INTERNATIONAL TELECOMMUNICATION UNION

ITU-T   H.248 Sub-series Implementors' Guide

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

Implementors' Guide for the H.248 Sub-series of Recommendations ("Media Gateway Control Protocol")

Summary

This document is a compilation of reported defects identified in the ITU-T H.248 sub-series of Recommendations currently in force. It must be read in conjunction with the Recommendations to serve as an additional authoritative source of information for implementors. The changes, clarifications and corrections defined herein are expected to be included in future versions of affected H.248 sub-series Recommendations.

This revision contains all updates submitted up to and including those at Study Group 16 meeting in April 2006.

This document was approved by ITU-T Study Group 16 [13 April 2006] and obsoletes the earlier version of this Implementors' Guide approved on 26 November 2004. Please note that the Implementors' Guides for H.248.1 Version 1 and Version 2 are published as *separate* documents.

Change Log

(All changes that were included in corrigenda, amendments or revisions to the recommendations in the H.248 subseries are omitted here.)

V19 (Melbourne, February 2005)

Added new section for H.248.20, renumbering other sections as appropriate.

New:

6.12	Annex C and SDP parameters
6.13	Case Sensitivity of Profile Names
6.14	Profile Negotiation
6.15	Conflict between H.248.1 Version 2 Corrigendum 1 and H.248.8
7.1	Clarification of "At-Most-Once" Functionality
9.1	Media Values

V20 (Geneva, August 2005)

New:

6.16	AuditCapability of Signals
6.17	Media Type Mismatch
6.18	Notify Avalanche
6.19	Topology Reply
6.20	Statistics and Sub-lists
7.1	Probe Order Typo
9.2	New Error Code – Too many transactions
12.1	Alerting Confusion
13.1	Metering Pulses at Signal Replacement

V21 (Geneva, November 2005)

Removed items pertaining to H.248.1 Version 2, as they are incorporated into the new H.248.1 Version 2 IG. Added new section for H.248.1 Version 3. Removed existing items pertaining to H.248.8, as they are incorporated in the H.248.8 (09/2005) revision. Added new section for H.248.9. Renumbered existing sections.

New:

6.1	Clarification of ASN.1 definition of topologyDirectionExtension
6.2	Correction of ASN.1
6.3	Correction of Annex E.14.6 Procedures
6.4	Clarification of statistic reset capability
6.5	Clarification of delay calculation
6.6	Protocol version negotiation
9.1	Error text for error code 449

V22 (Geneva, April 2006)

Added new section for H.248.14. Renumbered existing sections.

New:

Contact Information

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Table of Contents

Implementors' Guide for the
H.248 Sub-series of Recommendations

1   Scope

This guide resolves defects in the following categories:

- editorial errors

- technical errors, such as omissions and inconsistencies

- ambiguities

In addition, the Implementors' Guide may include explanatory text found necessary as a result of interpretation difficulties apparent from the defect reports.

This Guide will not address proposed additions, deletions, or modifications to the Recommendations that are not strictly related to implementation difficulties in the above categories. Proposals for new features should be made through contributions to the ITU-T.

2   Introduction

The H.248 Implementors' Guide is a compilation of reported defects for all versions of the H.248.x sub-series of Recommendations, except H.248.1 Version 1 (03/2002) and H.248.1 Version 2 (05/2002) Corrigendum 1 (03/2004). *For the defects in Version 1, see the H.248.1 Version 1 Implementors' Guide. For the defects in Version 2, see the H.248.1 Version 2 Implementors' Guide.*

In this edition of the Guide, reported defects identified as of 4/2006 are given for:

- H.248.1 version 3 (09/2005)

- H.248.2 (1/2005)

- H.248.5 (11/2000)

- H.248.8 (09/2005)

- H.248.9 (01/2005)

- H.248.14 (03/2002)

- H.248.20 (11/2002)

- H.248.22 (07/2003)

- H.248.30 (03/2004)

The Guide must be read in conjunction with the H.248.x sub-series of Recommendations to serve as an additional source of information for implementors. The changes, clarifications and corrections defined herein are expected to be included in future versions of affected H.248.x Recommendations.

3   Defect Resolution Procedure

Upon discovering technical defects with any components of the H.248.x Sub-series Recommendations, please provide a written description directly to the editors of the affected Recommendations with a copy to the Q.3/16 Rapporteur. The template for a defect report is located at the end of the Guide. Contact information for these parties is included at the front of the

document. Return contact information should also be supplied so a dialogue can be established to resolve the matter and an appropriate reply to the defect report can be conveyed. This defect resolution process is open to any interested party. Formal membership in the ITU is not required to participate in this process.

4   References

This document refers to the following H.248.x sub-series Recommendations:

−   ITU-T Recommendation H.248.1 Version 3 (09/2005), *Gateway Control Protocol: Version 3*

−   ITU-T Recommendation H.248.2 (01/2005), *Gateway Control Protocol: Fax, text conversation and call discrimination packages*

−   ITU-T Recommendation H.248.5 (11/2000), *Gateway Control Protocol: Transport over ATM*

−   ITU-T Recommendation H.248.8 (09/2005), *Gateway Control Protocol: Error code and service change reason description*

−   ITU-T Recommendation H.248.9 (01/2005), *Gateway control protocol: Advanced media server packages*

−   ITU-T Recommendation H.248.14 (03/2002), *Gateway control protocol: Inactivity timer package*

−   ITU-T Recommendation H.248.20 (11/2002), *Gateway Control Protocol: The use of local and remote   descriptors with H.221 and H.223 multiplexing*

−   ITU-T Recommendation H.248.22 (07/2003), *Gateway Control Protocol: Shared Risk Group Package*

−   ITU-T Recommendation H.248.30 (03/2004), *Gateway Control Protocol: RTCP extended performance metrics packages*

5   Nomenclature

In addition to traditional revision marks, the following marks and symbols are used to indicate to the reader how changes to the text of a Recommendation should be applied:

Symbol	Description
[Begin Correction]	Identifies the start of revision marked text based on extractions from the published Recommendations affected by the correction being described.
[End Correction]	Identifies the end of revision marked text based on extractions from the published Recommendations affected by the correction being described.
...	Indicates that the portion of the Recommendation between the text appearing before and after this symbol has remained unaffected by the correction being described and has been omitted for brevity.

6   Technical and Editorial Corrections to H.248.1 (09/2005)

6.1   Clarification of ASN.1 definition of topologyDirectionExtension

Description:	In H.248.1 v3 Annex A.2 ASN.1 Syntax Definition, the new two topology modes 'onewayexternal' and 'onewayboth' have been defined in a new Information Element. This was due to the lack of extension capability of the existing Information Element topologyDirection. Since the Information Element topologyDirection is mandatory, in those cases where topology is set to one of the new modes, the receiver of the command will receive two different modes, e.g. Oneway and OnewayBoth. It should be clarified that if the new element topologyDirectionExtension is present, it takes precedence to the element topologyDirection. Furthermore, the new type should be OPTIONAL.
Reference:	AVD-2805

[Begin Correction]

A.2   ASN.1 syntax specification

                                             …

```
TopologyRequest            ::= SEQUENCE
{
     terminationFrom             TerminationID,
     terminationTo               TerminationID,
     topologyDirection           ENUMERATED
     {
          bothway(0),
          isolate(1),
          oneway(2)
     },
     …,
     streamID                    StreamID OPTIONAL,
     topologyDirectionExtension  ENUMERATED OPTIONAL
     {
          onewayexternal(0),
          onewayboth(1),
          …
     }
     -- if present, topologyDirectionExtension takes precedence over
     -- topologyDirection
}
```

[End Correction]

6.2   Correction of ASN.1

Description:	Per clause 11.3/X.680, ASN.1 Identifiers shall start with a lower case character.

Reference:	AVD-2805

[Begin Correction]

A.2   ASN.1 syntax specification

…

```
NotifyBehaviour        ::= CHOICE
{
     nNotifyImmediate        NULL,
     nNotifyRegulated        RegulatedEmbeddedDescriptor,
     nNeverNotify            NULL,
     …
}
```

[End Correction]

6.3   Correction of Annex E.14.6 Procedures

Description:	ABNF in examples of Annex E.14.6 seems to be not inline concerning short token notation of the "SegmentationCompleteToken", as defined in Annex B.2.
Reference:	AVD-2815

[Begin Correction]

E.14.6   Procedures

…

Example 1:
```
Sender:   !/3 [12.34.56.78]:2944 P=1/1{C=1{AV=term1{…}, AV=term2{…}}}
Receiver:    !/3 [12.34.56.79]:2944 SM=1/1
Sender:   !/3 [12.34.56.78]:2944 P=1/2{C=1{AV=term3{…}},C=2{AV=term4{…}}}
Receiver:    !/3 [12.34.56.79]:2944 SM=1/2
Sender:   !/3 [12.34.56.78]:2944 P=1/3/&#{C=3{AV=term5{…}}}
Receiver:    !/3 [12.34.56.79]:2944 SM=1/3/&#
Receiver:    !/3 [12.34.56.79]:2944 K=1
```

Example 2:
```
Sender:   !/3 [12.34.56.78]:2944 P=1/1{C=1{AV=term1{…}, AV=term2{…}}}
Receiver:    !/3 [12.34.56.79]:2944 SM=1/1
Sender:   !/3 [12.34.56.78]:2944 P=1/4/&#{C=3{AV=term5{…}}}
Receiver:    !/3 [12.34.56.79]:2944 SM=1/4/&#
/* Segmentation Timer Expires */
Receiver:    !/3 [12.34.56.79]:2944 ER=459{"2,3"}
```

[End Correction]

6.4 Clarification of statistic reset capability

Description:	It is generally agreed that it is possible to reset the value of a statistic in H.248.1 Version 3. However, there is no text describing how this might be achieved.
Reference:	Discussion at November 2005 Geneva Q3 Rapporteur's Meeting

[Begin Correction]

7.1.15 Statistics Descriptor

…

Statistics are cumulative; reporting statistics does not reset them. The value of a Statistic at a termination level is the result of a meaningful superior function (like for instance sum or average) of the values as if it had been placed on all the streams in the termination. Such a superior function is dependent of the particular statistic type. Unless specified otherwise in the package that defines a particular statistic, the default behaviour is a sum of the values. Statistics are reset when a termination ceases to exist or is returned to the NULL ~~context~~ Context due to a Subtract Command.

For terminations not in the NULL Context, the MGC may send a Modify Command with a Statistics Descriptor to disable one or more statistics followed by a second Modify Command including a Statistics Descriptor to re-enable those statistics. As explained above, this has the effect of resetting the included statistics. By bundling the two commands together into the same action or transaction, the MGC can minimize the time during which statistics are not collected by the MG. An audit of the Statistics Descriptor via the Audit Descriptor in the Modify Command or a separate AuditValue Command must be performed before the included statistics are reactivated to collect their values.

…

[End Correction]

6.5 Clarification of delay calculation

Description:	Is the "propagation delay" statistic rtp/delay intended to be • the propagation delay in sending direction (PD_{Tx})? • the propagation delay in receiving direction (PD_{Rx})? • the round-trip propagation delay (RTPD) as indicated in § 6.4.1/RFC 3550 (based on RTCP SR information)? • the round-trip delay (RTD), termed as total round-trip time in § 6.4.1/RFC 3550? • the estimated mean oneway propagation delay (OPD) based on the measured round-trip propagation delay? • the "delay since last SR" (DLSR), i.e., RTCP SR header field DLSR (see also § 6.4.1/RFC 3550)? • others? Our understanding is that H.248 statistic **`rtp/delay`** is related to the RTPD metric.
Reference:	AVD-2788

[Begin Correction]

E.12.4.5 Delay

  Statistic Name: Delay

StatisticID:delay (0x0008)

Description: Requests the current value of packet <u>round-trip</u> propagation delay <u>(RTPD)</u> expressed in timestamp units. This is the same as average latency. <u>The computation of RTPD may be based upon RTCP sender reports (SR) and receiver reports (RR).</u>

Type: Double

Possible values: any 64 bit integer 0 and up

Level: Either

…

[End Correction]

6.6   Protocol version negotiation

Description:	H.248.1 is silent on what to do when either the MGC or the MG fails to abide by the negotiated protocol version within a control association. Consider the following: The MG offers Version 2, which the MGC accepts. The MG then starts sending all messages as Version 1. This is clearly not what was intended in the version negotiation procedures. H.248.1 should allow the receiver of the "off-version" messaging to reject it as not in line with the negotiated version. The most appropriate error code is 406, "Version not supported".
Reference:	AVD-2820

[Begin Correction]

11.3   Negotiation of protocol version

…

<u>If the MGC supports the version indicated by the MG,</u> ~~it~~ <u>both the MGC and MG</u> shall conform to that version in all subsequent messages. In this case it is optional for the MGC to return a version in the ServiceChange Reply. <u>Any subsequent messaging that does not conform to the negotiated version shall be rejected with Error Code 406 ("Version Not Supported").</u>

…

[End Correction]

6.7   Clarification of error code usage in wildcarding procedures

Description:	It appears that the error code required in clause 6.3.2/H.248.1 is a cut and paste error, as error code 435 makes more sense. However, the long-standing existence of 431 in that clause may lead to backwards compatibility problems if the error code is just changed. The text needs to be updated to allow either possibility.
Reference:	COM16 D-223

[Begin Correction]

6.3.2 ContextID wildcarded (ALL) with TerminationID specific

In the case where the ContextID is wildcarded (i.e. ContextID = ALL) and the TerminationID is fully specified, the effect is identical to a command specifying the non-NULL context that contains the specified termination. Thus a search must be made to find the context and only one instance of the command is executed. No errors are reported for contexts that do not contain the specified termination. If the termination is not contained in any (non-NULL) context then <u>435 ("TerminationID is not in specified context") is returned, though </u>Error Code 431 ("No TerminationID matched a wildcard") <u>may be returned</u>is returned <u>in order to maintain backward compatibility</u>is returned. If there are no contexts other than NULL in existence, Error Code 411 ("The transaction refers to an unknown ContextID") is returned. Use of this form of action rather than one specifying the ContextID is discouraged but may be useful, for example in correcting conflicting state between MG and MGC.

> *For example: Taking the above gateway configuration. The command:*
>
> *Context=*{Command=t1/1{Descriptor/s}}*
>
> *Returns:*
>
> *Context=1{Command=t1/1{Descriptor/s}}*

…

[End Correction]

6.8 ServiceStates clarification for continuity testing

Description:	The continuity package does not specify whether or not a termination must be placed in the Test state prior to conducting a continuity test.
Reference:	COM16 D-224

[Begin Correction]

E.10.5 Procedures

…

When a continuity test is performed on a termination, no echo devices or codecs shall be active on that termination. <u>The termination under test does not need to have its ServiceStates Property set to Test.</u>

…

[End Correction]

6.9 Reference to location of ServiceChangeMgcID definition

Description:	There are dedicated sub-clauses for each parameter of ServiceChange in clause 7.8 with one exception: ServiceChangeMgcID is embedded in the section of ServiceChangeAddress. It is proposed to indicate this by editorial changes.
Reference:	COM16 D-224

F.5.7   ServiceChangeMgcID

The use of the ServiceChangeMgcID parameter is described in clause 7.2.8/H.248.1, specifically clause 7.2.8.1.3/H.248.1. The MGC may send this parameter in a ServiceChange command directed toward the Root Termination. Upon receipt during a registration attempt, the MG shall attempt registration with the MGC at the specified address. When received in a Handoff command from the MG's primary MGC, the MG shall utilize the procedures outlined in clause 11.5/H.248.1.

…

6.10   Clarification of termination service state upon restart of MG

Description:	During discussion on the 3GPP and IETF Megaco mailing lists it became apparent that there is a source of confusion on the default states of all terminations after a ServiceChange restart. It is widely agreed that all terminations including physical and ephemeral terminations are default "InService" after the ServiceChange. However H.248.1 doesn't explicitly make this statement.
Reference:	COM16 D-274

7.2.8   ServiceChange

…

3)   Restart – indicates that service will be restored on the specified terminations after expiration of the ServiceChangeDelay. The ServiceStates Property should be set to "inServiceInService" upon expiry of ServiceChangeDelay. Upon receipt of a ServiceChange Command on Root with ServiceChangeMethod Restart all terminations are assumed to be "InService". This includes physical and ephemeral terminations. Those terminations which are "OutOfService" may be reported by subsequent ServiceChange Commands with ServiceChangeMethod Forced.

…

6.11   Alignment of text among events in the Tone Detection Package

Description:	The Tone Detection Package specifies three different events for tone detection: 'Start Tone Detected', 'End Tone Detected' and 'Long Tone Detected'. While the '*' wildcard in the EventsDescriptor parameter 'tl' is allowed for the 'Start Tone Detected' and 'Long Tone Detected' events, H.248 currently doesn't allow it in the 'End Tone Detected' event. There is no reason why the wildcard should not be allowed in the 'End Tone Detected' event. In fact, a very common use of this event, as of the other two, is the detection of DTMF tones. For DTMF it is common to order the MGW to detect any DTMF digit, as it is not known in advance which DTMF digit will be received in the line.
Reference:	COM16 D-303

E.4.2.2 End Tone Detected

Event Name: End tone detected

EventID: etd (0x0002)

Description: Detects the end of a tone.

EventsDescriptor Parameters:

Tone ID List

Parameter Name: Tone ID List

ParameterID: tl (0x0001)

Description: A list of tone IDs to be detected.

Type: Sublist of enumeration

Optional: No

Possible values: <u>The only tone id defined in this package is "wild card" which is "*" in text encoding and 0x0000 in binary.</u> ~~No possible values are specified in this package.~~ Extensions to this package would add possible values for tone ID. <u>If tl is "wild card", any tone id is detected.</u>

Default: None

[End Correction]

6.12 Clarification of package definition requirements for enumerations

Description:	Packages may define properties, statistics and parameters for signals and events of enumeration type. As stated in the guideline for package definition in H.248.1, the possible values for these parameters must be also specified in the package. Once the values are specified, the binary encoding is unambiguous, as with ASN.1 each of the values of an enumeration type is associated to an integer. However, with text encoding, the encoded values may use any character or character string, not only integers. Therefore it is important that the package specifies not only the possible values that a property, statistic or parameter of type enumeration may take, but also the strings to be used to encode each of the values if ABNF, Annex B/H.248.1 is used.
Reference:	COM16 D-303

[Begin Correction]

12.1.2   Properties

Properties defined by the package, specifying:

…

Type: One of:

Boolean

String: UTF-8 string

Octet String: A number of octets. See Annex A and B.3 for encoding

Integer: 4 byte signed integer

Double: 8 byte signed integer

Character: Unicode UTF-8 encoding of a single letter. Could be more than one octet.

Enumeration: one of a list of possible unique values. Packages MUST define the text and binary encodings for each value in the enumeration.

Sub-list: a list of several values from a list. The type of sub-list shall also be specified. The type shall be chosen from the types specified in this section (with the exception of sub-list). For example, Type: sub–list of enumeration. The encoding of sub-lists is specified in Annexes A and B.2.

…

12.1.5   Statistics

Statistics defined by the package, specifying:

…

Type: One of:

Boolean

String: UTF-8 string

Octet String: A number of octets. See Annex A and Annex B.3 for encoding

Integer: 4 byte signed integer

Double: 8 byte signed integer

Character: Unicode UTF-8 encoding of a single letter. Could be more than one octet.

Enumeration: One of a list of possible unique values. Packages MUST define the text and binary encodings for each value in the enumeration.

Sub-list: A list of several values from a list. The type of sub-list shall also be specified. The type shall be chosen from the types specified in this section (with the exception of sub-list). For example, Type: sub–list of enumeration. The encoding of sub-lists is specified in Annexes A and B.2.

…

12.2   Guidelines to defining parameters to events and signals

…

Type: One of:

Boolean

String: UTF-8 octet string

Octet String: A number of octets. See Annex A and B.3 for encoding

Integer: 4-octet signed integer

Double: 8-octet signed integer

Character: Unicode UTF-8 encoding of a single letter. Could be more than one octet.

Enumeration: one of a list of possible unique values. Packages MUST define the text and binary encodings for each value in the enumeration.

Sub-list: a list of several values from a list (not supported for statistics). The type of sub-list shall also be specified. The type shall be chosen from the types specified in this section (with the exception of sub-list). For example, Type: sub-list of enumeration. The encoding of sub-lists is specified in Annex A and B.2.

…

[End Correction]

6.13 Clarification on Profile Definition Template

Description:	Appendix III/H.248.1 Profile Definition Template provides tables to specify which descriptors are sent in each command. For each command, request and reply and handled separately with different tables, as different descriptors may be supported by the profile in the request and in the reply. However for the Notify command, a single table is provided with the legend "Descriptors used by Notify Request or Notify Reply". This is misleading, as the reply does not contain descriptors, and the table should refer only to the Notify Request.
Reference:	COM16 D-303

[Begin Correction]

5.8.7 Notify

Which descriptors can be used in a Notify Command?

Descriptors used by Notify Request or Reply:	<ObservedEvents, Error>

[End Correction]

6.14 Clarification of use of ABNF encodings of octet strings

Description:	Properties, statistics and signal and events parameters can be defined as of type Octet String, among other types. This is described in H.248.1 12.1.2, 12.1.5 and 12.2. These chapters refer to Annex B.3 for how the actual encoding of the Octet String shall be done. Annex B.3 does indeed describe a method for the encoding of strings, but fails to make a precise reference to the type Octet String, as the object of the method it is describing. Instead, it talks about "representing a string of octets" or "encoding octet strings". As ABNF defines still another type called "octetString" to describe SDP lines, and which is different to the type Octet String defined above (is not compatible), there is a risk to misinterpret the applicability of B.3.
Reference:	COM16 D-303

[Begin Correction]

B.3 Hexadecimal octet coding

Hexadecimal octet coding is a means of representing a string of octetspackage elements of type Octet String as a string of hexadecimal digits, with two digits representing each octet. This octet encoding should be used when encoding octet stringsvalues of type Octet String in the text version of the protocol.

For each octet, the 8-bit sequence is encoded as two hexadecimal digits. Bit 0 is the first transmitted; bit 7 is the last.

Bits 7-4 are encoded as the first hexadecimal digit, with Bit 7 as MSB and Bit 4 as LSB. Bits 3-0 are encoded as the second hexadecimal digit, with Bit 3 as MSB and Bit 0 as LSB.

Examples:

Octet bit pattern	Hexadecimal coding
00011011	D8
11100100	27
10000011 10100010 11001000 00001001	C1451390

This encoding is not applicable to the octetString construct defined in section B.2

[End Correction]

6.15 Clarification of encoding for packet loss statistic in Annex E.12

Description:	H.248.1 E.12.4 defines the statistics packet loss rtp/pl to describe the packet loss rate, as a percentage. Although this statistics element is defined as type double, it is meant to hold both the whole part and the fractional part of the percentage. The ASN.1 "double" encoding of this element entails multiplying the percentage by $2 \wedge 32$ in order to obtain an integer and then use 4 octets to encode the resulting integer. In ABNF is questionable if the same applies, as that would lead to a long string. This seems unnecessary, especially considering that RFC 3550, to which E.12.4 refers to when defining rtp/pl, defines the packet fraction lost with only 8 bits. Therefore it is proposed to clarify that the notation x.y is allowed when encoding rtp/pl with ABNF.
Reference:	COM16 D-303

[Begin Correction]

E.12.4.3 Packet Loss

…

Possible values: a 32-bit whole number and a 32-bit fraction. The value shall be encoded in ABNF as "x.y" where x is the whole part and y the fractional part of the percentage.

…

[End Correction]

6.16 Missing ServiceChange parameter from Appendix III

Description:	The ServiceChangeProfile parameter is missing out of the Profile Template in Appendix III.
Reference:	COM16 D-312

[Begin Correction]

Appendix III

5.8.8   ServiceChange

…

Which version of H.248.1 is used by ServiceChangeVersion? The lowest value here should be the minimum version defined in 5.3.

Version used in ServiceChangeVersion:	<1, 2, 3>

Is the ServiceChangeProfile parameter mandatory?

ServiceChangeProfile mandatory:	<Yes/No>

Can multiple profiles be supported according to H.248.18?

Profile negotiation as per H.248.18:	<Yes/No>

…

[End Correction]

6.17 Clarification of ServiceChangeMethod Graceful behavior on ephemeral terminations

Description:	The wording in clause F.4.1.3 regarding the use of the Graceful ServiceChangeMethod on an ephemeral termination is confusing, as it makes statements that are clearly the behaviour for ephemeral terminations, but does not actually describe what the scenario described really means.
Reference:	COM16 D-313

[Begin Correction]

F.4.1.3 ServiceChange Method Behavior on Ephemeral Terminations

…

Graceful – When sent by the MG, it indicates that the termination(s) is going OutOfService at the end of the ServiceChangeDelay period. The MGC is responsible for subtracting the termination(s) at the expiry of the ServiceChangeDelay. The MGC shall not send ServiceChangeMethod "Graceful" for ephemeral terminations. Using a ServiceChangeDelay equal to zero indicates that the termination is going OutOfService immediately. ~~shall be destroyed when it is removed from context through subtraction.~~ The MG should set the termination's ServiceStates Property at the expiry of ServiceChangeDelay ~~or the removal of the termination from an active context (whichever is first),~~ to "Out of Service". The MGC is responsible for subtracting the termination in either case. To cancel a previously sent (and acknowledged) ServiceChange with ServiceChangeMethod of "Graceful", the entity initiating the Graceful sends a ServiceChange Command with ServiceChangeMethod Restart and the ServiceChangeReason of 918 Cancel Graceful.

…

[End Correction]

---

7 Technical and Editorial Corrections to H.248.2 (2005)

7.1 Probe Order Typo

Description:	The probe order in H.248.2 allows the MGC to specify what modes to probe for. There is a statement that "Any combination of none to six of the type indicators" are allowed. Providing a "sub-list of none" does not make sense therefore it is believed the "none" should instead read "one".
Reference:	Subject: R: H.248 and UTF-8 strings.
	Date: Thu, 23 Jun 2005 18:20:28 +1000
	From: Contardi Angelo <Angelo.Contardi@italtel.it>
	To: Christian Groves (BR/EPA) <christian.groves@ericsson.com>

[Begin Correction]

8.1.5   Probe Order

Property name: Probe Order

PropertyID: probeorder (0x0005)

Description:

> This property holds an indication on what modes to probe for, and the order the probes will be transmitted. Probing is a time-consuming procedure and it is important that the most likely modes are probed first. The order to select depends on whether or not any legacy mode textphones are on the market in the area where the gateway is installed. An optimized order can be composed by enumerating the desired specific type indicators. Note that leaving out a type from probing may cause connection problems for connection with textphones of that type.

Type: Sub-List of Enumeration

Possible values: (for recommended orders, see V.18)

Any combination of ~~none~~ to six of the type indicators

> | | |
> |---|---|
> | V21 | (0x0001) |
> | DTMF | (0x0002) |
> | Baudot | (0x0003) |
> | EDT | (0x0004) |
> | MINITEL | (0x0005) |
> | BELL | (0x0006) |
>
> in any desired order

[End Correction]

7.2   Reference Update

Description:	IETF RFC 2793 (2000), *RTP Payload for Text Conversation* has been replaced by RFC 4103. This should be reflected in H.248.2.
Reference:	D-274

[Begin Correction]

2.1 **Normative references**

<div align="center">…</div>

– IETF RFC ~~2793~~ 4108 (~~2000~~2005), *RTP Payload for Text Conversation*.

<div align="center">…</div>

[End Correction]

8   Technical and Editorial Corrections to H.248.5 (2000)

8.1   Clarification of "At-Most-Once" Functionality

Description:	At the January 2004 Geneva SG16 meeting D376 introduced a clarification to H.248.4 on the issue of providing the at most once functionality. It described the issue as: *"In section 3 "Providing the at most once functionality" the procedure recommends that the procedures of H.248 Annex D.1.1 be followed apart from the use of LONG TIMER and TransactionResponseAck.* *When referencing a potential confusion exists in that the procedure to compare and remove duplicate transaction identities uses the LONG TIMER. Readers may assume that as LONG TIMER is not used then the procedure of comparing and identifying duplicate transaction identities is also not supported. This is an incorrect assumption. It is proposed to clarify that procedures to identify duplicate transaction ID are needed."* H.248.5 has the same text with regards to providing at most once functionality. Thus it is proposed that a clarification is added that the MTP backward sequence number is added to H.248.5.
Reference:	AVD-2663

[Begin Correction]

---

2.   **References**

–   Recommendation ITU-T Q.703 (07/1996), *Specifications of Signalling System No. 7 – Message transfer part.*

…

4.1   **Providing At-Most-Once functionality**

Messages, being carried over MTP3b, may be subject to losses. In the absence of a timely response, commands are repeated. Most commands are not idempotent. The state of the MG would become unpredictable if, for example, Add commands were executed several times. The transmission procedures shall thus provide an "At-Most-Once" functionality.

The procedures in D.1.1/H.248.1 shall be followed with two exceptions:

–   The LONG-TIMER shall not be used to remove a Transaction Identity from the list of responses. The MTP Backward Sequence Number (as defined in Q.703 § 5.2) or a response to the requested command shall be used.;

–   The TransactionResponseAck parameter shall not be used.

…

[End Correction]

9   Technical and Editorial Corrections to H.248.8 (2005)

9.1   Error text for error code 449

Description:	The new version of H.248.8 has introduced the new error code 449 "Unsupported or Unknown Parameter or Property Value". It states that in the error text, the receiver of the command shall specify the unsupported or unknown property value.

	However, the sender of the command, when it receives the error reply, doesn't necessarily know to which parameter it corresponds.
Reference:	AVD-2805

[Begin Correction]

4.2.27 Error Code #: 449

Name: Unsupported or Unknown Parameter or Property Value

Definition: The value of a Property or Parameter within a descriptor is not recognized and the command including the property/item is not carried out.

Error Text in the error Descriptor: The <u>parameter or property name followed by the </u>unsupported or unknown value is included in the error text in the error descriptor.

Comment: –

[End Correction]

9.2 Protocol error on command level

Description:	H.248.8 defines Error Code 401 "Protocol Error" on transaction level, indicating that the transaction request has been disregarded due to a violation of Megaco procedures. There are situations when protocol error could occur at command level and therefore it is proposed to allow this error code at command level.
Reference:	D-303

[Begin Correction]

4.2.2 Error Code #: 401

Name: Protocol Error

Definition: The transaction <u>or command</u> request(s) has been disregarded due to a violation of Megaco protocol procedures having been detected.

Error Text in the <u>E</u>error Descriptor: –

Comment: Use more specific error codes (e.g. 505) if possible.

[End Correction]

9.3 New error code 511

Description:	H.248.8 defines Error Code 510 "Insufficient resources" to indicate that the MG can not execute the command due to lack of resources. The MGC may also experience temporary congestion of software resources. Therefore a new error code is proposed to indicate that the MG has temporary lack of resources to execute the command.
Reference:	D-303

4.2.47   Error Code #: 511

Name: Temporarily Busy

Definition: The command(s) was rejected due to a temporary busy condition in the MGC.

Error Text in the Error Descriptor: None

Comment: Upon receiving this error code, the command may be resent as the busy condition may have abated.

…

{Editor's Note: Subsequent sections of H.248.8 will be renumbered when H.248.8 is next amended.}

[End Correction]

10 Technical and Editorial Corrections to H.248.9 (2005)

10.1 Clarification on terminating PlayRecord successfully via MGC command

Description:	This is the basic scenario: The media server is used to record a message for a subscriber. The user finishes recording and hangs up. As a result, a SIP BYE is sent to the MGC controlling the media server.
	The media server at this point has detected silence and has started a post speech timer. This timer is necessary to handle pauses in natural speech.
	The MGC receives the BYE. It wants to terminate the running PlayRecord Signal in such a way that the recording is successful and the results of the recording (the URL where the recording is stored, the recording length, etc) are returned to the MGC. Having the MGC to wait for the post speech timer to trip is not acceptable for a number of reasons, including but not limited to resource utilization, etc.
	NotifyCompletion was examined as a possible mechanism. NotifyCompletion can be used to generate a SignalComplete Event when the PlayRecord Signal is terminated due to the receipt of an empty Signals Descriptor. The problem with NotifyCompletion is that the recording information is not returned to the MGC with the SignalComplete Event. What is needed is a mechanism that lets the MGC terminate the PlayRecord Signal in such a way that the signal returns success (if possible) along with the recording parameters.
	There is no current mechanism described in H.248 to do this. However, a convention seems to have sprung up in the vendor community to handle this problem. The MGC sends an empty Signals Descriptor along with a new Events Descriptor containing the PlayRecord Success and Audio Operation Failure Events. The MG interprets this as a request to terminate the playrec Signal immediately, successfully if possible (i.e. if audio has been recorded), and to return the precsucc or audfail Event with the event parameters that describe the recording.
	The H.248.9 spec should document this industry convention, so as to promote the widest possible interoperation.

Reference:	AVD-2820

[Begin Correction]

10.5 Procedures

…

Failure of the MakePersistent signal must be reported as an appropriate error code in the response to the transaction invoking it. That is, the response must not be returned to the MGC until the outcome of the MakePersistent operation is known.

When the MGC sends a Modify Command containing a Signals Descriptor that no longer contains the playrec Signal along with a new Events Descriptor containing the audfail and precsucc Events, the MG should interpret this as a request to immediately halt recording and return precsucc if the recording succeeded or audfail if the recording failed.

…

[End Correction]

10.2 Correction in type-ahead handling

Description:	H.248.9 says that type-ahead is supported, and can be controlled with the clear digit buffer command. It goes on to say that the digit buffer should be cleared at the start of each play-collect, and then cleared on reattempts within the signal, if the clear digit buffer parameter is set to true.
	This is an error: the digit buffer should be cleared on reattempts within the signal, regardless of the setting of the clear digit buffer parameter.
	Type-ahead should work in the following manner:
	• For the first play-collect or play-record in a call, the digit buffer should be cleared to make sure there are no digits left over from the previous call.
	• For re-attempts within a single play-collect or play-record, the buffer should always be cleared. By definition, the previous attempt failed, so the subsequent attempt should start with a clean slate.
	• For play-collects or play-records subsequent to the first play-collect or play-record for the call, the digit buffer should only be cleared if the clear buffer parameter is set to true.
	This resolves issues with holding over digits from a previous failed attempt, thereby corrupting a subsequent attempt.
Reference:	AVD-2820

[Begin Correction]

9.5.1   PlayCollect digit processing model

<center>…</center>

2) Collection loop. Increment number of attempts. Initialize digit map processing. ~~If <ClearDigitBuffer> is TRUE, clear the digit collection buffer.~~<u>Clear the digit collection buffer if:</u>

- <u>this is the first PlayCollect Signal set on this termination in this context,</u>

- <u>the number of attempts within this PlayCollect Signal is greater than one, or</u>

- <u><ClearDigitBuffer> is TRUE.</u>

<center>…</center>

11) Failure to match digit map. Check number of attempts. If it is equal to <MaxAttempts>, play <FailureAnnouncement> if one has been specified, exit and generate an Audio Operation Failure event with return code 619 "Max Attempts Exceeded". Otherwise set current announcement to <Reprompt>, ~~retain any digit accumulation buffer contents beyond the digits already processed (i.e., discarding the digit which "broke the pattern")~~<u>discard all digit accumulation buffer contents</u>~~,~~ and return to step 2).

<center>…</center>

<center>*[End Correction]*</center>

11 Technical and Editorial Corrections to H.248.14 (2002)

11.1 Provisioning of the Inactivity Timeout Event

Description:	The development of H.248.14 was controversial in that people did not see the necessity for it for high traffic gateways. However it was agreed that the MGC shouldn't be burdened with having to do large amount of extra signalling or processing in order to get this inactivity timer functionality. AVD-2119 shows the original rationale behind the proposal. Given the history of H.248.14 the contributors believe the following statements can be made: 1. In the original discussions in mid-2001 people favoured a mechanism that did not cause extra burden on the MGC. 2. H.248.14 was seen to be used for residential gateways where the signalling load was insufficient for a keep-alive mechanism. 3. There could be tens of thousands of residential gateways per MGC. 4. If the MGC had to set the "timeout" event on each gateway at restart this would cause a significant signalling load on the MGC. Therefore in keeping with one of the original aims of H.248.14 and given its nature of use with large numbers of MGs it is proposed to recommend that the inactivity timeout event should be provisioned. Furthermore this recommendation is extended to other events which may be provisioned at start up. Another benefit of the provisioning is that the MG may detect if the MGC fails immediately after restart and can take corrective action.
Reference:	D-274

<center>*[Begin Correction]*</center>

5.5 Procedures

<center>…</center>

If the MGC has failed, the event will not receive a reply. If no reply is received, the MG will consider the MGC to have failed and will follow the procedures of 11.5/H.248.1.

<u>NOTE – To minimize signalling load at MGC restarts in networks where there are large numbers of MGs that implement the Inactivity Timer Package, the Inactivity Timeout Event may be provisioned in both the MGC and MG. This also enhances the ability of the MG to detect MGC failures immediately after the MGC restarts.</u>

…

[End Correction]

12 Technical and Editorial Corrections to H.248.20 (2002)

12.1 Media values

Description:	H.248.20 defines the following for the use of the Media field in the SDP m= line: *5.1.2 "m=line" Line for H.221 and H.223 MUX termination* *The syntax of the media field:* **media-field = "m=" media SP port ["/" integer] SP proto 1*(SP fmt) CRLF** *The possible media values for media are "audio", "video", "data" and "control", depending on the media type within the specific H.248.1 Stream. "Control" is used if a Stream is defined for the demultiplexed H.245 messages.* Currently the IETF are working on updating the SDP RFC (see: http://www.ietf.org/internet-drafts/draft-ietf-mmusic-sdp-new-23.txt). In this text the IETF have removed the value "control" from the allowed list of media types. Thus it will soon be invalid to use value "control". It is therefore proposed to allow the use of "application" for a de-multiplexed H.245 message. The draft defines the users of the media type "application" as: *"Voice over IP, video teleconferencing, streaming media, instant messaging, etc. See also section 3 of RFC XXXX."* From this definition it is seen that type "application" would be appropriate for use for H.248.20.
Reference:	AVD-2663

[Begin Correction]

5.1.2   "m=line" Line for H.221 and H.223 MUX termination

The syntax of the media field:

media-field = "m=" media SP port ["/" integer] SP proto 1*(SP fmt) CRLF

The possible media values for media are "audio", "video", "data" and "application~~control~~", depending on the media type within the specific H.248.1 Stream. "application~~Control~~" is used if a Stream is defined for the demultiplexed H.245 messages.

Note: Some older applications may use the value "control". To aid interoperability MGs should be able to recognize "control".

…

[End Correction]

13 Technical and Editorial Corrections to H.248.22 (2003)

13.1 Correction of typographical errors

Description:	H.248.22 contains typographical errors in that the property "shrisk/srgi" is referenced however the correct property reference is "shrisk/srgir".
	H.248.1 defines the "Include shared risk group" property with the values "on/off". Eg.
	5.1.1 Property Name: Include shared risk group
	PropertyID: incl, 0x0001
	Description:
	The value of this property indicates if the shared risk group specified is requested to be used or to not be used (see 5.5.1.1 for further details).
	Type: Sublist of type Boolean
	Possible Values:
	"on" (TRUE) Use resources from the specified SRGI only [Default]
	"off" (FALSE) Use resources from any but the specified SRGI
	However the procedures use yes/no instead of on/off in one place. The procedures should be corrected to align with 5.1.1.
Reference:	AVD-2467 and COM 16 D-44

[Begin Correction]

5.5.1.1 Usage of the "Include shared risk group" property

The "Include shared risk group" property shall be used to indicate to the MG if resources from the specified shared risk group identity (*shrisk/srgir*) must be used for the termination (*shrisk/incl = ~~yes~~on*) or if resources from the specified risk group identity must not be used for the termination (*shrisk/incl = ~~no~~off*). If the MGC is not concerned with which shared risk groups are used then it should not include the *shrisk/incl* nor *shrisk/srgir* properties. The *shrisk/incl* and *shrisk/srgir* properties are valid only for the command that they are contained in. They cannot be read/audited after the execution of the command. Wildcarding values with CHOOSE ($) or ALL (*) shall not be used with *shrisk/incl* and/or *shrisk/srgir.* For example: in the case of a semi-permanent connection and a protective secondary link, by specifying (*shrisk/incl = on, shrisk/srgir = 1*) for the primary link and (*shrisk/incl = off, shrisk/srgir = 1*) for the secondary, the MGC is assured that the primary and secondary links are not sharing the same groups of resources.

…

[End Correction]

14 Technical and Editorial Corrections to H.248.30 (2004)

14.1 Correction of StatisticID conflicts

Description:	In RTCP XR Base Package defined in H.248.30 (03/2004) the statisticsID are from 1 to 12. The IDs 4 to 8 of that coincides with the statisticsID of the base pkg, rtp version1.
	Also R Factor and External R Factor have the same strings 'ns'

Reference:	From: Geetha [geetha@ccpu.com]
	Sent: Friday, November 12, 2004 5:07 PM
	To: megaco@ietf.org
	Subject: r: [Megaco] ToneID conflicts

[Begin Correction]

5.4.1   Network Packet Loss Rate

StatisticID: nplr (0x0009~~1~~)

…

5.4.2   Jitter Buffer Discard Rate

StatisticID: jdr (0x000a~~2~~)

…

5.4.3   RTCP Round-Trip Delay

StatisticID: rtd (0x000b~~3~~)

…

5.4.4   End System Delay

StatisticID: esd (0x000c~~4~~)

…

5.4.5   Signal Level

StatisticID: sl (0x000d~~5~~)

…

5.4.6   Noise Level

StatisticID: nl (0x000e~~6~~)

…

5.4.7   Residual Echo Return Loss

StatisticID: rerl (0x000f~~7~~)

…

5.4.8   R Factor

StatisticID: ns (0x0010~~08~~)

…

5.4.9   External R Factor

StatisticID: xns (0x0011~~09~~)

…

5.4.10   Estimated MOSLQ

StatisticID: lq (0x0012~~0a~~)

…

5.4.11   Estimated MOSCQ

StatisticID: cq (0x0013~~0b~~)

…

6.4.1   Burst Loss Density

StatisticID: bld (0x0014~~0e~~)

<div align="center">…</div>

6.4.2   Burst Duration

StatisticID: bd (0x0015~~0d~~)

<div align="center">…</div>

6.4.3   Gap Loss Density

StatisticID: gld (0x0016~~0e~~)

<div align="center">…</div>

6.4.4   Gap Duration

StatisticID: gd (0x0017~~0f~~)

<div align="center">…</div>

<div align="center">

[End Correction]

</div>

Annex: Defect Report Form for H.248 Sub-series	

DATE:	
CONTACT INFORMATION	
NAME:	
COMPANY:	
ADDRESS:	
TEL:	
FAX:	
EMAIL:	
AFFECTED RECOMMENDATIONS:	
DESCRIPTION OF PROBLEM:	
SUGGESTIONS FOR RESOLUTION:	

NOTE - Attach additional pages if more space is required than is provided above.

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