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Synchronization Standard – Physical Interconnection for Ethernet-Based Timing Distribution

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Is an American National Standard developed by the **Synchronization (SYNC)** Subcommittee under the **ATIS Copper/Optical Access, Synchronization and Transport Committee (COAST)**.

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American National Standard on

SYNCHRONIZATION STANDARD – PHYSICAL INTERCONNECTION FOR ETHERNET-BASED TIMING DISTRIBUTION

Alliance for Telecommunications Industry Solutions

Approved April 2, 2009

Abstract

This standard addresses the interconnection between the Timing Signal Generator (TSG) and Network Elements (NE) in an intra-Central-Office environment. The principal focus of this standard is the physical layer connectivity for Ethernet signals, including the connectorization, cabling, and shielding requirements for delivering a timing reference from the Office TSG to the NE. Protection (e.g., lightning) is out of the scope of this document. The higher layer protocols, formats, and requirements that make the Ethernet signal suitable for timing are not in the scope of this document, but are provided in an Annex for information. This standard does not obsolete timing reference distribution based on traditional twisted-pair cabling used for DS1 and composite-clock (CC) intra-office timing distribution.

FOREWORD

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

This document is entitled: *Synchronization Standard – Physical Interconnection for Intra-Office Ethernet-based Timing Distribution*.

Footnotes are not officially part of this standard.

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between providers, customers, and manufacturers. The Copper/Optical Access, Synchronization and Transport (COAST) Committee – formerly the Optical Transport and Synchronization Committee (OPTXS) -- engages industry expertise to develop and recommend standards and technical reports for home, access and transport network and synchronization technologies over copper and optical mediums. COAST is committed to proactive engagement with national, regional and international standards development organizations and forums that share its scope of work. The technical requirements, measurement techniques, metrics, and operational practices documented in COAST's work products encompass copper and optical network interfaces and transceiver functionality required for access to, and transport through, telecommunications networks.

ANSI guidelines specify two categories of requirements: mandatory and recommendation. The mandatory requirements are designated by the word *shall* and recommendations by the word *should*. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages.

Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, COAST, 1200 G Street NW, Suite 500, Washington, DC 20005.

At the time of initiation or issuance of the letter ballot for this document, COAST, which was responsible for its development, had the following roster:

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TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

American National Standard for Telecommunications –

Synchronization Standard -- Physical Interconnection for Ethernet-based Timing Distribution

1 SCOPE

This standard addresses the interconnection between the Timing Signal Generator (TSG) and Network Elements (NE) in an intra-Central-Office environment. The principal focus of this standard is the physical layer connectivity for enabling Ethernet-based timing distribution. The primary facets addressed are the connectorization, cabling, and shielding requirements for delivering a timing reference from the Office TSG to the NE.

The Ethernet signals considered here belong to the Fast Ethernet and Gigabit Ethernet categories. Both electrical (i.e., utilizing twisted-pair cabling) and optical (i.e., utilizing fiber-optic cabling) signals are considered. The relevant forms of Fast Ethernet included are 100Base-T, 100Base-FX, 100Base-SX, and 100Base-BX. The relevant forms of Gigabit Ethernet included are 1000Base-T, 1000Base-LX, 1000Base-SX, and 1000Base-BX10.

Higher layer protocols, formats, and methods that make the Ethernet signal suitable for timing are not within the scope of this standard, but indicated in Annex A for information. These include Precision Time Protocol (PTP), Network Time Protocol (NTP), and Synchronous Ethernet. The standard does not preclude the development of enhancements or additional protocols provided the physical layer connectivity comply with the requirements provided herein.

Protection (e.g., lightning) is out of the scope of this document.

The standard does not render timing distribution methods based on prevailing twisted-pair cabling (e.g., DS1, composite-clock or CC) obsolete or irrelevant.

2 REFERENCES

2.1 Normative

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

[1] ANSI/TIA/EIA-568-B (B.1, B.2, and B.3), *Commercial Building Telecommunications Standard*, first release-1995.[1]

[1] This document is available from the Telecommunications Industry Association (TIA).
< http://www.tiaonline.org/standards/overview.cfm >