Terminology Ad hoc Report

John D'Ambrosia

Futurewei, Subsidiary of Huawei

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Introduction

- Jan 2018 Terminology Ad Hoc Chartered
  - Provide definitions for terminology identified by SG on Page 6 of http://www.ieee802.org/3/B10K/public/18_01/dambrosia_b10k_01a_0118.pdf to facilitate clear understanding of terms as related to potential optical objectives of the Study Group, with particular emphasis on terminology related to optical / DWDM technologies.

- Teleconference Meetings
  - Feb 13 - http://www.ieee802.org/3/B10K/public/adhoc/18_0213/index.shtml
  - Feb 27 - http://www.ieee802.org/3/B10K/public/adhoc/18_0227/index.shtml

Terms (dambrosia_b10k_01a_0118, p. 6)

1. Lane
2. Signal
3. Lambda
4. PHY
5. Link
6. Channel
7. Point-to-point link
8. WDM
9. DWDM
10. DWDM Link
11. DWDM Systems
12. DWDM Network
13. In-line amplification

1. **Lane** - Proposed Updated Definition per http://www.ieee802.org/3/cj/comments/P8023-D3p0-Comments-Final-byID.pdf

    - "A logical subset of the data and control information transmitted from one sublayer (e.g., PCS, PMA) to an adjacent sublayer across the inter-sublayer interface or from one PHY to another across the transmission medium (e.g. optical fiber, optical wavelength, wire pair). Lanes are transmitted in parallel and combine to deliver the full set of data and control information across the interface."

2. **Signal** - An impulse or fluctuating quantity, as of electrical voltage or light intensity, whose variations represent coded information. (http://www.thefreedictionary.com/signal)

3. **Lambda** - indicates the wavelength in a wavelength-division multiplexing optical communications system. (https://en.wikipedia.org/wiki/Lambda)

4. **PHY** (1.4.372) - **Physical Layer entity (PHY):** Within IEEE 802.3, the portion of the Physical Layer between the Medium Dependent Interface (MDI) and the Media Independent Interface (MII), Gigabit Media Indepen-dent Interface (GMII) or 10 Gigabit Media Independent Interface (XGMII), consisting of the Physical Cod-ing Sublayer (PCS), the Physical Medium Attachment (PMA), and, if present, the WAN Interface Sublayer (WIS) and Physical Medium Dependent (PMD) sublayers. The PHY contains the functions that transmit, receive, and manage the encoded signals that are impressed on and recovered from the physical medium. (For example, See IEEE Std 802.3, Clauses 23 to 26, Clause 32, Clause 36, Clause 40, Clauses 48 to 54, Clauses 58 to 63, Clause 65, Clause 66, Clauses 82 to 89, and Clause 96.)

5. **Link** - One PHY transmitting to another PHY through a transmission path between them.

   • All links under consideration by this Study Group will be point-to-point links, and will not include point-to-multipoint.

6. **Channel** – The transmission path between a PHY transmitting to another PHY

7. **Point-to-point link** -One PHY transmitting to only one other PHY through the transmission path between them.

   • All links under consideration by this Study Group will be point-to-point links, and will not include point-to-multipoint.

- **WDM** – optical technology that couples more than one wavelength in the same fiber, thus effectively increasing the aggregate bandwidth per fiber to the sum of the bit rates of each wavelength.
- **DWDM** – A WDM technology where the frequency spacing is less than or equal to 1000 GHz.
- **DWDM PHY**: An Ethernet PHY that operates at a single wavelength on a defined frequency grid and is capable of running over a DWDM system
- **DWDM Channel**: The transmission path between a DWDM PHY transmitting to another DWDM PHY
- **DWDM Link**: One DWDM PHY transmitting to one other DWDM PHY through the transmission path between them
- **DWDM System**: An aggregate of DWDM links over a single optical fiber.
- **DWDM Network** - same as DWDM System. Do not use.
- **In-line amplification:** Optical amplification that resides within a DWDM Channel
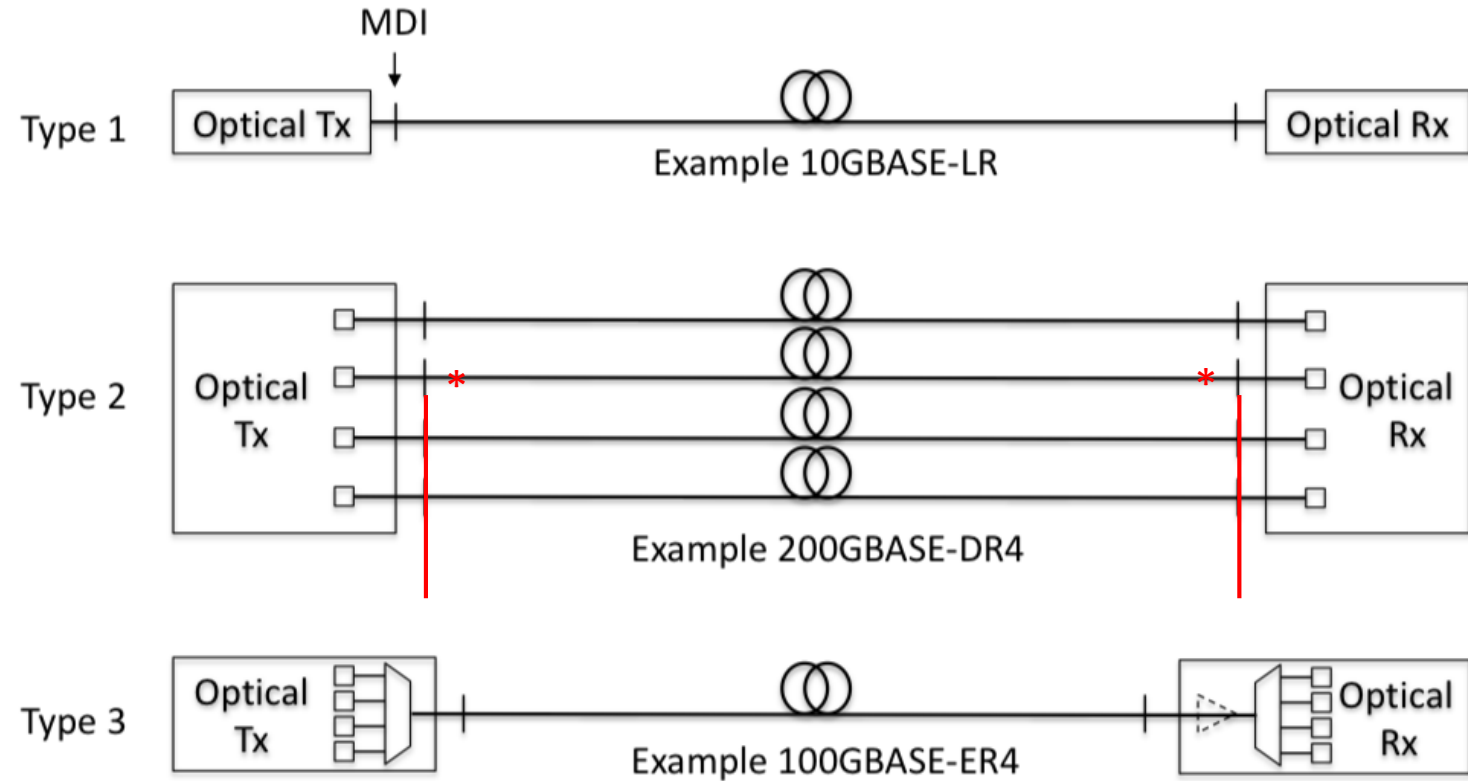
Link Types

Presented by Pete Anslow.

Excellent summary of link type configurations.

Type 1, 2, 3 all represent what would be typical of past IEEE 802.3 PMDs

Common usage would call these "Optical PHYs" as opposed to "Electrical PHYs" and different to the "DWDM PHY" that could be the outcome of this SG.

Source: nowell_b10k_02_180227

Optical link types 1 to 3

Type 1 — MDI — Optical Tx — Optical Rx — Example 10GBASE-LR

Type 2 — Optical Tx * — Optical Rx * — Example 200GBASE-DR4

Type 3 — Optical Tx — Optical Rx — Example 100GBASE-ER4

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http://www.ieee802.org/3/B10K/public/18_01/anslow_b10k_01_0118.pdf
* Proposed modification to slides
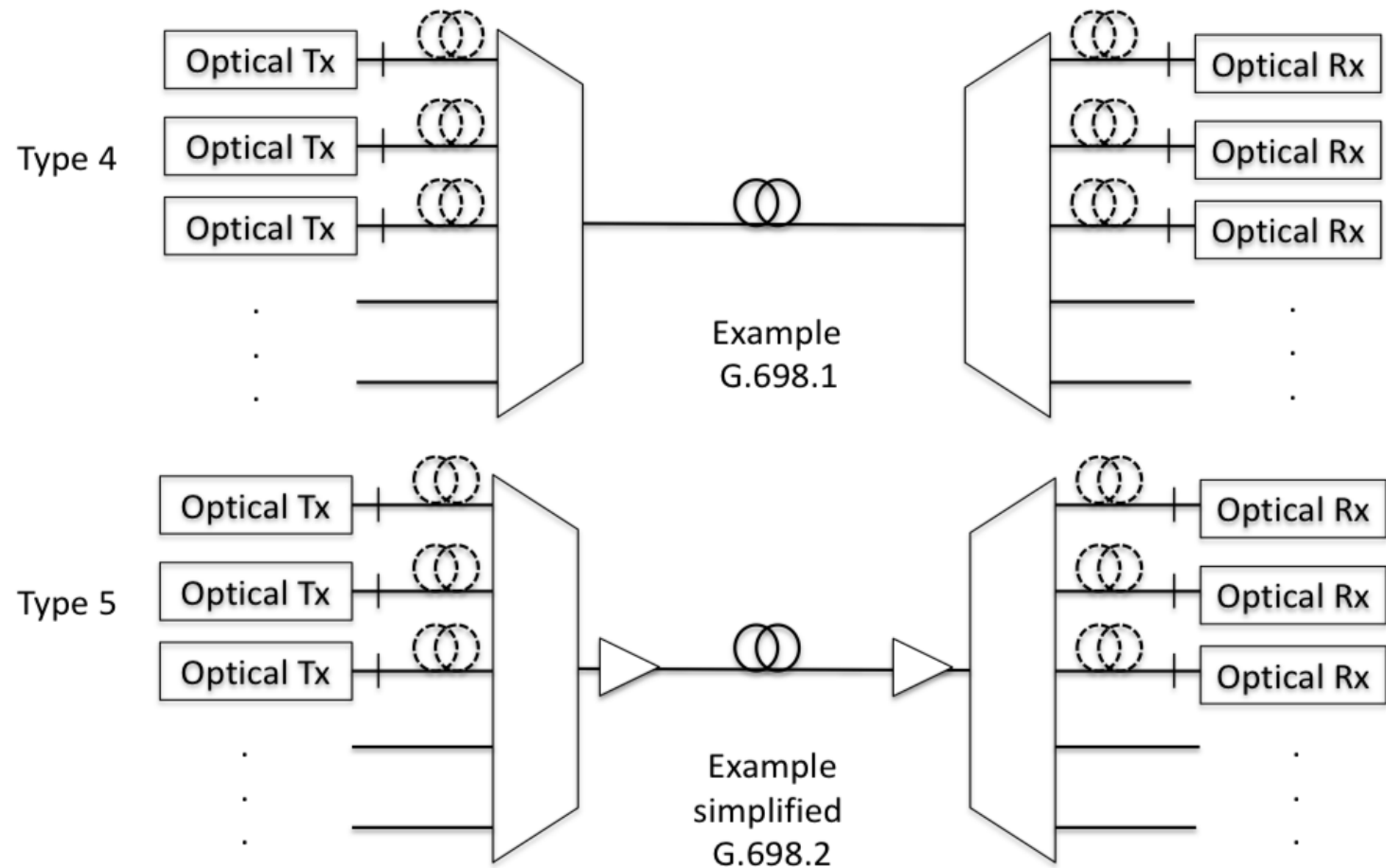
Link Types

Link Types 4 & 5 are representative of network topologies consistent with DWDM systems and technologies.

Difference between Type 4 and Type 5 is the inclusion of the optical amplifiers which would typically be used to extend reaches beyond ~40km.

Optical link types 4 and 5

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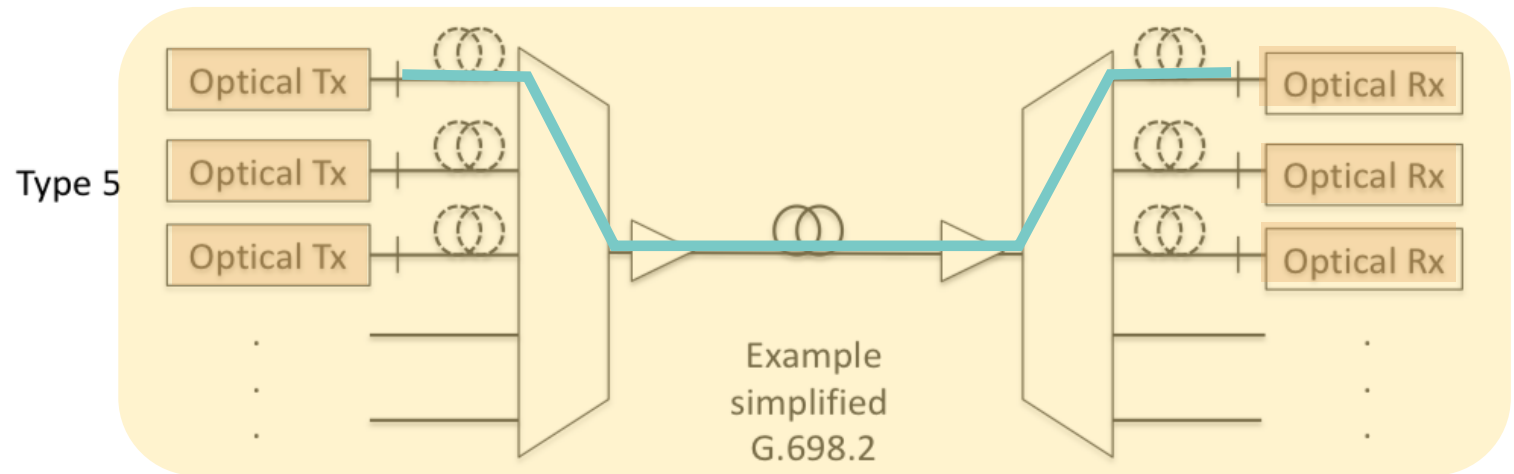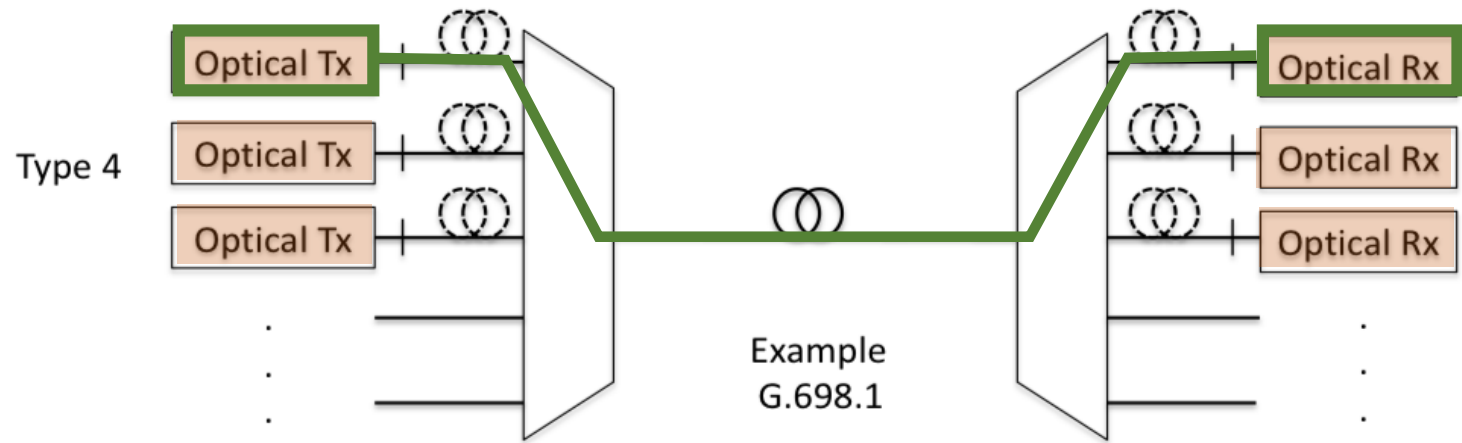
http://www.ieee802.org/3/B10K/public/18_01/anslow_b10k_01_0118.pdf

DWDM Link Types and Terminology

DWDM PHY:

DWDM Channel: ⎯⎯⎯ (blue)

DWDM Link: ⎯⎯⎯ (green)

DWDM System:

Source: nowell_b10k_02_180227

Optical link types 4 and 5

Type 4 — Optical Tx / Optical Rx — Example G.698.1

Type 5 — Optical Tx / Optical Rx — Example simplified G.698.2

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http://www.ieee802.org/3/B10K/public/18_01/anslow_b10k_01_0118.pdf

Reminder

- Any agreed upon terminology is within the Study Group for the purpose of clarity of communications to move the group forward.

- Any agreed upon terminology would not have any official status until it was included in a draft that was balloted and approved. Note – in some instances definitions within IEEE 802.3 have been used (Lane, PHY)

- It was also noted that any agreed upon terminology might come in conflict with approved 802.3 terminology, and the chair would review this prior to presenting, and note any conflicts. (Link, Channel