

STUDY GROUP **16/WP2 Q.13**

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SOURCE*: Nortel Networks

TITLE: Use of inband tones in H.323 using special RTP payload types

Introduction

The topic of using in-band tones with a special RTP payload type has been discussed previously within this group. At the time, the IETF was still working on defining the RTP-based mechanism: it was therefore premature to look at the potential implication on H.323.

The IETF has now issued RFC 2833 on this topic (See <http://www.ietf.org/rfc/rfc2833.txt>).

Many applications, such as IVR systems or voice system rely on synchronization of DTMF input. In some cases (such as recording voice messages), the synchronization of the packet stream with the DTMF digits is in the same direction (e.g., recording a message on a mailbox and pressing a digit when the recording is finished). Timely delivery of DTMF is also important when listening and transmitting DTMF in the other direction. Users may press the digits twice if the feedback is not immediate.

H.323 systems can not be taken in isolation in VoIP, and in-band RTP tones may be sent to an H.323 system: there will be no way for the other endpoint's H.323 proxy to prevent it.

It is therefore necessary to add support for RFC2833 tones in H.323v4.

RFC2833 defines "named telephone events" and "telephony tones".

Named telephone events are a logical description of DTMF tones, fax-related tones, standard subscriber line tone, country-specific tones and trunk events. Named telephone events are identified by MIME type "audio/telephone-event". Each event is identified by a decimal number. When telephone events are used, support for the following DTMF is mandatory: 0-9, #, *, A, B, C, D.

Telephony tones are a description of the waveform properties. This is useful in cases where it is necessary to accurately reproduce non-standard tones. Telephony tones are identified by MIME type "audio/tone".

Telephone events and tones in RFC2833 do not use a specific RTP payload type: rather, they use dynamic RTP payload. An out-of-band mechanism is required to negotiate the payload type.

This contribution proposes to add support for advertising support for RFC2833, including telephone events and tones.

Proposal

H.245 already includes a mechanism to identify a payload type by its RFC number. Unfortunately, this is not sufficient since there are two distinct mechanism in RFC2833. Using a MIME type (as per RFC2833) is thus preferable. It is thus proposed that the RTPPayloadType field be modified as follows:

```
RTPPayloadType ::= SEQUENCE
{
    payloadDescriptor CHOICE
    {
        nonStandardIdentifier NonStandardParameter,
        rfc-number            INTEGER (1..32768, ...),
        oid                   OBJECT IDENTIFIER,
        ...,
    },
    payloadType          INTEGER (0..127) OPTIONAL,
    ...,
    audioEventsAndTonesDescriptor CHOICE -- Only used when rfc-number is 2833
    {
        audioTelephoneEvent GeneralString, -- As per <list of values> in
3.9/RFC2833
        audioTone           NULL,
        ...
    } OPTIONAL
}
```

In section B.2.2.4/H.245v7 describing multiplex capabilities, the following shall be added to the section describing the payload type in the H2250Capability:

payloadType may be included to indicate which payload type is associated with this format. If used in capability exchange, the payloadType shall be set to a statically assigned payload type iff one exists for this payload format. Otherwise, the payloadType shall be omitted. If used in conjunction with OpenLogicalChannel, the payloadType shall indicate the payload type value to be used. If a dynamic payload type is used, the values of the payloadType field and the dynamicPayloadType field shall match. When the rfc-number is 2833, only dynamic RTP payload type shall be used.

The audioEventsAndTonesDescriptor is only included when the rfc-number field is 2833. When the information is audioTelephoneEvent, the listed of supported events is described as the <list of values> field in section 3.9 of RFC2833.

In H.323v4, every instance of UserInputIndication should also refer to “audioEventsAndTonesDescriptor for RTPPayloadType”.