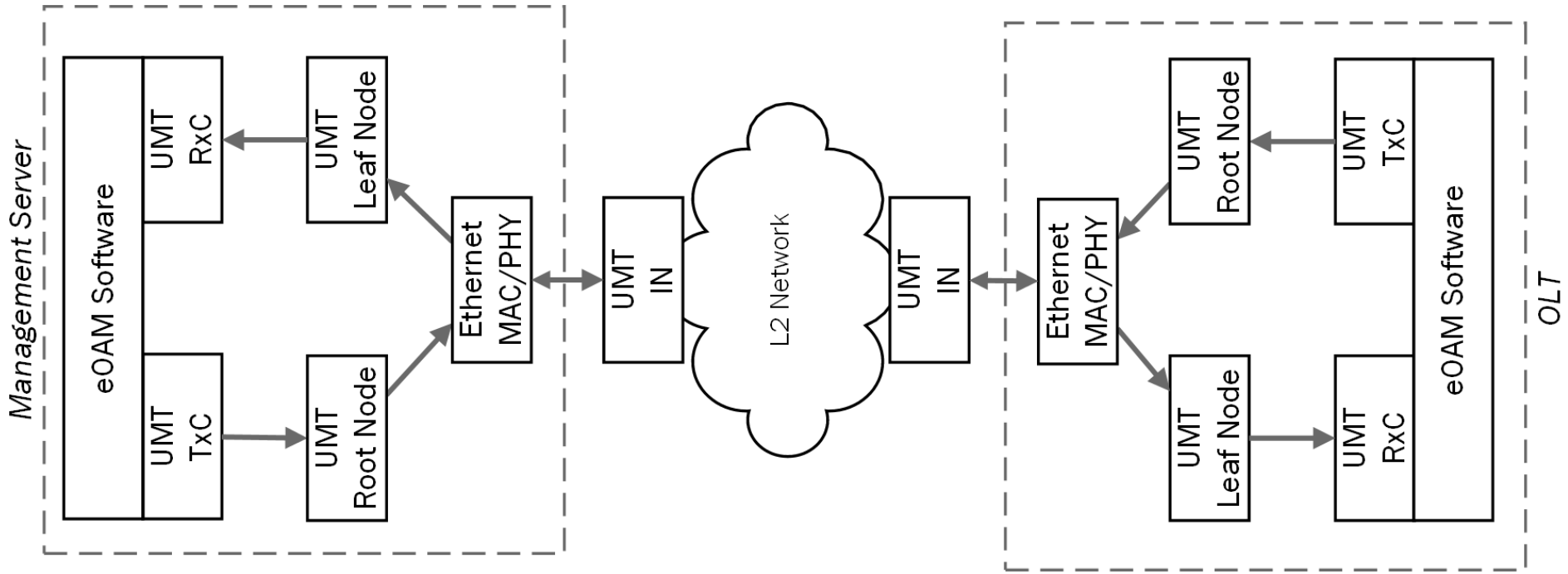
1. OAM Software (UMT-TxC) in Management Station registers with UMT-RN
2. OAM Software (UMT-TxC) forms OAMPDU
3. OAM Software (UMT-TxC) sends OAMPDU to UMT-RN (UMT Sublayer) (specifying DA)
4. UMT-RN (UMT Sublayer) Encapsulates OAMPDU in UMTPDU
5. UMT-RN (UMT Sublayer) passes UMTPDU to MAC
6. MAC transmits UMTPDU (DA as specified by the OAM TxC)

Use Case – Management Station Receive OAM

1. OAM Software (UMT-RxC) in Management Station registers with UMT-LN (UMT Sublayer)
2. UMTPDU is received by MAC
3. MAC passes UMTPDU to UMT-LN (UMT Sublayer)
4. UMT-LN decapsulates and demultiplexes. Sub-Type=OAM
5. UMT-LN function passes OAMPDU to OAM Software (UMT-RxC)
6. OAM Software processes OAMPDU

SIEPON OAM over UMT to Discover and Manage OLT

Example Use Cases – Management of OLT via OAM



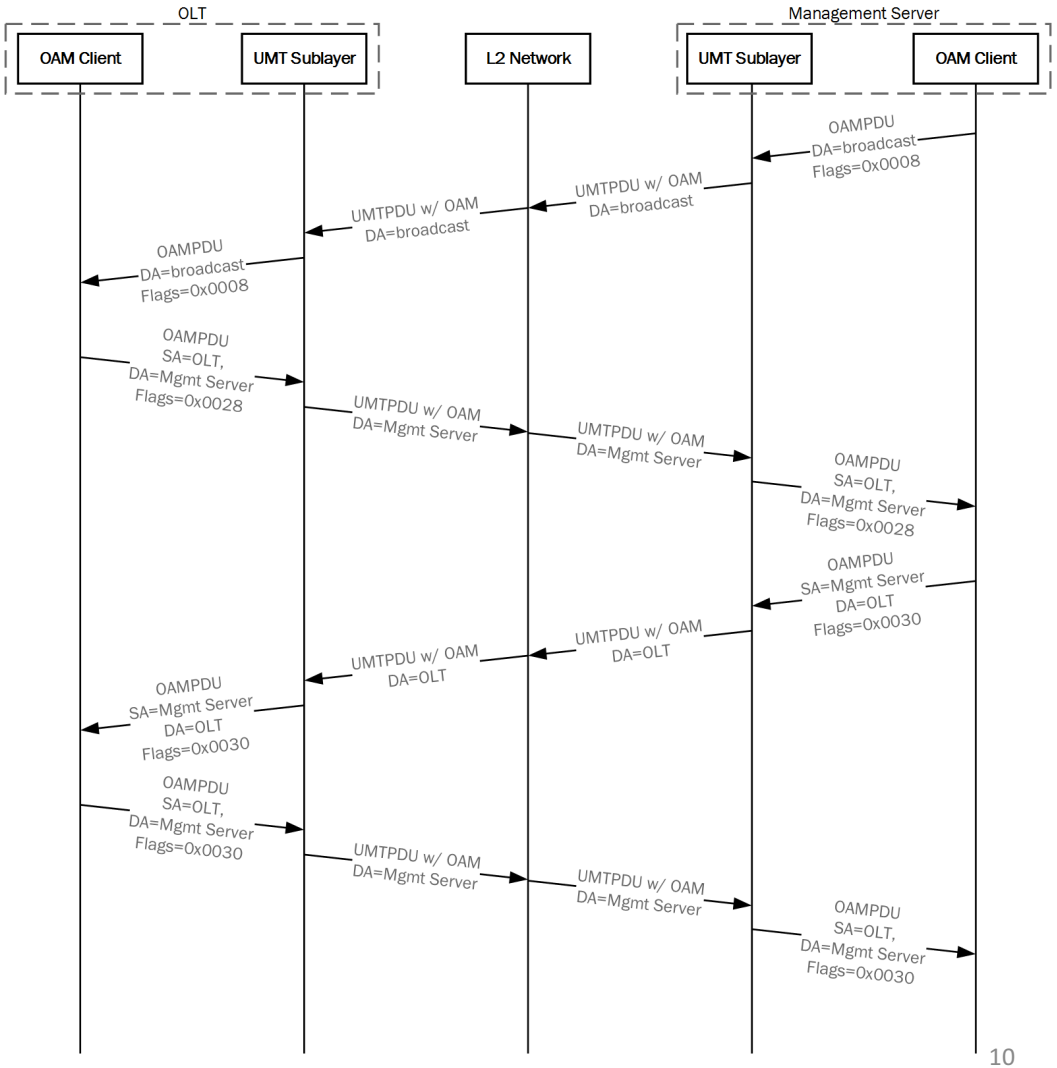
Use Case –
OAM Discovery of OLT (part 1/2)

1. OLT Network Entry Complete
2. OLT Waits
3. Management Station transmits OAMPDU via UMT (DA=broadcast)
4. OLT receives (on NSI) Broadcast UMTPDU
    1. MAC Passes UMTPDU to UMT-LN (UMT Sublayer) Function
    2. UMT-LN (UMT Sublayer) Function Decapsulates and DeMultiplexes. Sub-Type = OAM
    3. UMT-LN (UMT Sublayer) Function passes OAMPDU to OAM Software (UMT-RxC)
    4. OAM Software (UMT Client) processes OAMPDU (Discovery)
5. OLT Responds (on NSI) to OAM Discovery
    1. OAM Software (UMT TxC) forms OAMPDU (Info) in response to Discovery
    2. OAM Software (UMT-TxC) passes OAMPDU to UMT-RN (UMT Sublayer) function in OLT
    3. UMT-RN (UMT Sublayer) encapsulates OAMPDU in UMTPDU
    4. UMT-RN (UMT Sublayer) passes UMTPDU to MAC
    5. MAC transmits UMTPDU on NSI with DA=SA from UMTPDU containing discovery

Use Case –
OAM Discovery of OLT (part 2/2)

6. Management Station receives UMTPDU
   1. MAC Passes UMTPDU to UMT-LN Function (UMT Sublayer)
   2. UMT-LN Function (UMT Sublayer) Decapsulates and DeMultiplexes. Sub-Type = OAM
   3. UMT-LN Function (UMT Sublayer) passes OAMPDU to UMT-RxC for OAM Software
   4. OAM Software (UMT RxC) processes OAMPDU
7. Management Station Responds to OAM (via UMT)
8. OLT Receives and Responds (via UMT)
9. Repeat (7-8) until state is stable on OLT and Management Station

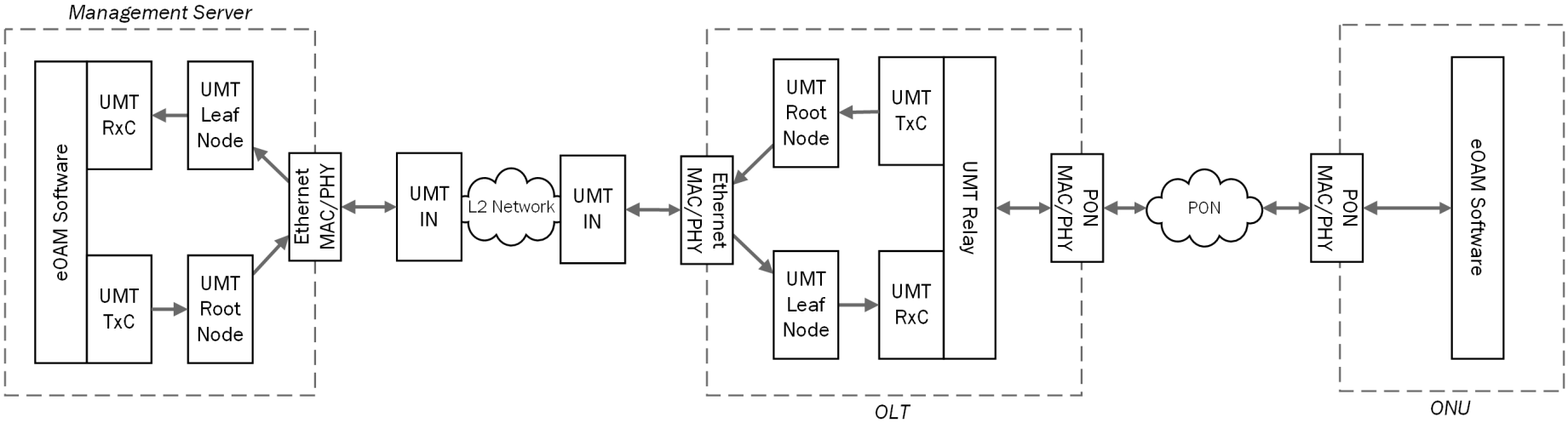
OLT OAM Discovery



SIEPON OAM over UMT to manage 10G EPON ONU

GENERALIZED CASE

Example Use Cases – Management of ONU via UMT Relay



- *UMT Relay is simply a specially designed UMT client and does not necessarily need to be defined in 1904.2*

Assumptions

- IEEE 802.3 10G EPON implementation
- SIEPON compliant
- ONU does not have UMT software onboard
- OLT has UMT software onboard

Generalized Use Case
OAM Discovery of ONU (part 1/?)

1. OLT Network Entry Complete
2. OLT OAM Discovery Complete
3. ONU Network Entry Complete
4. ONU Waits

Generalized Use Case
OAM Discovery of ONU (part 2/?)

5. Management Station transmits OAMPDU via UMT (DA=broadcast)
6. OLT receives (on NSI) Broadcast UMTPDU
    1. MAC Passes UMTPDU to UMT-LN Function (UMT Sublayer)
    2. UMT-LN (UMT Sublayer) Decapsulates and DeMultiplexes. Sub-Type = OAM
    3. UMT-LN (UMT Sublayer) passes OAMPDU to UMT-RxC for OAM Software
    4. UMT-LN (UMT Sublayer) ALSO passes OAMPDU to UMT-Relay function
    5. OAM Software (RxC) processes OAMPDU (Discovery) – NOOP for OLT
    6. UMT-Relay Function changes DA=slow-protocols on OAMPDU for transmission over PON
        1. Pre-Requisite – UMT-Relay function has registered itself as a receiver for OAM from PON and from UMT-RxC
    7. UMT-Relay Function passes OAMPDU to PON MAC for transmission
    8. OLT transmits OAMPDU onto PON

Generalized Use Case
OAM Discovery of ONU (part 3/?)

7. ONU receives (on PON) OAMPDU
   1. ONU MAC passes OAM message to OAM software
   2. OAM Software processes OAM PDU
8. ONU responds to OAM discovery
   1. OAM Software forms OAMPDU (Info) in response to Discovery
   2. OAM Software passes OAMPDU to MAC
   3. MAC transmits UMTPDU on PON DA=slow protocols

Generalized Use Case
OAM Discovery of ONU (part 4/?)

9. OLT receives (on PON) OAMPDU
    1. MAC Passes OAMPDU to UMT-Relay Function
    2. UMT-Relay Function forwards OAMPDU to OAM Software in OLT
        1. OLT OAM Software must decide whether to process the OAMPDU or not
    3. UMT-Relay's UMT-TxC function forwards OAMPDU to UMT-RN in OLT
    4. UMT-RN encapsulates OAMPDU in UMTPDU
    5. UMT-RN passes UMTPDU to MAC
    6. MAC transmits UMTPDU on NSI (DA=??)

Generalized Use Case
OAM Discovery of ONU (part 5/?)

10. Management Station receives UMTPDU
    1. MAC Passes UMTPDU to UMT-LN Function
    2. UMT-LN Function Decapsulates and DeMultiplexes. Sub-Type = OAM
    3. UMT-LN Function passes OAMPDU to UMT-RxC for OAM Software
    4. OAM Software processes OAMPDU
11. Management Station Responds to OAM via UMT
12. ONU Receives and Responds (via UMT)
13. Repeat (11-12) until state is stable on ONU and Management Station

MORE PROTOCOLS TO BE ADDRESSED IN THE FUTURE

Use Cases to be Expanded

- OMCI over UMT to discover XGS-PON ONT
- IP over UMT
- LLDP over UMT
- IGMP over UMT
- MACSEC over UMT

Thanks!

Q&A