© INTERNATIONAL JOURNAL FOR RESEARCH PUBLICATION & SEMINAR
ISSN: 2278-6848 | Volume: 07 Issue: 03 | | April - June 2016
Paper is available at www.jrps.in | Email : info@jrps.in

Review on Data transmission in SONET & SDH

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ABSTRACT :

Synchronous Optical Networking & **Synchronous Digital Hierarchy** are standardized protocols that transfer multiple digital bit streams synchronously over optical fiber using lasers or highly coherent light from light-emitting diodes. At low transmission rates data could also be transferred via an electrical interface. method was developed to replace plesiochronous digital hierarchy (PDH) system for transporting large amounts of telephone calls & data traffic over same fiber without synchronization problems. SONET generic criteria are detailed in Telcordia Technologies Generic Requirements document GR-253-CORE. Generic criteria applicable to SONET & other transmission systems (e.g., asynchronous fiber optic systems or digital radio systems) are found in Telcordia GR-499-CORE.

SONET & SDH, which are essentially same, were originally designed to transport circuit mode communications (e.g., DS1, DS3) from a variety of different sources, but they were primarily designed to support real-time, uncompressed, circuit-switched voice encoded in PCM format.[3] primary difficulty in doing this prior to SONET/SDH was that synchronization sources of these various circuits were different. This meant that each circuit was actually operating at a slightly different rate & with different phase. SONET/SDH allowed for simultaneous transport of many different circuits of differing origin within a single framing protocol. SONET/SDH is not a communications protocol in itself, but a transport protocol.

1. INTRODUCTION

SONET & SDH often use different terms to describe identical features or functions. This could cause confusion & exaggerate their differences. With a few exceptions, SDH could be thought of as a superset of SONET. SONET is a set of transport containers that allow for delivery of a variety of protocols, including traditional telephony, ATM, Ethernet, & TCP/IP traffic. SONET therefore is not in itself a native communications protocol & should not be confused as being necessarily connection-oriented in way that term is usually used. The protocol is a heavily multiplexed structure, with header interleaved between data in a complex way. This permits encapsulated data to have its own frame rate & be able to "float around" relative to SDH/SONET frame structure & rate. This interleaving permits a very low latency for encapsulated data. Data passing through equipment could be