International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.9963
Amendment 1
(01/2014)

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

Access networks – In premises networks

Unified high-speed wire-line based home networking transceivers – Multiple input/multiple output specification

Amendment 1: Alignment with modifications to ITU-T G.9961

Recommendation ITU-T G.9963 (2011) – Amendment 1

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Recommendation ITU-T G.9963

**Unified high-speed wire-line based home networking transceivers –
Multiple input/multiple output specification**

Amendment 1

Alignment with modifications to ITU-T G.9961

Summary

Amendment 1 to Recommendation ITU-T G.9963 (2011) aligns this Recommendation with changes introduced by Amendment 1 to Recommendation ITU-T G.9961 (2010).

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FOREWORD

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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.

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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.9963

Unified high-speed wire-line based home networking transceivers –
Multiple input/multiple output specification

Amendment 1

Alignment with modifications to ITU-T G.9961

1) Clause 2

Add the following entry to clause 2:

[ITU-T G.9961 Amd.1]   Recommendation ITU-T G.9961 Amd.1 (2014), *Amendment 1 to Recommendation ITU-T G.9961 (2010).*

2) Clause 4

Replace clause 4 with the following:

4   Abbreviations and acronyms

In addition to the abbreviations defined in [ITU-T G.9960], [ITU-T G.9961] and [ITU-T G.9961 Amd.1], this Recommendation uses the following abbreviations:

BMAT   Bit and Tx port Mapping Allocation Table

MIMO   Multiple Input Multiple Output

SS   Spatial Stream

3) Clause 8.1

Revise clause 8.1 as follows:

8.1   Functional model and frame formats

See clause 8.1 of [ITU-T G.9961] and its subclauses, except for revisions introduced by [ITU-T G.9961 Amd.1] to clause 8.1.3.1.1.6 "OriginatingNode" and clause 8.1.3.1.1.10 "DestinationNode".

4) Clause 8.3

Revise clause 8.3 as follows:

8.3   Transmission opportunities (TXOPs) and time slots (TSs)

See clause 8.3 of [ITU-T G.9961] and its subclauses, except for revisions to clause 8.3.3.4.3 "CBTS back-off rules" introduced by [ITU-T G.9961 Amd.1].

5) Clause 8.5

Revise clause 8.5 as follows:

8.5 Functions of the endpoint node

See clause 8.5 and its subclauses, of [ITU-T G.9961] except for revisions to clause 8.5.5 "Reporting of detected neighbouring domains" introduced by [ITU-T G.9961 Amd.1].

6) Clause 8.6

Revise clause 8.6 as follows:

8.6 Domain master node functional capabilities

See clause 8.6 of [ITU-T G.9961] and its subclauses, except for revisions to clause 8.6.1.1.4.2 "Registration response message (ADM_DmRegistrResponse.cnf)", clause 8.6.4.2.1 "Endpoint node topology maintenance in CRTM mode" and clause 8.6.4.3.1 "Format of MMPL of the TM_NodeTopologyChange.ind message" introduced by [ITU-T G.9961 Amd.1].

Also see new clause 8.6.9 "Per-node transmit PSD shaping" and new clause 8.6.10 "Selection of initialization seeds used for generating preamble, PR, INUSE, NACK and IDPS signals" introduced by [ITU-T G.9961 Amd.1].

7) Clause 8.7

Revise clause 8.7 as follows:

8.7 Addressing scheme

See clause 8.7 of [ITU-T G.9961] and its subclauses, except for revisions to Table 8-61 "Definition and valid values of node identification parameters" in clause 8.7.1.2 introduced by [ITU-T G.9961 Amd.1].

8) Clause 8.8

Revise clause 8.8 as follows:

8.8 Medium access plan (MAP) frame

See clause 8.8 of [ITU-T G.9961] and its subclauses, except for revisions to Table 8-65 "TXOP Attributes Extension Data format" in clause 8.8.4.1.1, Table 8-73 "Types of auxiliary information sub-fields" in clause 8.8.5 and Table 8-77 "Format of PSD-related domain info sub-field" in clause 8.8.5.5 introduced by [ITU-T G.9961 Amd.1].

Also see new clause 8.8.5.11 "Contention window (CW) information sub-field" and clause 8.8.5.12 "NDIM information sub-field" introduced by [ITU-T G.9961 Amd.1].

9) Clause 8.10.1.1

Revise clause 8.10.1.1 as follows:

8.10.1.1 Management message OPCODEs

Management message OPCODEs are formatted as 12-bit unsigned integers. Valid values of OPCODEs are presented in Table 8-1 as well as Table 8-88 of [ITU-T G.9961 Amd.1]. OPCODEs are categorized (typically by their associated protocol or procedure) according to the value of their 8 MSBs.

Table 8-1 – OPCODEs of management messages

Category	Message name	OPCODE (hex)	Description	MMPL Reference
MIMO Channel Estimation (80X-81X)	MCE_ProbeSlotAssign.req	800	MIMO channel estimation bandwidth assignment request	Clause 8.12.7.1
	MCE_ProbeSlotRelease.req	801	MIMO channel estimation bandwidth release request	Clause 8.12.7.2
	MCE_ParamUpdate.req	802	MIMO channel estimation parameters update request	Clause 8.12.7.3
	MCE_ParamUpdateRequest.ind	803	Request for MIMO channel estimation parameter update	Clause 8.12.7.4
	MCE_PartialBmatUpdate.req	804	Partial BMAT update request	Clause 8.12.7.5
	MCE_ACESymbols.ind	805	Request for an ACE symbol attachment	Clause 8.12.7.6
	MCE_ProbeSlotAssign.cnf	806	MIMO channel estimation bandwidth assignment confirmation	Clause 8.12.7.7
	MCE_ProbeSlotRelease.cnf	807	MIMO channel estimation bandwidth release confirmation	Clause 8.12.7.8
	MCE_ParamUpdate.cnf	808	MIMO channel estimation parameters update confirmation	Clause 8.12.7.9
	MCE_PartialBmatUpdate.cnf	809	Partial BMAT update confirmation	Clause 8.12.7.10
	MCE_Request.ind	80A	MIMO channel estimation trigger	Clause 8.12.7.11
	MCE_Initiation.req	80B	MIMO channel estimation initiation request	Clause 8.12.7.12
	MCE_Initiation.cnf	80C	MIMO channel estimation initiation confirmation	Clause 8.12.7.13

Table 8-1 – OPCODEs of management messages

Category	Message name	OPCODE (hex)	Description	MMPL Reference
	MCE_ProbeRequest.ind	80D	Request for PROBE frame transmission	Clause 8.12.7.14
	MCE_Cancellation.req	80E	MIMO channel estimation cancellation request	Clause 8.12.7.15
	MCE_BmatIdMaintain.ind	80F	BMAT ID maintenance	Clause 8.12.7.16
	MCE_Cancellation.cnf	810	MIMO channel estimation cancellation confirmation	Clause 8.12.7.17
Reserved	Reserved	820-9FF	Reserved by ITU-T	

10)   Clause 8.15

Revise clause 8.15 as follows:

8.15   Operation in the presence of neighbouring domains

See clause 8.14 of [ITU-T G.9961 Amd.1].

11)   Clause 9

Add Annex V "Versioning dependencies of G.9963" after Annex H as follows:

Annex V

Versioning dependencies of ITU-T G.9963

(This annex forms an integral part of this Recommendation.)

For details on the versioning mechanism, see clause 8.20.

The versioning dependencies between this Recommendation and other Recommendations of the G.996x family is described in Table V.1. The number indicated in the following table represents the minimum amendment that is compatible with the Recommendation described in this document.

Table V.1 – Versioning dependencies of ITU-T G.9963

G.9960	G.9961	G.9962	G.9963	G.9964
0	1	X	N/A	0
NOTE – The following values apply to this table: • A value of 0 indicates the base document of a Recommendation. • A value of X indicates that this Recommendation is not dependent on the indicated Recommendation. • A value of N/A indicates this Recommendation.				

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