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Request for feedback on new work on a 1-Gbit/s point-to-point Ethernet-based optical access system

1.   Introduction

Optical access services have been widely deployed, for which point-to-point (P2P) optical access systems and passive optical networks (PON) are applied depending on the requirement. While

ITU-T has standardized the 100Mbit/s P2P optical access system (G.985), B-PON (G.983 series) and G-PON (G.984 series), the needs of the 1-Gbit/s P2P optical access system are also increasing to provide broadband services to apartment buildings for example.

For a 1-Gbit/s P2P optical access system, IEEE 802.3 has already standardized 1000BASE-BX10 in the "Ethernet in the First Mile (EFM)" task force. However, this is not sufficient to cover all of the requirements for optical access systems due to its limited loss/distance budget as well as OAM functions. As a result, many proprietary 1-Gbit/s P2P optical systems are on the market now.

For this reason, ITU-T has started studying common requirements for a 1-Gbit/s P2P optical access system. In this document, we share the tentative result of this study (in section 2) and propose a way forward to realize additional standards for a 1-Gbit/s P2P optical access system.

2. Requirements for enhanced 1-Gbit/s point-to-point optical access systems

Loss budget: IEEE 802.3 has already standardized 1000BASE-BX10 in the "Ethernet in the First Mile (EFM)" task force for 1-Gbit/s optical access. This assumes up to 10-km transmission with 10.5 dB ODN loss (i.e. fibre loss) plus power penalty. In some cases this budget is not sufficient and the ODN requirement of Class S (ODN loss: 15dB, Power penalty: 1dB), Class A (ODN loss: ffs, distance: 20km), and Class B (ODN loss: ffs, distance: 30km) specified in G.985 should be considered.

Operation, administration and maintenance (OAM) functions: In order to provide sufficient operation, administration and maintenance (OAM) functions for their 1-Gbit/s P2P optical access systems, some vendors have implemented proprietary OAM functions with the consequence that interoperability is not guaranteed. The IEEE EFM OAM functions can be adapted, but some additional development for the specification especially related to ONTs may be needed. Necessary OAM functions for network operators have been identified as follows.

- UNI management functions
    - ➢ Configuration of UNI speed
    - ➢ Detection of UNI speed and link down
- UNI loop-back test

Consistency with existing optical access systems: ITU-T has already standardized a 100-Mbit/s P2P optical access system (G.985) and PON systems from 100-Mbit/s to 1-Gbit/s (G.983 series and G.984 series). IEEE has generated standards from the EFM task force, including the GE-PON system and has ongoing work in the 802.3av task force towards 10G EPON. For the study of the requirements for an enhanced 1-Gbit/s PtoP optical access system, consistency with requirements of these existing optical access systems is important in terms of the economical efficiency through the common use of techniques adopted in these systems.

3. Proposed way forward

In order to address these requirements while ensuring multi-vendor interoperability, ITU-T is considering developing a new ITU-T Recommendation "1-Gbit/s point-to-point Ethernet-based optical access system" in communication with IEEE. Note that we well recognize that the new Recommendation should be complementary rather than competitive to the IEEE EFM specification.

The group would appreciate your feedback for the above thought. Alternative ways forward (e.g. IEEE starts revising point-to-point EFM specs to realize these requirements) are welcome as well.

The group would appreciate to receive any response before the Q2/15 interim meeting planned for June 2008.

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