

JJ-201.01

IP電話の通話品質評価法

I.<概要>

本標準では、IP 電話サービスの総合品質指標として ITU-T 勧告 G.107[1]に準拠した R 値を用いることを前提として、この算出のためにサービス提供事業者が考慮すべき品質パラメータを特定し、その評価法を規定する。品質パラメータや評価法に関しては、該当する ITU-T 勧告に準拠することを基本とし、国際標準化との整合を図ることとする。

さらに、本標準では、ITU-T 勧告 G.107[1]が考慮していない品質要因がある点、R 値と主観品質の対応関係に関する検証が必ずしも十分でない点を鑑み、R 値を補完する品質パラメータ及びその評価方法も規定する。

JJ-201.01

A Method for Speech Quality Assessment of IP Telephony

I.<Overview>

The purpose of this standard

- taking account of the standardization trends of ITU-T and other organizations, to define a method of assessment with the overall quality index, the R value, specified in the ITU Recommendation G.107 as the overall quality index for IP telephony services and a method of assessment of parameters to complement the R value*.

TTC Study Policies

- In principle, make sure that the standard conforms to related international/regional standards (ITU-T, ETSI, and TIA standards).
- Use the overall quality index, the R value, for IP telephony services.
- Specify evaluation conditions and method of assessment for the calculation of the R value.
- In defining conditions and method of assessment, ensure the ease of assessment and fairness (strictness).
 - * The R value is the index calculated based on the E-Model, which has been developed as a network planning tool. Because of the facts that there are quality factors that cannot be assessed with the R value and that the verification of the correspondence between the R value and subjective qualities has not been completed, parameters to complement the evaluation based on the R value are necessary, so is a method of their assessment.

II.<参考>

1. 国際勧告等の関連

本標準に対応する国際標準は無い。

2. 参照文書

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The E-model, a computational model for use in transmission planning¹

G.107 Erratum (07/2001)

Erratum to Recommendation ITU-T G.107(07/2000).

JT-G.107 E-model 伝送計画のための計算モデル, 2003 年 4 月

Amendment 1: New Appendix II – Provisional impairment factor framework for wideband speech transmission (06/2006)

[2] ITU-T G.177 (09/1999)

Transmission planning for voiceband services over hybrid Internet/PSTN connections

[3] ETSI TR 101 329-1 (01/2002)

End-to-end Quality of Service in TIPHON systems; Part 1: General aspects of Quality of Service (QoS)

[4] ITU-T G.109 (09/1999)

Definition of categories of speech transmission quality

[5] ITU-T P.76 (11/1988)

Determination of loudness ratings; fundamental principles

JT-P76 ラウドネス定格の決定;基本原理

[6] ITU-T P.79 (09/1999)

Calculation of loudness ratings for telephone sets

P.79 Erratum (05/2000)

Erratum to Recommendation ITU-T P.79 (09/1999).

JT-P79 電話セットのラウドネス値計算方法

[7] ITU-T G.711 (11/1988)

II.<References>

1. Relation with international standards and national standards

This standard is TTC original.

2. References

[1] ITU-T G.107 (03/2005)

The E-model, a computational model for use in transmission planning¹

G.107 Erratum (07/2001)

Erratum to Recommendation ITU-T G.107 (07/2000).

Amendment 1: New Appendix II – Provisional impairment factor framework for wideband speech transmission (06/2006)

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Erratum to Recommendation ITU-T P.79 (09/1999).

[7] ITU-T G.711 (11/1988)

Pulse code modulation (PCM) of voice frequencies

G.711 Appendix I (09/1999)

A high quality low-complexity algorithm for packet loss concealment with G.711

JT-G711 音声周波数帯域信号の PCM 符号化方式

[8] ITU-T G.113 (05/2002)

Transmission impairments due to speech processing

JT-G.113 音声信号処理による伝送劣化, 2003 年 4 月

[9] ITU-T P.833 (02/2001)

Methodology for derivation of equipment impairment factors from subjective listening-only tests

JT-P833 受聴主観評価試験に基づいた装置劣化要因導出法

[10] ITU-T P.834 (07/2002 (Pre-Published))

A methodology for the derivation of equipment impairment factors from instrumental models

JT-P834 計測モデルに基づく装置劣化要因導出法

[11] ITU-T P.862 (02/2001 (Pre-Published))

Perceptual evaluation of speech quality (PESQ), an objective method for end-to-end speech quality assessment of narrow-band telephone networks and speech codecs

JT-P862 狭帯域電話網および符号化方式のエンドーエンド音声品質評価のための客観評価法

[12] ETSI TS 101 329-5 (11/2000)

End-to-end quality of service in TIPHON systems; Part5: Quality of service (QoS) measurement methodologies

[13] ETSI TR 101 329-7 (02/2002)

End-to-end quality of service in TIPHON systems; Part7: Design guide for elements of TIPHON connection from an end-to-end speech transmission

Pulse code modulation (PCM) of voice frequencies

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[13] ETSI TR 101 329-7 (02/2002)

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performance point of view

[14] ITU-T G.122 (03/1993)
Influence of national systems on stability and talker echo in international connections

[15] ITU-T G.131 (08/1996)
Control of talker echo

[16] ITU-T G.165 (03/1993)
Echo cancellers
JT-G.165 エコーキャンセラ, 2003 年 4 月

[17] ITU-T G.168 (04/2000)
Digital network echo cancellers

[18] ITU-T P.310 (05/2000)
Transmission characteristics for telephone-band (300–3400 Hz) digital telephones

[19] ETSI TR 101 329-6 (02/2002)
End-to-end Quality of Service in TIPHON systems; Part 6: Actual measurements of network and terminal characteristics and performance parameters in TIPHON networks and their influence on voice quality

[20] ETSI TS 101 329-2 (01/2002)
End-to-end quality of service in TIPHON systems; Part2: Definition of speech Quality of Service (QoS) classes

[21] ITU-T E.500 (11/1998)
Traffic intensity measurement principles

[22] ETSI EG 201 769 (10/2000)
QoS parameter definitions and measurements; Parameters for voice telephony service required under the ONP voice telephony directive

[23] ITU-T Y.1541 (05/2002 (Pre-Published))
Network performance objectives for IP-Based services

performance point of view

[14] ITU-T G.122 (03/1993)
Influence of national systems on stability and talker echo in international connections

[15] ITU-T G.131 (08/1996)
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[16] ITU-T G.165 (03/1993)
Echo cancellers

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[19] ETSI TR 101 329-6 (02/2002)
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Network performance objectives for IP-Based services

JT-Y1541 インターネットプロトコル通信サービス -IP 性能目標, 2002 年 5 月

[24] ITU-T P.800 (08/1996)

Methods for subjective determination of transmission quality

JT-P800 伝送品質の主観的決定法

[25] ITU-T G.114 (05/2000)

One-way transmission time

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Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications

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Higher-Speed Physical Layer Extension in the 2.4 GHz Band

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Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications

High-speed Physical Layer in the 5 GHz Band

[29] IEEE Std 802.11gTM-2003 [Amendment to IEEE Std 802.11TM, 1999 Edition (Reaff 2003) as amended by IEEE Stds 802.11aTM-1999, 802.11bTM-1999, 802.11bTM-1999/Cor 1-2001, and 802.11dTM-2001]

Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications

Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band

[30] ARIB STD-T71 2.0 版(06/2003)

Broadband Mobile Access Communication System (CSMA)

広帯域移動アクセスシステム (CSMA)

[31] ITU-T P.862.1 (11/2003)

Mapping function for transforming P.862 raw result scores to MOS-LQO

[32] ITU-T P.862.3 (11/2005)

Application guide for objective quality measurement based on Recommendations P.862, P.862.1 and P. 862.2

[33] ITU-T P.830 (02/1996)

Subjective performance assessment of telephone-band and wideband digital codecs

[34] ITU-T Recommendation P.862.2 (11/2005)

Wideband extension to Recommendation P.862 for the assessment of wideband telephone networks and speech codecs

[24] ITU-T P.800 (08/1996)

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[35] ITU-T Recommendation P.564 (7/2006)

Conformance testing for narrowband voice over IP transmission quality assessment models

[36] IETF RFC3611 (11/2003)

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[37] ITU-T Y.1540 (12/2002)

Internet protocol data communication service - IP packet transfer and availability performance parameters

JT-Y1540 インターネットプロトコルデータ通信サービス -IPパケット転送性能パラメータと可用性パラメータ, 2001年11月

[38]ITU-T P.1010 (07/2004)

Fundamental voice transmission objectives for VoIP terminals and gateways

[35] ITU-T Recommendation P.564 (7/2006)

Conformance testing for narrowband voice over IP transmission quality assessment models

[36] IETF RFC3611 (11/2003)

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Fundamental voice transmission objectives for VoIP terminals and gateways

3. 改版の履歴

版数	制定日	改版内容
第1版	2003年4月23日	制定
第2版	2005年6月2日	・パケット長とコーデックのパケット損失耐性の適用範囲の拡充・無線LANを用いたIP電話の通話品質評価に関する留意事項の追加(TS-1010仕様の盛り込み)・ソフトフォンを用いたIP電話の通話品質評価に関する留意事項の追加・相互接続環境におけるIP電話の通話品質評価に関する留意事項の追加
第3版	2006年6月1日	・PESQ アプリケーションガイド(ITU-T 勧告 P.862.3)に対応したガイダンスの追加 ・ITU-T 勧告 G.107 改版に伴う記述の修正
第4版	2007年3月15日	・付録 IX 広帯域IP電話サービスの通話品質評価法の追記
第5版	2008年8月25日	・インサービス品質管理に関する記述追加 ・IP電話の通話品質評価におけるNW品質値の扱いに関する留意事項の追加

3. Change history

Version	Date	Outline
1	April 4, 2003	Published
2	June 2, 2005	<ul style="list-style-type: none"> ・ Addition of a condition and enhancement of notices ・ Based on feedback from domestic IP telephony service experience. ・ Changes from JJ-201.01 (Apr. 2003) <ol style="list-style-type: none"> 1.Addition of the Condition about Packet Length and Packet Loss of CODEC 2.Notice on Speech Quality Assessment of IP Telephony over Wireless LAN 3.Notice on Speech Quality Assessment of IP Telephony that uses Softphone 4.Notice on Speech Quality Assessment of IP Telephony on interoperability between IP Networks

3	June 1, 2006	<ul style="list-style-type: none"> • Addition of the guidance of ITU-T Rec. P.862.3 Application Guide. • Modify the description of ITU-T Rec G.107 revision.
4	March15,2007	<ul style="list-style-type: none"> •Addition of the Appendix IX “A Method for Speech Quality Assessment of Wideband IP Telephony”
5	Aug. 25,2008	<ul style="list-style-type: none"> •Addition of the description for in-service quality management. •Addition of the guideline for IP network performance measurement in quality assessment of IP Telephony

4. 標準策定部門

網管理専門委員会

Ⅲ.<目次>

<参考>

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 - 6.1 R 値パラメータの分類と要規定項目
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4. Working Group that developed this standard

Network Management Working Group

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Bibliography