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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

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Gateway control protocol: Package for removal of digits and tones

Recommendation ITU-T H.248.68

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Recommendation ITU-T H.248.68

Gateway control protocol: Package for removal of digits and tones

Summary

Recommendation ITU-T H.248.68 defines a package that allows a media gateway controller to indicate to a media gateway whether to remove tones and/or digits from the media stream where the package properties are set.

Source

Recommendation ITU-T H.248.68 was approved on 16 March 2009 by ITU-T Study Group 16 (2009-2012) under Recommendation ITU-T A.8 procedure.

FOREWORD

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In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Gateway control protocol: Package for removal of digits and tones

1 Scope

This Recommendation defines a package that allows a media gateway controller (MGC) to indicate to a media gateway (MG) whether it should remove tones (such as those defined in [ITU-T H.248.27]) and/or DTMF digits (such as those defined in [ITU-T H.248.16]) from the media stream where the package properties are set. It is applicable to media streams transported over any type of transport protocol.

This Recommendation primarily addresses signal (tone and digit) removal, rather than signal relay.

Any signal removal capability requires a signal detection capability. In many systems there is first a "pre-detection" phase where there is a notification that a tone may be starting. Thus, signal detection requires a minimum detection time (e.g., Tmin).

If this notification is given after a minimal amount of time (typically 1 to 5 ms), the false alarm rate may be high. Therefore, the period of the minimum detection time leads to the following considerations:

a) 100% signal removal implies an artificial delay in the forwarding of media/bearer traffic.

   The delay in forwarding of bearer traffic in certain cases may be acceptable; however, for real-time communications, this typically is not appropriate.

b) Signal removal without additional delay implies only X% of signal removal (with X < 100%), i.e., the signal is partially removed.

   The partial removal of X% leads to a 'leakage' in the forwarding direction, where "leakage" is the partial transmission of the signal. The acceptable leakage depends on the type of signal and/or tele/bearer service. Too much leakage may lead to problems in subsequent gateways/terminals, with stray audio confusing signal processing equipment and/or users, and with degradation of non-tone speech. Therefore, enabling the tone/digit removal function may cause problems that would otherwise not happen if the received signal was kept.

c) Samples may be discarded during the pre-detection phase

   In order to keep the delay down, samples received in the initial "pre-detection" phase are often used but not forwarded by the signal detection equipment. Signals are not released to the other end until the signal detection capability is more certain as to what signal(s) are present. This may result in loss of a few milliseconds of speech when the signal pre-detection is a false alarm.

As can be observed, the signal removal capabilities in this Recommendation have important network performance/quality aspects. However, these aspects are not issues specific to an H.248 implementation. The same aspects occur in all signal removal equipment, whether it is for split or monolithic MGC/MGs.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the

currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T H.248.1] Recommendation ITU-T H.248.1 (2005), *Gateway control protocol: Version 3*.

[ITU-T H.248.16] Recommendation ITU-T H.248.16 (2002), *Gateway control protocol: Enhanced digit collection packages and procedures*.

[ITU-T H.248.27] Recommendation ITU-T H.248.27 (2003), *Gateway control protocol: Supplemental tones packages*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 ADD.req: [ITU-T H.248.1] Add command request.

3.1.2 MOD.req: [ITU-T H.248.1] Modify command request.

3.1.3 MOV.req: [ITU-T H.248.1] Move command request.

3.1.4 NOTIFY.req: [ITU-T H.248.1] Notify command request.

3.2 Terms defined in this Recommendation

This Recommendation defines the following term:

3.2.1 signal: For the purposes of descriptions in this Recommendation, "signal" comprises "tone" and (MF or DTMF) "digit".

4 Abbreviations any acronyms

This Recommendation uses the following abbreviations and acronyms:

DTMF Dual Tone Multi-Frequency

MF Multi-Frequency

MG Media Gateway

MGC Media Gateway Controller

5 Conventions

None.

6 Removal of digits and tones package

Package Name: Removal of digits and tones

Package ID: rdt (0x00e9)

Description: This package defines a mechanism which allows the MGC to set whether or not the tones and/or digits should be removed from the received media stream by the MG before passing it through into the Context for further processing or transmission.

Version: 1

Extends: None

6.1 Properties

6.1.1 Tone Removal

Property Name: Tone Removal

Property ID: tr (0x0001)

Description: This property indicates whether tones in the media stream should remain or be removed.

Type: Boolean

Possible values: *On* – Tones are removed from the media stream

Off – Tones remain in the media stream

Default: *Off*

NOTE – While [b-IETF RFC 5022] defines the default to be "*On*", in this Recommendation the default is set to "*Off*" in order to align with H.248 behaviour.

Defined in: LocalControl

Characteristics: Read/Write

6.1.2 Tone Removal List

Property Name: Tone Removal List

Property ID: trl (0x0002)

Description: This property indicates the list of tones that should be removed from the media stream.

Type: Sub-list of String (text), Sub-list of Octet String (binary)

Possible values: Each element of the sub-list is a valid H.248 PackageID/SignalID pair related to a particular toneID. They are formatted according to the pkgdName syntax. To indicate "all" tones, the text "all" is used in the case of text encoding, or the value "0xFFFF" is used in the case of binary encoding.

Default: "all" tones

Defined in: LocalControl

Characteristics: Read/Write

6.1.3 Digit Removal

Property Name: Digit Removal

Property ID: dr (0x0003)

Description: This property indicates whether digits in the media stream should be removed or remain.

Type: Boolean

Possible values: *On* – Digits are removed from the media stream

Off – Digits remain in the media stream

Default: *Off*

NOTE – While [b-IETF RFC 5022] defines the default to be "*On*", in this Recommendation the default is set to "*Off*" in order to align with H.248 behaviour.

Defined in: LocalControl

Characteristics: Read/Write

6.2 Events

None.

6.3 Signals

None.

6.4 Statistics

None.

6.5 Error codes

None.

6.6 Procedures

The default behaviour of H.248 with respect to removal of tones (including DTMF) from media streams is that the MGC assumes that the MG does not alter the media stream, and the tones pass through into the Context. If the MGC requires that for a certain media stream the tones and/or digits be removed, it should use the removal of digits and tones (*rdt*) package to indicate this.

Whilst [ITU-T H.248.1] treats digit detection as an extension of tone detection, DTMF digits are not treated as tones for the purposes of this package.

If the MGC sets the Tone Removal (*rdt/tr*) property to "*On*", the MG shall remove all detected tones from the media stream and the property is set on before passing it through into the Context for further processing or transmission.

While the *rdt/tr* property is set with "*On*", if the MGC wants to individually control which tones are to be removed, it shall set the Tone Removal List (*rdt/trl*) property to include these tones. The MG shall then remove only the detected tones indicated by the *rdt/trl* property from the media stream. The *rdt/trl* property is unavailable when the *rdt/tr* property is valued "*Off*".

The tone removal should occur at the detection stage. Example behaviours are:

- If an event was set on the media stream to detect the tone, it would still be detected and reported to the MGC. Then, the tone would be removed from the media stream before passing it through into the Context for further processing or transmission.
- If the media stream was being recorded, the tone would not appear in the recording. This is because recording is considered as a further processing in the Context, which would occur later than the event detected.
- If the media stream is transmitted to other terminations in the Context or other endpoint, they would not receive it.

NOTE – A MG usually only has the capability to detect a certain set of tones. If a tone not belonging to that set is received on the MG, it cannot be detected and will be passed through into the Context.

If the MGC sets the *rdt/tr* property to "*Off*", or this property uses the default value, tones will be passed with the media stream into the Context for further processing or transmission.

The use of the Digit Removal (*rdt/dr*) property is as per the *rdt/tr* property, except that DTMF digits (instead of tones) are affected.

Bibliography

[b-IETF RFC 5022] IETF RFC 5022 (2007), *Media Server Control Markup Language (MSCML) and Protocol*. <http://www.ietf.org/rfc/rfc5022.txt?number=5022>

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