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**STUDY GROUP 12 – DELAYED CONTRIBUTION 96**

**Source:** Telchemy Incorporated

**Title:** Degradation factors

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## ABSTRACT

This contribution discusses the application of the IP packet metric based non-intrusive monitoring algorithm, and specifically highlights the need for analysis of the degradation factors (i.e. the components of the difference between ideal and actual (estimated) call quality scores.

### 1 Introduction

The applications of the IP packet metric based transmission monitoring algorithm include non-intrusive monitoring of Voice over IP based services and the location and diagnosis of problems that affect service quality. It is most helpful to service providers and network managers if, rather than being presented with a single score with no supporting explanation of its derivation, they are instead given a detailed breakdown of the factors that led to the degradation in quality. This gives more confidence in the result, allows value judgments to be made concerning specific impairments and (most importantly) identifies which are the main issues that need to be addressed in order to restore service quality.

In order to provide consistency in the analysis of results amongst multiple vendors' equipment it is highly desirable to adopt a consistent methodology for calculating degradation factors.

### 2 Degradation Factors

From a user perspective it is helpful to understand which of the following contribute to degradation in call quality *and* the *extent* to which each contribute. For example, knowing the jitter level is useful but knowing the effect that jitter had on the overall quality score is both more useful and easier for the user to understand:

- (i) Network packet loss
  - a. Packet loss rate
  - b. Quality degradation due to packet loss
  - c. Percentage of total degradation

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**Contact:** Alan Clark  
Telchemy Incorporated  
USA

Tel: +1-770-614-6944  
Fax: +1-770-614-3951  
Email: alan@telchemy.com

- (ii) Packet discards due to jitter
  - a. Packet discard rate
  - b. Quality degradation due to packet discard
  - c. Percentage of total degradation
- (iii) Distribution of loss/discards
  - a. Packet loss/discard burst statistics
  - b. Percentage of total degradation
- (iv) CODEC/ Vocoder selection
  - a. CODEC/vocoder type
  - b. Quality degradation due to CODEC type
  - c. Percentage of total degradation
- (v) Delay
  - a. Packet discard rate
  - b. Quality degradation due to packet discard
  - c. Percentage of total degradation

### **3 Summary**

This contribution has explained the need for providing degradation factors to assist service providers and network managers with the task of identifying those issues in their networks that affect call quality.

The use of a consistent methodology is more important in a Voice over IP service as it is common for the VoIP packet stream to pass through multiple service provider or enterprise/ service provider networks – in order for problems to be identified within these more complex services it is necessary to compare measurements made at different locations.

It is proposed that Q.16 specify the methodology used to compute degradation factors, to the extent necessary in order to obtain a consistent result. In the interests of computational efficiency it would also be desirable that the computation of these degradation factors form part of the algorithm for calculating the overall call quality score.

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