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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”)**

ITU-T

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 Geneva, 21 November - 02 December 2011.

This Implementors' Guide was approved by ITU-T Study Group 16 on 2 December 2011 (TD 422/Plen) and it obsoletes the earlier version of this Implementors' Guide approved on 30 July 2010.

NOTE: 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.)

V33 (Geneva, December 2011)

New:

H.248.1 Section

6.5 ServiceChange Annex F referencing error

H.248.15 Section

10.1 Usage of the SDP H.248 package attribute

H.248.19 Section

14.1 Duplicated event and signal parameter identities

H.248.41 Section

26.1 Duplicated property identity

H.248.61 Section

28.1 Definition clarifications

H.248.64 Section

29.1 Clarification of clause 7.2

H.248.78 Section

30.1 Incorrect definition of MSRP

Updated:

None

Removed:

H.248.12 Section

H.248.34 Section

Contact Information

ITU-T Study Group 16 /
Question 3 Rapporteur

Christian Groves
Australia

Tel: +61 3 9391 3457

E-mail: Christian.Groves@nteczone.com

H.248 Sub-series
Implementors' Guide
Editor

Christian Groves
Australia

Tel: +61 3 9391 3457

E-mail: Christian.Groves@nteczone.com

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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 12/2011 are given for:

- H.248.1 (09/2005) & Amendment 2 (12/2009)
- H.248.2 (01/2005)
- H.248.3 (11/2000)
- H.248.8 (08/2007)
- H.248.15 (03/2002)
- H.248.16 (11/2002)
- H.248.17 (11/2002) & Corrigendum 1 (03/2004)
- H.248.18 (11/2002)
- H.248.19 Amendment 2 (03/2009)
- H.248.20 (11/2002)
- H.248.22 (07/2003)
- H.248.23 (01/2005) & Corrigendum 1 (05/2006)
- H.248.25 (01/2007)
- H.248.26 (01/2005)
- H.248.29 (01/2005)
- H.248.30 (01/2007)
- H.248.32 (01/2005)

- H.248.36 (01/2005)
- H.248.37 (06/2008)
- H.248.40 (01/2007)
- H.248.41 (2006) & Amendment 1 (08/2006)
- H.248.57 (06/2008)
- H.248.61 (03/2009)
- H.248.64 (12/2009)
- H.248.78 (09/2010)

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:

- Recommendation ITU-T H.248.1 (09/2005) Amendment 2 (12/2009), *Gateway Control Protocol*
- Recommendation ITU-T H.248.2 (01/2005), *Gateway Control Protocol: Facsimile, text conversation and call discrimination packages*
- Recommendation ITU-T H.248.3 (11/2000), *Gateway Control Protocol: User interface elements and actions packages*
- Recommendation ITU-T H.248.8 (08/2007), *Gateway control protocol: Error code and service change reason description*
- Recommendation ITU-T H.248.15 (03/2002), *Gateway control protocol: SDP H.248 package attribute*
- Recommendation ITU-T H.248.16 (11/2002), *Gateway control protocol: Enhanced digit collection packages and procedures*
- Recommendation ITU-T H.248.17 (11/2002), Corrigendum 1 (03/2004), *Gateway control protocol: Line test packages*
- Recommendation ITU-T H.248.18 (11/2002), *Gateway control protocol: Package for support of multiple profiles*

- Recommendation ITU-T H.248.19 Amendment 2 (03/2009), *Gateway control protocol: Decomposed multipoint control unit, audio, video and data conferencing packages, Amendment 2: Floor control enhancements*
- Recommendation ITU-T H.248.20 (11/2002), *Gateway Control Protocol: The use of local and remote descriptors with H.221 and H.223 multiplexing*
- Recommendation ITU-T H.248.22 (07/2003), *Gateway Control Protocol: Shared Risk Group Package*
- Recommendation ITU-T H.248.23 (01/2005), Corrigendum 1 (05/2006), *Gateway Control Protocol: Enhanced alerting packages*
- Recommendation ITU-T H.248.25 (01/2005), *Gateway Control Protocol: Basic CAS packages*
- Recommendation ITU-T H.248.26 (01/2005), *Gateway Control Protocol: Enhanced analog lines packages*
- Recommendation ITU-T H.248.29 (01/2005), Corrigendum 1 (05/2006), *Gateway Control Protocol: International CAS compelled register signalling packages*
- Recommendation ITU-T H.248.30 (01/2007), *Gateway Control Protocol: RTCP extended performance metrics packages*
- Recommendation ITU-T H.248.32 (01/2005), *Gateway Control Protocol: Detailed congestion reporting package*
- Recommendation ITU-T H.248.36 (09/2005), *Gateway Control Protocol: Hanging Termination Detection package*
- Recommendation ITU-T H.248.37 (01/2005), *Gateway Control Protocol: IP NAPT traversal package*
- Recommendation ITU-T H.248.40 (01/2007), *Gateway Control Protocol: Application Data Inactivity Detection Package*
- Recommendation ITU-T H.248.41 (01/2007) Amd.1 (06/2008), *Gateway Control Protocol: IP domain connection package*
- Recommendation ITU-T H.248.57 (06/2008), *Gateway Control Protocol: RTP control protocol package*
- Recommendation ITU-T H.248.61 (03/2009), *Gateway Control Protocol: Packages for network level H.248 statistics*
- Recommendation ITU-T H.248.64 (12/2009), *Gateway Control Protocol: IP router packages*
- Recommendation ITU-T H.248.78 (09/2010), *Gateway Control Protocol: Bearer-level application level gateway*

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
<u>[Begin Correction]</u>	Identifies the start of revision marked text based on extractions from the published Recommendations affected by the correction being described.
<u>[End Correction]</u>	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.
--- SPECIAL INSTRUCTIONS --- {instructions}	Indicates a set of special editing instructions to be followed.

6 Technical and Editorial Corrections to H.248.1 (09/2005) & Amd.2 (12/2009)

6.1 Signals Descriptor clarifications

Description:	An empty Signals Descriptor from <i>syntactical</i> perspective is a valid construct. It was clarified with H.248.1 V3 ABNF grammar in our understanding. However, the semantic for empty and replacement Signals Descriptor is not explicitly specified, thus a potential cause for misinterpretations. Signals may be applied on Termination or at Stream level. A MGC may apply a Termination level Signal and then subsequently add an additional stream. Whether the signal is applied to the new stream or not is unclear. In order that the signal is applied to the new stream the MGC should ensure that the signal is included in the request to add a new stream.
Reference:	AVD-3859 & C.505

[Begin Correction]

7.1.11 Signals Descriptor

7.1.11.1 Introduction to Signals

Signals are MG-generated media such as tones and announcements as well as bearer-related signals such as hookswitch. More complex signals may include a sequence of such simple signals

interspersed with and conditioned upon the receipt and analysis of media or bearer-related signals. Examples include echoing of received data as in the Basic Continuity Package (clause E.10). Signals may also request preparation of media content for future signals.

7.1.11.2 Overview of Signals Descriptor

A Signals Descriptor is a parameter that contains the set of signals that the Media Gateway is asked to apply to a termination (or stream). A Signals Descriptor contains a number of signals and/or sequential signal lists. A Signals Descriptor may contain zero signals and sequential signal lists. Support of sequential signal lists is optional.

7.1.11.3 Specification and Identification of Signals

Signals are defined in packages. Signals shall be named with a PackageID (in which the signal is defined) and a SignalID. No wildcard shall be used in the SignalID. Signals that occur in a Signals Descriptor have an optional StreamID parameter (default is 0, to indicate that the signal is not related to a particular media stream), an optional signal type (see below), an optional duration and possibly parameters defined in the package that defines the signal. This allows a single signal to have some variation in meaning, obviating the need to create large numbers of individual signals.

7.1.11.4 Stream-level Signals

In case the MGC does not specify the StreamID parameter (or sets the StreamID parameter value explicitly to 0) the Signals Descriptor shall be applied to all streams (including any existing Streams and any new Stream defined by the command containing the Signals Descriptor). Therefore where a MGC has previously requested a Signals Descriptor be applied to all streams in a termination and the MGC subsequently creates an additional stream, in order for the existing signals to be applied to the new stream the MGC shall also apply the Signals Descriptor to the new stream.

7.1.11.5 Indication of Signal Completion

The optional NotifyCompletion Parameter allows a MGC to indicate that it wishes to be notified when the signal finishes playout. The possible cases are that the signal timed out (or otherwise completed on its own), that it was interrupted by an event, that it completed a cycle/iteration of the signal, that it was halted when a Signals Descriptor was replaced, or that it stopped or never started for other reasons. If the NotifyCompletion Parameter is not included in a Signals Descriptor, notification is generated only if the signal stopped or was never started for other reasons. For reporting to occur, the Signal Completion Event (see E.1.2) must be enabled in the currently active Events Descriptor. The optional parameter "RequestID" may be associated with a particular instance of a SignalID where multiple signals of the same SignalID are requested. This allows the MGC to distinguish between different Signal Completion ObservedEvents for that particular instance of a signal. The RequestID parameter shall not be included if the NotifyCompletion Parameter is not present.

7.1.11.6 Duration of Signals

The duration is an integer value that is expressed in hundredths of a second.

7.1.11.7 Types of Signals

There are three types of signals:

- OnOff (OO): the signal lasts until it is turned off either with an empty Signals Descriptor or a replacement Signals Descriptor which removes the signal from the descriptor;
- TimeOut (TO): the signal lasts until it is turned off (as above) or a specific period of time elapses. The signal will remain in the Signals Descriptor until removed;

- Brief (BR): the signal will stop on its own unless a new Signals Descriptor is applied that causes it to stop; no timeout value is needed. The signal shall remain in the Signals Descriptor unless removed. Due to the brief nature of the signals even if the new Signals Descriptor is empty or excludes the signal, the signal is not guaranteed to be stopped (or changes done by start can't be undone) as it may have already completed playout.

If a signal of default type other than TO has its type overridden to type TO in the Signals Descriptor, the duration parameter must be present.

If the signal type is specified in a Signals Descriptor, it overrides the default signal type (see 12.1.4). It is not possible to change the semantics of a signal by overriding the signal type. If duration is specified for an on/off signal, it shall be ignored.

7.1.11.8 List of Signals

A sequential signal list consists of a SignalListID and a sequence of signals to be played sequentially. Only the trailing element of the sequence of signals in a sequential signal list may be an on/off signal. The duration of a sequential signal list is the sum of the durations of the signals it contains plus the sum of the intersignal delay timings specified as parameters to the signals.

If an intersignal delay is specified for a signal that is not in a sequential signal list or is the last element in a sequential signal list, it shall be ignored and the signal shall be determined to have completed at the termination of the signal, prior to the application of the intersignal delay timing. The duration of a signal in a SignalList with an intersignal delay includes the intersignal delay timing.

Multiple signals and sequential signal lists in the same Signals Descriptor shall be played simultaneously.

7.1.11.9 Directionality of Signals

Signals have directionality, which is identified by the direction parameter in the base syntax or by package defined direction parameters. The direction parameter can be used to indicate the direction that the tone is to be sent. External indicates that the tone is sent from the MG to an external point. Internal indicates that the tone is played into the Context to the other terminations. Bothway indicates both internal and external behaviour.

Signals are defined as proceeding from the termination towards the exterior of the context unless otherwise specified. If the signal direction is specified in a Signals Descriptor, it overrides the default signal direction. For those signals which have a direction parameter, the base protocol direction parameter takes precedence over any package-defined direction parameter when both are specified. If the MGC specifies a direction for a signal with which the MG cannot comply, the MG shall return Error Code 501 ("Not implemented"). When the same signal is applied to multiple terminations within one transaction, the MG should consider using the same resource to generate these signals.

7.1.11.10 Stop of Signal Generation

Production of a signal on a termination is stopped by application of a new Signals Descriptor, or detection of an event on the termination (see 7.1.9).

7.1.11.11 Consecutive Signals Descriptor

A new Signals Descriptor replaces any existing Signals Descriptor. Any already started and not yet stopped signals applied to the termination not in the replacement descriptor (which may be empty) shall be stopped irrespective of the signal type, and new signals are applied, except as follows. Signals present in the replacement descriptor and containing the KeepActive flag shall be continued if they are currently playing and have not already completed. If a replacement Signals Descriptor

contains a signal that is not currently playing and contains the KeepActive flag, that signal shall be ignored. If the replacement descriptor contains a sequential signal list with the same identifier as the existing descriptor, then:

- the signal type and sequence of signals in the sequential signal list in the replacement descriptor shall be ignored; and
- the playing of the signals in the sequential signal list in the existing descriptor shall not be interrupted.

[End Correction]

6.2 Time based Statistics and applicability to multi flow streams

Description:	<p>The time-based statistics <i>Jitter</i> and <i>Delay</i> are expressed in terms of RTP timestamp units, i.e. a relative time basis. This may lead to ambiguities in particular situations, e.g., when the MGC would enable multiple media formats, with different timestamp units, in a single RTP session. Such an RTP media flow on an H.248 stream may be created by using a <i>ReserveValue</i> setting of ‘True’ (e.g., the MGC could enable narrowband and wideband audio codec types “in parallel” on an RTP endpoint, which may lead to a mutual transmission of RTP packet sequences with different sample rates (and thus different timestamp units)).</p> <p>In order to solve this problem in the a new parameter/statistic could be introduced to indicate the time associated with a particular statistic. An alternative would be to change the type of the jitter and delay statistics to a sub-list of double. However these would require package/protocol updates.</p> <p>As an alternative it is recommended that where multi-flow streams are used that statistics that are based on RTCP extended reports are used.</p>
Reference:	C.399

[Begin Correction]

2 References

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[ITU-T H.248.14]ITU-T Recommendation H.248.14 (2009), *Gateway control protocol: Inactivity timer package*.

[ITU-T H.248.30] ITU-T Recommendation H.248.30 (03/2004), *Gateway control protocol: RTCP extended performance metrics packages*[ITU-T H.323]ITU-T Recommendation H.323 (2003), *Packet-based multimedia communications systems*.

...

[End Correction]

E.12.5 Procedures

E.12.5.1 Working with RTP

When RTCP is associated with an RTP stream, RTCP shall remain unaffected by the H.248.1 Mode Property in the LocalControl Descriptor.

When RTCP is associated with an RTP stream and the MG receives an Empty Remote Descriptor for that stream, the MG shall stop the RTCP stream along with the corresponding RTP stream.

Where the Payload Transition (*pltrans*) event is used the codec currently used by the relevant Stream on the MG is the start codec. In the case where a MG has not selected a codec for use it can be assumed that the initial codec is the first one listed in the Local descriptor (e.g. SDP). Therefore an MG receiving the *pltrans* event from the MGC in should consider the first codec listed as the “start codec”. If the MG chooses another codec it should send a Notify.req with the *pltrans* observed event.

E.12.5.2 Calculation of the Octets Sent and Octets Received Statistics

Because the *os* and *or* statistics are inherited from the nt package, they must retain the same calculation for both packages. Therefore, these statistics are calculated as defined in the nt package, even when addressed in the rtp package. This means that the octet counts include all data from layer 4 and above, including UDP, RTP and the application data.

E.12.5.3 Time based Statistics and applicability to multi flow streams

The time-based statistics *Jitter* and *Delay* are expressed in terms of RTP timestamp units, i.e. a relative time basis. This may lead to ambiguities in particular situations, e.g., when the MGC would enable multiple media formats, with different timestamp units, in a single RTP session. Such an RTP media flow on an H.248 stream may be created by using a *ReserveValue* setting of ‘True’ (e.g., the MGC could enable narrowband and wideband audio codec types “in parallel” on an RTP endpoint, which may lead to a mutual transmission of RTP packet sequences with different sample rates (and thus different timestamp units)). The use of time-based statistics in multiflow streams may lead to undefined behaviour (Note: behaviour may be defined by a profile specification). Therefore where multi-flow streams are used other statistics based on RTCP extended report (e.g. [b-IETF RFC 3611]) such as those defined in [ITU-T H.248.30] or subsequently defined Recommendations should be used (NOTE: the correspondent metrics defined by RTCP extended reports are unambiguous due to absolute time).

[End Correction]

[Begin Correction]

Bibliography

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[b-IETF RFC 3389] IETF RFC 3389 (2002), *Real-time Transport Protocol (RTP) Payload for Comfort Noise (CN)*.

[b-IETF RFC 3611] IETF RFC 3389 (2003), *RTP Control Protocol Extended Reports (RTCP XR)*. [b-IETF RFC 4566] IETF RFC 4566 (2006), *SDP: Session Description Protocol*.

...

[End Correction]

6.3 Impact of the Mode property on Statistics

Description:	Clause 7.1.7 / [ITU-T H.248.1] indicates that signals and events are unaffected by the mode property. However the text is silent on the effect of mode on Statistics.
Reference:	C.399

[Begin Correction]

7.1.7 LocalControl Descriptor

a) Overview

The LocalControl Descriptor contains the Mode Property, the ReserveGroup and ReserveValue Properties and properties of a termination (defined in packages) that are stream specific, and are of interest between the MG and the MGC. Values of properties may be specified as in 7.1.1.

b) Mode Property (for directionality control)

The allowed values for the Mode Property are "SendOnly", "RecvOnly", "SendRecv", "Inactive" and "LoopBack". "SendOnly", "RecvOnly" and "LoopBack" are with respect to the exterior of the context, so that, for example, a stream set to mode = "SendOnly" does not pass received media into the context. When a stream is set to "LoopBack" on a termination, media received (Local Descriptor) on the termination will be looped back to the sending side (Remote Descriptor) of the termination and no media is passed between that termination and other terminations in the context. The looped back media shall be sent according to the Remote Descriptor. The default value for the Mode Property is "Inactive". Signals and events are not affected by the Mode Property. Statistics may or may not be affected by the Mode property depending on the semantic of the statistic. For example: if the Mode was set to "SendOnly" and the Octet Received Statistic was set then the statistic would not be affected. If the Octet Sent Statistic was set then it would be affected by the mode. The LocalControl Mode Property takes precedence over any mode specified in the Local and Remote Descriptors. However duplication and use of mode information in the SDP should be avoided. Due to the default of LocalControl Mode Property being "Inactive", if mode information was added to the Local and Remote Descriptor SDP and the LocalControl Mode was not explicitly sent, the effective mode would still be inactive.

[End Correction]

6.4 Events Descriptor clarifications

Description:	Events may be applied on Termination or at Stream level. A MGC may apply a Termination level Event and then subsequently add an additional stream. Whether the event is applied to the new stream or not is unclear. In order that the event is applied to the new stream the MGC should ensure that the event is included in the request to add a new stream.
Reference:	C.506

[Begin Correction]

7.1.9 Events Descriptor

7.1.9.1 Introduction to Events

The Events Descriptor parameter contains a RequestID and a list of events that the Media Gateway is requested to detect and report. The RequestID is used to correlate the request with the notifications that it may trigger. Requested events include, for example, fax tones, continuity test results, and on-hook and off-hook transitions. The RequestID is omitted if the Events Descriptor is empty (i.e., no events are specified).

7.1.9.2 Specification, Parameterization and Identification of Events

Each event in the descriptor contains the event name, an optional StreamID, an optional KeepActive flag, an optional NotifyBehaviour flag, an optional ResetEventsDescriptor flag and optional parameters. The event name consists of a PackageID (where the event is defined) and an EventID. The ALL wildcard may be used for the EventID, indicating that all events from the specified package have to be detected. The default StreamID is 0, indicating that the event to be detected is not related to a particular media stream. Where a MGC has previously requested a Termination-level Event (i.e. default) and the MGC subsequently creates an additional stream, in order for the existing event/s to be applied to the new stream the MGC should also apply the event/s via an EventsDescriptor on the new stream.

Events can have parameters. This allows a single event description to have some variation in meaning without creating large numbers of individual events. Further event parameters are defined in the package.

If a DigitMap completion event is present or implied in the Events Descriptor, the EventDM Parameter is used to carry either the name or the value of the associated DigitMap. See 7.1.14 for further details.

7.1.9.3 Reporting of detected Events

When an event is processed against the contents of an active Events Descriptor and found to be present in that descriptor ("recognized"), the default action of the MG is to send a Notify Command to the MGC. Notification may be deferred if the event is absorbed into the current dial string of an active DigitMap (see 7.1.14). The sending of a Notify Command may be influenced by the NotifyBehaviour flag. Moreover, event recognition may cause currently active signals to stop, or may cause the current Events and/or Signals Descriptor to be replaced, as described at the end of this subclause. Unless the Events Descriptor is replaced by another Events Descriptor, it remains active after an event has been recognized.

7.1.9.4 Buffering (and deferred reporting) of detected Events

7.1.9.4.1 Event Buffer Concept

If the value of the EventBufferControl Property equals "LockStep", following detection of such an event, normal handling of events is suspended. Any event which is subsequently detected and occurs in the EventBuffer Descriptor is added to the end of the EventBuffer (a FIFO queue), along with the time that it was detected. The MG shall wait for a new Events Descriptor to be loaded. A new Events Descriptor can be loaded either as the result of receiving a command with a new Events Descriptor, or by activating an embedded Events Descriptor.

If EventBufferControl equals "Off", the MG continues processing based on the active Events Descriptor.

In the case of an embedded Events Descriptor being activated, the MG continues event processing based on the newly activated Events Descriptor.

NOTE 1 – For purposes of EventBuffer handling, activation of an embedded Events Descriptor is equivalent to receipt of a new Events Descriptor.

7.1.9.4.2 Event Buffer Control

When the MG receives a command with a new Events Descriptor, one or more events may have been buffered in the EventBuffer in the MG. The value of EventBufferControl, then determines how the MG treats such buffered events.

Case 1

If EventBufferControl equals "LockStep" and the MG receives a new Events Descriptor, it will check the FIFO EventBuffer and take the following actions:

- 1) If the EventBuffer is empty, the MG waits for detection of events based on the new Events Descriptor.
- 2) If the EventBuffer is non-empty, the MG processes the FIFO queue starting with the first event:
 - a) If the event in the queue is in the events listed in the new Events Descriptor, the MG acts on the event and removes the event from the EventBuffer. The time stamp of the Notify shall be the time the event was actually detected. The MG then waits for a new Events Descriptor. While waiting for a new Events Descriptor, any events detected that appear in the EventBuffer Descriptor will be placed in the EventBuffer. When a new Events Descriptor is received, the event processing will repeat from step 1).
 - b) If the event is not in the new Events Descriptor, the MG shall discard the event and repeat from step 1).

Case 2

If EventBufferControl equals "Off" and the MG receives a new Events Descriptor, it processes new events with the new Events Descriptor.

If the MG receives a command instructing it to set the value of EventBufferControl to "Off", all events in the EventBuffer shall be discarded.

The MG may report several events in a single transaction as long as this does not unnecessarily delay the reporting of individual events.

For procedures regarding transmitting the Notify Command, refer to the appropriate annex or H.248.x Recommendation for specific transport considerations.

The default value of EventBufferControl is "Off".

NOTE 2 – Since the EventBufferControl Property is in the TerminationState Descriptor, the MG might receive a command that changes the EventBufferControl Property and does not include an Events Descriptor.

7.1.9.5 Interaction between Events and Signals

Normally, recognition of an event shall cause any active signals to stop. When KeepActive is specified in the event, the MG shall not interrupt any signals active on the termination on which the event is detected.

7.1.9.6 Shaping the Events Reporting traffic

The NotifyBehaviour flag may be used to indicate that the Notify Command is:

- sent immediately (NotifyImmediate: this is the default);
- never sent (NeverNotify);
- or regulated (i.e., sent or suppressed) according to the MGC load (RegulatedNotify).

See E.15 for more details on the use of NotifyBehaviour. When used with DigitMaps the notify behaviour occurs when the active DigitMap is completed. The Regulated Notify may have an alternate regulated embedded Events or Signals Descriptor associated with it. If a notification is regulated (i.e., suppressed), then this alternate regulated embedded descriptor shall be activated. If the Notify is not regulated, then the original embedded descriptor is triggered. If NotifyImmediate or NeverNotify is set, then any original embedded descriptor is triggered on detection of the event.

7.1.9.7 Resetting Events

The result of encountering the ResetEventDescriptor flag set against an event depends on whether or not the Events Descriptor containing the event is an embedded Events Descriptor. In the case of an embedded Events Descriptor the ResetEventsDescriptor flag causes the Events Descriptor for that termination to be reset to its state prior to when the embedded descriptor was activated (i.e., the last Events Descriptor explicitly set by a Modify Command or, if there has been no Modify Command since the termination was last reset by being put into the NULL Context, the MG-provisioned Events Descriptor). In the case of a non-embedded Events Descriptor the ResetEventsDescriptor flag causes the active Events Descriptor for that termination to be reset by re-activating any DigitMap completion event(s) that have been matched and deactivated.

The ResetEventsDescriptor flag shall be set on physical terminations only. The ResetEventsDescriptor flag shall be acted on when the termination is in the NULL Context. If the ResetEventsDescriptor flag is encountered when the termination is out of the NULL Context, then it shall have no effect.

7.1.9.8 Hierarchical Events and Signals: embedded Events / Signals Descriptors

An event can include an embedded Signals Descriptor and/or an embedded Events Descriptor which, if present, replaces the current Signals/Events Descriptor when the event is recognized. It is possible, for example, to specify that the dial-tone signal be generated when an off-hook event is recognized, or that the dial-tone signal be stopped when a digit is recognized. A media gateway controller shall not send Events Descriptors with an event both marked KeepActive and containing an embedded Signals Descriptor.

Only one level of embedding is permitted. An embedded Events Descriptor shall not contain another embedded Events Descriptor; an embedded Events Descriptor may contain an embedded Signals Descriptor.

7.1.9.9 Consecutive Events Descriptors

An Events Descriptor received by a media gateway replaces any previous Events Descriptor. Event notification in process shall complete, and events detected after the command containing the new Events Descriptor executes, shall be processed according to the new Events Descriptor.

An empty Events Descriptor disables all event recognition and reporting. An empty EventBuffer Descriptor clears the EventBuffer and disables all event accumulation in "LockStep" mode: the only events reported will be those occurring while an Events Descriptor is active. If an empty Events Descriptor is activated while the termination is operating in "LockStep" mode, the EventBuffer is immediately cleared.

[End Correction]

6.5 ServiceChange Annex F referencing error

Description:	H.248.1 Annex F clause F.3.10.2 incorrectly references sections F.4.2 and F.4.3. In TD-34 from the 2005 Maysville meeting the headings "F.4.2 ServiceChange Method Behavior on Physical Terminations" and "F.4.3 ServiceChange Method Behavior on Ephemeral Terminations" were moved from a level 3 to level 4 heading. F.4.2 became F.4.1.2 and F.4.3 became F.4.1.3. However this was not picked up by the references. Therefore the correct references are F.4.1.2 and F.4.1.3 respectively.
Reference:	AVD-4035

[Begin Proposal]

F.3.10.2 Physical Terminations

To place a termination or group of terminations "OutOfService", the MGC sends a ServiceChange Command with a ServiceChangeMethod of "Forced" or "Graceful" on the termination(s) in question. Appropriate ServiceChangeReasons may include 904 ("Termination malfunctioning"), 905 ("Termination taken out of service"), 906 ("Loss of lower layer connectivity"), or 907 ("Transmission failure"), among others. See F.4.1.2 and F.4.1.3 for actions to be taken by the MGC.

ServiceChangeDelay indicates the time period at the end of which the service cancellation will occur. See F.5.3 for details.

To cancel a previously issued (and acknowledged) Graceful on a termination or group of terminations, the MG sends a ServiceChange with a ServiceChangeMethod of "Restart" and ServiceChangeReason 918 ("Cancel Graceful") on the termination(s) in question. The termination shall remain InService. In the event that the termination has already transitioned OutOfService, it shall be returned to service just as it would with any ServiceChange Restart.

[End Proposed Correction]

7 Technical and Editorial Corrections to H.248.2 (01/2005)

7.1 Message Name Error

Description:	The message in step 19 of “Figure I.1/H.248.2 – MGC controlled call discrimination” Appendix I should be a MOD resp.
Reference:	Subject: [Megaco] Error in H.248.2 Date: Thu, 29 Oct 2009 11:35:17 +0100 From: Arturo Martin De Nicolas <arturo.martin-de-nicolas@ericsson.com> To: <megaco@ietf.org>

[Begin Correction]

Appendix I – Call Discrimination Flows

...

Step (19) MOD.resp(T3)

...

Figure I.1/H.248.2 – MGC Controlled Call Discrimination

[End Correction]

8 Technical and Editorial Corrections to H.248.3 (2000)

8.1 Set Indicator Value Discrepancy and clarifications

Description:	<p>There is a discrepancy in the possible values of "Indid" parameter of "Setindactor" signal of "Indicator" package recommended in the ITU-T Rec. H.248.3.</p> <p>The "Set of line indicators" for the parameter "Indid" are having values "l001-1999 (0x0003-0x03f9)".</p> <p>In decimal number notation, this range corresponds to 999 values while in hexadecimal notation, this range corresponds to 1015 values.</p> <p>The hexadecimal notation should also correspond to 999 values, i.e., it should be "l001-1999 (0x0003-0x03e9)".</p> <p>The lack of signal type for <i>ind/is</i> is causing issues wrt replacement (which could be empty) Signals Descriptor. If one reads this signal type as OnOff then to keep this signal active the replacement Signals Descriptor should include <i>ind/is</i> and mark it as KeepActive. If one reads this signal type as Brief then to keep this signal active the replacement Signals Descriptor need not include <i>ind/is</i>. The <i>ind/is</i> is considered to be driving the state machine on MGW to send the necessary signal on the wire, which is similar to <i>bcas/sz</i> (seize) signal. To turn off <i>ind/is</i> MGC has to send the signal with property "state=off". Therefore the signal type should be stated.</p>
Reference:	<p>Subject: [Megaco] Discrepancy in possible values of parameter of Indicator package recommended in ITU-T Rec. H.248.3</p> <p>Date: Wed, 16 Apr 2008 12:36:08 +0530</p> <p>From: Suruchi Agarwal <suruchi.agarwal@aricent.com></p> <p>To: megaco@ietf.org megaco@ietf.org</p> <p>For clarifications see: AVD-3950</p>

8.3 Signals

8.3.1 Set Indicator

Signal Name: *SetIndicator*

SignalID: is (0x0001)

Description: The signal sets the indicator state.

Signaltype: Brief

Duration: Not applicable (See “Signal Procedures”).

8.3.1.1 Additional parameters

8.3.1.1.1 Indicator description

Parameter name: Indicator description

Parameter ID: Indid (0x0001)

Description: This parameters specifies the indicator to be set.

Type: Enumeration.

Optional: No

Possible values:

Name	Description
off (0x0000)	Off
il (0x0001)	Hold
ic (0x0002)	Conference
1001-1999 (0x0003-0x03e9)	Set of line indicators
f001-f999 (0x03fa-0x07e0)	Set of assignable function indicators
ir (0x07e1)	Ringer/Alerter indication
im (0x07e2)	Message waiting indicator

Note: Values 0x03ea to 0x03f9 are reserved.

Default: None.

8.3.1.1.2 State

Parameter name: State

Parameter ID: state (0x0002)

Description: This parameter specifies the state of the associated indicator. Type: Enumeration.

Optional: Yes

Possible values:

On (0x0001),

off (0x0002),

blink (0x0003),

fast_blink (0x0004),

slow_blink (0x0005). **Default:** off.

[End Correction]

[Begin Correction]

8.5 Procedures

8.5.1 General

Indicators can be co-related with physically associated Function Keys using Indicator indid and Function Key keyid. If the IDs are identical, the MGC application can safely assume that the key and indicator are physically (or otherwise) associated on the actual device. This avoids assumptions and/or the requirement for application level knowledge of device-specific layout of the physical resources. See also the Function Keys package (kf in clause 7).

8.5.2 Signal Procedures

Each addressed indicator always has a certain state. The *SetIndicator* signal shall therefore be considered to control state changes rather than as persistent signal associated with a period of time of length greater than zero.

[End Correction]

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

9.1 Allow the MG to issue error #511

Description:	H.248.8 currently defines three error codes dealing with lack of resources: <ol style="list-style-type: none">1. Error #510 indicates a lack of common resources. This error may only be issued by the MG.2. Error #511 indicates a temporary lack of resources; usually due to an overload of H.248 commands. This error may only be issued by the MGC.3. Error #526 indicates a lack of bandwidth resources. This error may only be issued by the MG. Therefore an MG may use the error code in order differentiate between lack of common resources and bandwidth resources. However the MG cannot indicate that a command was not handled due to overload.
Reference:	COM16-C.342 (2005-2008)

[Begin Correction]

4.2.49 Error code #: 511

Name: Temporarily busy

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

Error text in the error descriptor: –

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

[End Correction]

9.2 Response to unknown “Disconnected/900” ServiceChange

Description:	<p>If the MGC fails to respond to the "Disconnected/900" ServiceChange request (i.e. this request also times-out), the MG considers the control association as down. It will no longer accept requests received on this control-association. Instead it will try registering with other MGCs using a "Failover/909" ServiceChange. Whenever its configuration indicates that it should try registering with the original MGC, it would instead try to renew the original control-association using a "Disconnectd/900" request. Note that this "renewing" is not a registration; i.e. the MG usually never tries to re-register with the original MGC as this will wipe previously established information on the MG.</p> <p>If this is correct, what error should the MGC return when it receives a "Disconnected/900" ServiceChange but knows nothing about an existing control-association? Some error must be returned, as otherwise the MG will never be able to connect with that MGC.</p> <p>A Error 401 “Protocol Error” may be used as a generic response however a new descriptive error code should be added.</p> <p>Error Code 507 “Unknown Control Association”.</p>
Reference:	<p>Subject: Re: [Megaco] Version of "Disconnected" ServiceChange messages</p> <p>Date: Wed, 7 May 2008 01:58:04 -0400</p> <p>From: Kevin Boyle <kboyle@nortel.com></p> <p>To: Elad Chomsky <elad@juniper.net>, Carsten Waitzmann <cwaitzmann@alcatel-lucent.de></p> <p>CC: megaco@ietf.org</p> <p>And</p> <p>AVD-3583</p>

[Begin Correction]

4.2.47 Error code #: 506

Name: Number of TransactionPendings Exceeded

Definition: Indicates that the maximum number of TransactionPendings have been received and that the transaction can be assumed to be in error.

Error Text in the Error Descriptor: –

Comment: –

4.2.4x Error code #: 507

Name: Unknown Control Association

Definition: Returned by a MGC in response to a ServiceChangeRequest with method “Disconnect” when the MGC has no knowledge of the indicated control association. MGC should only return responses to MGs that it has knowledge of in order to minimise security issues.

Note: The MGC should respond using the same H.248 message version as the received message.

Error Text in the Error Descriptor: –

Comment: –

4.2.48 Error code #: 510

Name: Insufficient resources

Definition: The command(s) was rejected due to lack of common resources in the MG.

Error Text in the Error Descriptor: The Error Text in the Error Descriptor includes the name or identity of the property, signal or event that represents a resource lacking in the MG.

Comment: –

[End Correction]

10 Technical and Editorial Corrections to H.248.15 (03/2002)

10.1 Usage of the SDP H.248 package attribute

Description:	Given the high level description of the "SDP H.248 package attribute" potential users of H.248.15 may be unsure when this attribute is used. As such it is proposed to add some clarifying text.
Reference:	COM16-C.624 (2009-2012)

[Begin Correction]

1 Scope

This Recommendation is part of the Gateway Control Protocol family of Recommendations and extends the basic functionality in ITU-T Rec. H.248.1. This Recommendation describes a new SDP attribute that allows for the carriage of properties in the local and remote descriptor in the textual H.248 encoding.

The advantages of this approach are:

- if H.248 properties for local and remote descriptor usage are available (due to existing H.248 packages from e.g. the ITU-T H.248.x-series of Recommendations), but a correspondent SDP information element is missing, then new SDP attributes do not have to be defined and registered for each property;

- that the property is defined in one place and is applicable to both binary and textual encodings.

[End Correction]

11 Technical and Editorial Corrections to H.248.16 (11/2002)

11.1 Unsuccessful Digit Map match reporting

Description:	<p>See item 6.21.</p> <p>As this problem is confined to DigitMap Events rather than adding a generic parameter to the H.248.1 syntax it is proposed to add a new Event Parameter to the DigitMap Completion Event in the DTMF Detection Package (Clause E.6.22/H.248.1v3) and also the Extended Digit Map and the Matched Digit Map Completion Events in the Extended DTMF Detection Package (Clause 5.2/H.248.16).</p> <p>Note: An Implementors' Guides typically only provides clarification to existing behaviour. The item is considered to introduce new functionality. However given the nature of the issue it is raised and recorded here whilst an Amendment is being prepared.</p>
Reference:	COM16-C.445 (2005-2008)

[Begin Correction]

5 Extended DTMF detection package

PackageID: xdd (0x0052)

Version: 2

Extends: dd (0x0006) version 2

This package provides an extended DTMF digit map completion event, incorporating detailed reporting of timeouts, digit buffering control, and reporting and control of processing of extra events.

5.1 Properties

None.

5.2 Events

Extended DigitMap Completion Event

EventID: xce (0x0005)

Generated when a digit map completes as described in 7.1.14/H.248.1, or in 5.5 "Procedures" of this Recommendation, as appropriate.

EventsDescriptor parameters:

Buffer Control

ParameterID: bc (0x0001)

Type: integer
Possible values: 0 upwards. Default value is 0.

Description:

Maximum period for which digit buffering should occur following reporting of this event, in seconds.

Extra Digit Disposition

ParameterID: xdd (0x0002)
Type: Boolean
Possible values: ON or OFF. Default value is OFF.

Description:

If ON, an extra digit event triggering digit map completion by causing mismatch to all candidate patterns is discarded. If OFF, the extra digit event is processed as indicated by step 5 of the appropriate matching procedures.

Match Procedure

ParameterID: mp(0x0003)
Type: enumeration
Possible values: base or enhanced. Default value is base.
"base" (0x0001) Use match procedures described in 7.1.14/H.248.1.
"enhanced" (0x0002) Use match procedures described in 5.5.

Description:

Indicates which matching procedures should be used for this digitmap.

Unsuccessful Match Reporting

Parameter Name: Unsuccessful Match Reporting
ParameterID: umr (0x0004)
Description: The MGC may use this parameter to control whether the DigitMap Completion Event is generated in the event of an unsuccessful DigitMap match (i.e. match with method "Partial match" or "Full Match").

Type: Boolean

Optional: Yes

Possible values:

- On* Generate DigitMap Completion Event on unsuccessful match.
- Off* Do not generate a DigitMap Completion Event on an unsuccessful match.

Default: *On*

...

5.5.1.4 DigitMap completion event

These procedures are identical to those in 7.1.14.4/H.248.1. By default DigitMaps are processed according to the procedures of 7.1.14 and when the DigitMap has completed (see clause 7.1.14.4) it is notified to the MGC and any embedded signals and embedded events are triggered. However if the Unsuccessful Match Reporting parameter is set to “off” and the DigitMap completion was triggered as a result of an unsuccessful match then the DigitMap completion event is not notified to the MGC nor are embedded signals and/or embedded events triggered. The DigitMap however will be de-activated.

...

6 Enhanced DTMF detection package

PackageID: edd (0x0066)

Version: 2

Extends: xdd (0x0052) version 1

This package provides an enhanced DTMF digit map completion event, incorporating additional digit collection procedures for reporting a completion event.

6.1 Properties

None.

6.2 Events

Matched DigitMap Completion Event

EventID: mce (0x0006)

Generated when a digit map completes as described in 7.1.14/H.248.1, or in 5.5, as appropriate.

EventsDescriptor parameters:

Buffer Control

ParameterID: bc (0x0001)

Type: integer

Possible values: 0 upwards. Default value is 0.

Description:

Maximum period for which digit buffering should occur following reporting of this event, in seconds.

Unsuccessful Match Reporting

Parameter Name: Unsuccessful Match Reporting

ParameterID: umr (0x0002)

Description: The MGC may use this parameter to control whether the DigitMap Completion Event is generated in the event of an unsuccessful DigitMap match (i.e. match with method “Partial match” or “Full Match”).

Type: Boolean

Optional: Yes

Possible values:

- On* Generate DigitMap Completion Event on unsuccessful match.
- Off* Do not generate a DigitMap Completion Event on an unsuccessful match.

Default: *On*

...

6.5.1.4 DigitMap completion event

See clause 5.5.1.4.

...

[End Correction]

12 Technical and Editorial Corrections to H.248.17 (2002) Corr. 1 (2004)

12.1 Correction of Typographical error in Clause 8.3.1.2/H.248.17

Description:	In clause 8.3.1.2/H.248.17 there is a reference to the "bcg/bdtq" (A.8/Q.1950) signal. This should be "bcg/bdt".
Reference:	AVD-2843

[Begin Correction]

8.3.1.2 Auto Answering Trunk (AAT)

Auto Answering Trunk with forced disconnection

To perform the line test described in JJ-90-10 Appendix A.4.1 over an MGC/MG interface, the MGC shall request the MG, via the signal "bgc/brt"(A.8/Q.1950, "Basic Call Progress Tones Generator with Directionality") in an AMM command, to initiate a ringing tone. After 6 seconds the MGC shall then request the MG, via the signal "bcg/bdt" (A.8/Q.1950), to initiate a dial tone. After reception of Modify acknowledgement, the MGC having timed the Dial Tone for a period of 10 seconds will request MG to stop Dial Tone by sending a MOD command.

...

[End Correction]

13 Technical and Editorial Corrections to H.248.18 (11/2002)

13.1 Duplicated Error Code 459

Description:	H.248.26 specifies error code #459: 7.5.1 Invalid Combination of Metering Detection Events <i>Error Code #: 459</i>
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	<p><i>Name: Invalid Combination of Metering Detection Events</i></p> <p><i>Definition: The command was disregarded because the Events Descriptor contained more than one metering detection event.</i></p> <p><i>Error Text in the error Descriptor: --</i></p> <p><i>Comment: -/</i></p> <p>However H.248.18 (and the IANA registration page) also specifies error code #459 as:</p> <p>5.6 Error Codes</p> <p><i>This package defines a new error code:</i></p> <p><i>#: 459 Name: Unsupported or Unknown Profile</i></p> <p><i>Definition: The Profile Name is not supported by the receiver. The command related to the unknown profile is disregarded.</i></p> <p>This leads to a duplication of error codes numbers. Whilst H.248.18 was approval before H.248.26, H.248.26 has been more widely implemented, therefore it is proposed to change the error code in H.248.18 from 459 to 461.</p>
Reference:	<p>Subject: [Megaco] Duplicated Error Code 459</p> <p>Date: Thu, 31 Jan 2008 17:34:04 +1100</p> <p>From: megaco ietf <megaco@ietf.org></p>

[Begin Correction]

5.5 Procedures

...

The MGC may set the Prof_supp property using a Modify command to indicate the profile/s that it will use on the MG. The MGC shall use one or more of the profiles that the MG indicated in an AuditCapability of the Prof_supp property. If the MGC tries to set the Prof_supp property on the MG to a profile value that is unknown by the MG, at the first unknown profile the MG shall reply with error code 461 "Unsupported or Unknown Profile". If the Prof_supp property is not set by the MGC then it shall be assumed that the MGC supports all the profiles supported by MG and that the MGC can use functionalities/capabilities of any of the profiles.

NOTE – This aligns with the ServiceChange procedure where by the MGC may indicate which profile it supports.

An Audit value command may be used to determine the profile/s that have been set.

5.6 Error Codes

This package defines a new error code:

#: 461 Name: Unsupported or Unknown Profile

Definition:

The Profile Name is not supported by the receiver. The command related to the unknown profile is disregarded.

Package: Profile Package prp, 0x0050

Reference: H.248.18

Error Text in the error Descriptor:

The Profile Name is included in the error text in the error descriptor. String Length 1 – 67 characters – 64 for name, 1 for "/" and 2 for version.

Comment: –

[End Correction]

14 Technical and Editorial Corrections to H.248.19 Amendment 2 (03/2009)

14.1 Duplicated event and signal parameter identities

Description:	<p>H.248.19 Amendment 2 contains two duplicated identities.</p> <p>1.) In clause “10.5 Floor Status Change Handling Package”, two parameters have the same binary identity:</p> <p>10.5.3.1.1.1 Floor Status ParameterID: fs, 0x0001</p> <p>10.5.3.1.1.2 Result ParameterID: res, 0x0001</p> <p>The parameter “res” should have a binary identity of 0x0002.</p> <p>2.) In clause “10.6 Floor Control Signalling Package”, two events have the same binary identity:</p> <p>10.6.2.1 Floor Control Association Timeout EventID: tout, 0x0001</p> <p>10.6.2.2 Floor Control Association Release EventID: rel, 0x0001</p> <p>The event “rel” should have a binary identity of 0x0002.</p>
Reference:	<p>Raised during discussions during the November 2011 Question 3/16 meeting in Geneva.</p>

[Begin Correction]

10.5.3.1.1.2 Result

Parameter Name: Result

ParameterID: res, 0x0002

Description: This parameter is used to indicate whether the media characteristic update has been successful or not.

NOTE – Whilst the *fschp/fsdr* Event allows multiple floors and status, section 4.1 of [IETF RFC 4582] defines that multiple requests are treated as atomic actions. This is, if one fails, then all the floors fail.

Type: Enumeration

Optional: Yes.

Possible values: "Success" 0x0001 The media characteristics modifications have been successfully applied.

"Fail" 0x0002 The one or more of the media characteristics modifications have failed.

Default: Success.

[End Correction]

[Begin Correction]

10.6.2.2 Floor Control Association Release

Event name: Release

EventID: rel, 0x0002

Description: This event allows the MP to indicate to the MC that a floor control client has released the connection with the Floor Control Server. This allows the MC to remove the floor control protocol addressing information and floor control policy information from the Termination/Streams associated with the released client.

[End Correction]

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

15.1 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 <i>The syntax of the media field:</i>
---------------------	--

	<p>media-field = "m=" media SP port ["/" integer] SP proto 1*(SP fmt) CRLF</p> <p><i>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.</i></p> <p>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.</p> <p>The draft defines the users of the media type "application" as: <i>"Voice over IP, video teleconferencing, streaming media, instant messaging, etc. See also section 3 of RFC XXXX."</i></p> <p>From this definition it is seen that type "application" would be appropriate for use for H.248.20.</p>
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", depending on the media type within the specific H.248.1 Stream. "application" 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]

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

16.1 Correction of typographical errors

Description:	<p>H.248.22 contains typographical errors in that the property "shrisk/srgi" is referenced however the correct property reference is "shrisk/srgir".</p> <p>H.248.1 defines the "Include shared risk group" property with the values "on/off". Eg.</p> <p>5.1.1 Property Name: Include shared risk group</p>
---------------------	---

	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 COM16-D.44 (2005-2008)

[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 = on*) or if resources from the specified risk group identity must not be used for the termination (*shrisk/incl = 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]

17 Technical and Editorial Corrections to H.248.23 (2005) Corr. 1 (2006)

17.1 Clarification of default pattern ID

Description:	The Corrigendum deleted a sentence that was in direct conflict with the defined default value for the pattern parameter of the dwa signal. Some confusion as to how the pattern is applied when not included in the signal has ensued. As with any other signal, the default is applied when the parameter is absent. A notation indicating that data to be sent without alerting should use the data signal would help ease the confusion.
Reference:	COM16-C.110 (2005-2008)

[Begin Correction]

6.3.1.1.2 Pattern

...

Description: The pattern is an abstract indication of the distinctive alerting pattern that will be applied to the line. If data is to be applied without alerting, the data signal should be used.

...

[End Correction]

17.2 Clarification of solutions to possible race condition in dwa signal

Description:	A possible, but rare, race condition for the dwa signal has been raised in a number of contributions to SG16. There is a solution that utilizes the base protocol constructs that needs documentation in the package.
Reference:	Discussions arising from COM16 C-70 (2005-2008)

[Begin Correction]

6.5 Procedures

...

For ADSI, there are constraints similar to the off-hook data with alerting around ACK digits and softkey/digit responses. Any responses that the MGC wishes to be made aware of should be requested in the Events descriptor. Digitmaps may be used for this application.

There is a possible race condition where an MGC might apply the dwa signal intending power ringing and data to be applied, but before the signal reaches the MG, the termination undergoes a transition to offhook. The result is that the signal would apply a call waiting tone in the interim while the MG reports the offhook and the MGC responds with updated Events and Signals Descriptors. It may be desirable to prevent any possibility of this race condition occurring. To achieve this, implementations may embed the andisp/dwa signal on the onhook event with its strict parameter set to “state”. This will enforce that the dwa signal is only applied if the termination is still onhook when the command arrives at the MG.

Binary encoding SHALL carry the binary data. Text encoding SHALL carry the data as a hex string encoded as big-endian hex data.

...

[End Correction]

18 Technical and Editorial Corrections to H.248.25 (01/2007)

18.1 Provisioning RBS Package Events

Description:	The H.248 events “psoff” and “pson” as defined in H.248.25 robbed bit
---------------------	---

	<p>signalling “rbs” package, are specified with an EventsDescriptor parameter “psto”. The current particular events description is in contradiction to the EventsDescriptor parameter specification itself concerning the indication whether the parameter is optional or not and consequently regarding the provisioned default value.</p> <p>The text below fixes this contradiction.</p>
Reference:	AVD-3618

[Begin Correction]

8.2 Events

8.2.1 Pulse off

Event Name: Pulse Off

EventID: psoff (0x0001)

Description: The MG detects and reports a timed transition from on-hook to off-hook (leading edge) to on-hook (trailing edge). The parameter "pulse timeout" can be optionally included to specify a timeout for the receipt of the pulse. The default value for the timer is provisioned in the MG. The minimum and maximum duration of the pulse are defined by the Minimum Pulse Detection Duration and Maximum Pulse Detection Duration properties respectively.

EventsDescriptor Parameters:

Pulse Timeout

Parameter Name: Pulse Timeout

ParameterID: psto (0x0001)

Type: Integer

Optional: Yes

Possible values: Any non-negative integral number of milliseconds

Description: Specifies the timer for the receipt of the pulse. A value of 0 indicates a timer should not be applied.

Default: Provisioned

ObservedEventsDescriptor Parameters: None

8.2.2 Pulse on

Event Name: Pulse On

EventID: pson (0x0002)

Description: The MG detects and reports a timed transition from off-hook to on-hook (leading edge) to off-hook (trailing edge). The parameter "pulse timeout" can be optionally included to specify a timeout for the receipt of the pulse. The default value for the timer is provisioned in the MG. The minimum and maximum duration of the pulse are defined by the Minimum Pulse Detection Duration and Maximum Pulse Detection Duration properties respectively.

EventsDescriptor Parameters:

Pulse Timeout

Parameter Name: Pulse Timeout

ParameterID: psto (0x0001)

Description: Specifies the timer for the receipt of the pulse. A value of 0 indicates a timer should not be applied.

Type: Integer

Optional: Yes

Possible values: Any non-negative integral number of milliseconds

Default: Provisioned

ObservedEventsDescriptor Parameters: None

[End Correction]

19 Technical and Editorial Corrections to H.248.26 (01/2005)

19.1 Inconsistent default for Pulse Repetition Interval

Description:	<p>The Metering Pulse Burst signal defined in H.248.26 (01/2005) has two parameters: Burst Pulse Count & Pulse Repetition Interval. The Burst Pulse Count parameter specifies the number of metering pulses to be applied as a burst on the line. The description of this parameter says that "The type, duration and pulse repetition interval for the metering pulses comprising the burst are provisioned in the MG".</p> <p>Considering that the pulse repetition interval is provisioned in the MG, it is unclear why this signal has a "Pulse Repetition Interval" parameter. Furthermore the default value for the "Pulse Repetition Interval" parameter is "1" rather than "provisioned".</p> <p>In order to solve the inconsistencies it proposed to alter the defaults to align with the text and "optionality". In 6.3.1.1.2 with "Optional: No" there is no default because a value must always be sent. 6.3.2.1.2 should say "Optional: Yes", "Default: Provisioned". This aligns with the original intent.</p>
Reference:	<p>Subject: [Megaco] Pulse Metering</p> <p>Date: Fri, 17 Jul 2009 10:33:48 +0200</p> <p>From: <bruno.chatras@orange-ftgroup.com></p> <p>To: <megaco@ietf.org></p>

[Begin Correction]

6.3.1.1.2 Pulse Repetition Interval

Parameter name: Pulse Repetition Interval

Parameter ID: pri (0x0002)

Description: This parameter specifies the interval over which the pulses specified in the pulse count should be issued, or, if the pulse count is 0 or not present, the interval between pulses, in milliseconds. For a specified non-zero pulse count, it represents the time over which the pulses should occur. It is up to the MG to perform the appropriate calculations to determine the pulse interval. For a zero or unspecified pulse count, it represents the time that should elapse between the leading edge of a pulse and the leading edge of the succeeding pulse. There is no default value for this parameter, and the MGC should always provide a positive non-zero value.

Type: Integer

Optional: No

Possible values: 1 or more milliseconds

Default: None

...

6.3.2.1.1 Burst Pulse Count

Parameter name: Burst Pulse Count

Parameter ID: bpc (0x0001)

Description: This parameter specifies the number of metering pulses to be applied as a burst on the line. The type and duration for the metering pulses comprising the burst are provisioned in the MG. The pulse repetition interval is provisioned in the MG but may be overridden through use of the *pri* parameter.

Type: Integer

Optional: Yes

Possible values: 1 or more pulses

Default: 1

6.3.2.1.2 Pulse Repetition Interval

Parameter name: Pulse Repetition Interval

Parameter ID: pri (0x0002)

Description: This parameter allows the MGC to override the provisioned interval from the leading edge of a metering pulse to the leading edge of the next metering pulse in this burst.

Type: Integer

Optional: Yes

Possible values: 1 or more milliseconds

Default: Provisioned.

[End Correction]

20.1 Unsuccessful Digit Map match reporting

Description:	<p>See item 6.21.</p> <p>Also related to this issue but not strictly related to DTMF digit detection is the Generic CAS Compelled Register Signalling Package (<i>icascgen</i>) in H.248.29. The Generic Digit Information Event utilizes a Detection Event Map. The MGC may encounter overload issues with CAS signalling and as such the problem of double event notification may occur. Therefore it is proposed to modify H.248.29 to incorporate a new Event Parameter in the Generic Digit Information Event (Clause B.1.2.2.1/H.248.29).</p> <p>Note: An Implementors' Guides typically only provides clarification to existing behaviour. The item is considered to introduce new functionality. However given the nature of the issue it is raised and recorded here whilst an Amendment is being prepared.</p>
Reference:	COM16-C.445 (2005-2008)

[Begin Correction]

B.1.2.2.1 EventsDescriptor parameters**B.1.2.2.1.1 Detection Events Map**

Parameter Name: Detection Events Map

ParameterID: dem (0x0001)

Description: Detection Events Map parameter is activated for collection of register signals. When a Detection Events Map is missing, the received events are reported event by event.

Type: String

Optional: Yes

Possible values: A detected sequence of the characters '0' through '9' and 'B-F', 'x', '.' and the interdigit threshold timers 'T', 'S' and 'L'. In addition, it can also contain '<' and '>' indicating the used backward acknowledge signal. ABNF Syntax is specified in B.2.2.

NOTE 1 – The SSR2 Events Map is a specific Detection Events Map for Signalling System R2 codepoints.

NOTE 2 – "x" represents any character in the range of "0" through "9".

Default: None

B.1.2.2.1.2 Unsuccessful Match Reporting

Parameter Name: Unsuccessful Match Reporting

ParameterID: umr (0x0002)

Description: The MGC may use this parameter to control whether the Generic Digit Information Event is generated in the event of an unsuccessful events map

match (i.e. match with method “Partial match, unmatched event” or “Partial Match, timer expired”).

Type: Boolean

Optional: Yes

Possible values:

On Generate a Generic Digit Information Event on unsuccessful match.

Off Do not generate a Generic Digit Information Event on an unsuccessful match.

Default: *On*

...

[End Correction]

21 Technical and Editorial Corrections to H.248.30 (2007)

21.1 Correction of title of clause 8

Description:	The title of clause 8 is incorrect due to a cut/paste error.
Reference:	AVD-2972a

[Begin Correction]

8 Received RTCP XR Burst Metrics Package

...

[End Correction]

22 Technical and Editorial Corrections to H.248.32 (2005)

22.1 Correction of Resource Extension names

Description:	Currently H.248.32 defines that the Extension Resource being 1 to 20, with the text names ext1, ext2 .. ext20 and the binary ids 0x0021 to 0x0040. However this leads to a potential mismatch in values as it is not clear whether the text name is decimal or hexadecimal. The text name is decimal so the values should be updated to reflect this.
Reference:	Subject: [Megaco] Number of Extension Resources in Detailed Congestion Reporting Package Date: 07.03.2007 12:56 From: "Arvind Charanyan"<arvind.charanyan@ccpu.com> To: <megaco@ietf.org>

[Begin Correction]

5.1.1 Resources Definitions

...

Table 1/H.248.32 – Resource Names

Resource Name:	PropertyID/EnumerationValue	
	Text Identifier	Binary Identifier
General Resources	gen	0x0001
DSP Resources	dsp	0x0002
IP Resources	ip	0x0003
ATM Resources	atm	0x0004
Reserved		0x0005 – 0x0020
Extension Resource 1	ext1	0x0021
Extension Resource 2	ext2	0x0022
	...	
Extension Resource 32	ext32	0x0040

...

[End Correction]

23 Technical and Editorial Corrections to H.248.36 (2005)

23.1 Clarification of cleanup of hanging terminations

Description:	Some wording about the cleanup of hanging terminations in H.248.36 is confusing in regard to which entity has responsibility for cleaning up these terminations. This needs to be clarified.
Reference:	Discussions at March 2007 Shenzhen meeting related to AVD-3089

[Begin Correction]

5.6.1 Detection of hanging terminations

...

In the case the MGC is unable to detect these terminations, the MG needs to be able to detect and clean up terminations that are hanging by sending Notify Commands to the MGC identifying the hanging terminations. The MG can detect hanging terminations by error responses to commands. Typically, during a stable speech call state, very few H.248.1 messages are generated by the MG, thus a mechanism is needed to trigger a periodic message from the MG. The MG may issue a periodic Notify command on the concerned termination and check the response to determine if the

MGC has a record of the termination or not. The time period for this Notify may be parameter driven.

...

[End Correction]

24 Technical and Editorial Corrections to H.248.37 (06/2008)

24.1 Incorrect Binary PackageID

Description:	In the Recommendation text the “lstat” package was assigned a binary package identity of 0x00e3. However IANA assigned this value to another package. The binary package identity should be aligned with the IANA allocated value of 0x00e4.
Reference:	This contribution.

[Begin Correction]

8 Latch statistics package

Package Name: Latch statistics package

PackageID: lstat, (0x00E4)

Description: This package complements the IP NAPT Traversal Package to enable the recording of discarded packets due to implicit filtering by the latching function.

Version: 1

Extends: *ipnapt* version 1

...

[End Correction]

25 Technical and Editorial Corrections to H.248.40 (01/2007)

25.1 Provisioning of application-specific detection times

Description:	H.248.40 defines detection time (adid/ipstop/dt) as an optional EventDescriptor parameter. Thus default values have to be defined if the parameter isn't sent by the MGC. The provisioning approach is attractive because it offloads the MGC from signalling that information element and also typically justified because the timer value is fixed for a particular application. However, in multi-application environments (like multimedia networks) there would be multiple applications with typically different application data inactivity detection times, just due to the nature of the particular application.
---------------------	--

	<p>E.g., the traffic activity is typically varying between interactive, conversational, retrieval or streaming applications. There might be e.g. significant orders of differences concerning activity periods, ranging between a few seconds up to tens of minutes or even hours.</p> <p>Multiple, application-specific default value settings might be beneficial for such environments. The selection of a particular default value by the MG may be coupled to “application information” carried in the H.248 Stream Descriptor (like e.g. the media type).</p>
Reference:	AVD-3857

[Begin Correction]

6.2.1.1 EventDescriptor parameters

6.2.1.1.1 Detection time

Parameter name: Detection time

Parameter ID: dt (0x0001)

Description: This is the interval of time after which if no application data flow is detected, the IP Flow Stop Detection event is triggered. The MG checks over intervals of detection time *dt* if any application data traffic has occurred. If no application data has arrived, then the *adid/ipstop* event is triggered.

NOTE – This may result that more than the detection time has passed between the IP data flow stop and the detection of the event.

Type: Integer

Optional: Yes (if default is provisioned).

Possible values: Any positive number of seconds.

Default: Provisioned

NOTE:

a) Application-independent versus application-specific values:

Either a single, global default value or multiple, application specific default values may be provisioned. There is typically a single value configured in case of a provisioning approach, valid for all applications. Multiple, application-specific default values could be also provisioned. The value selection could be tied to application information like the LD/RD-embedded media description. The specific selection method is out of scope of this package definition and may be e.g. defined in an H.248 profile specification.

b) Stream- versus Termination-level event arming:

When applied at a Termination level, where might be aggregated traffic based on multiple applications (in case of multiple streams). The value selection may be again application-specific or a single value. However in this case value selection must be based on the fact that the event will be notified when only all streams on the Termination have timed out.

...

[End Correction]

26.1 Duplicated property identity

Description:	In H.248.41 Amendment 1, the IP Realm Availability (ipra) package is defined as extending the IP Domain Connection (ipdc) package. IP Realm Availability has a property, "available realms" (ar), that is assigned binary property ID 0x0001. This appears to clash with the inherited "realm" property that is assigned property ID 0x0001 in the parent IP Domain Connection package. In order to resolve this clash the package extension is removed.
Reference:	Subject: [Megaco] Error in H.248.41 IP Realm Availability package definition? Date: Mon, 25 Apr 2011 16:28:12 -0400 From: Charlie Ross <charlie.ross@ericsson.com> To: megaco@ietf.org <megaco@ietf.org>

[Begin Correction]

...

6 IP Realm Availability Package

Package name: IP Realm Availability

Package ID: ipra (0x00e0)

Description: This package defines a new root property and a new root event to enable a discovery mechanism for IP realm availability.

Version: 1

Extends: None.

...

[End Correction]

27 Technical and Editorial Corrections to H.248.57 (06/2008)

27.1 Package Descriptor Clarification

Description:	The description of the rtcp package refers to a single RTP profile, which may be misleading. The package as such is applicable for all (known) RTP profiles due to its scope on IP transport address control for RTCP control flows. To clarify this issue, the notion of <i>media flow</i> and <i>control flow</i> as potential elements of H.248 streams is introduced.
Reference:	C.402

[Begin Correction]

6 RTCP Handling Package

Package name: RTCP Handling Package

Package ID: rtcp (0x00b5)

Description: This package allows the MGC to indicate to the MG per stream whether or not to establish an RTCP control flow when an RTP media flow (e.g. for RTP profiles such as RTP/AVP, etc.) is created.

Version: 1

Extends: none

[End Correction]

28 Technical and Editorial Corrections to H.248.61 (03/2009)

28.1 Definition clarifications

Description:	It has been clarified that a Lookup keys relates to a single element. Furthermore it used been clarified that a flow identifier may also relate to other layer 4 protocols such as the Stream Control Transmission Protocol (SCTP).
Reference:	C-660

[Begin Correction]

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 flow (see clause 3.3 of [b-ITU-T Y.2121]): A unidirectional sequence of packets with the property that, along any given network link, a flow identifier has the same value for every packet.

3.1.2 flow identifier (see clause 3.6 of [b-ITU-T Y.2121]): A vector (or n-tuple) comprising the values of a number of elements taken from the IP, TCP/UDP header fields, encapsulation header, and label fields attached to a packet. The flow identifier for a flow within a single IP network is unique.

NOTE - The header fields values are not limited to TCP/UDP other layer 4 protocols may also be used.

3.1.3 measurement point (see clause 3.9 of [b-ITU-T M.2301]): The physical or logical point at which measurements can be made and to which the data obtained is related.

3.1.4 IP bearer (see clause 3.1 of [b-ITU-T Q.1970]): A bidirectional user plane association between two BIWFs for carrying media stream information across IP networks. An IP bearer is an instance of a backbone network connection (BNC) type defined in clause 3 of [b-ITU-T Q.1902.1].

3.2 Terms defined in this Recommendation

This Recommendation defines the following term:

3.2.1 lookup-key: Flow identifier element that can be used for packet classification with regard to H.248 Context delivery.

[End Correction]

29.1 Clarification of clause 7.2

Description:	<p>The delivery process of an incoming packet to the H.248 Context/Termination/Stream is described in H.248.64 and H.248.79. The description is not consistent.</p> <p>Starting point – H.248.79:</p> <p>The delivery process description in H.248.79 is correct. The description focuses on the major IP (packet) connection models of either a single IP (ephemeral) termination or an (IP, IP) model in B2BIH mode (see clause 6.2.1 <i>Basic concept</i>).</p> <p>The IPR model would be not part of clause 6.2/H.248.79, rather subject of clause 6.3 <i>Lookup-keys based on H.248 Properties</i> (example of ContextAttribute).</p> <p>H.248.64, clause 7.2:</p> <p>The delivery process as illustrated by Fig. 8 shows a MG configuration with IPR and B2BIH context types.</p> <p>The delivery to B2BIH is typically according clause 6.2.1/H.248.79.</p> <p>The IPR context type differs in two aspects (vs B2BIH context type):</p> <ol style="list-style-type: none"> 1. Terminations created without any Media Descriptor (thus without any stream), see Table 1 in clause 9.6.2.1. 2. Context-level property <i>ipr/ifm</i> determines delivery process. <p>Source of confusion:</p> <p>Whilst reading the note at the end of clause 7.2, the reader may have the IPR context type in mind, but the note refers to the previous paragraph, which talks about B2BIH. The note should be improved.</p>
Reference:	Raised during discussions at the Question 3/16 Geneva, 21 Nov.-2 Dec. 2011

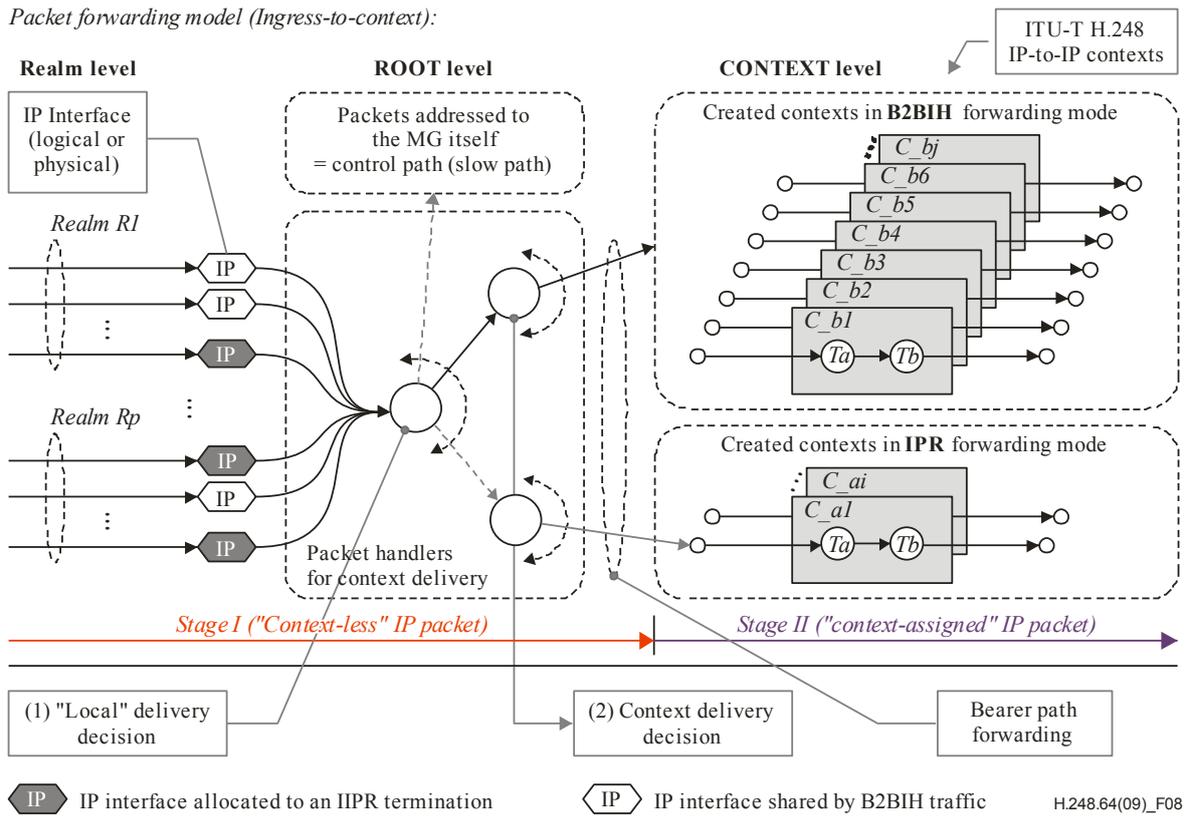
[Begin Correction]

7.2 "Local" delivery and context delivery decisions

Figure 8 illustrates the delivery process. Any received IP packet must firstly be checked against the "IP header validation" rules according to clause 5.2.2 of [IETF RFC 1812]. The next processing step is the "local delivery decision" according to clause 5.2.3 of [IETF RFC 1812]. This decision will lead to a separation into *control path* (i.e., IP packets with destination to the MG itself) and *data path* (or *bearer path*) traffic; and a further *data path* traffic separation into B2BIH and IPR traffic (Figure 8 shows the *bearer path* only).

The "*local*" *delivery decision* is primarily based on the DA value (see previous subclause) of the received IP packet: any DA matching the *local* space A_L is forwarded to the subsequent *delivery decision* for the B2BIH path, and vice-versa for the IPR path.

Packet forwarding model (Ingress-to-context):



Packet Forwarding Model (Ingress-to-Context):

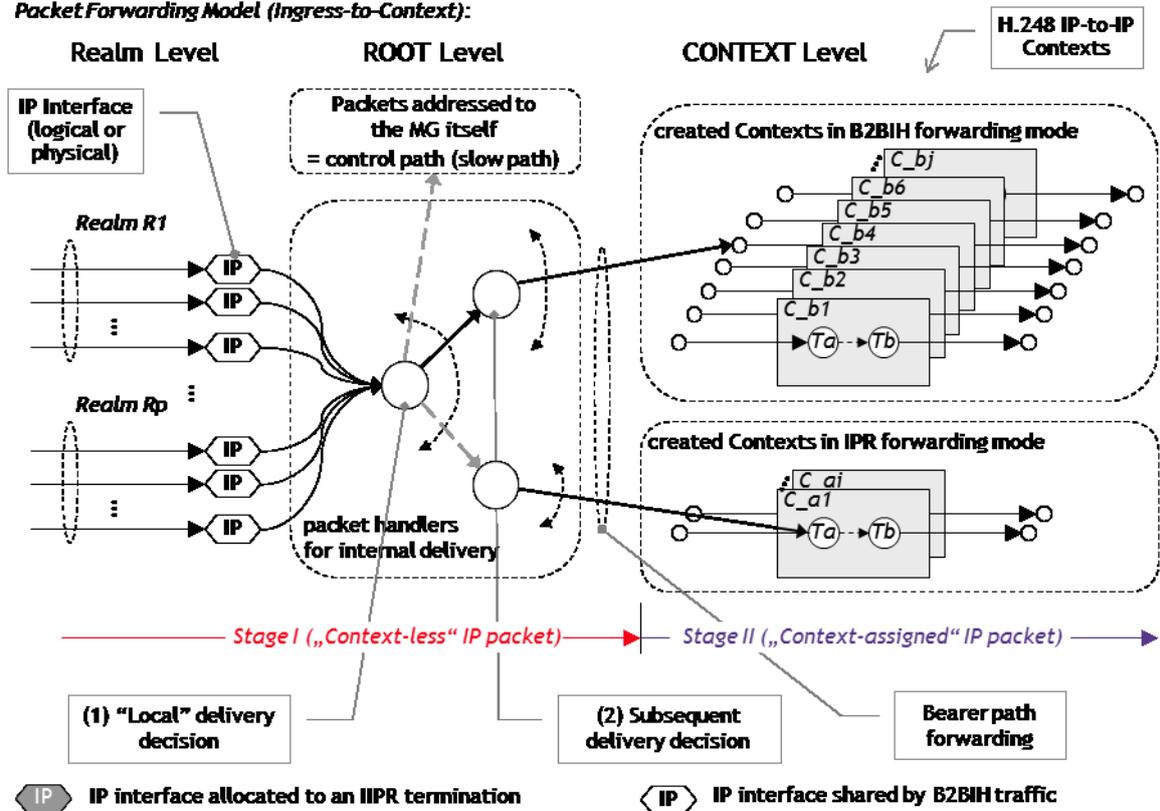


Figure 8 – Packet-to-context assignment – Multi-stage decision process

The subsequent *delivery decision* functions (for each bearer path) may use other, different and/or additional information elements for packet-to-context assignment.

For the B2BIH mode, the first subsequent delivery decision assigns the packet to a stream and the next subsequent delivery decisions assign it to the Termination hosting the Stream, and the Context holding the Termination. [ITU-T H.248.79] describes this delivery process in more detail in clause 6.2.

For the IPR mode, it assigns the packet to the termination associated with the interface over which the packet was received and then to the IIPR context hosting this termination.

[End Correction]

30 Technical and Editorial Corrections to H.248.78 (09/2010)

30.1 Incorrect definition of MSRP

Description:	Three places the term ""Message Sending Relay Protocol" is used. The correct definition of MSRP is "Message Session Relay Protocol". This should be updated.
Reference:	AVD-4065

[Begin Correction]

Summary

Recommendation ITU-T H.248.78 defines a package that allows bearer-level application protocol (such as real time streaming protocol (RTSP) or message session relay protocol (MSRP)) messages received by a media gateway (MG) to be communicated to a media gateway controller (MGC). This allows the MGC to perform application-level gateway functionality such as network address translation on the messages and then forward the messages to the MG for sending to the destination.

[End Correction]

[Begin Correction]

4 Abbreviations

This Recommendation uses the following abbreviations and acronyms:

ALG	Application Level Gateway
B2B	Back to Back
DNS	Domain Name System
HTML	HyperText Mark-up Language
HTTP	HyperText Transfer Protocol
IP	Internet Protocol
IPv4	Internet Protocol Version 4

IPv6	Internet Protocol Version 6
L3	Layer three
L4	Layer four
L4+	Above layer four
MG	Media Gateway
MGC	Media Gateway Controller
MSRP	Message Session Relay Protocol
NAPT	Network Address and Port Translation
OSI	Open Systems Interconnection
RTSP	Real Time Streaming Protocol
SCTP	Stream Control Transport Protocol
SDP	Session Description Protocol
SIP	Session Initiation Protocol
TCP	Transmission Control Protocol
UDP	User Datagram Protocol

[End Correction]

[Begin Correction]

6 Application-level gateway functionality

Address information carried at layer four (L4) or above (L4+) according to the ISO 7-layer model is primarily related to call/session control signalling (like the session initiation protocol (SIP)). Such *call-level ALGs* are consequently out of scope of ITU-T H.248 Recommendations. However, there are IP applications with bearer-level transport of "L4+ address information". These services may need a *bearer-level ALG* located in the ITU-T H.248 MG.

Examples use cases (see also Figure 1) which may require a *bearer-level ALG* are:

- Message session relay protocol (MSRP)-over-TCP/IP (instant messaging in session mode; ITU-T H.248 MG as in-path node between MSRP client and MSRP server, or between MSRP relay; not necessarily using the procedures of [ITU-T H.248.69]);

[End Correction]

Annex: Defect Report Form for the 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.