INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.7041/Y.1303

Corrigendum 1

(03/2003)

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

Digital terminal equipments – General

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE AND INTERNET PROTOCOL ASPECTS

Internet protocol aspects – Transport

Generic framing procedure (GFP)

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ITU-T Recommendation G.7041/Y.1303

Generic framing procedure (GFP)

Corrigendum 1

Summary

This corrigendum contains the following corrections and additions for ITU-T Rec. G.7041/Y.1303:

- Corrections to Table II.1.
- Completes the living list item for ITU-T Rec. G.7041/Y.1303 (GFP) on determining the bandwidth available for Client Management frames in GFP-T.

Source

Corrigendum 1 to ITU-T Recommendation G.7041/Y.1303 (2001) was prepared by ITU-T Study Group 15 (2001-2004) and approved under the WTSA Resolution 1 procedure on 16 March 2003.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. 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.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

CONTENTS

ITU-T Recommendation G.7041/Y.1303

Generic framing procedure (GFP)

Corrigendum 1

1) Clause 8.4.2.1

Replace the first two sentences of this clause with the following:

Fibre Channel full rate output data (after 8B/10B encoding) shall be 531.25, 1062.5, 2125 or 4250 Mbit/s, 100 ppm, as specified in ANSI X3.230 Fibre Channel Physical and Signalling Interface (FC-PH).

2) Table II.1

Make the following correction to Table II.1:

The hexadecimal representation of the Type fields for all of the Transparent mappings should have a most significant character of 0 rather than 1, which indicates that no pFCS is in use.

3) Appendix IV

Replace the text portion of Appendix IV with the following (preserving Table IV.1):

IV.1 Introduction

In GFP-T, there are an integer number (*N*) of 536-bit superblocks in a client data frame. The value of *N* must be chosen so that the efficiency of the client data bits relative to the GFP frame overhead bits allows enough bandwidth to transport the client data signal. The value of *N* can be chosen to allow enough additional "spare" bandwidth in the channel for the transport of Client Management frames (CMFs). The minimum values of *N* are shown here as a function of the various overhead bits and the number of Client Management frames that are allowed to be transmitted between successive GFP-T client data frames.

IV.2 Calculation of "spare" bandwidth

The spare bandwidth in a GFP-T channel is defined as:

SBW = (minimum bit rate for carrying client bits in the channel) – (client data bit rate)

= (minimum channel bit rate)(ratio of client data bits to total bits) – (client data bit rate)

where:

the client data bit rate is the data rate after decoding the block line code (e.g., 8B/10B), and the total number of bits in the channel is the client data bits plus all GFP-T overhead bits.

SBW as a function of *N* is:

$$SBW(N) = (Min.Chan.rate)\left(\frac{client\ data\ bits/GFP\text{-}T\ \ frame}{total\ bits/GFP\text{-}T\ \ frame}\right) - (Max.\ client\ data\ rate)$$

$$SBW(N) = \frac{(512)(N)(ChBW_{\min})}{GFPOH + (536)(N)} - CSBW_{\max}$$

where:

$ChBW_{min}$ = transport channel bandwidth with slowest end of the transport clock tolerance;

$CSBW_{max}$ = client signal data rate with fastest end of the client clock tolerance; and

$GFPOH$ = the number of GFP frame overhead bits per GFP frame.

The minimum value of N is the smallest N such that $SBW(N) > 0$:

$$N_{min} = \left\lceil \frac{(CSBW_{max})(GFPOH)}{(512)(ChBW_{min}) - (536)(CSBW_{max})} \right\rceil$$

where the notation $\lceil x \rceil$ represents the smallest integer that is $\geq x$.

The minimum VC path sizes with their associated N_{min} values are shown in Table IV.1.

IV.3 Calculation of available bandwidth for CMFs

The bandwidth available to be used for CMFs is the spare bandwidth subject to the constraints on the number of CMFs that can be transmitted between two client data frames. If there were no restrictions on the number of CMFs that could be transmitted, then the largest allowable value of N would give the largest amount of bandwidth available for CMFs; where:

N_{max} = (65536-GFPOH)/67

= 978 with no Extension header or payload FCS; and

= 977 with Extension header and/or payload FCS.

In order to minimize the latency and buffering requirements associated with the ingress to the GFP-T source adaptation process, it desirable to send no more than one CMF between client data frames. The longer the client data frames are, the fewer opportunities per second exist for transmitting CMFs (i.e., the fewer inter-client data frame gaps exist for sending CMFs). As a result, as N increases, the number of CMF transmission opportunities decreases, and hence the available CMF bandwidth decreases. With this restriction, the optimum value of N is the one that fills the entire bandwidth with exactly one CMF per client data frame. A smaller value of N would reduce the spare bandwidth such that it is not adequate to allow a CMF between each client data frame. A larger value of N would result in fewer CMFs per second. In general, if m CMFs are allowed to be transmitted between client data frames, the available CMF bandwidth is:

$$CMFBW(N,m) = \text{(CMF/second)(bits/CMF)}$$

$$CMFBW(N,m) = \frac{(ChBW_{min})(CMFL)(m)}{(m)(CMFL) + GFPOH + (536)(N)}$$

where:

$CMFL$ = CMF frame length;

m = the number of CMFs that can be transmitted between client data frames; and

there is constraint that:

$$\frac{(512)(N)(ChBW_{min})}{GFPOH + (536)(N) + (m)(CMFL)} \geq CSBW_{max}$$

The actual payload bandwidth of the client management frames is the ratio of the CMF payload area to the total CMF frame length:

$$CMPLBW = (CMFBW(N,m))\left(\frac{CMFPAL}{CMFL}\right)$$

where:

CMPLBW = the CMF useable payload bandwidth

CMFPAL = the number of bits in the CMF payload area used for CMF payload (i.e., the payload area minus the pFCS if it is used).

For a given value of *m*, the value of *N* that gives the most useable CMF bandwidth will be integer closest to:

$$N_{opt} = \frac{(CSBW_{\max})[GFPOH + (m)(CMFL)]}{(512)(ChBW_{\min}) - (536)(CSBW_{\max})}$$

4) Table IV.1

Add the following new line at the end of the table:

3400 Mbit/s	Fibre Channel	VC-4-24v	13

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