OTN Reference Point Clarifications

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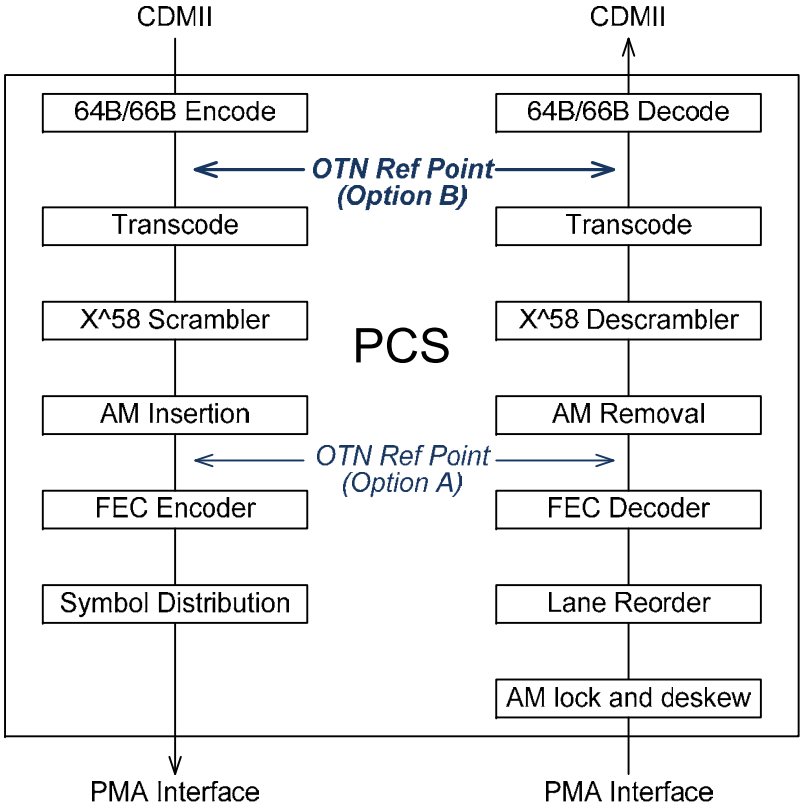
Introduction

- At the Atlanta Interim meeting (Jan 2015), “Option B” described in [1] was adopted as the OTN Reference Point
- The goal of this contribution is not to discuss whether Option A or Option B is a better choice
  - Both Options have pros and cons, as discussed in [1]
  - Option B is a good choice
- The goal of this contribution is to discuss and clarify the meaning of the “OTN Reference Point” and its interaction with ITU-T SG15/Q11

[1] http://www.ieee802.org/3/bs/public/15_01/trowbridge_3bs_01a_0115.pdf

OTN Reference Point

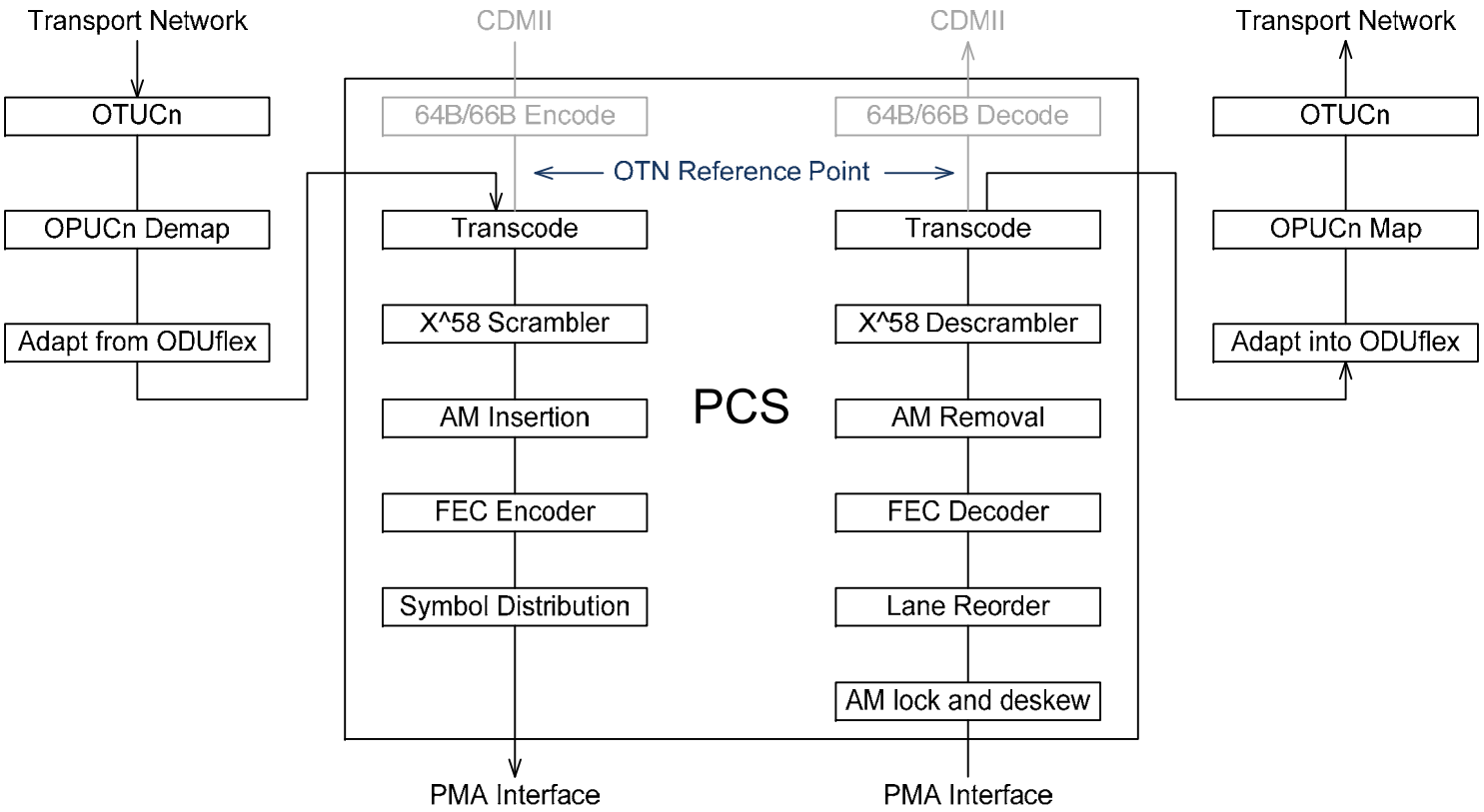
- As discussed in [1], an advantage of “Option B” is that the format at the OTN reference point (a 66b encoded stream without AMs) is expected to be independent from the logical lane striping used by any future 400GbE PMDs



OTN Reference Point

Example 1: 400GE client port adapted to the OTN Transport Network

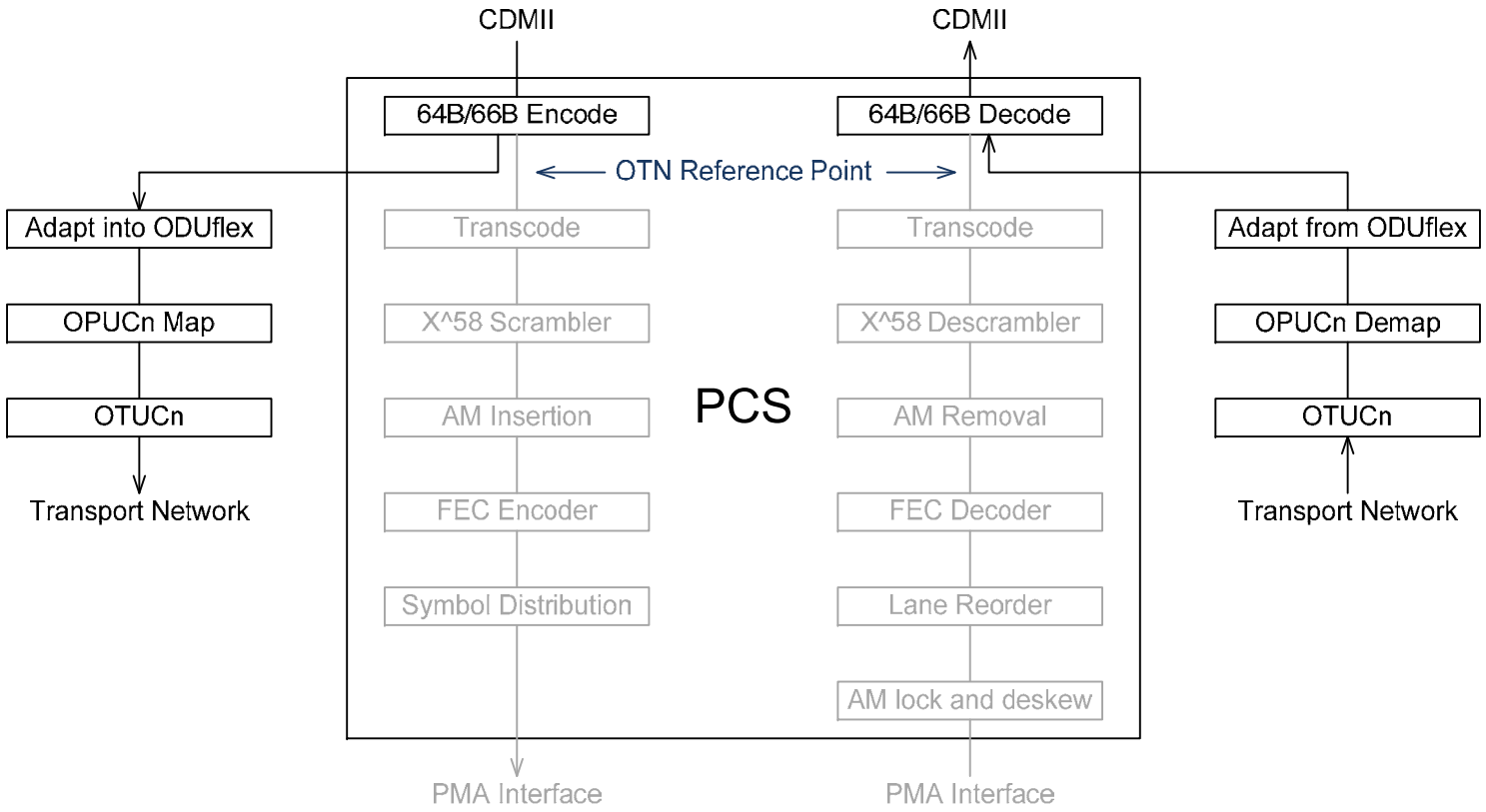
- The diagram below corresponds to a Transponder / Muxponder application



OTN Reference Point

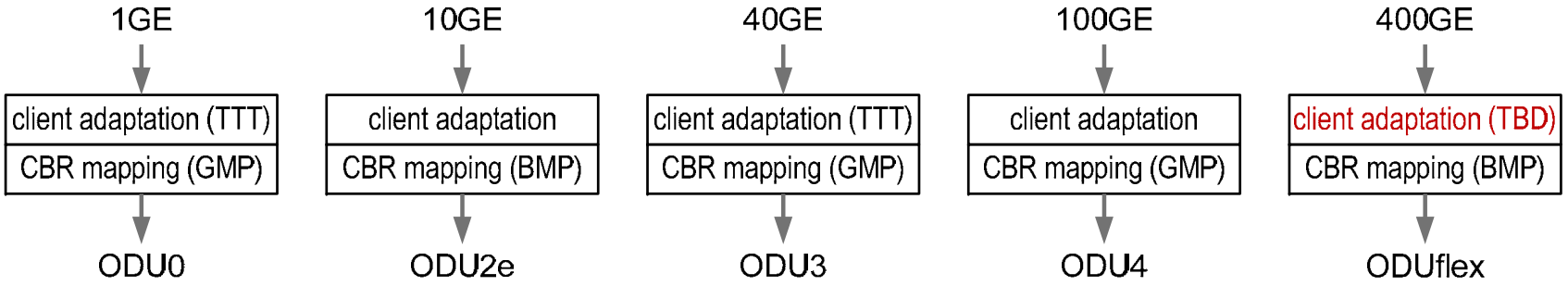
Example 2: 400GE packet stream adapted to the OTN Transport Network

- The diagram below corresponds to a PCS/RS/MAC termination application



OTN Reference Point – adaptation to OTN

- ITU-T's current working assumption for the mapping of 400GE to OTN is based on bit transparent mapping (BMP) of 400GE into an ODUflex
- The "characteristic information" at the OTN Reference Point (a 66b encoded stream without AMs) will be adapted using a 400GE client adaptation function to be defined by ITU-T SG15/Q11



- Most likely, the 400GE client adaptation function will be defined similarly to the existing 10GE/40GE/100GE adaptation functions

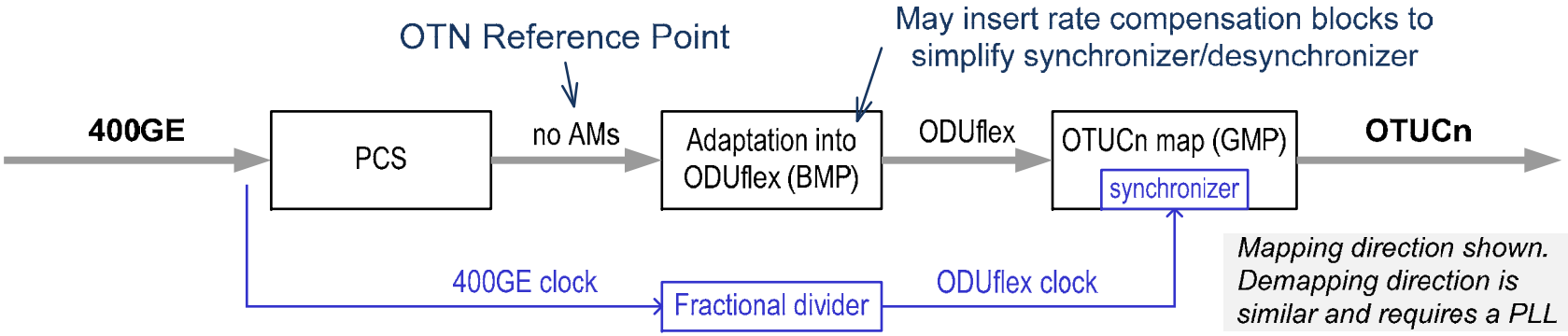
OTN Reference Point – An agreeable definition

- **The OTN reference point defines what information must be carried transparently over the OTN transport network, it does not define how that information is adapted to OTN**
- The specific format/methods used to adapt 400GE into OTN is an ITU-T task which depends on many different factors
  - Avoiding the need for a complex synchronization plane (large fractional dividers)
  - Avoiding the creation of new odd transmission rates
  - Enabling the reuse of existing synchronization IP and methods
  - Overall simplification of the transport equipment
- Please note that the same topic has been recently discussed for the adaptation of FlexE to the OTN Transport Network [3] [4]

[3] OIF contributions oif2015.138.00.pptx and oif2015.139.00.pptx, April 2015, Lisbon

[4] COM 15 – WD11-49 “Adaptation of FlexEthernet to the OTN Transport Network”, Q11 interim meeting, Allen TX, 16-20 March 2015

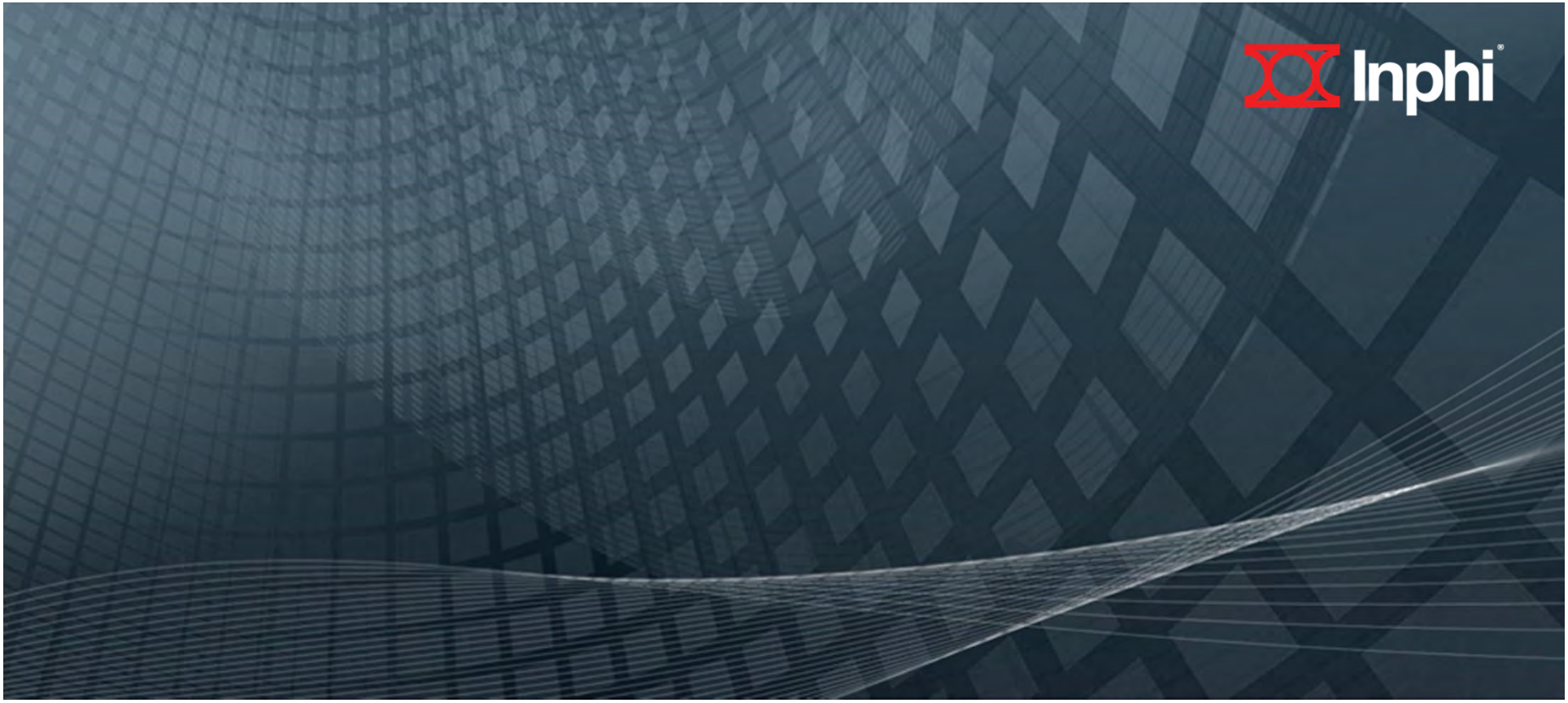
OTN Reference Point – adaptation to OTN
Synchronization plane



- What would happen if the "characteristic information" at the OTN Reference Point (a 66b encoded stream without AMs) was mapped directly into OTN?
  - 400GE_without_AMs_rate = 400GE_rate * (16K-1)/16K
  - ODUflex_rate = 400GE_rate * (16K-1)/16K * 239/238
    - This requires large fractional dividers (22 bit) and results in the creation of a new "odd" rate
- This is how ITU-T may define the mapping of 400GE into OTN
  - Potentially, ITU-T may decide to add rate compensation (padding) blocks to the 66b client stream to compensate for the bandwidth of the "missing" AMs
  - ODUflex_rate = 400GE_rate * 239/238
    - This requires smaller fractional dividers (8 bit) and results in a "natural" ODUflex rate (client_rate * 239/238), in line with existing ITU-T CBR client mappings

Conclusion

- The OTN reference point defines what information must be carried transparently over the OTN transport network, it does not define how that information is adapted to OTN
- The definition of the specific format/method used to adapt 400GE into OTN is an ongoing task at ITU-T



Thank You