Layering with OAM
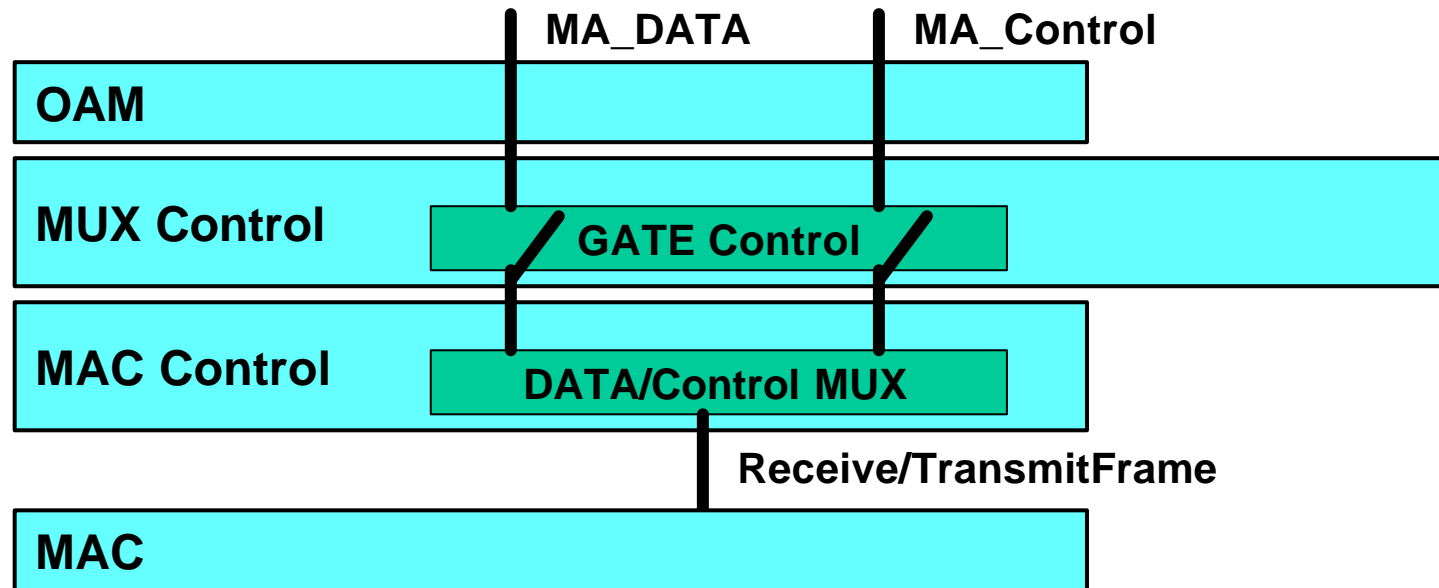
Samsung, Optical Networking R&D

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OAM Layering in the current draft

MA_DATA   MA_Control

OAM

MUX Control	GATE Control

MAC Control	DATA/Control MUX

Receive/TransmitFrame

MAC

Background
- OAM is located above MAC Control and MUX Control.
- OAM uses slow protocol.
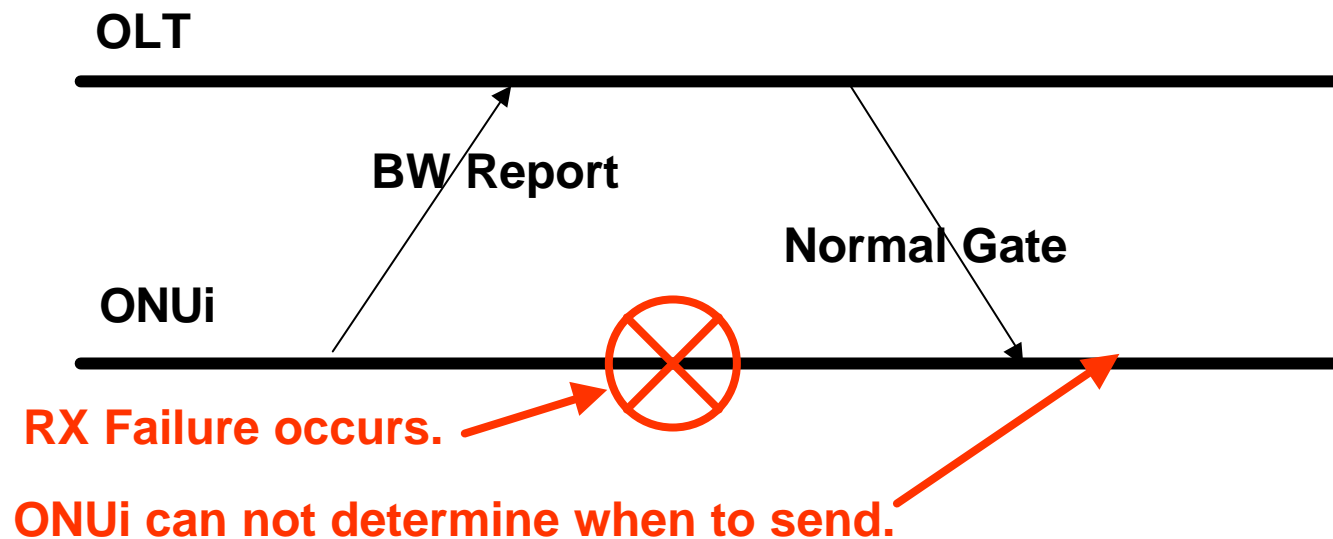- OAM frame uses MA_DATA primitive.

Due to its location and primitive it uses,
- OAM can not be transmitted if GATA is not open.
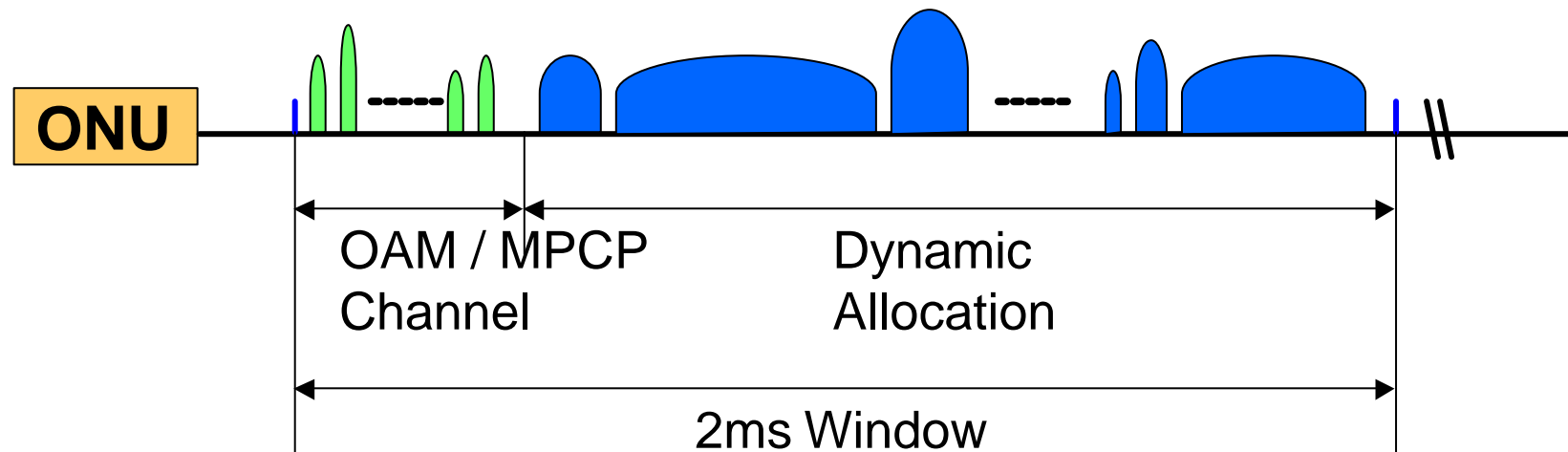- OAM can not be transmitted if PAUSE is occurred.

OAM Layering Issues – Unidirectional Mode

- **Unidirectional Mode**
    - **When the receive path of the local device is non-operational, OAM needs to transmit remote fault indication in unidirectional operation.**
    - **However, ONU can not send any message unless GATE (Slot Staet Time and Slot Length) is known.**
    - **Does MPCP have to support the unidirectional operation for OAM, and how?**

OLT

BW Report

Normal Gate

ONUi

RX Failure occurs.

ONUi can not determine when to send.

Possible Solution for unidirectional operation

ONU

OAM / MPCP
Channel

Dynamic
Allocation

2ms Window

• OAM may have a dedicated channel in upstream only.
• There will be some BW efficiency loss (~1% for 20 LLIDs).
• This channel will be always available even in unidirectional operation.
• MAC Control has to distinguish OAM from the other traffic, which means a different primitive.

OAM Layering Issues – Pause

- When PAUSE is received, OAM can not be transmitted.
- OAM baseline recommends not to use PAUSE in EPON.
- Using PAUSE as a flow control is ongoing issue of P2MP STF.
- Should EFM support PAUSE for flow control?

MA_DATA   MA_Control

OAM

PAUSE

MAC Control

Control/DATA MUX
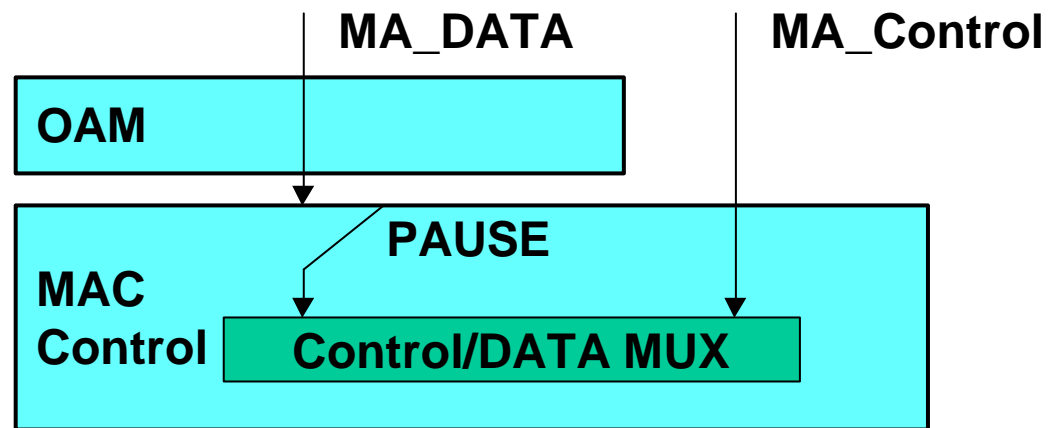
Solution for OAM TX in PAUSE
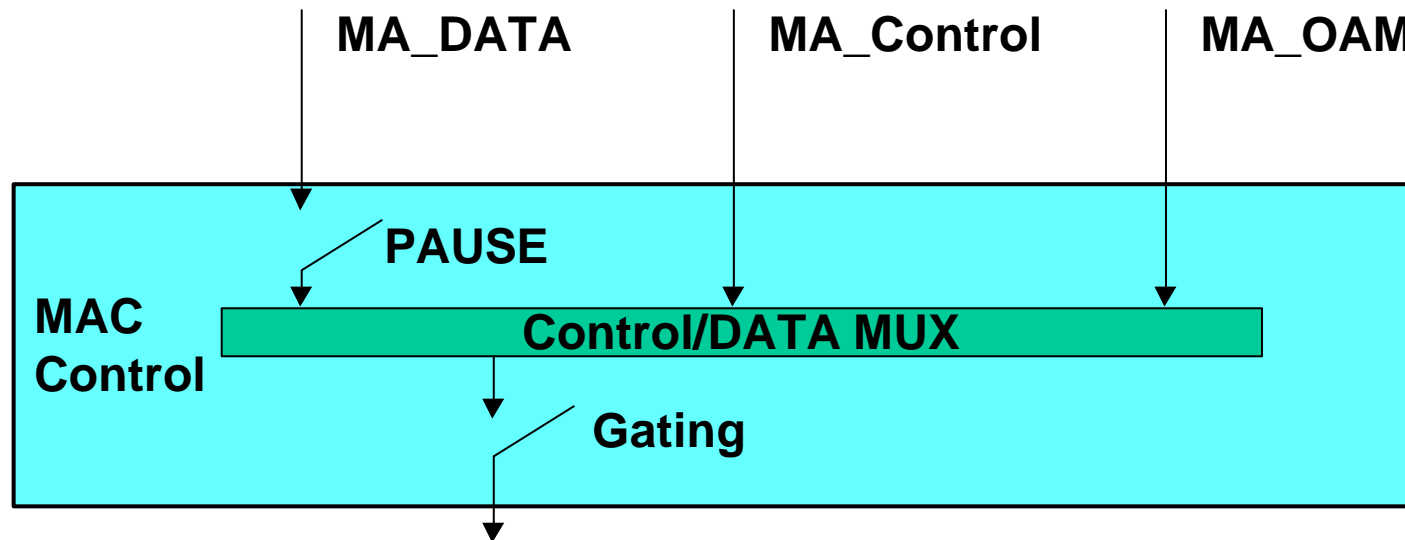
- Do not use Slow Protocol.
- If OAM can use a different primitive such as MA_Control or a brand new primitive, not MA_DATA, OAM can be transmitted in PAUSE.

What do you prefer?

Option 1 :

   No unidirectional operation and No PAUSE in EPON.

   Pros : Simple and No modification in draft.
   Cons : Can't support both operations.

Option 2 :

   Define a new primitive for EPON OAM

   Pros : Resolve both issues.
   Cons : OAM protocol change.

Option 3 :

   Others?