International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.709/Y.1331
Amendment 3
(12/2014)

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Recommendation ITU-T G.709/Y.1331 (2012) – Amendment 3

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Recommendation ITU-T G.709/Y.1331

Interfaces for the optical transport network

Amendment 3

Summary

Amendment 3 to Recommendation ITU-T G.709/Y.1331 (2012) contains extensions related to the:
−   addition of CPRI option 7 and option 8 client signals (Appendix VIII).

History

Edition	Recommendation	Approval	Study Group	Unique ID[*]
1.0	ITU-T G.709/Y.1331	2001-02-09	15	11.1002/1000/5350
1.1	ITU-T G.709/Y.1331 (2001) Amd. 1	2001-11-29	15	11.1002/1000/5629
2.0	ITU-T G.709/Y.1331	2003-03-16	15	11.1002/1000/6265
2.1	ITU-T G.709/Y.1331 (2003) Amd. 1	2003-12-14	15	11.1002/1000/7060
2.2	ITU-T G.709/Y.1331 (2003) Cor. 1	2006-12-14	15	11.1002/1000/8982
2.3	ITU-T G.709/Y.1331 (2003) Amd. 2	2007-11-22	15	11.1002/1000/9155
2.4	ITU-T G.709/Y.1331 (2003) Cor.2	2009-01-13	15	11.1002/1000/9646
2.5	ITU-T G.709/Y.1331 (2003) Amd. 3	2009-04-22	15	11.1002/1000/9671
3.0	ITU-T G.709/Y.1331	2009-12-22	15	11.1002/1000/10398
3.1	ITU-T G.709/Y.1331 (2009) Cor. 1	2010-07-29	15	11.1002/1000/10875
3.2	ITU-T G.709/Y.1331 (2009) Amd. 1	2010-07-29	15	11.1002/1000/10874
3.3	ITU-T G.709/Y.1331 (2009) Amd. 2	2011-04-13	15	11.1002/1000/11115
4.0	ITU-T G.709/Y.1331	2012-02-13	15	11.1002/1000/11485
4.1	ITU-T G.709/Y.1331 (2012) Cor. 1	2012-10-29	15	11.1002/1000/11776
4.2	ITU-T G.709/Y.1331 (2012) Amd. 1	2012-10-29	15	11.1002/1000/11774
4.3	ITU-T G.709/Y.1331 (2012) Amd. 2	2013-10-22	15	11.1002/1000/11982
4.4	ITU-T G.709/Y.1331 (2012) Amd. 3	2014-12-05	15	11.1002/1000/12363
4.5	ITU-T G.709/Y.1331 (2012) Cor. 2	2015-01-13	15	11.1002/1000/12365
4.6	ITU-T G.709/Y.1331 (2012) Amd. 4	2015-01-13	15	11.1002/1000/12364

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[*]   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

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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/.

Recommendation ITU-T G.709/Y.1331

Interfaces for the optical transport network

Amendment 3

1 Introduction

This amendment contains extensions to the forth version (02/2012) of Recommendation ITU-T G.709/Y.1331, related to the:

–   addition of CPRI option 7 and option 8 client signals (Appendix VIII).

2 Additions

2.1 Appendix VIII

Modify the text in this appendix as follows:

CPRI constant bit rate signals (CPRI options 1 to ~~6~~8) may be transported over an ODUk connection. These CBR signals are mapped into an LO OPUk via the generic mapping procedure as specified in clause 17.7 for CPRI options 1 to 3 and via the bit-synchronous mapping procedure as specified in clause 17.9 for CPRI options 4 to ~~6~~8.

Two CPRI signals (options 1 and 2) are transported via OPU0, one CPRI signal (option 3) is transported via OPU1 and ~~three~~ the remaining CPRI signals (options 4~~, 5 and 6~~to 8) are transported via OPUflex. The GMP C_m and C_n (n=1) values associated with the CPRI options 1 to 3 signals are presented in Tables VIII.1 and VIII.2.

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Table VIII.3 – supra-2.488G CBR clients

Client signal	Nominal bit rate (kbit/s)	Bit-rate tolerance (ppm)
CPRI option 4	3 072 000	±0.002
CPRI option 5	4 915 200	±0.002
CPRI option 6	6 144 000	±0.002
CPRI option 7	9 830 400	±0.002
CPRI option 8	10 137 600	±0.002

Table VIII.4 – Replacement signal for CPRI clients

Client signal	Replacement signal	Bit-rate tolerance (ppm)
CPRI option 1	Link Fault	±100
CPRI option 2	Link Fault	±100
CPRI option 3	Link Fault	±100
CPRI option 4	Link Fault	±100
CPRI option 5	Link Fault	±100
CPRI option 6	Link Fault	±100
CPRI option 7	Link Fault	±100
CPRI option 8	TBD	±100

Table VIII.5 – Number of tributary slots required for ODUj into HO OPUk

	# 2.5G tributary slots		# 1.25G tributary slots			
LO ODU	**OPU2**	**OPU3**	**OPU1**	**OPU2**	**OPU3**	**OPU4**
ODUflex(CBR)						
– ODUflex(CPRI Opt 4)	–	–	–	3	3	3
– ODUflex(CPRI Opt 5)	–	–	–	4	4	4
– ODUflex(CPRI Opt 6)	–	–	–	5	5	5
– ODUflex(CPRI Opt 7)	–	–	–	8	8	8
– ODUflex(CPRI Opt 8)	–	–	–	–	9	8

Table VIII.6 – C_m and C_n (n=8) for ODUj into ODTU2.M

ODUj signal	M	m=8×M	Floor $C_{m,min}$	Minimum c_m	Nominal c_m	Maximum c_m	Ceiling $C_{m,max}$
ODUflex(CBR)			ODUflex(CBR) dependent				
– ODUflex(CPRI 4)	3	24	12534	12534.900	12536.404	12537.909	12538
– ODUflex(CPRI 5)	4	32	15041	15041.880	15043.685	15045.490	15046
– ODUflex(CPRI 6)	5	40	15041	15041.880	15043.685	15045.490	15046
– ODUflex(CPRI 7)	8	64	15041	15041.880	15043.685	15045.490	15046

			Floor $C_{8,min}$	Minimum c_8	Nominal c_8	Maximum c_8	Ceiling $C_{8,max}$
ODUflex(CBR)			ODUflex(CBR) dependent				
– ODUflex(CPRI 4)	3	24	37604	37604.700	37609.213	37613.726	38614
– ODUflex(CPRI 5)	4	32	60167	60167.519	60174.740	60181.961	60182
– ODUflex(CPRI 6)	5	40	75209	75209.399	75218.425	75227.452	75228
– ODUflex(CPRI 7)	8	64	120335	120335.039	120349.48	120363.923	120364

Table VIII.7 – C_m and C_n (n=8) for ODUj into ODTU3.M

ODUj signal	M	m=8×M	Floor $C_{m,min}$	Minimum c_m	Nominal c_m	Maximum c_m	Ceiling $C_{m,max}$
ODUflex(CBR)			ODUflex(CBR) dependent				
– ODUflex(CPRI 4)	3	24	12482	12482.010	12483.508	12485.006	12486
– ODUflex(CPRI 5)	4	32	14978	14978.412	14980.210	14982.007	14983
– ODUflex(CPRI 6)	5	40	14978	14978.412	14980.210	14982.007	14983
– ODUflex(CPRI 7)	8	64	14978	14978.412	14980.210	14982.007	14983
– ODUflex(CPRI 8)	9	72	13730	13730.211	13731.859	13733.507	13764
			Floor $C_{8,min}$	Minimum c_8	Nominal c_8	Maximum c_8	Ceiling $C_{8,max}$
ODUflex(CBR)			ODUflex(CBR) dependent				
– ODUflex(CPRI 4)	3	24	37446	37446.030	37450.524	37455.018	37456
– ODUflex(CPRI 5)	4	32	59913	59913.648	59920.838	59928.029	59929
– ODUflex(CPRI 6)	5	40	74892	74892.060	74901.048	74910.036	74911
– ODUflex(CPRI 7)	8	64	119827	119827.296	119841.677	119856.058	119857
– ODUflex(CPRI 8)	9	72	123571	123571.899	123586.729	123601.560	123602

Table VIII.8 – C_m and C_n (n=8) for ODUj into ODTU4.M

ODUj signal	M	m=8×M	Floor $C_{m,min}$	Minimum c_m	Nominal c_m	Maximum c_m	Ceiling $C_{m,max}$
ODUflex(CBR)			ODUflex(CBR) dependent				
– ODUflex(CPRI 4)	3	24	12006	12006.001	12007.442	12008.883	12009
– ODUflex(CPRI 5)	4	32	14407	14407.201	14408.930	14410.659	14411
– ODUflex(CPRI 6)	5	40	14407	14407.201	14408.930	14410.659	14411
– ODUflex(CPRI 7)	8	64	14407	14407.201	14408.930	14410.659	14411
– ODUflex(CPRI 8)	8	64	14857	14857.426	14859.209	14860.993	14861
			Floor $C_{8,min}$	Minimum c_8	Nominal c_8	Maximum c_8	Ceiling $C_{8,max}$
ODUflex(CBR)			ODUflex(CBR) dependent				
– ODUflex(CPRI 4)	3	24	36018	36018.003	36022.326	36026.649	36027
– ODUflex(CPRI 5)	4	32	57628	57628.805	57635.722	57642.638	57643
– ODUflex(CPRI 6)	5	40	72036	72036.007	72044.652	72053.297	72054
– ODUflex(CPRI 7)	8	64	115257	115257.611	115271.443	115285.276	115286
– ODUflex(CPRI 8)	8	64	118859	118859.411	118873.676	118887.941	118888

ITU-T Y-SERIES RECOMMENDATIONS

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