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Amendment 2
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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS
Infrastructure of audiovisual services – Communication procedures

Gateway control protocol: Decomposed multipoint control unit, audio, video and data conferencing packages

Amendment 2: Floor control enhancements

Recommendation ITU-T H.248.19 (2004) – Amendment 2

Recommendation ITU-T H.248.19

Gateway control protocol: Decomposed multipoint control unit, audio, video and data conferencing packages

Amendment 2

Floor control enhancements

Summary

Recommendation ITU-T H.248.19 describes the functionality of a decomposed multipoint control unit, in particular the interface between a media controller and media processor which is based on Recommendation ITU-T H.248. This Recommendation contains guidelines for the use of a decomposed gateway that may support audio, video and data conferencing. This Recommendation contains packages for floor control, volume control, video windows, audio and video mixing for point-to-point, multi-cast and hybrid conferencing scenarios.

Amendment 1 defines two new packages – the Text Overlay Package and the Border and Background Package, which together with the Video Window Package may be used to provide additional conference control capabilities.

Amendment 2 provides enhancements to H.248.19 Amendment 1 for greater floor control of conferences. It enables floor control to be determined on a stream basis through the use of the "Controlled by Chair" property. It enables a media gateway controller to set a floor control policy through the use of the "Floor Control Policy" package and to request to be notified when a change of floor status occurs through the use of the "Floor Status Change Handling" package.

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Recommendation ITU-T H.248.19

Gateway control protocol: Decomposed multipoint control unit, audio, video and data conferencing packages

Amendment 2

Floor control enhancements

Modifications introduced by this amendment are shown in revision marks. Unchanged text is replaced by ellipsis (…). Some parts of unchanged text (clause numbers, etc.) may be kept to indicate the correct insertion points.

…

1   Scope

…

This Recommendation describes packages and functions associated with the H.248 interface for audio, video and data conferencing. This includes the specification of mixing, conference capabilities and core H.248.1 protocol usage. The packages and functionality described in this Recommendation are optional according to the rules of ~~H.248.1~~[ITU-T H.248.1]. A multipoint control unit may implement one or more of the packages described in this Recommendation.

2   References

…

~~ITU-T Recommendation H.248.1 (2002), *Gateway control protocol: Version 2*.~~

~~ITU-T Recommendation H.248.2 (2000), *Gateway control protocol: Facsimile, text conversation and call discrimination packages*.~~

~~ITU-T Recommendation H.248.10 (2001), *Gateway control protocol: Media gateway resource congestion handling package*.~~

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

~~ITU-T Recommendation T.140 (1998), *Protocol for multimedia application text conversation*.~~

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

[ITU-T H.248.2]   Recommendation ITU-T H.248.2 (2000), *Gateway control protocol: Facsimile, text conversation and call discrimination packages*.

[ITU-T H.248.10]   Recommendation ITU-T H.248.10 (2001), *Gateway control protocol: Media gateway resource congestion handling package*.

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

[ITU-T T.140]   Recommendation ITU-T T.140 (1998), *Protocol for multimedia application text conversation.*

[IETF RFC 4376]   IETF RFC 4376 (2006), *Requirements for Floor Control Protocols.*

[IETF RFC 4582]   IETF RFC 4582 (2006), *The Binary Floor Control Protocol (BFCP).*

[IETF RFC 4583]   IETF RFC 4583 (2006), *Session Description Protocol (SDP) Format for Binary Floor Control Protocol (BFCP) Streams.*

3   Definitions

...

3.5   floor: A permission to temporarily access or manipulate a specific shared resource or set of resources.

3.6   floor chair (floor controller): A logical entity that manages one floor (grants, denies or revokes a floor).

3.7   floor participant: A logical entity that requests floors.

4   Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

BFCP   Binary Floor Control Protocol

BNF   Backus-Naur Form

MC   Media Controller

FCFS   First-Come First-Served

MCU   Multipoint Control Unit

MP   Media Processor

SDP   Session Description Protocol

SIP   Session Initiation Protocol

TDM   Time Division Multiplex

5   Conferencing architecture

...

Clause 6 of ~~H.248.1~~[ITU-T H.248.1] describes the connection model. By placing the relevant terminations in the same or different contexts, it allows the MCU to perform the different types of "multipoint" conferencing.

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6   Speaking and listening in a conference

As part of a conference who "speaks" and who "listens" may need to be controlled. This is achieved by setting the stream mode of the stream representing the media on the termination that represents a user that is to be controlled. If the stream mode is set to "send" then the user can only listen or look. If the stream mode is set to "receive" then the user can only speak or send video/text. If the stream

mode is set to "send/receive" then the user can speak and listen. The stream mode is described in clause 7.1.7 of H.248.1[ITU-T H.248.1].

With whom the user can speak and listen to is controlled through the use of stream identities and topology. Stream identities are described in clause 7.1.4 of H.248.1[ITU-T H.248.1]. The users whose terminations have the same stream identities as other terminations have the possibility to speak and listen for the media represented by that stream identity. The default connection between all the terminations is that everyone can hear and see everyone else. This may be modified by the use of the Topology Descriptor that describes the connection relationship between the termination and streams in a context.

7 Determination and management of conferencing capabilities

An MC may determine the capabilities of a MP through the use of Audit Capabilities (clause 7.2.6 of H.248.1[ITU-T H.248.1]). By auditing the packages on a MP the MC can determine which conferencing functionality and corresponding packages are supported. The capabilities of a MP may also be determined through provisioning or via a management system.

•••

The MP is responsible for the management of its own resources. If congestion is a concern, then H.248.10[ITU-T H.248.10] "Media gateway resource congestion handling package" may be implemented. If partitioning of resources for different accesses is required, then Virtual Media Gateways (clause 11.1 of H.248.1[ITU-T H.248.1]) should be implemented.

8 Simultaneous support of media types

The H.248 model allows the use of different media types towards users through the use of multiple streams per termination. Simultaneous multiple stream or alternate streams may be supported. A separate stream identity shall be used for each media type.

9 MCUs and multiplexed media bearers

If a MP has H.22x TDM bearer(s) connected to it where individual media streams are multiplexed across one or more terminations, the audio/video and data properties, signals and events specified by the packages in this Recommendation shall be placed on the multiplexed termination not the individual TDM terminations. Multiplexed terminations are discussed in clause 6.2 of H.248.1 [ITU-T H.248.1] and clause 7.1.3 of H.248.1[ITU-T H.248.1].

10 Floor Control

An integral part of conferencing is the management of the users in a conference. For the purposes of this Recommendation this is termed "Floor Control". [IETF RFC 4376] describes the requirements associated with floor control.

The Packages defined in this clause (along with other H.248 Packages) allow the coordination of floor control policy and state between an MC and a MP. For example, The process of joining or leaving a conference is called a "Floor Action". If the MC receives a request to "make me chair", then it shall use the Floor Control Package to indicate this. If the MC receives a request to "make me broadcaster", then it shall apply a multi-cast configuration as per Figure 2. No additional packages are needed.

Typically, session level signalling is used to determine whether or not floor control is used in a Conference. Floor Control may involve the use of a floor control signalling protocol. The Packages allow for the establishment of a floor control protocol between a MP (acting as a floor control server) and a client. The packages are used in conjunction with SDP attributes such as the "UserID"

(a=userid:) and "Floor Identity" (a=floorid:) attributes (see sections 5 and 6 of [IETF RFC 4583]) in order to provide a linkage between the session level and floor control signalling.

NOTE – The "Floor Control Conference Identity" Context Attribute (see clause 10.6.1.1) is used instead of the SDP "ConferenceID" (a=confid:) attribute to minimize messaging.

The use of a floor control protocol allows the use of multiple floors per Termination. In order to associate resources to a particular floor, the MC shall use both the "Floor and Stream Association" (*fsa*) Context Attribute (see clause 10.6.1.2) and the "Floor Identity" attribute (a=floorid). The MC shall set the *fsa* Context Attribute to associate H.248 media streams with a particular FloorID for the particular Context. This indicates to the Terminations in the Context which Floor is allowed for each stream.

In order to indicate that a Termination (representing a user) participates in a floor control instance, the a=floorid SDP attribute is set on the Streams that are relevant for that particular floor on Terminations that are involved in the floor. If the MC tries to set a FloorID on a media stream that is not listed in the *fsa* Context Attribute, an error shall be returned.

The "Floor Identity Attribute" is defined in section 6 of [IETF RFC 4583] and its Augmented BNF syntax is:

```
floor-id-attribute = "a=floorid:" token [" mstrm:" token *(SP token)]
```

In H.248 where multiple media are defined, these appear in separate H.248 Streams and the SDP are independent from each other. Therefore, the use of the optional "mstrm" part of the attribute is superfluous and should not be sent to the MP. If the MP receives this optional component, it shall be ignored.

The "a=floorid" attribute may be set on more than one Stream, thus one Context can have multiple floors. A Stream cannot be associated with more than one floor.

The Floor Identity that is set may be used to tie an instance of floor control signalling (between an MP embedded Floor Control Server and Floor Control Client) to the Streams describing the media that the floor has access to.

For example:

An MC establishes a Context with 3 Terminations (A, B and C) each with 3 Streams (1, 2 and 3). There is a single floor (FloorID 123) for both the audio and media and a separate floor (FloorID 456) for messaging.

It sets the *fsa* Context Attribute: "123:1,2","456:3"

Stream(1) is an Audio media stream.

Stream(2) is a Video media stream.

Stream(3) is a Messaging media stream.

Stream(4) is a Stream established for floor control signalling.

Termination(A) does not participate in the floor so the "a=floorid" attribute is not set on that Termination.

Termination(B) participates in the floor for both the Audio and Video media streams, therefore the following is set:

```
        Termination(B) Stream(1) a=floorid:123,
                       Stream(2) a=floorid:123,
```

Termination(C) participates in the floor for both the Audio and Video media streams and the Messaging stream, the floor control signalling association is used for both, therefore the following is set:

```
Termination(C) Stream(1) a=floorid:123,
               Stream(2) a=floorid:123,
               Stream(3) a=floorid:456
```

10.1 Floor Control Package

Package Name: Floor Control Package

PackageID: fcp, 0x006e

Description: This package defines a property to indicate that the termination represents the user who is the conference floor controller (otherwise known as the "Moderator" or "Floor Chair"). In version 2, an additional property is added in order to be able to associate the floor control role to a particular floor/s.

Version: 12

Designed to be
extended only: No

Extends: None

10.1.1 Properties

10.1.1.1 ~~Property Name:~~ Activate Floor Controller

Property Name: Activate Floor Controller

PropertyID: afc, 0x0001

Description: This property indicates whether or not the termination represents the floor controller or not.

Type: Boolean

Possible values: "on" (0x0001) Floor Controller Handling

               "off" (0x0000) This Termination is n~~Not~~ the Floor Controller ~~Handling~~

~~[Default]:~~   off

Defined in: TerminationState Descriptor

Characteristics: Read/write

10.1.1.2 Controller's Floor Identity

Property Name: Controller's Floor Identity

PropertyID: cfi, 0x0002

Description: This property indicates for which floors the Termination is the floor controller.

Type: Sub-list of Integer

Possible values: 0-65535

Default: None

Defined in: TerminationState Descriptor

Characteristics: Read/write

10.1.2 Events

None.

10.1.3 Signals

None.

10.1.4   Statistics

None.

10.1.5   Error codes

10.1.5.1 Error code No. 479

Name: Only one floor chair per floor is allowed in the Context.

Definition: This error code indicates that the MP is unable to set a floor chair for the particular floor, due to that, a floor chair for the floor has already been allocated to a different Termination in the Context. The command is disregarded.

Error Text in the Error Descriptor: None.

Comment: The MC should remove the floor chair from the other Termination before setting on the new Termination.

10.1.~~5~~6 Procedures

The MC may set th~~is~~e *Activate Floor Controller* (*fcp/afc*) property on a media gateway to indicate that the termination relates to the floor controller (otherwise known as "Floor Chair" or "Moderator"). This property may be used where there is a single floor in the Context. Where there are multiple floors, the *Controller's Floor Identity* (*fcp/cfi*) property is used in order to uniquely identify the floor(s) of which the user is the controller.

The *fcp/afc* and *fcp/cfi*~~"Activate Floor Control~~" properties~~y~~ may be used by the media processor to mix user plane data for the conference. Furthermore, where the MP contains embedded floor control server functionality, the use of these properties identifies a Termination (user) as the floor chair for the purposes of floor control signalling.

There may only be one floor chair per floor per Context. If the MC tries to set an addition floor chair per floor, error code 479 "One floor chair per floor is allowed in the Context" is returned.

NOTE – The identification of a Floor Chair that is not part of the same Context where the floor is defined (see [IETF RFC 4376]) is for further study.

~~10.1.6   Error code~~

~~None.~~

10.2   Floor Action Package

The Conference Tones Generation Package in ~~H.248.27~~[ITU-T H.248.27] supports the following indications:

...

10.4   Floor Control Policy Package

Package Name: Floor Control Policy Package

PackageID: fcpoli, binary 0x00ab

Description: This package allows the MC to set floor control policy for the Conference represented by the Context. The use of Context attributes allows the MC to set the policy per floor only once per Context rather than having to manipulate individual terminations/streams.

NOTE – The use of these Properties in this Package at the TerminationState level is primarily for the support of H.248.1 Version 1 and 2 implementations which does not allow Context Attributes.

Version:	1
Extends:	None

10.4.1   Properties

10.4.1.1   Floor Control Algorithm

Property Name:	Floor Control Algorithm
PropertyID:	fca, 0x0001
Description:	This property indicates the algorithm used in granting the floor per floor in the Conference.
Type:	Sub-list of String
Possible values:	Each instance of String is of type **FCA** defined by the following ABNF:

```
FCA = FloorID COLON Algorithm
FloorID = UINT16
Algorithm = "MOD" / "FCFS" / "RAN"
; MOD indicates "moderator-controlled"
; FCFS indicates "first come first served"
; RAN indicates "Random"
```

Default:	None.
Defined in:	ContextAttribute/TerminationState
Characteristics:	Read/write

10.4.1.2   Max Floor Users

Property Name:	Max Floor Users
PropertyID:	mfu, 0x0002
Description:	This property indicates the maximum number of users who can hold the floor at the same time.
Type:	Sub-list of String
Possible values:	Each instance of String is of type **MFU** defined by the following ABNF:

```
MFU = FloorID COLON NumUsers
FloorID = UINT16
NumUsers = UINT16
```

Default:	Provisioned.
Defined in:	ContextAttribute/TerminationState
Characteristics:	Read/write

10.4.1.3   Max Floor Hold Time

Property Name:	Max Floor Hold Time
PropertyID:	mht, 0x0003
Description:	This property indicates the maximum time period a floor participant can hold the floor for. It relates to the floor holding instance rather than the total amount of time per conference.
Type:	Sub-list of String
Possible values:	Each instance of String is of type **MHT** defined by the following ABNF:

```
MHT = FloorID COLON HoldTime
FloorID = UINT16
HoldTime = UINT16
; HoldTime units in 1/10 second
```

Default: Provisioned.

Defined in: ContextAttribute/TerminationState

NOTE – As this is set at a Context level, all users will be subject to the same time. If differing times is needed, this should be defined at the TerminationState level.

Characteristics: Read/write

10.4.2 Events

None.

10.4.3 Signals

None.

10.4.4 Statistics

None.

10.4.5 Error Codes

None.

10.4.6 Procedures

Where the MP supports conferences with floor control, the MC may provide the conference floor policy. Depending on the information, the MC may provide policy in different ways.

In order to set the media policy for the floor, the MC shall use the SDP "a=floor-id" attribute to associate a floor with a particular media (represented by a H.248 Stream). See clause 10 for more details.

In order to set the floor control algorithm policy, the MC shall use the "Floor Control Algorithm" (*fcpoli/fca*) Property to set an algorithm for the floor.

In order to set the maximum number of floor users policy, the MC shall use the "Max Floor Users" (*fcpoli/mfu*) Property to set the maximum number of floor holders for a particular floor.

In order to set the maximum number of floor users policy, the MC shall use the "Max Floor Hold Time" (*fcpoli/mht*) Property to set the maximum time that a user can hold the floor for. When the duration that the floor is granted exceeds the value of the *mht* property, the MP shall release the floor and notify the MC if the *fschp/fsdr* event (which is defined in clause 10.5.2.1) is detected.

Where the Properties are set on the Context level, the policy shall apply to all Terminations/Streams in the Context where the floor is set (see above paragraph).

Where the Properties are set at the Termination level, the policy information should be set on all Terminations participating in floor control. If the MP detects conflicting information between the policies set on different terminations, it shall respond with error code "473 – Conflicting Property Values".

In order to indicate who the floor controller (otherwise known as "floor chair" or "moderator") is, the MC shall use the Floor Control package to assign which Termination represents the controller for the floor.

10.5　Floor Status Change Handling Package

Package Name:	Floor Status Change Handling Package
PackageID:	fschp, 0x00aa
Description:	This package defines Signals and Events that are used in order for the MP to indicate a particular floor status change in order for the MC to update the associated media characteristics. It also allows the MC to indicate whether the change of media characteristics has been successful.
Version:	1
Extends:	None

10.5.1　Properties

None.

10.5.2　Events

10.5.2.1　Floor Status Detection and Reporting

Event name:	Floor Status Detection and Reporting
EventID:	fsdr, 0x0001
Description:	The MC sets this Event in order to allow the MP to indicate to the MC that it has determined that the floor status associated with a particular Termination/FloorID needs to change and that the MC should change the associated media characteristics accordingly.

10.5.2.1.1　EventsDescriptor Parameters

10.5.2.1.1.1　Floor Identity

Parameter Name:	Floor Identity
ParameterID:	fid, 0x0001
Description:	This is used to identify to which of the Termination's floors the status detection should apply.
Type:	Sub-list of Integer
Optional:	Yes.
Possible values:	0-65535
Default:	0 Indicates all floors.

10.5.2.1.2　ObservedEventsDescriptor Parameters

10.5.2.1.2.1　Floor Status

Parameter Name:	Floor Status
ParameterID:	fs, 0x0001
Description:	This is used to indicate the required floor status and to identify which of the Termination's floors the change of status applies to.
Type:	Sub-list of String
Optional:	No.
Possible values:	Each instance of String of type "Status". Syntax according to the following ABNF:

```
FloorStatus = FloorID COLON Status
FloorID = UINT16
Status = "granted" / "revoked" / "released"
```

Where:

granted (0x0001): the user represented by the termination has been granted the floor.

revoked (0x0002): the floor associated with the user represented by the termination has been revoked.

released (0x0003): the floor associated with the user represented by the termination has been released.

Default: None.

10.5.3 Signals

10.5.3.1 Confirm Media Update

Signal Name: Confirm Media Update

SignalID: cmu, (0x0001)

Description: This signal allows the MC to indicate whether or not it has successfully applied the media update related to the floor status change indicated by the Floor Status Detection and Reporting ObservedEvent.

Signal Type: Brief

Duration: Not Applicable

10.5.3.1.1 Additional parameters

10.5.3.1.1.1   Floor Status

Parameter Name: Floor Status

ParameterID: fs, 0x0001

Description: This is used to correlate the results of the media characteristics change with a particular floor status report (*fschp/fsdr* ObservedEvent).

Type: Sub-list of String

Optional: No.

Possible values: Each instance of String of type "Status". Syntax according to the following ABNF:

```
FloorStatus = FloorID COLON Status
FloorID = UINT16
Status = "granted" / "revoked" / "released"
```

Where:

granted (0x0001): the user represented by the termination has been granted the floor.

revoked (0x0002): the floor associated with the user represented by the termination has been revoked.

released (0x0003): the floor associated with the user represented by the termination has been released.

Default: None.

10.5.3.1.1.2   Result

Parameter Name: Result

ParameterID: res, 0x0001

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.

10.5.4   Statistics

None.

10.5.5   Error code

None.

10.5.6   Procedures

The MC needs to be able to change the media characteristics of a Termination/Stream based on the floor status. Where the MP contains Floor Control Server functionality, this information must be communicated to the MC. In order to receive this information, the MC sets the "Floor Status Detection and Reporting" (*fschp/fsdr*) Event.

The Floor control server functionality in a MP uses a floor control protocol (e.g., BFCP) to determine that the floor status needs to be changed. If the *fschp/fsdr* Event is set, once the MP has determined that the floor status needs to be changed for a particular Termination (representing a user) and floor(s), it shall generate a Notify command with a *fschp/fsdr* ObservedEvent. The ObservedEvent shall contain the FloorIDs and Status that the MC should consider when changing the media characteristics. The Notification indicates to the MC that an update of media characteristics (e.g., change of "Streammode") needs to be made.

NOTE – The MP does not provide exactly which characteristics are to be changed. As per section 3.1 of [IETF RFC 4582], this is out of the scope of floor control protocols.

On reception of the notification, the MC will modify the media characteristics associated with the Termination/Stream based on the TerminationID, FloorID and Status.

Once the media characteristics change attempt has occurred, the MC will send the "Confirm Media Update" (*fschp/cmu*) Signal indicating whether or not the changes have been successful. The signal shall include the same value in the "Floor Status" signal parameter as that received in the "FloorStatus" parameter in the associated ObservedEvent. This is in order to correlate the request and confirmation. In case multiple FloorIDstatus and media characteristic changes are requested, if one change fails, then all changes are deemed to fail. The MC shall (if possible) return the media characteristics to a state before it had processed the *fschp/fsdr* ObservedEvent.

On reception of this *fschp/cmu*, the MP shall analyse the result and where required, the MP will then perform the necessary BFCP signalling to notify the users/chairs associated with the applicable Termination/Floor that the status has changed.

10.6   Floor Control Signalling Package

Package Name: Floor Control Signalling Package

PackageID: fcsig, 0x00e5

Description: This package allows an MC to manage a floor control signalling association per Termination (User) on the MP. It assumes that the MP contains an embedded Floor Control Server. An example protocol that may be used over this control association is the binary floor control protocol (BFCP) defined in [IETF RFC 4582].

Version: 1

Extends: None

10.6.1   Properties

10.6.1.1   Floor Control Conference Identity

Property Name: Floor Control Conference Identity

PropertyID: fconfid, 0x0001

Description: This property indicates the Conference Identity associated with a Floor Control Conference.

NOTE 1 – Whilst the H.248 ContextID uniquely identifies a conference instance on a MP, the BFCP utilizes a Conference Identity that is provided in session level SDP signalling. This must be communicated to the MP.

NOTE 2 – The usage of the Conference Identity at a Context level imposes the restraint that there may only be one FCS conference per H.248 Context.

Type: Integer

Possible values: Any integer

Default: None.

Defined in: ContextAttribute

Characteristics: Read/write

10.6.1.2   Floor and Stream Association

Property Name: Floor and Stream Association

PropertyID: fsa, 0x0002

Description: This property indicates which media streams may be associated with a particular floor. There may only be one FloorID per media stream.

Type: Sub-list of String

Possible values: Each instance of String of type "Association". Syntax according to the following ABNF:

```
Association = FloorID COLON StreamID [* COMMA
                StreamID]
FloorID = UINT16
StreamID = UINT16
```

Default: None.

Defined in: ContextAttribute

Characteristics: Read/write

10.6.2   Events

10.6.2.1   Floor Control Association Timeout

Event name: Timeout

EventID: tout, 0x0001

Description: This event allows the MP to indicate to the MC that the Floor control protocol association between the Floor Control Server and Client has timed out. This allows the MC to seek to re-establish the association (for example, see section 7 of [IETF RFC 4583]).

10.6.2.1.1 EventsDescriptor Parameters

None.

10.6.2.1.2 ObservedEventsDescriptor Parameters

10.6.2.1.2.1   Floor Identity

Parameter Name: Floor Identity

ParameterID: fid, 0x0001

Description: This is used to identify which of the Termination's floors are affected due to the floor control protocol association timeout.

NOTE – Whilst the use of multiple bearer floor control protocol associations in a single Conference for a single user is uncommon, it is not forbidden.

Type: Sub-list of Integer

Optional: Yes.

Possible values: 0-65535

Default: None.

10.6.2.2   Floor Control Association Release

Event name: Release

EventID: rel, 0x0001

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.

10.6.2.2.1 EventsDescriptor Parameters

None.

10.6.2.2.2 ObservedEventsDescriptor Parameters

10.6.2.2.2.1   Floor Identity

As per clause 10.6.2.1.2.1.

10.6.3 Signals

None.

10.6.4 Statistics

None.

10.6.5 Error code

None.

10.6.6 Procedures

Where floor control server functionality is embedded in a MP, an MC is responsible for requesting the MP to establish the floor control protocol associations between the floor control server and the clients involved in the floor/conference.

In order to create a floor control protocol association for a particular Termination (User), the MC shall create a new Stream on the Termination for this purpose. [IETF RFC 4583] provides SDP which may be used in a Local or Remote Descriptor in order to describe the use of the Binary Floor Control Protocol [IETF RFC 4582] on this Stream. Wildcarding may be used in order to determine information to be provided to the client through session related signalling. The "a=floorid" attribute in conjunction with the "Floor and Stream Association" (*fsa*) property shall be used to associate H.248 resources with a particular StreamID. Furthermore, the MC may provide the Conference Identity to be used by floor control signalling via the "Floor Control Conference Identity" (*fconfid*) Context Attribute. See clause 10 for more information.

In addition to providing the correct SDP/H.248 Package elements, the MC should set the events in the Floor Signalling Package is order to correctly manage the state of the association. This Event shall be set on the H.248 Stream that defines floor control association.

Once the association is established between the Termination and the client, the MP is then responsible for receiving, processing and replying to floor control protocol messages (according to any set floor policies, see clause 10.4). The MC may learn of the floor control state through the use of the Floor Status Change Handling package (see clause 10.5).

Where the MP detects a timeout on the floor control signalling association and the "timeout" (*fcsig/tout*) Event is set, then it shall send a notification to the MC.

Where the MP detects a release of the floor control signalling association and the "release" (*fcsig/rel*) Event is set, then it shall send a notification to the MC.

If the MC removes the Stream defining the floor control protocol association and if the association has not already been released, the MP shall gracefully release the association. Any events associated with the Stream shall be de-activated.

11 Audio cConferencing

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11.3 Volume Level Mixing Package

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Version: 12

Designed to be extended only: No

Extends: None

11.3.1 Properties

11.3.1.1 Property Name: Volume Mixing Level

...

Defined in:	LocalControl Descriptor or ContextAttribute
Characteristics:	Read/write

11.3.1.2 Property Name: N Speakers Mixing

...

Defined in:	LocalControl Descriptor or ContextAttribute
Characteristics:	Read/write

...

11.3.5 Procedures

The MC may set the *mixlevel* property on a media processor to indicate the threshold volume level for the mixing algorithm for a particular conference. The *mixlevel* property is set on each applicable stream on terminations in the context representing a conference. Alternatively, it may be set on the Context level and will apply to all Terminations in the Context. When the volume of a participant represented by the *mixlevel* property is equal to or exceeds the threshold, the media stream coming from that participant will be included in the mix. When the volume of a participant is less than the threshold, the media stream coming from that participant will not be mixed. If the *mixlevel* property is not assigned to a termination, then this termination will not be included in the mix.

The MC may set the *nspeakmix* property on a media processor to indicate the threshold volume level for the mixing algorithm for a particular conference. The *nspeakmix* property is assigned to each termination in the context representing the conference that would like to hear the N loudest speakers. Alternatively, it may be set on the Context level and will apply to all Terminations in the Context. The MP shall then mix the N loudest speakers of the conference that equal or exceed the *mixlevel* (if set) and output it to the relevant terminations.

...

11.5 Include Participant in Mix Package

Package Name:	Include Participant in Mix Package
PackageID:	ipm, 0x00e6
Description:	This package defines functionality that allows the MC to indicate to the MP that it should give preferential treatment in the mix to the Termination/Stream where the property in the package is set.
Version:	1
Extends:	None

11.5.1 Properties

11.5.1.1 Preferred Mix

Property Name:	Preferred Mix
PropertyID:	pm, 0x0001

Description:	This property indicates that media received on the Termination external to the MP should be given preferential treatment by the MP when mixing the Stream.
Type:	Boolean
Possible values:	*ON* Include in the mix
	OFF Use normal methods to determine if it is included in the mix
	NOTE – A "Do not include" in the mix codepoint is not provided as the MC can use the Streammode to control whether an incoming stream is mixed.
Default:	*OFF*
Defined in:	LocalControl
Characteristics:	Read/write

11.5.2 Events

None.

11.5.3 Signals

None.

11.5.4 Statistics

None.

11.5.5 Error codes

None.

11.5.6 Procedures

The MC may set the "Preferred Mix" (*ipm/pm*) property on a MP to indicate that media received on the Termination external to the MP should be given preferential treatment by the MP when mixing the Stream. This function is distinct from the use of topology or stream mode in that the MP may mix a subset of streams for the given connection topology. For example, if the incoming stream is not part of the n-loudest in mix it should still be included. Therefore, the "Preferred Mix" property overrides the "N Speakers Mixing" properties if set on the Termination/Stream. This behaviour may result in a N + 1 Speakers mix.

If the "Preferred Mix" and the "Volume Mixing Level" properties are both set on the Termination/Stream, then the incoming stream must be included if the volume exceeds the "Volume Mixing Level".

11.6 Speaker Reporting Package

Package Name:	Speaker Reporting Package
PackageID:	speakrep, 0x00e7
Description:	This package defines functionality that allows the MC to determine which active speakers make up the mix that a user represented by a Termination/Stream hears.
Version:	1
Extends:	None

11.6.1 Properties

None.

11.6.2 Events

11.6.2.1 Active Speakers

Event Name: Active Speakers

EventID: actspeak, 0x0001

Description: This event allows the MC to receive a periodic report indicating which speakers make up the mix that a user related to a particular Stream/Termination hears.

11.6.2.1.1 EventsDescriptor parameters

11.6.2.1.1.1 Reporting Interval

Parameter Name: Reporting Interval

ParameterID: int, 0x0001

Description: This parameter indicates the interval between active speaker notifications.

Type: Integer

Optional: Yes

Possible values: 0-65535 seconds (0 indicates a single report immediately)

Default: 60 seconds

11.6.2.1.2 ObservedEventsDescriptor parameters

11.6.2.1.2.1 Speaker Terminations

Parameter Name: Speakers Terminations

ParameterID: speakterm, 0x0001

Description: This parameter provides a list of the TerminationIDs associated with the active speakers.

Type: Binary encoding, Sub-list of Octet String

      Text Encoding, Sub-list of String

Optional: No

Possible values: For binary encoding, each instance is an octet string size (1-8).

      For text encoding, each instance is a string defined by the following ABNF:

```
TerminationID   = pathNAME
pathNAME        = ["*"] NAME *("/" / "*"/ ALPHA /
                   DIGIT /" " / "$")["@"pathDomainName]
```

      For further definitions, see Annexes A and B of [ITU-T H.248.1].

Default: None.

11.6.3 Signals

None.

11.6.4 Statistics

None.

11.6.5 Error codes

None.

11.6.6 Procedures

The MC may set the "Active Speakers" (*speakrep/actspeak*) event to determine the speakers involved in the mix that a particular user represented by a Termination hears. The "Reporting Interval" is used to minimize the number of reporting events. For example, the Active speaker may change quickly in a conversation. This event shall be associated with a particular StreamID when several streams are defined on the Termination.

Once set and on expiry of the timer associated with the "Reporting Interval" (*int)* parameter, the MP shall generate an ObservedEvent only if the list of active speakers has changed from the previous report. This is in order to minimize the messaging between the MP and MC. The MP and MC therefore must maintain the active speaker lists for each relevant Termination.

If the ObservedEvent is detected, a Notify.request command is sent indicating (via the "Speakers Termination" (*speakterm*) parameter) which Terminations (e.g., the active speaker's terminations) are involved in the mix for that particular Termination/Stream. The *speakterm* parameter contains only the TerminationIDs of the active speakers.

The *int* timer is reset upon expiration.

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13.1   Chat and messaging conferencing

Chat services are services where real-time delivery of text is assured. Such services are defined in [ITU-T T.140]~~ITU-T Rec. T.140~~. The use of Chat services in a decomposed MCU is discussed below. Messaging services are services where non-real-time delivery of text occurs, for example, [b-IETF RFC 3428]. These services are typically based on call level messages exchanged between MCs. No MC/MP interaction results from this exchange. As such, messaging service conferencing is not discussed further in this Recommendation.

The Text Conversation service shall be based on [ITU-T T.140]~~ITU-T Rec. T.140~~. The procedures used to establish a T.140 session are beyond the scope of this Recommendation; however, [ITU-T H.248.2]~~ITU-T Rec. H.248.2~~ may be used to establish and negotiate a T.140 Text Telephony session. ~~ITU-T Rec. H.248.2~~[ITU-T H.248.2] provides procedures for alternating text and voice modes. The MP may also provide translation between legacy text conversation standards and [ITU-T T.140]~~ITU-T Rec. T.140~~.

Each text stream received from a user is associated with a T.140 User Identity. The MP shall mix these input streams according to the topology and modes (described in clause 6) and the procedures in [ITU-T T.140]~~ITU-T Rec. T.140~~ and send the applicable text streams with User Identity information to the applicable users.

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Bibliography

[b-IETF RFC 3428]   IETF RFC 3428 (2002), *Session Initiation Protocol (SIP) Extension for Instant Messaging*.

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