

# ITU-T

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

# G.999.1

**Corrigendum 1**  
(04/2010)

SERIES G: TRANSMISSION SYSTEMS AND MEDIA,  
DIGITAL SYSTEMS AND NETWORKS

Digital sections and digital line system – Access networks

---

Interface between the link layer and the physical  
layer for digital subscriber line (DSL) transceivers

**Corrigendum 1**

Recommendation ITU-T G.999.1 (2009) –  
Corrigendum 1

## ITU-T G-SERIES RECOMMENDATIONS

**TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS**

INTERNATIONAL TELEPHONE CONNECTIONS AND CIRCUITS	G.100–G.199
GENERAL CHARACTERISTICS COMMON TO ALL ANALOGUE CARRIER-TRANSMISSION SYSTEMS	G.200–G.299
INDIVIDUAL CHARACTERISTICS OF INTERNATIONAL CARRIER TELEPHONE SYSTEMS ON METALLIC LINES	G.300–G.399
GENERAL CHARACTERISTICS OF INTERNATIONAL CARRIER TELEPHONE SYSTEMS ON RADIO-RELAY OR SATELLITE LINKS AND INTERCONNECTION WITH METALLIC LINES	G.400–G.449
COORDINATION OF RADIOTELEPHONY AND LINE TELEPHONY	G.450–G.499
TRANSMISSION MEDIA AND OPTICAL SYSTEMS CHARACTERISTICS	G.600–G.699
DIGITAL TERMINAL EQUIPMENTS	G.700–G.799
DIGITAL NETWORKS	G.800–G.899
DIGITAL SECTIONS AND DIGITAL LINE SYSTEM	G.900–G.999
General	G.900–G.909
Parameters for optical fibre cable systems	G.910–G.919
Digital sections at hierarchical bit rates based on a bit rate of 2048 kbit/s	G.920–G.929
Digital line transmission systems on cable at non-hierarchical bit rates	G.930–G.939
Digital line systems provided by FDM transmission bearers	G.940–G.949
Digital line systems	G.950–G.959
Digital section and digital transmission systems for customer access to ISDN	G.960–G.969
Optical fibre submarine cable systems	G.970–G.979
Optical line systems for local and access networks	G.980–G.989
<b>Access networks</b>	<b>G.990–G.999</b>
MULTIMEDIA QUALITY OF SERVICE AND PERFORMANCE – GENERIC AND USER-RELATED ASPECTS	G.1000–G.1999
TRANSMISSION MEDIA CHARACTERISTICS	G.6000–G.6999
DATA OVER TRANSPORT – GENERIC ASPECTS	G.7000–G.7999
PACKET OVER TRANSPORT ASPECTS	G.8000–G.8999
ACCESS NETWORKS	G.9000–G.9999

*For further details, please refer to the list of ITU-T Recommendations.*

# **Recommendation ITU-T G.999.1**

## **Interface between the link layer and the physical layer for digital subscriber line (DSL) transceivers**

### **Corrigendum 1**

#### **Summary**

This corrigendum contains:

- Resolution of an inconsistency with TCI bit mapping relative to IEEE 802.1q
- Clarification of LENGTH field bit mapping
- Editorial corrections and clarifications to various clauses throughout the Recommendation..

#### **History**

Edition	Recommendation	Approval	Study Group
1.0	ITU-T G.999.1	2009-10-09	15
1.1	ITU-T G.999.1 (2009) Cor. 1	2010-04-22	15

## FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

## NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

## INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2010

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Interface between the link layer and the physical layer  
for digital subscriber line (DSL) transceivers

Corrigendum 1

1 Modifications to clause 6.1

Modify clause 6.1 as follows:

6.1 Fragmentation

The fragmentation block (see Figure 5-1) shall fragment each data unit as shown in Figure 6-1. The fragment format is shown in Figure 6-2.

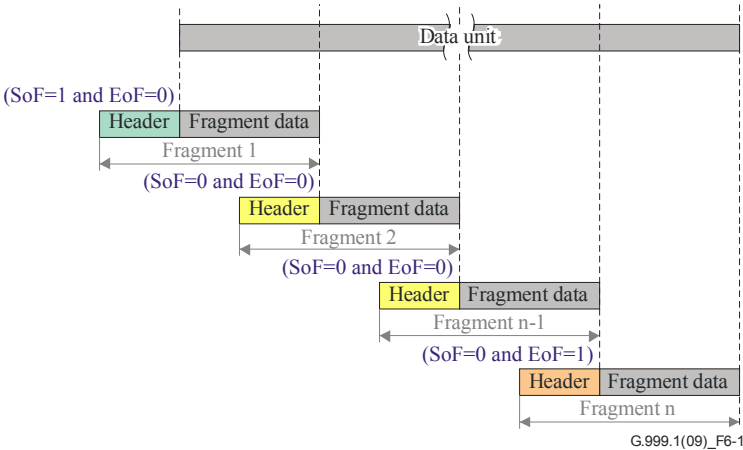


Figure 6-1 – Data unit fragmentation

		LSB							MSB	
2 Octets	TCI	0	0	0	0	0	1	EoF	SoF	
		0	0	0	0	0	0	0	0	
2 Octets	LENGTH									
N octets	Fragment Data									

Figure 6-2 – Non-tagged fragment format

The fragment header shall consist of the tag-control-identifier (TCI) field and the LENGTH field. The capability to insert the LENGTH field is mandatory. When Ethernet encapsulation is enabled, the LENGTH field shall be inserted. When Ethernet encapsulation is disabled, the LENGTH field is configurable to be used or not (see Table 7-1). When the LENGTH MODE is set to 1, the LENGTH

field shall be appended; otherwise the LENGTH field shall not be appended. In the TCI field, the [SoF] and [EoF] bits shall be defined as shown in Table 6-1. The remaining TCI bits shall be as defined in Figure 6-2 and partly further defined by the tag function. The LENGTH field shall contain the number of data unit octets in the fragment data field.

The LENGTH field, in which the value is encoded as a 16-bit unsigned integer, shall be transmitted with the high order (i.e., most significant) octet first; ~~where the value is encoded as a 16-bit unsigned integer.~~

**Table 6-1 – Definition of the data unit delimiters**

[SoF]	[EoF]	Description
0	0	Next fragment of data unit
1	0	First fragment of data unit
0	1	Last fragment of data unit
1	1	Single fragment data unit

For each fragment, the value of the length field shall not exceed the maximum fragment data size (TX\_MFS). If the length of a data unit is less than or equal to the TX\_MFS value (see Table 7-1), then that data unit shall be transmitted as a single fragment (i.e., SoF = 1 and EoF = 1). If the length of a data unit is higher than the TX\_MFS value, then that data unit shall be transmitted in multiple fragments, where fragments may have the same or a different length.

...

## 2 Modifications to Annex A

### 2.1 Modify the first paragraph of Annex A as follows:

DSL transceivers are based on transparent transport of data streams. A TPS-TC data stream is an input to a TPS-TC, where a data unit equals a 53-octet ATM cell (ATM-TC) (see clause K.2 of [ITU-T G.992.3] or clause K.2 of [b-ITU-T G.993.2]) or a packet (PTM-TC) (see clause K.3 of [ITU-T G.992.3] or clause K.3 of [b-ITU-T G.993.2]). In the Link/PHY interface, a data unit may, for example, contain an Ethernet frame, an Ethernet bonding fragment, one or more ATM cells or an ATM AAL5 PDU (see clause 5). A TPS-TC connects to a bearer channel. In the case of PTM-TC with pre-emption, a bearer channel may carry a high priority data stream and low priority data stream. Hence, for DSL transceivers, the stream identification (SID) shall identify a particular DSL line, a particular bearer channel and a particular priority within the bearer in the DSL line.

### 2.2 Modify the first sentence after Figure A.1 as follows:

In general, for a PHY device supporting N transceivers, there are  $N \cdot 4$  ~~SID~~ values and  $\frac{N}{2}$   $\left\lceil \frac{N}{2} \right\rceil = \left\lceil \frac{N \cdot 4}{8} \right\rceil$  octets in the DFC field of the pause unit. For example, ...

## 3 Modifications to Bibliography

Delete the informative references identified as [b-IEEE 802.1D] and [b-IEEE 802.1Q] from the Bibliography.



## SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
<b>Series G</b>	<b>Transmission systems and media, digital systems and networks</b>
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	Telecommunication management, including TMN and network maintenance
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Terminals and subjective and objective assessment methods
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks, open system communications and security
Series Y	Global information infrastructure, Internet protocol aspects and next-generation networks
Series Z	Languages and general software aspects for telecommunication systems