

# OAM in EFM Station Management versus Subscriber Management

---

Faye Ly  
Salira Optical Network Systems

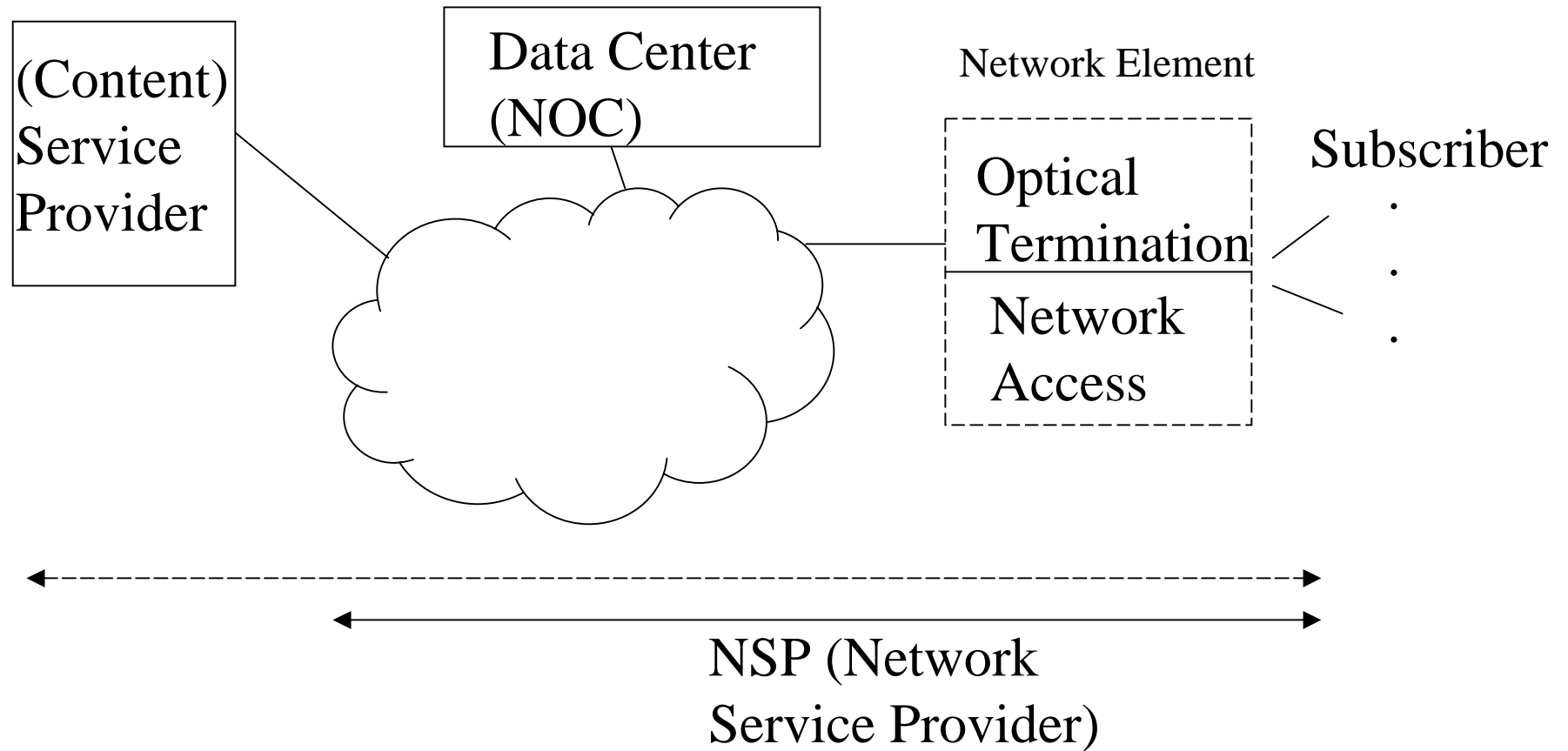
Dan Romascanu  
Avaya Communication

# OAM in EFM

## Scope

- Continuation from the May meeting regarding OAM requirements
- The need for Station Management objects in OAM
- EPON MAC/PHY Managed objects

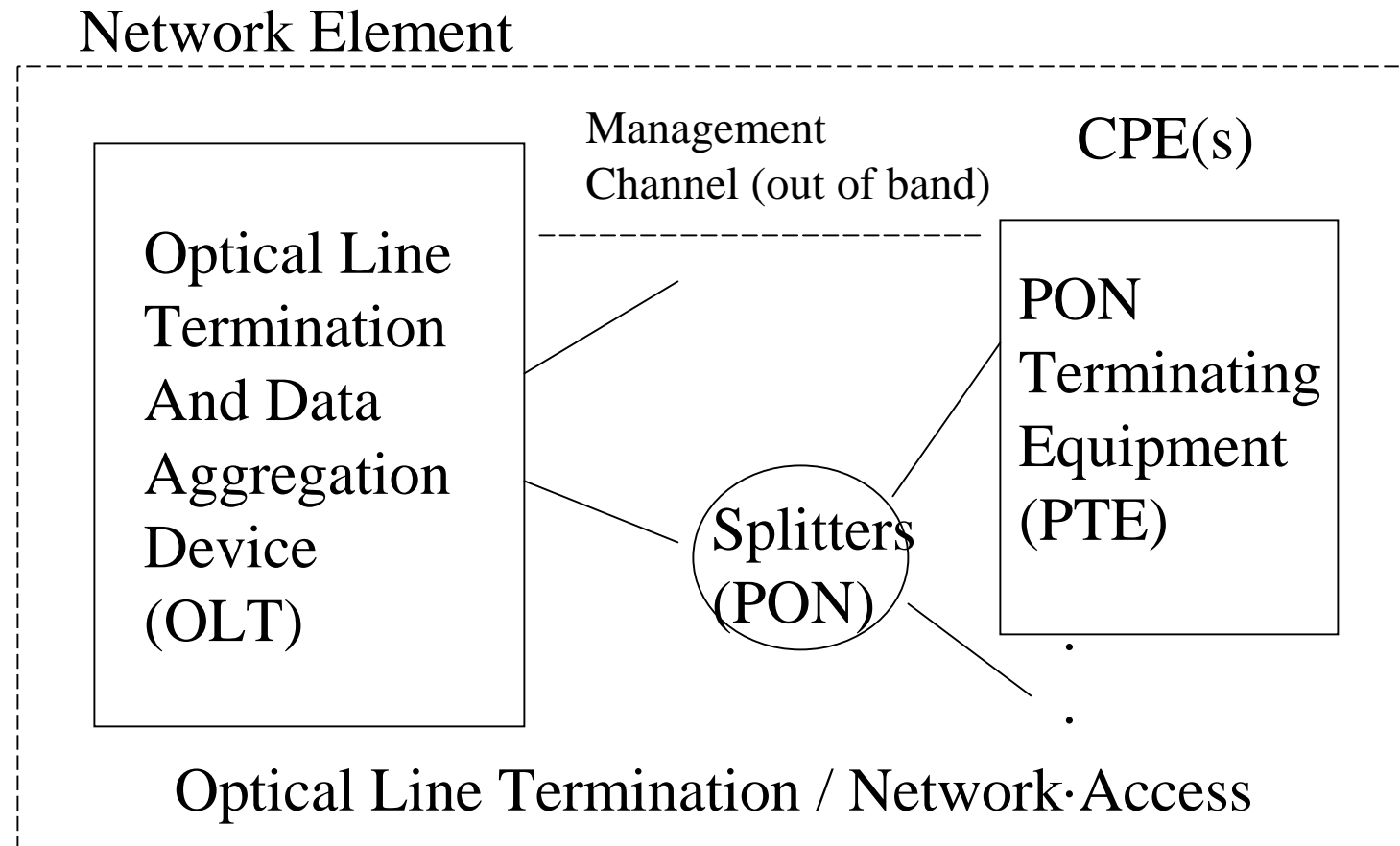
# Management Model



# Management Model (Continued)

- NSP sells service to subscribers.
- Out of band management channel.  
Reserved time slot for OAM.
- Network Center (NOC) is required to manage a single network element that provides both optical line termination and network access for the subscribers.

# Management Model (Continued)



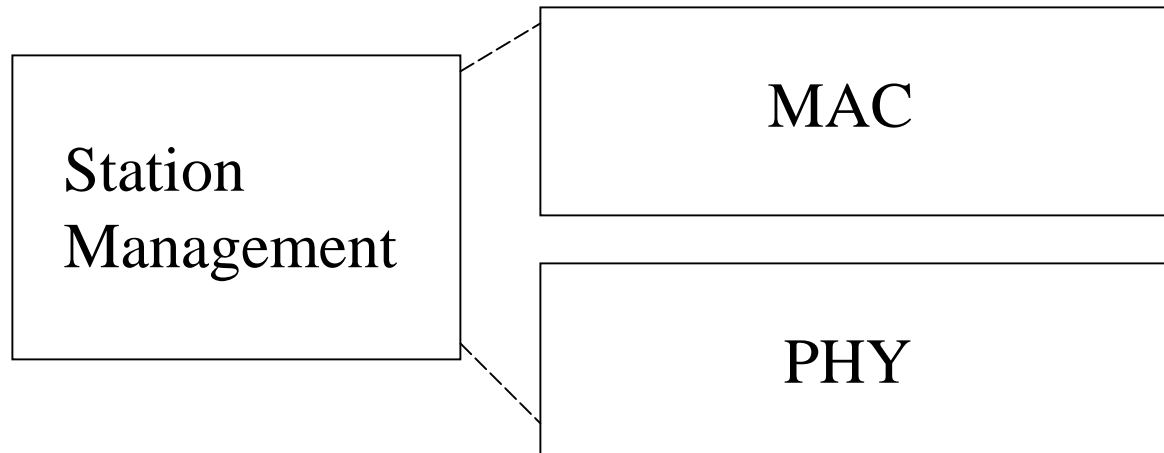
# Management Model (Continued)

- No matter where the demarcation point is, NSP has to have access to both OLT and PTE to provide network access.
- NSP has to be able to provision OLT line to enable and inter-operate with PTE.
- NSP has to be able to diagnose problems between OLT and PTE.
- Sometimes NSP owns both OLT and PTE.

# Management Objects

- Station Management
  - Objects used to manage both OLT and PTE
  - Port objects
- Subscriber Management
  - Manages services sold to the subscribers
  - Also manages subscriber information

# Station Management (Continued)



- Station Management encompass both MAC and PHY.
- Can't do remote management without having SM.



# PHY/MAC

## EPON Specific Management

- EPON is master slave as opposed to peer to peer
- How does EPON deal with 802.3 CSMA/CD?
  - EPON is TDMA
  - Collision avoidance (CA) as opposed to Collision Detection (CD)
  - Collision avoidance using request/grant
  - Dynamic TDMA request/grant using PAUSE frames
- May be applied to other point to multi-point EFM technology

# PHY/MAC

## EFM Management

- PHY layer objects
  - LOS (Loss Of Signal)
  - Optical performance degrading detection
  - Bit errors – Code violation and Incomplete burst counters
  - Range window min/max distance
  - Logical distance between OLT and PTE
  - Bit/Word/Frame Synchronization
  - Number of pre-amble ( $n*m\_words$ ) for upstream burst
  - Guard time (in  $n*m\_words$ ) for upstream burst

# PHY/MAC

## EFM Management

- MAC Layer objects
  - Up/down bandwidth allocation per PTE (allowed access rate)
  - Request/Grant counters
  - 802 Frame Counters (Dropped, Incomplete, under/over sized and CRC errors)
  - PTE ID (EPON\_ID)

# Station Management Objects

- OLT type and uptime
- OLT image information (version, file name ...)
  - Follows DMTF-CIM standard
- OLT status
- OLT alarm
- Number of port and status for OLT and PTE
  - Follows IEEE 802.3 Clause 30
- PTE type and uptime
- PTE serial number and image version
  - Follows DMTF-CIM standard

# Station Management Objects (Continued)

- PTE status and number of ports
  - Follows IEEE 802.3 Clause 30
- PTE alarm
- port counters
  - Follows IETF RFCs for IF counters and ethernet like interface counters (RFC 2233 and RFC 2665)

# Subscriber management objects

- Subscriber mgmt objects belong to IETF
- Subscriber SLA profile
- Subscriber alarm profile for SLA enforcement
- Subscriber information
- Subscriber usage counters (e.g. APP-MON, RMON and DS-MON work done at IETF RMON working group and ifMIB counters)
- Subscriber debugging utility such as ping

# Summary

- This set of slides drill down on the OAM objects required.
- Station management is required for OAM.