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IEEE Standard for Service Interoperability in Ethernet Passive Optical Networks (SIEPON)

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IEEE Std 1904.1™-2017
(Revision of
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Abstract: The system-level requirements needed to ensure service-level, multi-vendor interoperability of Ethernet Passive Optical Network (EPON) equipment is described. The existing IEEE 802.3 and IEEE 802.1 standards, which ensure the interoperability at the Physical Layer (PHY) and Data Link Layer, are complemented by the specifications. Specifically included in this specification are

— EPON system-level interoperability specifications covering equipment functionality, traffic engineering, and service-level quality of service/class of service (QoS/CoS) mechanisms;

— Management specifications covering equipment management, service management, and EPON power-saving mechanism.

Keywords: 1G-EPON, 10G-EPON, EPON, Ethernet Passive Optical Network, IEEE 1904.1, interoperability, QoS, quality of service, service interoperability, SIEPON

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BBF TR-200, Using EPON in the Context of TR-101, L. D. Lamb and C. Shen, Eds., Copyright © 2011, The Broadband Forum, Section 1.2, Figure 1, page 10.

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Introduction

This introduction is not part of IEEE Std 1904.1-2017, IEEE Standard for Service Interoperability in Ethernet Passive Optical Networks (SIEPON).

This standard builds upon the IEEE 802.3ah™ (1G-EPON) and IEEE 802.3av™ (10G-EPON) Physical Layer and Data Link Layer specifications and provides system-level and network-level definitions of numerous Ethernet Passive Optical Network (EPON) features, geared toward fostering interoperability between various implementations aiming to provide the same set of functionalities.[a] These Service Interoperability in Ethernet Passive Optical Networks (SIEPON) features allow "plug-and-play" interoperability of the transport, service, and control planes in a multi-vendor environment. This standard serves a number of important purposes:

— Compliant EPON devices follow a common specification for the worldwide market, potentially resulting in larger volumes and reduced costs.

— Operators may not face the challenge of developing system-level specifications and interoperability testing procedures before they can deploy EPON.

— EPON vendors may not need to implement multiple options to comply with multiple proprietary/national specifications. Reduced device complexity may further reduce cost.

— Competition among EPON equipment and component suppliers may increase, thus potentially driving further innovation and cost reductions.

[a] Information on references can be found in Clause 2.

Contents

IEEE Standard for Service Interoperability in Ethernet Passive Optical Networks (SIEPON)

1 Overview

1.1 Scope

This standard describes the system-level requirements needed to provide service-level, multi-vendor interoperability of Ethernet Passive Optical Network (EPON) equipment. The specifications complement the existing IEEE 802.3™ and IEEE 802.1™ standards, which enable the interoperability at the Physical Layer and Data Link Layer.[1] Specifically included in this specification are

— EPON system-level interoperability specifications covering equipment functionality, traffic engineering, and service-level quality of service/class of service (QoS/CoS) mechanisms;

— Management specifications covering equipment management, service management, and power utilization.

1.2 Purpose

The purpose of this standard is to build upon the IEEE 802.3ah (1G-EPON) and IEEE 802.3av (10G-EPON) Physical Layer and Data Link Layer standards and create a system-level and network-level standard, thus allowing full "plug-and-play" interoperability of the transport, service, and control planes in a multi-vendor environment.

1.3 Coverage

This specification for Service Interoperability in Ethernet Passive Optical Networks (SIEPON) provides a series of requirements for the operation of Optical Network Unit (ONU) and Optical Line Terminal (OLT) devices. To foster interoperability across the PON among equipment from different EPON vendors, this standard specifies the flow of information exchanged between the ONU and OLT as well as their associated behaviors. The interaction between the OLT and network management system (NMS) as well as between the ONU and customer premise equipment (CPE) devices is outside the scope of this specification and not covered in this document.

[1] Information on references can be found in Clause 2.