International Telecommunication Union

ITU-T G.8051/Y.1345

Amendment 1

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

(05/2014)

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

Packet over Transport aspects – Ethernet over Transport aspects

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS

Internet protocol aspects – Transport

Management aspects of the Ethernet Transport (ET) capable network element

Amendment 1: Updates to the requirements for on-demand and proactive measurements

Recommendation ITU-T G.8051/Y.1345 (2013) – Amendment 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
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
Ethernet over Transport aspects	**G.8000–G.8099**
MPLS over Transport aspects	G.8100–G.8199
Synchronization, quality and availability targets	G.8200–G.8299
Service Management	G.8600–G.8699
ACCESS NETWORKS	G.9000–G.9999

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

Recommendation ITU-T G.8051/Y.1345

Management aspects of the Ethernet Transport (ET) capable network element

Amendment 1
Updates to the requirements for on-demand and proactive measurements

Summary

Amendment 1 to G.8051/Y.1345 (2013) updates the requirements for on-demand and proactive measurements, including loss measurement and delay measurement.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T G.8051/Y.1345	2007-10-22	15	11.1002/1000/9186
2.0	ITU-T G.8051/Y.1345	2009-11-13	15	11.1002/1000/10430
2.1	ITU-T G.8051/Y.1345 (2009) Amd. 1	2011-06-06	15	11.1002/1000/11139
3.0	ITU-T G.8051/Y.1345	2013-08-29	15	11.1002/1000/12024
3.1	ITU-T G.8051/Y.1345 (2013) Amd. 1	2014-05-14	15	11.1002/1000/12186

* To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

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 not 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 2014

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

Recommendation ITU-T G.8051/Y.1345

Management aspects of the Ethernet Transport (ET) capable network element

Amendment 1
Updates to the requirements for on-demand and proactive measurements

1) Clause 10.2, Performance monitoring functions

Update requirement #16) of clause 10.2 "Performance monitoring functions" as follows, and delete current Figures 10-2 and 10-3.

16) On-demand loss measurement can be measured by directly counting the data traffic (e.g., using the ITU-T G.8013 defined LMM/LMR) or can be inferred by counting the synthetic traffic (e.g., using the ITU-T G.8013 defined SLM/SLR or 1SL). If on-demand loss measurement~~LM (e.g., LMM/LMR)~~ is supported, for each ~~on-demand LM~~ Measurement Interval, the Ethernet NE should:

- Receive from the transport plane the measurements (i.e., N_TF, N_LF, F_TF, F_LF) at the end of each Measurement Interval.

  Note that according to the definition of near-end and far-end frame loss in clause 8.1 of [ITU-T Y.1731], for a MEP, N_TF and N_LF refer to the transmitted and lost ingress frames while F_TF and F_LF refer to the transmitted and lost egress frames.

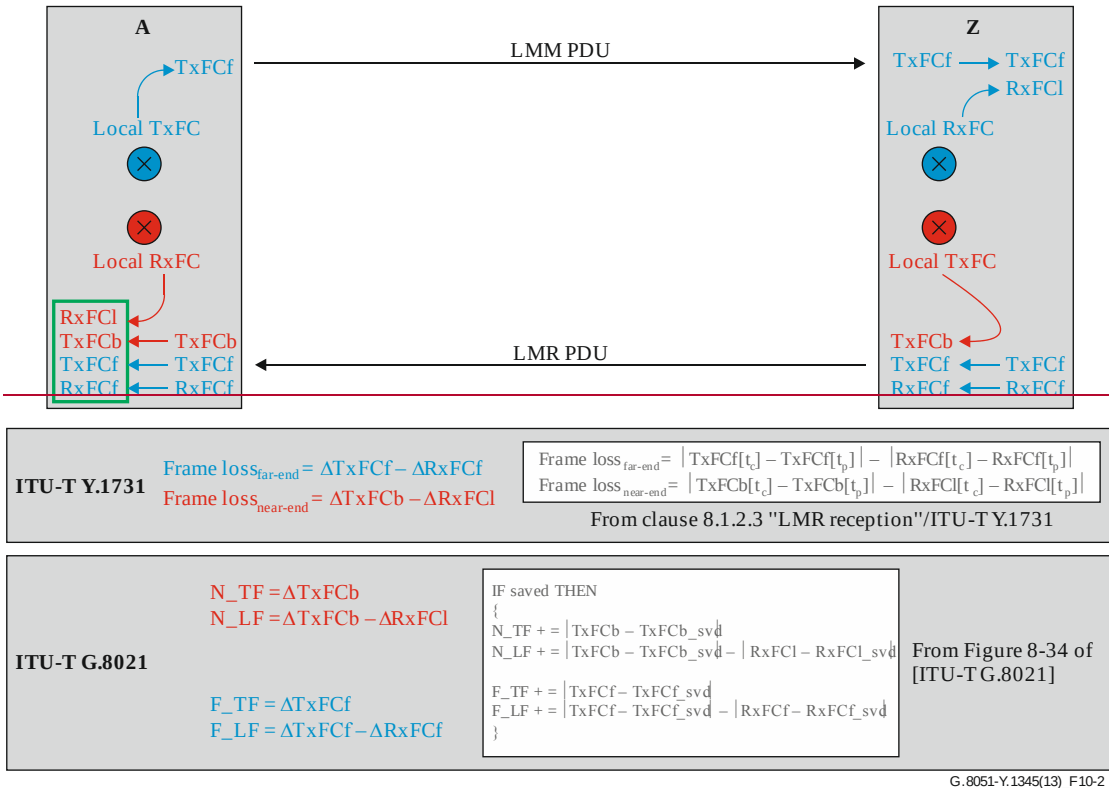
  Note that 1SL can provide only near-end measurements (i.e., N_TF, N_LF).

- Store the measurements (TN_TF, TN_LF, TF_TF, TF_LF) and calculate the FLRs (TN_FLR=TN_LF/TN_TF, TF_FLR=TF_LF/TF_TF). The measurements and FLRs shall be reported to the management system.

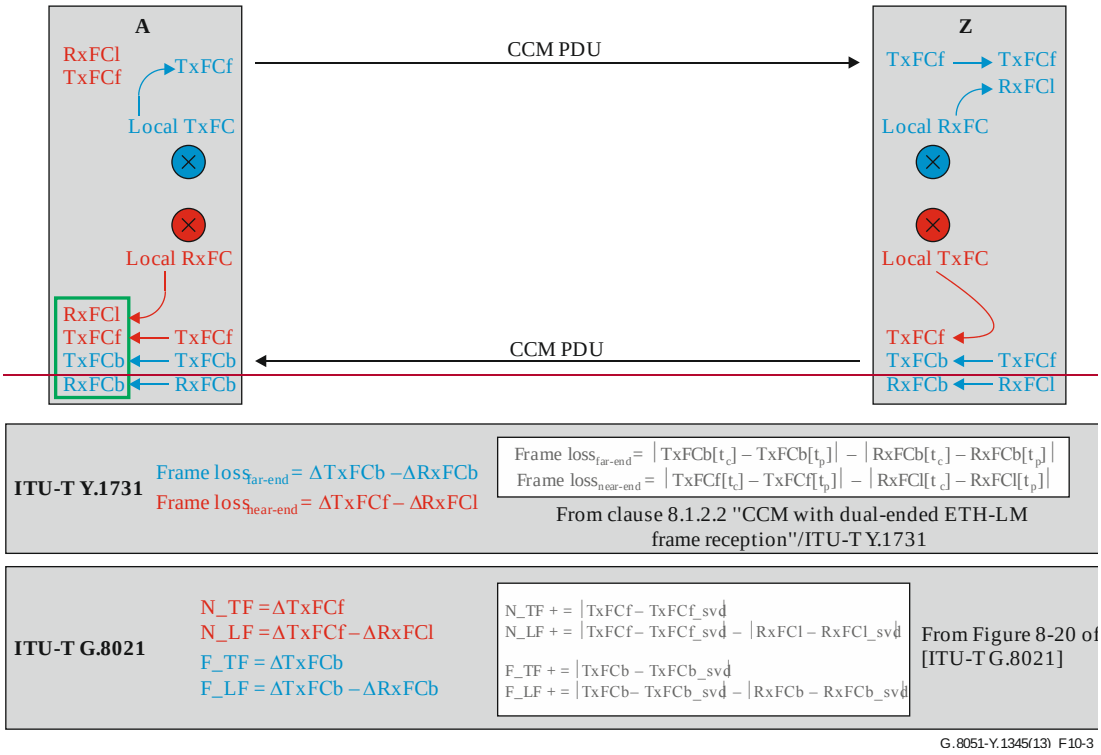
- At the instruction of the management system, the NE shall be able to request from the transport plane the intermediate (i.e., before the end of the Measurement Interval) measurements, calculate the intermediate FLRs, and report the intermediate results (TN_TF, TN_LF, TN_FLR, TF_TF, TF_LF, TF_FLR) to the management system.

~~Figure 10-2 and Figure 10-3 below illustrate the derivation of the on-demand (single-ended) and proactive (dual-ended) loss measurement from the counter values.~~

NOTE – An on-demand LM or DM session could be a single series of OAM messages or a single instance of OAM message. A single instance OAM could be considered as a special case of a single series OAM.



~~Figure 10-2 – Single-ended Loss Measurement using LMM/LMR~~



~~Figure 10-3 – Dual-ended Loss Measurement using CCM~~

2) Clause 10.2, Performance monitoring functions

Update to requirement #17) of clause 10.2 "Performance monitoring functions"

17) Proactive loss measurement can be measured by directly counting the data traffic (e.g., using the ITU-T G.8013 defined CCM or LMM/LMR) or can be inferred by counting the synthetic traffic (e.g., using the ITU-T G.8013 defined SLM/SLR or 1SL). If proactive loss

measurement~~LM (e.g., CCM-based or LMM/LMR)~~ is supported, for each loss measurement~~proactive LM~~ session the Ethernet NE should:

– Receive from the transport plane the measurements (i.e., pN_TF, pN_LF, pF_TF, pF_LF) for each OAM period.

  Note that 1SL can support only near-end measurement (i.e., N_TF, N_LF).

– Calculate the FLRs (N_FLR=pN_LF/pN_TF, F_FLR=pF-LF/pF_TF) for each OAM period; store the temporal minimum, average, and maximum statistics (mN_FLR, aN_FLR, xN_FLR, mF_FLR, aF_FLR, xF_FLR) in the current 15-minute and 24-hour registers. The stored statistics shall be available for retrieval by the management system.

– The FLR measurements of a monitored entity measured during an SES shall be included in the computation of its FLR statistics, unless the SES is part of the unavailable time period. Note: This is in line with the definition made in Note 1 of section 1 in [ITU-T Y.1563].

– At the maturity of the current 15-minute and 24-hour periods, the statistics in the current registers shall move to the history registers and then reset the current registers to zeros. See detailed requirements in [ITU-T G.7710].

3.3 Clause 10.2, Performance monitoring functions

In clause 10.2, after requirement item #22) and before Table 10-1, add the following text and figures.

For illustrative purposes, Figures 10-2 through to Figure 10-5 illustrate the derivation of the loss measurement from the counter values provided by the single-ended and dual-ended mechanisms.

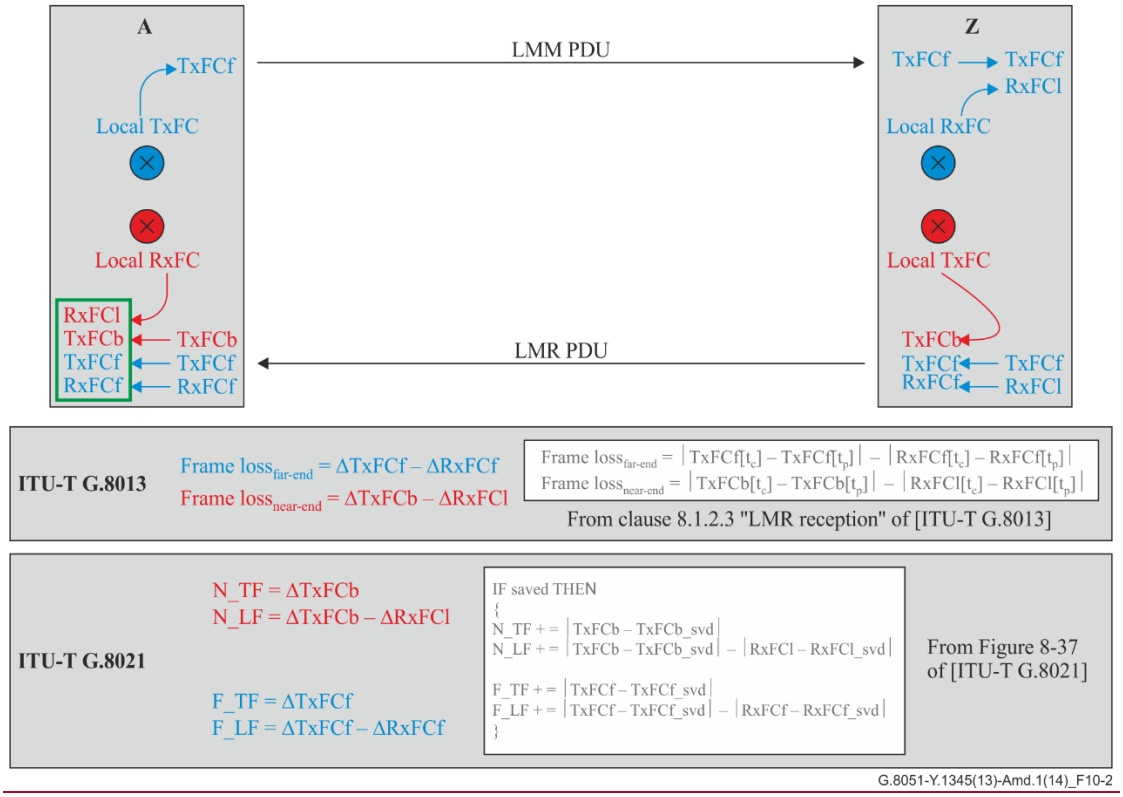


Figure 10-2 – Single-ended Loss Measurement using LMM/LMR

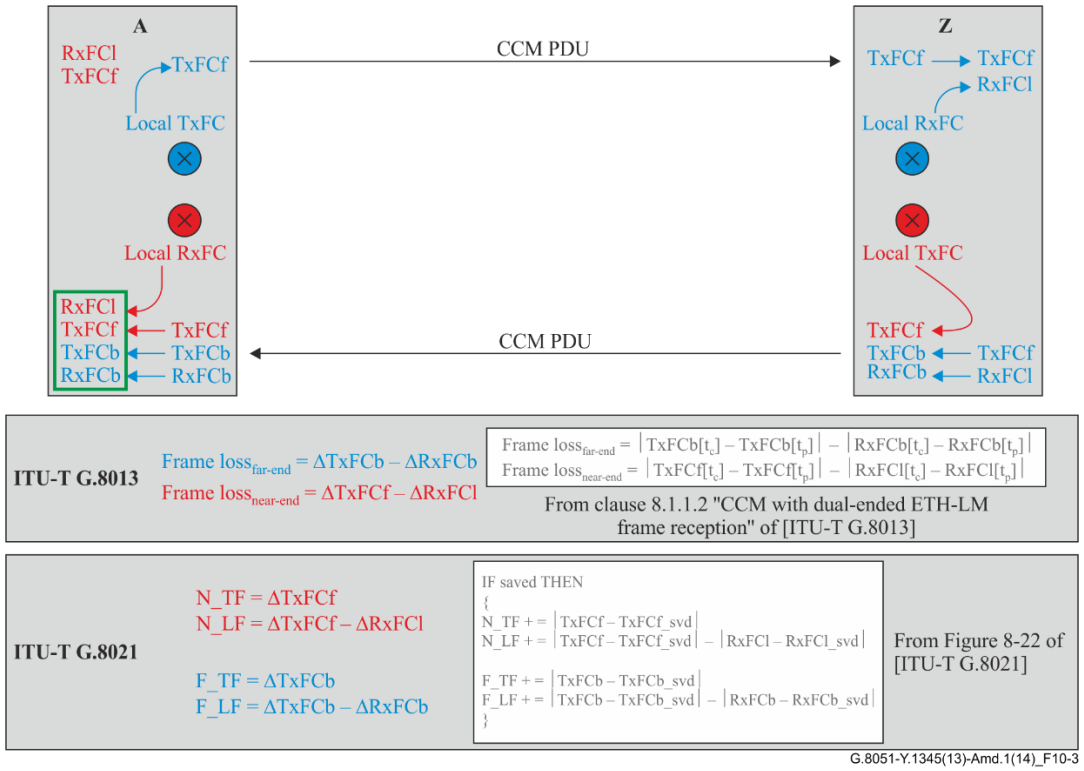


Figure 10-3 – Dual-ended Loss Measurement using CCM

(Note that for loss measurement, CCM is proactive only)

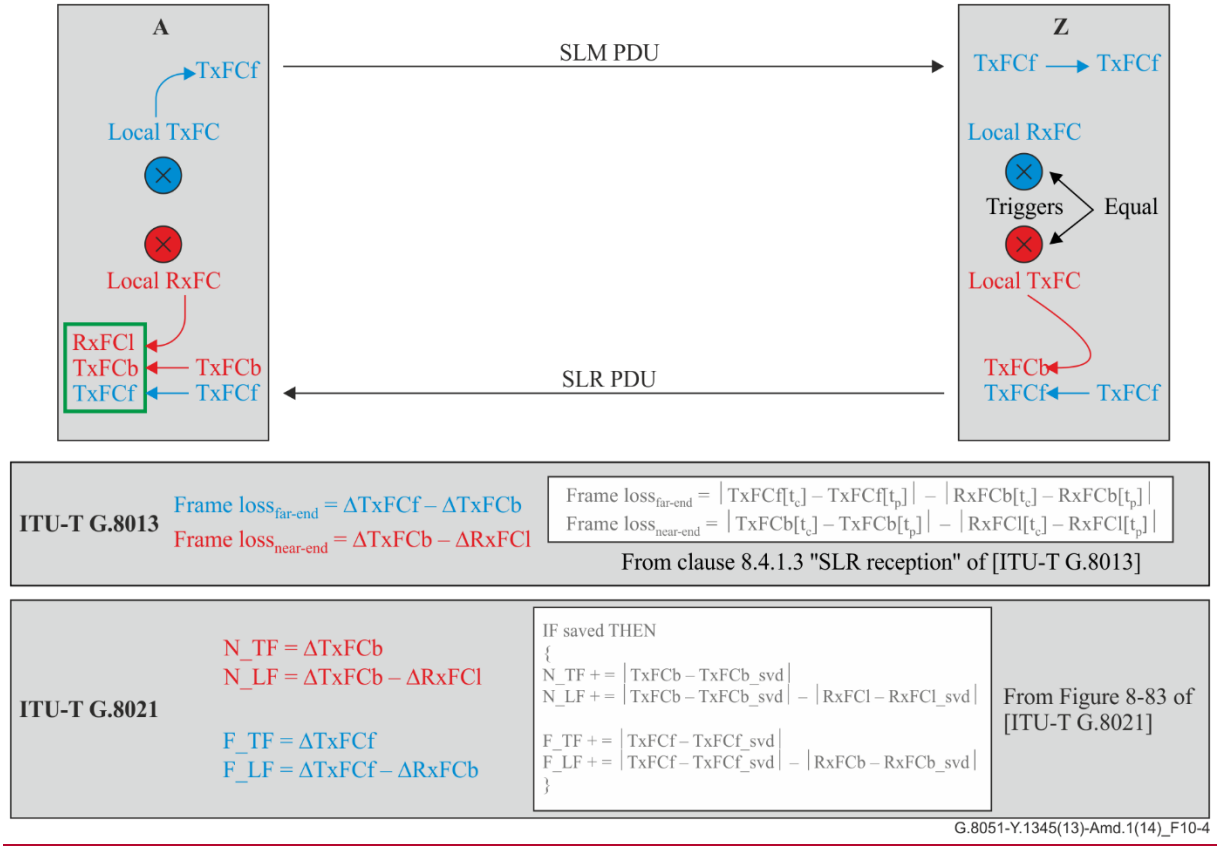


Figure 10-4 – Single-ended Loss Measurement using SLM/SLR

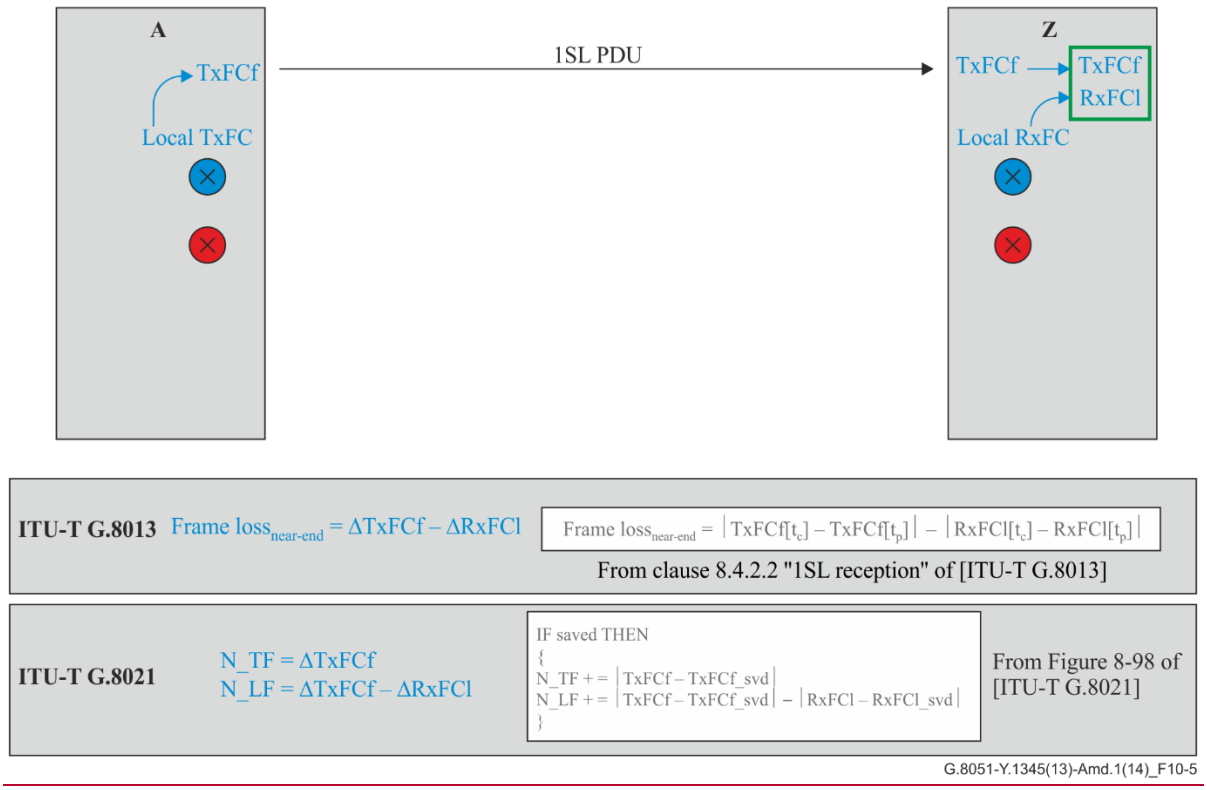


Figure 10-5 – Dual-ended Loss Measurement using 1SL

ET.NE provides the following PM management information (see Table 10-1).

ITU-T Y-SERIES RECOMMENDATIONS

GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS

GLOBAL INFORMATION INFRASTRUCTURE	
General	Y.100–Y.199
Services, applications and middleware	Y.200–Y.299
Network aspects	Y.300–Y.399
Interfaces and protocols	Y.400–Y.499
Numbering, addressing and naming	Y.500–Y.599
Operation, administration and maintenance	Y.600–Y.699
Security	Y.700–Y.799
Performances	Y.800–Y.899
INTERNET PROTOCOL ASPECTS	
General	Y.1000–Y.1099
Services and applications	Y.1100–Y.1199
Architecture, access, network capabilities and resource management	Y.1200–Y.1299
Transport	**Y.1300–Y.1399**
Interworking	Y.1400–Y.1499
Quality of service and network performance	Y.1500–Y.1599
Signalling	Y.1600–Y.1699
Operation, administration and maintenance	Y.1700–Y.1799
Charging	Y.1800–Y.1899
IPTV over NGN	Y.1900–Y.1999
NEXT GENERATION NETWORKS	
Frameworks and functional architecture models	Y.2000–Y.2099
Quality of Service and performance	Y.2100–Y.2199
Service aspects: Service capabilities and service architecture	Y.2200–Y.2249
Service aspects: Interoperability of services and networks in NGN	Y.2250–Y.2299
Enhancements to NGN	Y.2300–Y.2399
Network management	Y.2400–Y.2499
Network control architectures and protocols	Y.2500–Y.2599
Packet-based Networks	Y.2600–Y.2699
Security	Y.2700–Y.2799
Generalized mobility	Y.2800–Y.2899
Carrier grade open environment	Y.2900–Y.2999
FUTURE NETWORKS	Y.3000–Y.3499
CLOUD COMPUTING	Y.3500–Y.3999

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

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
Series G	**Transmission systems and media, digital systems and networks**
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

Printed in Switzerland
Geneva, 2014