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ITU-T adopted NTT quality estimation model for video-telephony services as Recommendation G.1070
~ Toward providing high-quality video-telephony services ~

The quality estimation model for video-telephony services, which was developed and proposed to ITU-T SG12 ([*1]) by NTT Service Integration Laboratories, was adopted by ITU as Recommendation G.1070 in April 2007. G.1070 is a counterpart of Recommendation G.107. G.1070 provides a quality estimation model for video-telephony services, while G.107 does that for IP-telephony services and is called the "E-model." This Recommendation contributes to the establishment of a common quality measure for video-telephony QoE ([*2]) and consequently to the development of high-quality video-telephony services.

[Introduction]
The spread of broadband IP services evokes the need for video-telephony services. Since December 2006, NTT has been providing the field trial service of the Next-Generation Network (NGN), which includes video telephony as one of its representative applications. In NGN, services with higher quality than that of conventional telecommunication services are expected. Video telephony as well as conventional IP-telephony is among those telecommunication services. Therefore, there has been a focus in ITU-T on establishing international standards that determine the quality of such services.

To provide high-quality video-telephony services, designing their quality in advance is very important. Then, services need to be managed so that they are provided with the intended level of quality. To do this, establishing a means for estimating QoE on the bases of the quality design and management parameters is indispensable. QoE represents the quality of service perceived subjectively by users.

NTT Service Integration Laboratories has been investigating QoE estimation methods for various services, including video telephony, on the basis of extensive know-how and subjective data that have been accumulated at NTT for several decades. Consequently, we have established a method for estimating the QoE of video-telephony services simply on the basis of physical characteristics of networks and terminals (See figure). This method was proposed to ITU-T and approved as ITU-T Recommendation G.1070 in April 2007. The pre-published version is now available at the URL below:
http://www.itu.int/rec/T-REC-G.1070-200704-P/en
(Although editorial changes may be made later, the pre-published version is effective in practice.)

G.1070 helps service providers develop high-quality video-telephony services

consequently protecting users from experiencing bad quality. At the same time, this Recommendation is quite valuable from the viewpoint of developing various rich video communication services over NGN.

[Technical keypoints]
The method standardized as Recommendation G.1070 is often called an "opinion model," which estimates user opinions about QoE on the basis of predetermined equations incorporating network/terminal/application quality parameters. The method consists of three individual models:

1) Speech quality estimation model
-This model estimates speech quality on the basis of speech-related quality parameters.
-Recommendation G.1070 adopts the E-model, which is recommended as G.107 in
 ITU-T, as a speech quality estimation model.

2) Video quality estimation model
-This model estimates video quality based on video-related quality parameters.
-The subjective effects of video coding bitrate and packet-loss rate are modeled.

3) Multimedia quality integration model
-This integrates the outputs from the speech and video quality estimation models and
 takes into account the effects of delay and synchronization between speech and video.

[Future work]
Various multimedia services including video telephony will be provided over NGN, which enables high-quality network services utilizing optical broadband networks. For popularizing such services, NTT thinks that standardizing objective QoE metrics, designing networks and terminals so that they meet the QoE requirements, and maintaining QoE are of high importance. NTT will continue to investigate QoE and incorporate its know-how in the quality design and management of our services. In addition, we will continue to contribute to the international standardization activities.

[Terminology]
*1 ITU-T SG12: The ITU Telecommunication Standardization Sector (ITU-T) is one of the three Sectors of the International Telecommunication Union (ITU). Study Group 12 (SG12) of ITU-T is responsible for Recommendations on the end-to-end transmission performance of terminals and networks, in relation to the perceived quality and acceptance by users of text, data, speech, and multimedia applications.

*2 QoE: The overall acceptability of an application or service, as perceived subjectively by the end-user. (Cited from ITU-T Recommendation P.10/G.100)

- Figure: Concept of quality estimation model for video-telephony services

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