
Question(s): 7/17

Geneva, 20-29 November 2002

TEMPORARY DOCUMENT**Source:** Q.7/17 Rapporteur**Title:** Proposed Draft Amendment 1 to ITU-T Rec. X.85/Y.1321, bit oriented method for LAPS

Annex D Bit-oriented operation

This annex presents a bit-oriented method related to IP over PDH using LAPS and Ethernet over PDH (i.e. IP traffic data and Ethernet frame are transport in one or more E1 or DS3 [Digital Signal 3] PDH [Plesiochronous Digital Hierarchy] Channels).

D.1 Introduction

It is also strongly recommended to use G.703 E1/T1/E3/T3/E4/T4 interface and SDH/SONET electrical specification as physical layer. ITU-T G.702 specifies the digital hierarchy which shall be used to carry bit-oriented plesiochronous signals, bit rates and code as follows:

E1: 2048 Kbps, code: HDB3

E2: 8448 Kbps, code:HDB3

E3: 34368 Kbps, code:HDB3

E4: 139264 Kbps, code: CMI

T1: 1544 Kbps, code: AMI or B8ZS

T2: 6312 Kbps, code: AMI or B6ZS or B8ZS

T3: 44736 Kbps, code: B3ZS

The LAPS treats an E1/E3/E4/T1/T3/T4 channel as bit-oriented synchronous full-duplex links in the bit-oriented case, and the associated control signals is not used for the physical layer. The bit stream shall be mapped into the above PDH Payload.

D.2 Operation

The operation of flag sequence, time fill, transmission order of a frame, invalid frame and scrambling/descrambling are the same as the case of octet-oriented. After FCS computation, the transmitter examines the entire frame between the two flag Sequences. A "0" bit is inserted after all sequences of five contiguous "1" bits (including the last 5 bits of the FCS) to ensure that a flag sequence is not transmitted. In the receiving side, prior to FCS computation, any "0" bit that directly follows five contiguous "1" bits is discarded.

D.3 Concatenation of PDH channel

The two or more homogeneous PDH channels (channel A1, A2, ...An) can be formed to a concatenation group to provide more bandwidth. ITU-T Recommendation G.704 presents the basic frame length (N0) of single PDH channel. N0=193 for T1, 256 for E1, 789 for E2, 4760 for T3 (the frame repetition rate is 8000 Hz), for example. After the formation of a homogeneous concatenation group (up to n channels), the bit order of mapping is A1 (bit 1), A2 (bit 1), ...An (bit 1), A1 (bit 2), A2 (bit 2), ...An (bit 2),, A1 (bit [N0-1]), A2 (bit [N0-1]), ...An (bit [N0-1]), A1 (bit N0), A2 (bit N0), ...An (bit N0). Since the different PDH channels can be transported via virtual container along a trail between source and sink, the latency of the different channels should be considered in the concatenation adaptation function unit. Link capacity detection and adjustment are not supported due to the not reserved overhead bit available in the G.704.
