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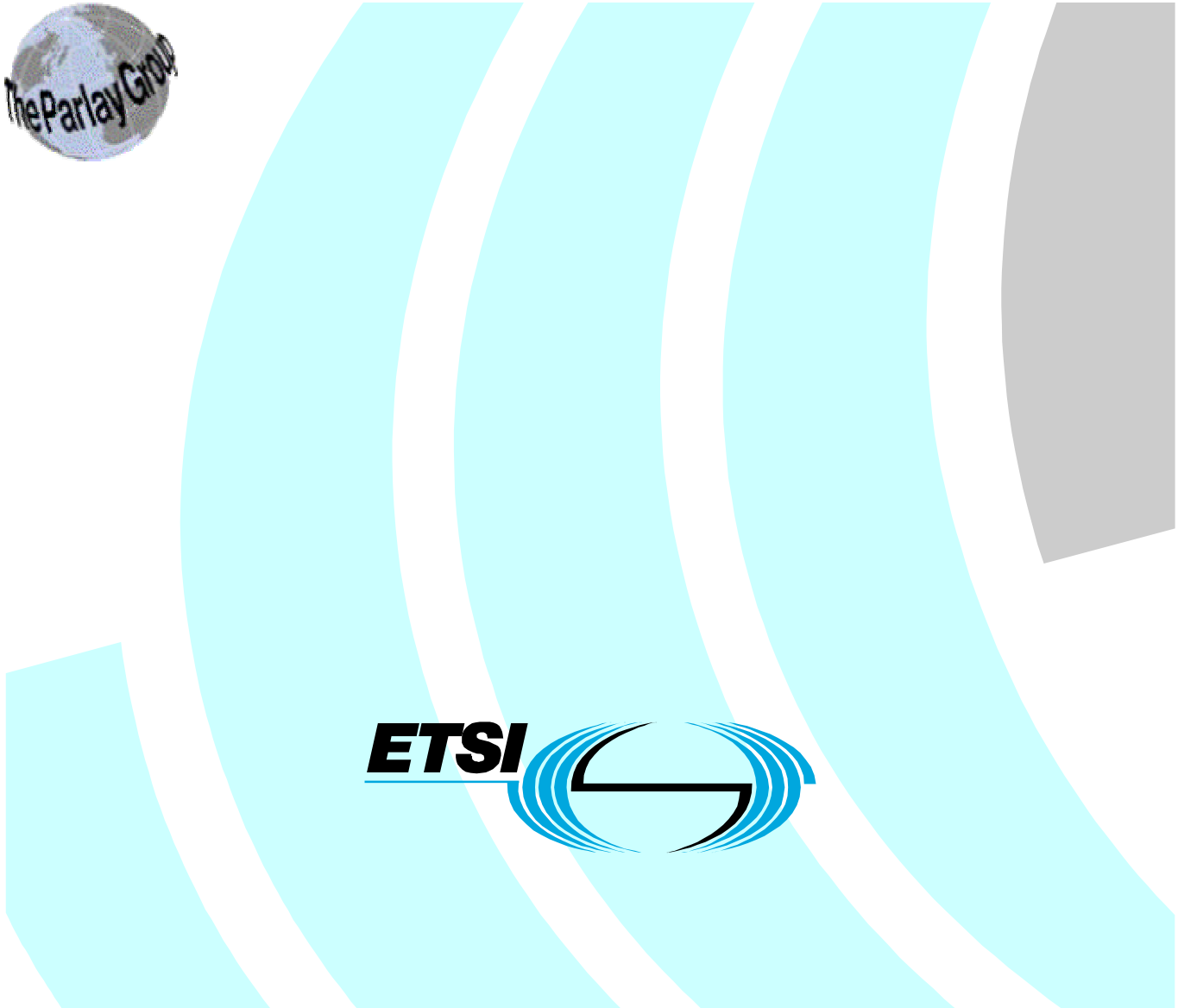
ETSI Standard

Open Service Access (OSA);
Application Programming Interface (API);
Part 4: Call Control;
Sub-part 4: Multi-Media Call Control SCF



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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 4, sub-part 4 of a multi-part deliverable covering Open Service Access (OSA); Application Programming Interface (API), as identified below. The API specification (ES 202 915) is structured in the following parts:

Part 1: "Overview";

Part 2: "Common Data Definitions";

Part 3: "Framework";

Part 4: "Call Control";

- Sub-part 1: "Call Control Common Definitions";
- Sub-part 2: "Generic Call Control SCF";
- Sub-part 3: "Multi-Party Call Control SCF";
- **Sub-part 4: "Multi-Media Call Control SCF";**
- Sub-part 5: "Conference Call Control SCF";

Part 5: "User Interaction SCF";

Part 6: "Mobility SCF";

Part 7: "Terminal Capabilities SCF";

Part 8: "Data Session Control SCF";

Part 9: "Generic Messaging SCF";

Part 10: "Connectivity Manager SCF";

Part 11: "Account Management SCF";

Part 12: "Charging SCF";

Part 13: "Policy Management SCF";

Part 14: "Presence and Availability Management SCF".

The present document has been defined jointly between ETSI, The Parlay Group (http://www.parlay.org) and the 3GPP, in co-operation with a number of JAIN™ Community (http://www.java.sun.com/products/jain) member companies.

The present document forms part of the Parlay 4.0 set of specifications.

The present document is equivalent to 3GPP TS 29.198-4-4 V5.1.0 (Release 5).

1 Scope

The present document is part 4, sub-part 4 of the Stage 3 specification for an Application Programming Interface (API) for Open Service Access (OSA).

The OSA specifications define an architecture that enables application developers to make use of network functionality through an open standardised interface, i.e. the OSA APIs.

The present document specifies the Multi-Media Call Control Service Capability Feature (SCF) aspects of the interface. All aspects of the Multi-Media Call Control SCF are defined here, these being:

- Sequence Diagrams
- Class Diagrams
- Interface specification plus detailed method descriptions
- State Transition diagrams
- Data Definitions
- IDL Description of the interfaces
- WSDL Description of the interfaces
- Reference to the Java API description of the interfaces

The process by which this task is accomplished is through the use of object modelling techniques described by the Unified Modelling Language (UML).

2 References

The references listed in clause 2 of ES 202 915-1 contain provisions which, through reference in this text, constitute provisions of the present document.

ETSI ES 202 915-1: "Open Service Access (OSA); Application Programming Interface (API); Part 1: Overview".

ETSI ES 202 915-2: "Open Service Access (OSA); Application Programming Interface (API); Part 2: Common Data Definitions".

ETSI ES 202 915-4-1: "Open Service Access (OSA); Application Programming Interface (API); Part 4: Call Control; Sub-part 1: Call Control Common Definitions".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ES 202 915-1 apply.

3.2 Abbreviations

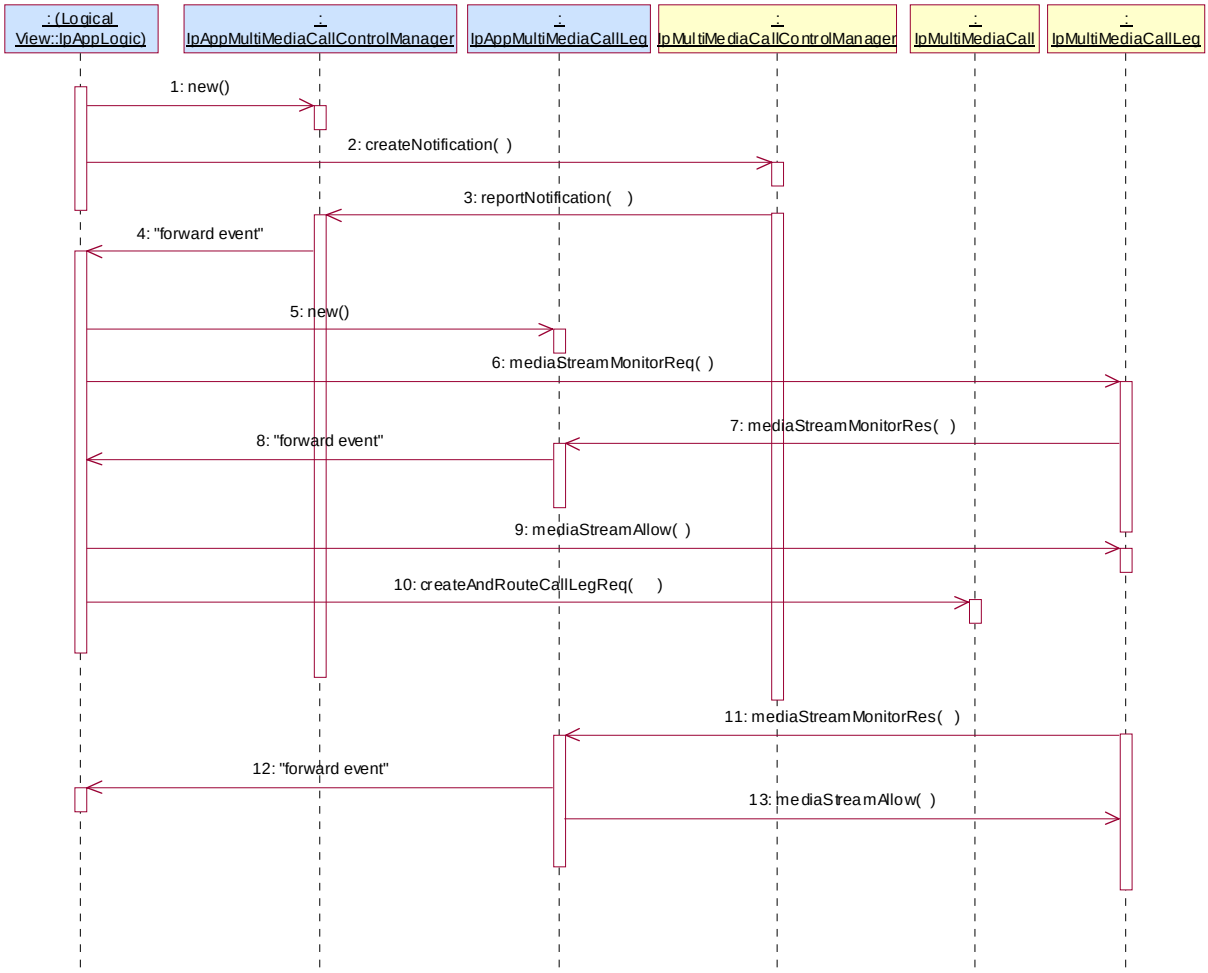
For the purposes of the present document, the abbreviations defined in ES 202 915-1 apply.

4 MultiMedia Call Control Service Sequence Diagrams

4.1 Barring for media combined with call routing, alternative 1

This sequence illustrates how one application can influence both the call routing and the media stream establishment of one call.

In this sequence there is one application handling both the media barring and the routing of the call.



1: The application creates a AppMultiMediaCallControlManager interface in order to handle callback methods.

2: The application expresses interest in all calls from subscriber A. Since createNotification is used and not createMediaNotification all calls are reported regardless of the media used.

3: A makes a call with the SIP INVITE with SDP media stream indicating video. The application is notified.

4: The event is forwarded to the application.

5: The application creates a new AppMultiMediaCallLeg interface to receive callbacks.

6: The application sets a monitor on video media streams to be established (added) for the indicated leg.

7: Since the video media stream was included in the SIP invite, the media streams monitored will be returned in the monitor result.

8: The event is forwarded to the application.

9: The application denies the video media stream, i.e. it is not included in the allowed media streams. This corresponds to removing the media stream from the setup.

10: The application requests to reroute the call to a different destination (or the same one...).

11: Later in the call the A party tries to establish a lower bandwidth video media stream. This is again reported with MediaStreamMonitorRes.

12: The event is forwarded.

13: This time the application allows the establishment of the media stream by including the media stream in the allowed list.

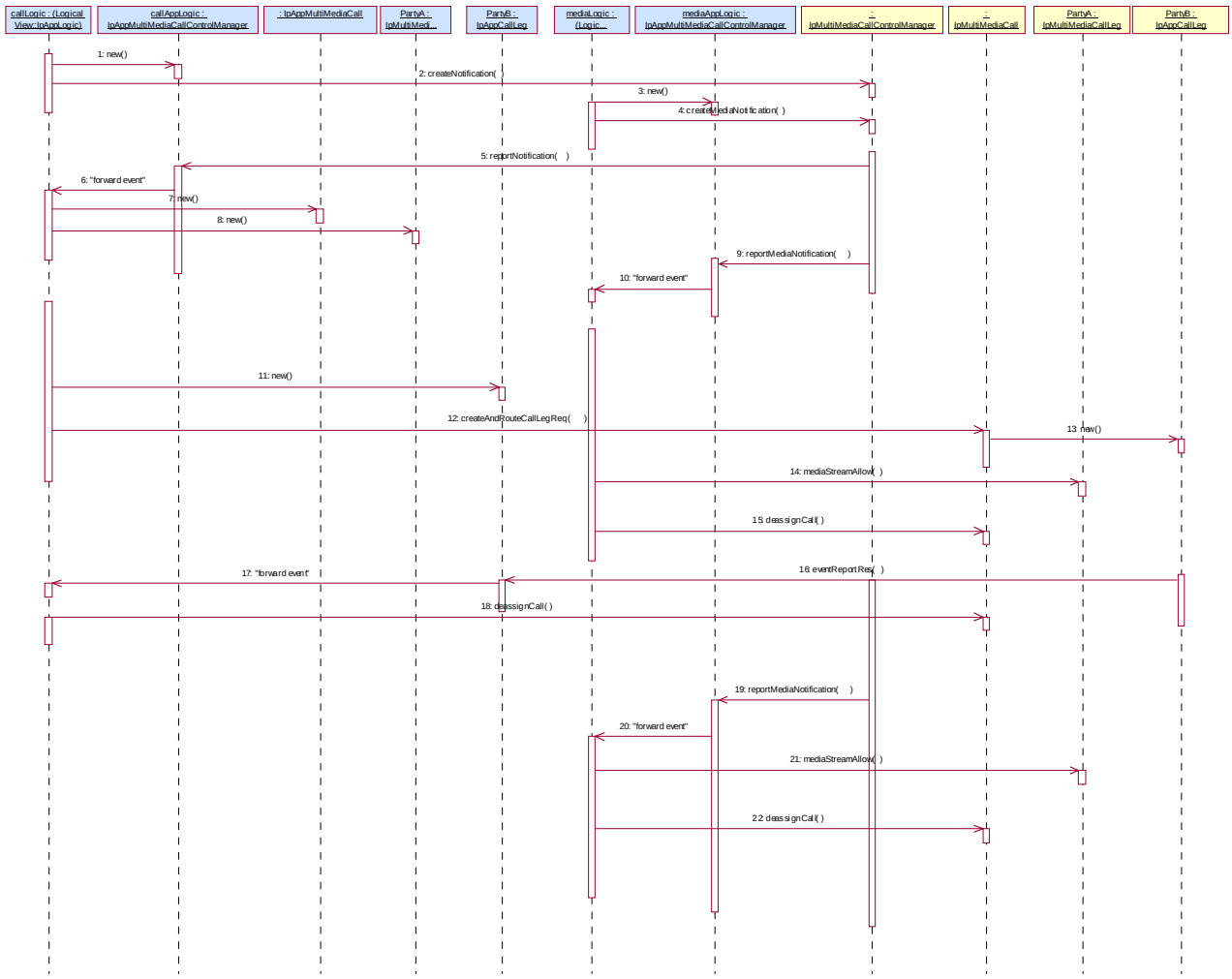
4.2 Barring for media combined with call routing, alternative 2

This sequence illustrates how one application can influence both the call routing and the media establishment of one call.

Media establishment and call establishment are regarded separately by the application.

From the gateway point of view it can actually be regarded as two separately triggered applications, one for media control and one for routing. This is also the way that it is shown here, for clarity.

However, an implementation of the application could combine the media logic and call logic in one object.



1: The application creates a new AppMultiMediaCallControlManager interface.

2: The application expresses interest in all calls from subscriber A for rerouting purposes.

3: The application creates a new AppMultiMediaCallControlManager interface. This is to be used for the media control only.

4: Separately the application expresses interest is some media streams for calls from and to A. The request indicates interrupt mode.

5: Subscriber A makes a call with the SIP INVITE with SDP media stream indicating video. Since the media establishment is combined with the SIP INVITE message, both applications are triggered (not necessarily in the order shown). Here the call application is notified about the call setup.

6: The event is forwarded to the call control application.

7: The call control application creates a new AppMultiMediaCall interface.

8: The call control application creates a new AppMultiMediaCallLeg interface.

9: The media application is notified about the call setup. All media streams from the setup will be indicated.

10: The event is forwarded to the media application.

11: The call control application creates a new AppMultiMediaCallLeg interface.

12: The call application decides to reroute the call to another address. Included in the request are monitors on answer and call end. However, since the media was also triggered in mode interrupt the call will not proceed until the media streams are confirmed or rejected.

14: The application allows the audio media stream, but refuses the high bandwidth video, by excluding it from the allowed list. Since both call processing and media handling is now acknowledged, the call routing can continue (with a changed SDP parameter reflecting the manipulated media).

15: The Media application is no longer interested in the call.

16: When the B subscriber answers the call application is notified.

17: The event is forwarded to the call application.

19: When later in the call A tries to establish a lower bandwidth video stream the media application is triggered.

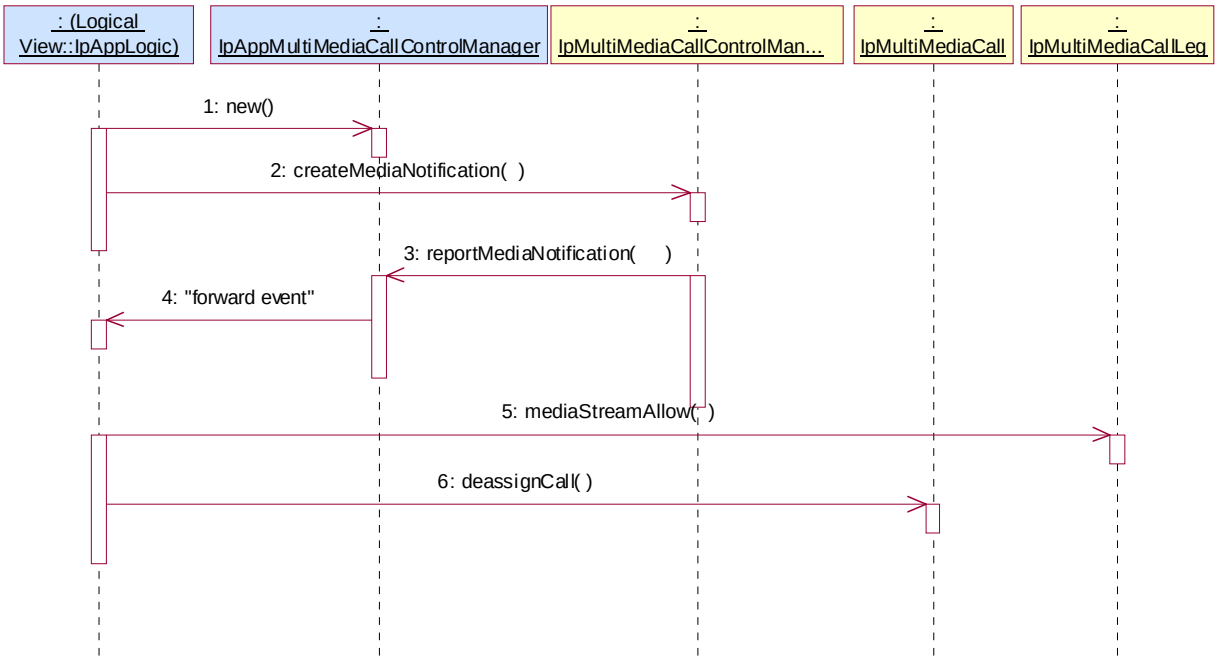
20: The triggering is forwarded to the media application.

21: The application now allows the establishment of the media stream by including the media stream in the mediaStreamAllow list.

22: The media application is no longer interested in the call.

4.3 Barring for media, simple

This sequence illustrates how an application can block the establishment of video streams for a certain user.



1: The application starts a new AppMultiMediaCallControlManager interface for reception of callbacks.

2: The application expresses interest in all calls from or to subscriber A that use video. The just created App interface is given as the callback interface.

3: Subscriber A makes a call with the SIP INVITE with SDP media stream indicating video.

4: The message is forwarded to the application.

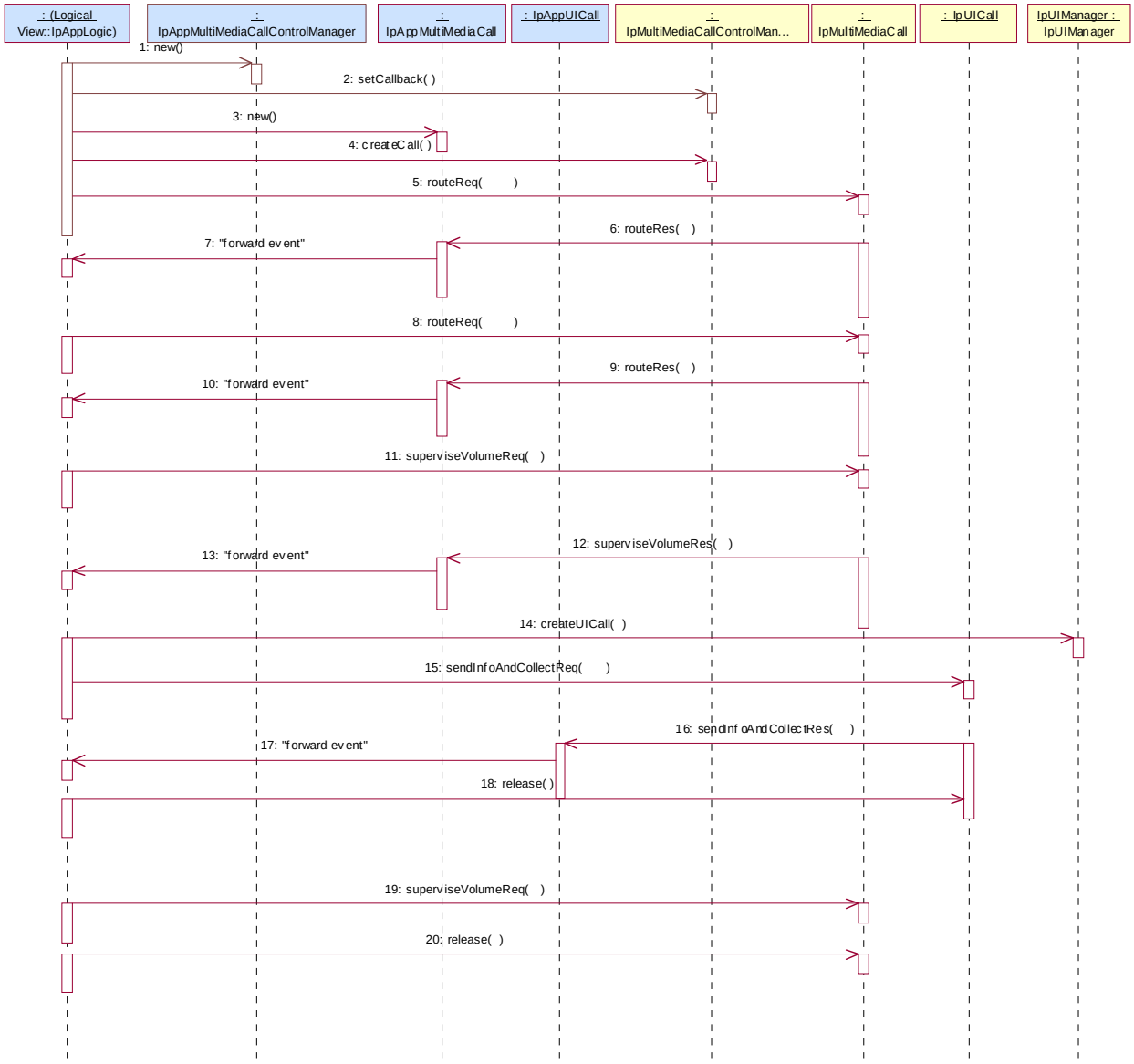
5: The application indicates that the setup of the media stream is not allowed by not including the media stream in the allowed list. This has the effect of suppressing the video capabilities in the setup.

6: The application is no longer interested in the call.

New attempts to open video streams will again be indicated with a createMediaNotification.

4.4 Call Volume charging supervision

This sequence illustrates how an application may supervise a call based on the number of bytes that are exchanged.



1: The application creates a new interface to receive callbacks on the call control manager.

2: The created interface is set as the callback interface for the call control manager.

3: The application creates a new interface to receive callback on the call.

4: The application requests the creation of a call.

5: The application initiates the call by routing to the origination. This will implicitly create a call leg. The application requests a notification when the party answers.

6: When the A party answers the application is notified.

7: The message is forwarded to the logic.

8: The application also routes the call to the destination. This implicitly creates a call leg. The application requests to be notified on answer of the B-party.

9: When the B-party answers the application is notified.

10: The message is forwarded to the logic.

11: The application requests to supervise the call. In the request the application specifies a limit on the amount of bytes that may be transferred. The application specifies that if the limit is reached the application should be notified.

12: When the limit is reached a notification is send to the application.

13: The message is forwarded to the logic.

15: The application plays an announcement to the user, asking whether the user wants to end the call or continue the call.

16: When the user answers whether the call should continue.

17: The message is forwarded to the logic.

18: The UIcall is released, since no further announcements are needed.

19: In case the user answers that the call should continue, the supervision is reset with a new maximum number of allowed bytes. (Note that this might have charging consequences, not shown).

20: If the user answered that the call should not continue, the call is released.

5 Class Diagrams

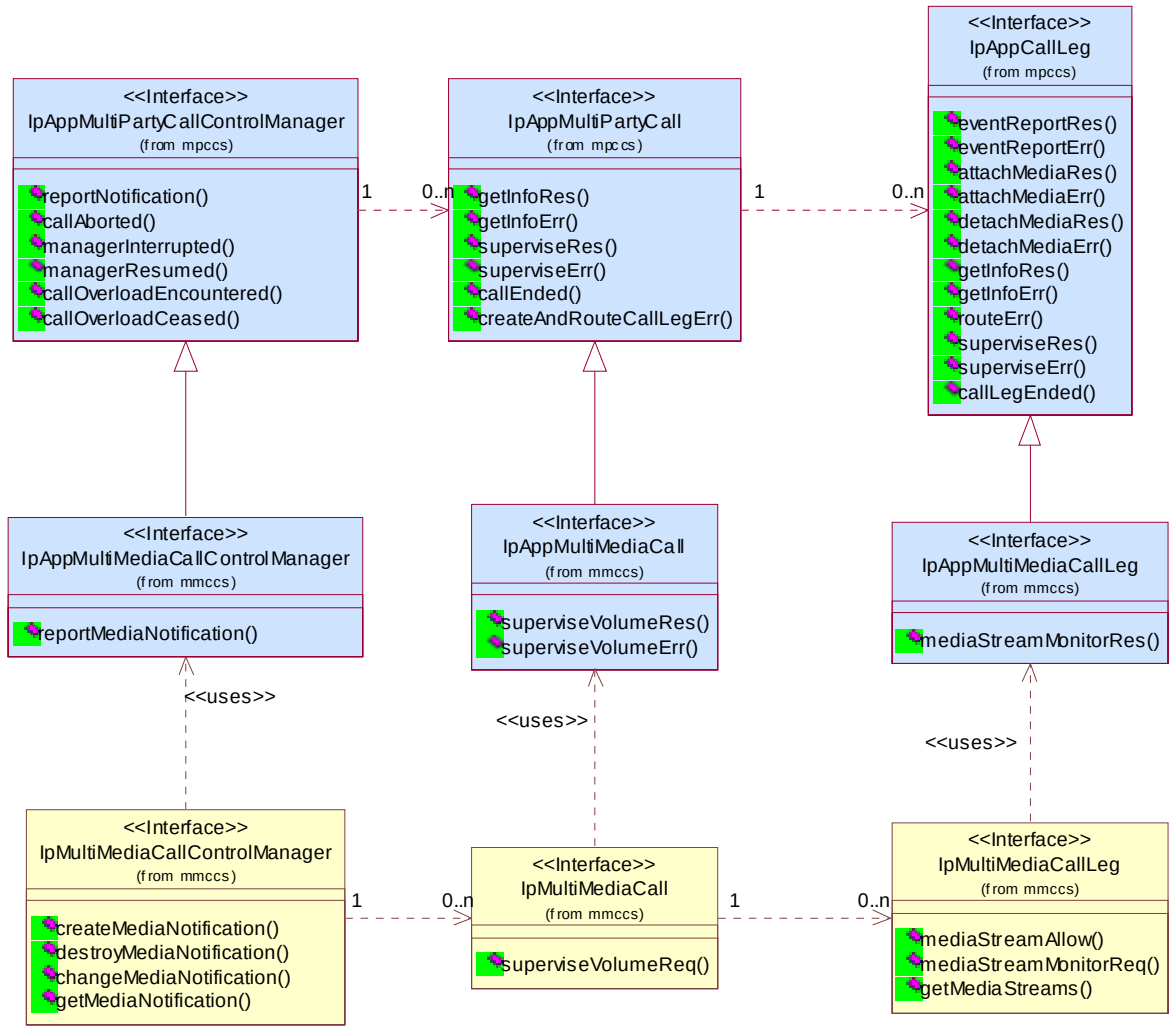


Figure 1: Application Interfaces

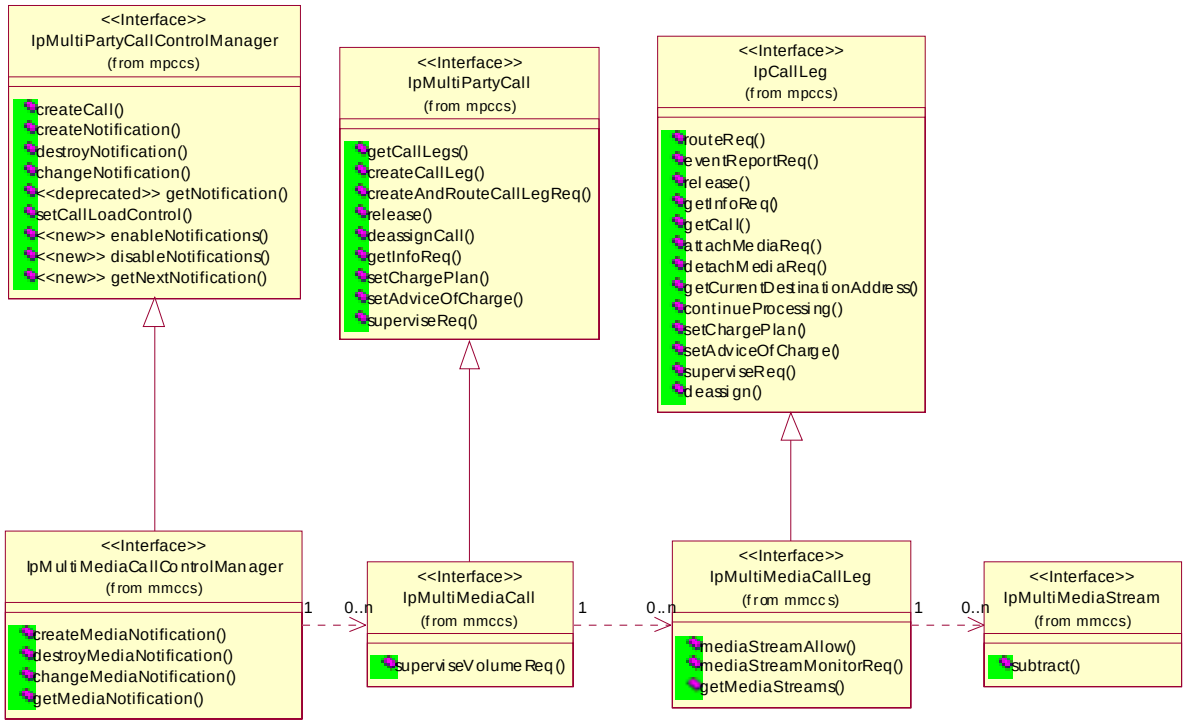


Figure 2: Service Interfaces

6 MultiMedia Call Control Service Interface Classes

The MultiMedia Call Control service enhances the functionality of the MultiParty Call Control Service with multi-media capabilities.

The MultiMedia Call Control Service is represented by the IpMultiMediaCallControlManager, IpMultiMediaCall, IpMultiMediaCallLeg and IpMultiMediaStream interfaces that interface to services provided by the network. Some methods are asynchronous, in that they do not lock a thread into waiting whilst a transaction performs. In this way, the client machine can handle many more calls, than one that uses synchronous message calls. To handle responses and reports, the developer must implement IpAppMultiMediaCallControlManager, IpAppMultiMediaCall and IpAppMultiMediaCallLeg to provide the callback mechanism.

To handle the multi-media aspects of a call the concept of media stream is introduced. A media stream is bi-directional media stream and is associated with a call leg. These media streams are usually negotiated between the terminals in the call. The multi-party Call Service gives the application control over the media streams associated with the legs in a multi-media call in the following way:

· the application can be triggered on the establishment of a media stream that meets the application defined characteristics;

· the application can monitor on the establishment (addition) or release (subtraction) of media streams of an ongoing call;

· the application can allow or deny the establishment of media streams (provided the stream establishment was monitored/notified in interrupt mode);

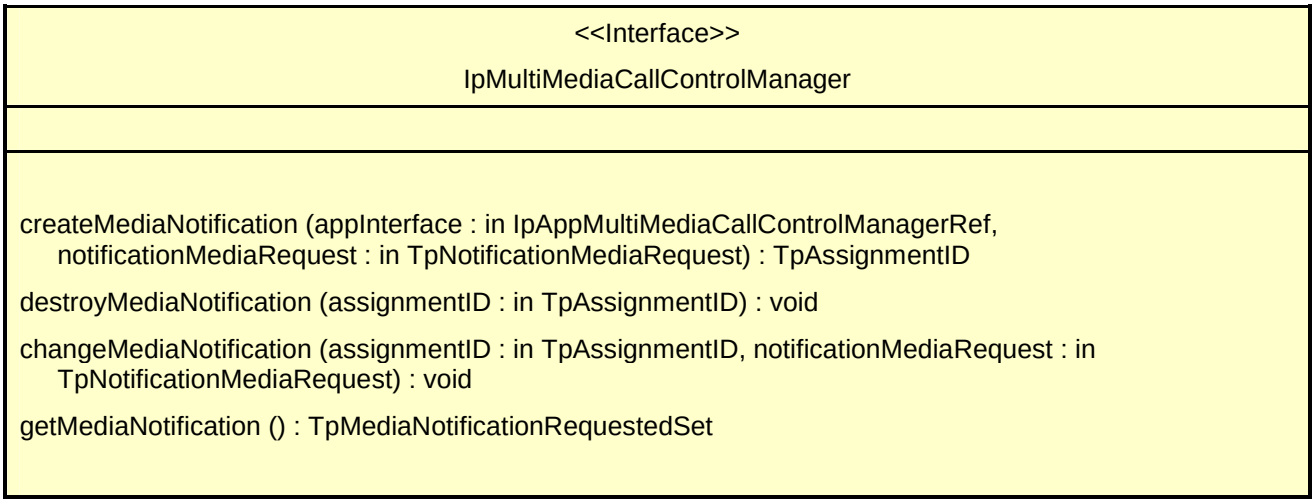
· the application can explicitly subtract already established media stream;

· the application can request the media streams associated with a specific leg.

6.1 Interface Class IpMultiMediaCallControlManager

Inherits from: IpMultiPartyCallControlManager

The Multi Media Call Control Manager is the factory interface for creating multimedia calls. The multi-media call control manager interface provides the management functions to the multi-media call control service. The application programmer can use this interface to create, destroy, change and get media stream related notifications.



6.1.1 Method createMediaNotification()

This method is used to create media stream notifications so that events can be sent to the application.

This applies both to callsetup media (e.g. SIP initial INVITE or H.323 with faststart) and for media setup during the call.

This is the first step an application has to do to get initial notifications of media streams happening in the network. When such an event happens, the application will be informed by reportMediaNotification(). In case the application is interested in other events during the context of a particular call session it has to use the mediaStreamMonitorReq() method on the Multi-Media call leg object.

The createMediaNotification method is purely intended for applications to indicate their interest to be notified when certain media stream events take place. It is possible to subscribe to a certain media stream event for a whole range of addresses, e.g. the application can indicate it wishes to be informed when a call is made to any number starting with 800.

If some application already requested notifications with criteria that overlap the specified criteria, the request is refused with P_INVALID_CRITERIA. The criteria are said to overlap if both originating and terminating ranges overlap and the same number plan is used.

If the same application requests two notifications with exactly the same criteria but different callback references, the second callback will be treated as an additional callback. Both notifications will share the same assignmentID. The gateway will always use the most recent callback. In case this most recent callback fails the second most recent is used. In case the createMediaNotification contains no callback, at the moment the application needs to be informed the gateway will use as callback the one that has been registered by setCallback().

Returns assignmentID: Specifies the ID assigned by the multi-media call control manager interface for this newly-created notification.

Parameters

`appInterface : in IpAppMultiMediaCallControlManagerRef`

Specifies a reference to the application interface, which is used for callbacks.

notificationMediaRequest : in TpNotificationMediaRequest

The mediaMonitorMode is a parameter of TpMediaStreamRequest and can be in interrupt or in notify mode. If in interrupt mode the application has to specify which media streams are allowed by calling mediaStreamAllow on the callLeg.

The notificationMediaRequest parameter specifies the event specific criteria used by the application to define the event required. This is the media portion of the criteria. Only events that meet the notificationMediaRequest are reported.

Individual addresses or address ranges may be specified for the destination and/or origination.

Returns

TpAssignmentID

Raises

TpCommonExceptions, P_INVALID_CRITERIA, P_INVALID_INTERFACE_TYPE, P_INVALID_EVENT_TYPE

6.1.2 Method destroyMediaNotification()

This method is used by the application to disable Multi Media Channel notifications.

Parameters

assignmentID : in TpAssignmentID

Specifies the assignment ID given by the Multi Media call control manager interface when the previous enableMediaNotification was called. If the assignment ID does not correspond to one of the valid assignment IDs, the exception P_INVALID_ASSIGNMENTID will be raised.

Raises

TpCommonExceptions

6.1.3 Method changeMediaNotification()

This method is used by the application to change the event criteria introduced with createMediaNotification. Any stored criteria associated with the specified assignmentID will be replaced with the specified criteria.

Parameters

assignmentID : in TpAssignmentID

Specifies the ID assigned by the multi-media call control manager interface for the media stream notification. If two callbacks have been registered under this assignment ID both of them will be disabled.

notificationMediaRequest : in TpNotificationMediaRequest

Specifies the new set of event specific criteria used by the application to define the event required. Only events that meet these criteria are reported.

Raises

TpCommonExceptions, P_INVALID_ASSIGNMENT_ID, P_INVALID_CRITERIA, P_INVALID_EVENT_TYPE

6.1.4 Method getMediaNotification()

This method is used by the application to query the event criteria set with createMediaNotification or changeMediaNotification.

Returns notificationsMediaRequested: Specifies the notifications that have been requested by the application.

Parameters
No Parameters were identified for this method

Returns

`TpMediaNotificationRequestedSet`

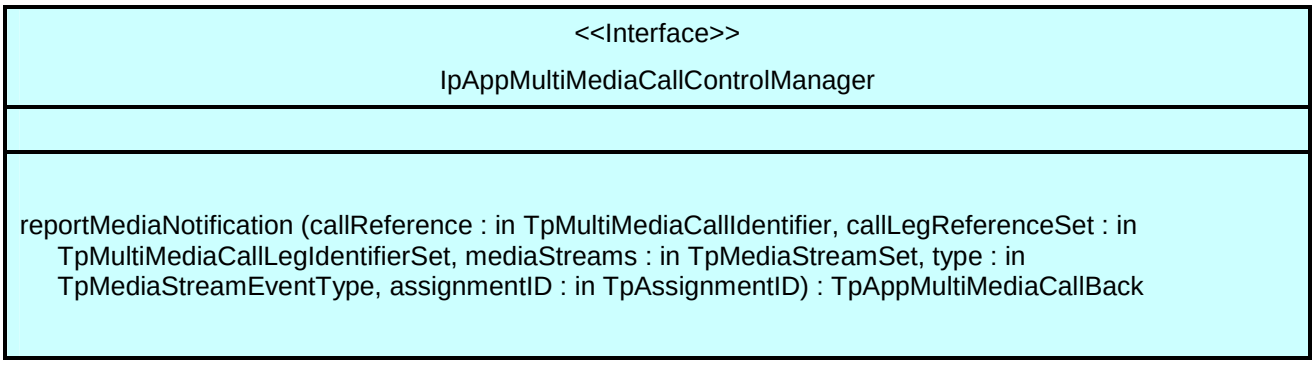
Raises

`TpCommonExceptions`

6.2 Interface Class IpAppMultiMediaCallControlManager

Inherits from: IpAppMultiPartyCallControlManager

The Multi Media call control manager application interface provides the application call control management functions to the multi media call control service.



6.2.1 Method reportMediaNotification()

This method is used to inform the application about the establishment of media streams.

If the corresponding monitor was in interrupt mode, then the application has to allow or deny the streams using mediaStreamAllow() method.

Returns appInterface: Specifies a reference to the application interface which implements the callback interface for the new call.

Returns appMultiMediaCallBack: Specifies references to the application interface which implements the callback interface for the new multi-media call and/or new call leg. This parameter may be null if the notification is being given in NOTIFY mode.

Parameters

`callReference : in TpMultiMediaCallIdentifier`

Specifies the call interface on which the media streams were added or subtracted. It also gives the corresponding sessionID.

callLegReferenceSet : in TpMultiMediaCallLegIdentifierSet

Specifies set of all callLeg references (interface and sessionID) for which the media streams were established or subtracted.

First in the set is the reference to the originating callLeg. It indicates the call leg related to the originating party. In case there is a destination call leg this will be the second leg in the set. From the notificationInfo can be found on whose behalf the notification was sent.

However, this parameter will be null if the notification is being given in NOTIFY mode.

mediaStreams : in TpMediaStreamSet

Specifies all the media streams that are established. Note that this can be more media streams than requested in the createMediaNotification, e.g. when faststart is used in H.323 or in SIP when an INVITE method with SDP media stream parameters is used.

type : in TpMediaStreamEventType

Refers to the type of event on the media stream, i.e. added or subtracted.

assignmentID : in TpAssignmentID

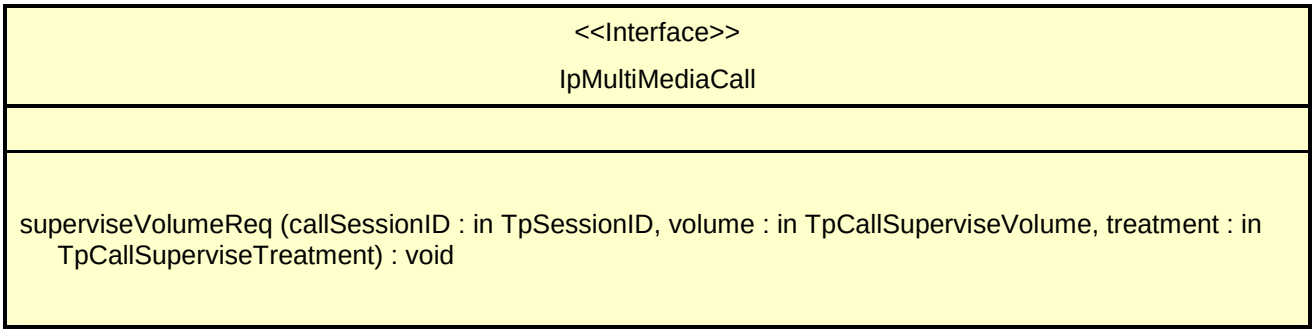
Specifies the assignment id which was returned by the createMediaNotification() method. The application can use assignment id to associate events with event specific criteria and to act accordingly.

Returns

TpAppMultiMediaCallBack

6.3 Interface Class IpMultiMediaCall

Inherits from: IpMultiPartyCall



6.3.1 Method superviseVolumeReq()

The application calls this method to supervise a call. The application can set a granted data volume this call.

Parameters

callSessionID : in TpSessionID

Specifies the call session ID of the call.

volume : in TpCallSuperviseVolume

Specifies the granted time in milliseconds for the connection.

`treatment : in TpCallSuperviseTreatment`

Specifies how the network should react after the granted volume expired.

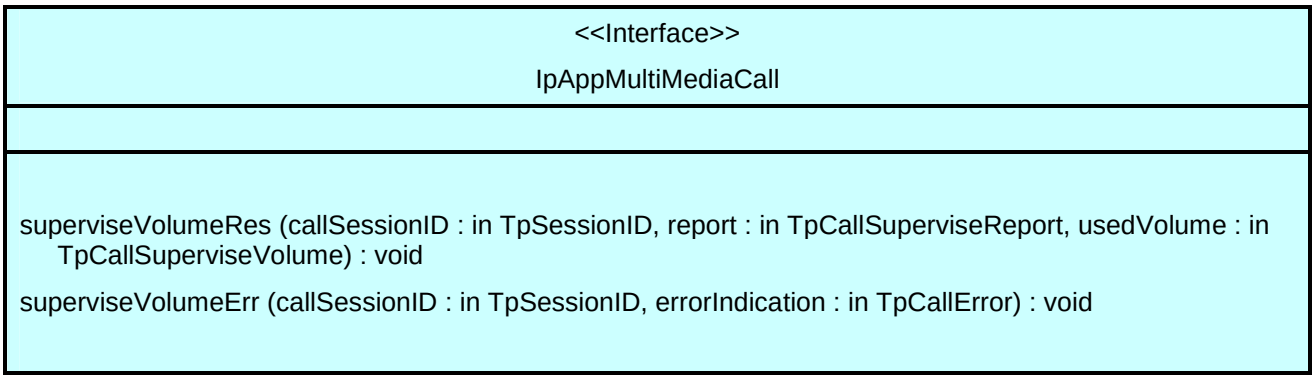
Raises

`TpCommonExceptions, P_INVALID_SESSION_ID`

6.4 Interface Class IpAppMultiMediaCall

Inherits from: IpAppMultiPartyCall

The application multi-media call interface contains the callbacks that will be used from the multi-media call interface for asynchronous results to requests performed by the application. The application should implement this interface.



6.4.1 Method superviseVolumeRes()

This asynchronous method reports a call supervision event to the application when it has indicated its interest in these kind of events.

It is also called when the connection is terminated before the supervision event occurs. Furthermore, this method is invoked as a response to the request also when a tariff switch happens in the network during an active call.

Parameters

`callSessionID : in TpSessionID`

Specifies the call session ID of the call

`report : in TpCallSuperviseReport`

Specifies the situation which triggered the sending of the call supervision response.

`usedVolume : in TpCallSuperviseVolume`

Specifies the used time for the call supervision (in milliseconds).

6.4.2 Method superviseVolumeErr()

This asynchronous method reports a call supervision error to the application.

Parameters

`callSessionID : in TpSessionID`

Specifies the call session ID of the call.

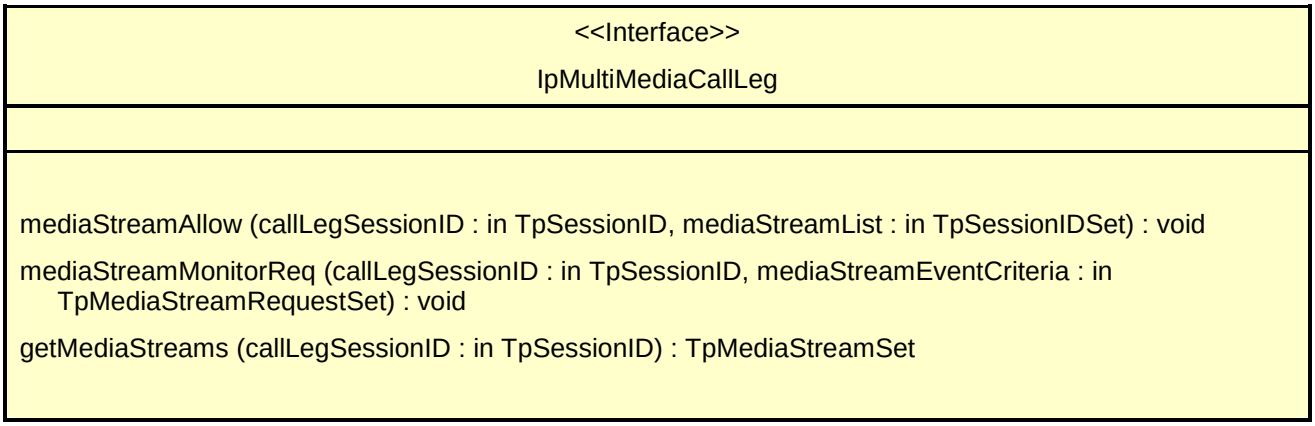
errorIndication : in TpCallError

Specifies the error which led to the original request failing.

6.5 Interface Class IpMultiMediaCallLeg

Inherits from: IpCallLeg

The Multi-Media call leg represents the signalling relationship between the call and an address. Associated with the signalling relationship there can be multiple media channels. Media channels can be started and stopped by the terminals themselves. The application can monitor on these changes and influence them.



6.5.1 Method mediaStreamAllow()

This method can be used to allow setup of a media stream that was reported by a mediaStreamMonitorRes method.

Parameters

callLegSessionID : in TpSessionID

Specifies the call leg session ID of the call leg.

mediaStreamList : in TpSessionIDSet

Refers to the media streams (sessionIDs) as received in the mediaStreamMonitorRes() or in the reportMediaNotification() that is allowed to be established.

Raises

TpCommonExceptions, P_INVALID_SESSION_ID

6.5.2 Method mediaStreamMonitorReq()

With this method the application can set monitors on the addition and subtraction of media streams. The monitors can either be general or restricted to certain types of codecs.

Monitoring on addition of media streams can be done in either interrupt of notify mode. In the first case the application has to allow or deny the establishment of the stream with mediaStreamAllow.

Monitoring on subtraction of media streams is only allowed in notify mode.

Parameters

callLegSessionID : in TpSessionID

Specifies the session ID of the call leg.

mediaStreamEventCriteria : in TpMediaStreamRequestSet

Specifies the event specific criteria used by the application to define the event required. The mediaMonitorMode .is a parameter of TpMediaStreamRequest and can be in interrupt or in notify mode. If in interrupt mode the application has to respond with mediaStreamAllow().

Raises

TpCommonExceptions, P_INVALID_SESSION_ID, P_INVALID_CRITERIA, P_INVALID_EVENT_TYPE

6.5.3 Method getMediaStreams()

This method is used to return all currently established media streams for the leg.

Parameters

callLegSessionID : in TpSessionID

This method is used to return all currently open media channels for the leg.

Returns

TpMediaStreamSet

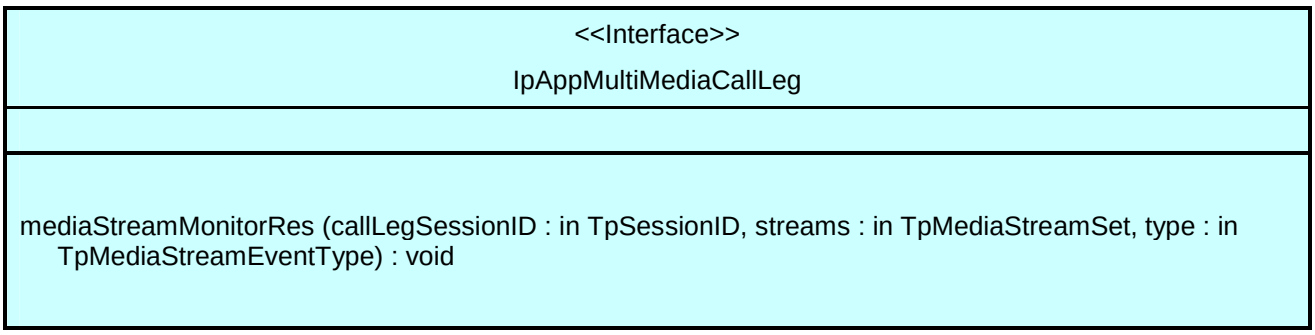
Raises

TpCommonExceptions, P_INVALID_SESSION_ID

6.6 Interface Class IpAppMultiMediaCallLeg

Inherits from: IpAppCallLeg

The application multi-media call leg interface contains the callbacks that will be called from the multi-media call leg for asynchronous results to requests performed by the application. The application should implement this interface.



6.6.1 Method mediaStreamMonitorRes()

This method is used to inform the application about the media streams that are being established (added) or subtracted.

If the corresponding request was done in interrupt mode, the application has to allow or deny the media streams using mediaStreamAllow().

Parameters

`callLegSessionID : in TpSessionID`

Specifies the session ID of the call leg for which the media channels are opened or closed.

`streams : in TpMediaStreamSet`

Specifies all the media streams that are added. Note that this can be more media streams than requested in the createMediaNotification, e.g. when faststart is used in H.323 or SIP INVITE with SDP media stream parameters is used.

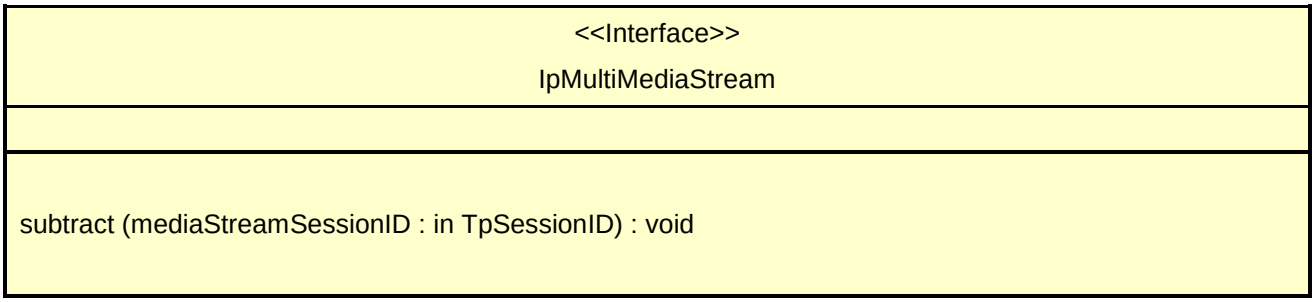
`type : in TpMediaStreamEventType`

Refers to the type of event on the media stream, i.e. added or subtraced.

6.7 Interface Class IpMultiMediaStream

Inherits from: IpService

The Multi Media Stream Interface represents a bi-directional information stream associated with a call leg. Currently, the only available method is to subtract the media stream.



6.7.1 Method subtract()

This method can be used to subtract the multi-media stream.

Parameters

`mediaStreamSessionID : in TpSessionID`

Specifies the sessionID for the media stream.

Raises

`TpCommonExceptions, P_INVALID_SESSION_ID`

7 MultiMedia Call Control Service State Transition Diagrams

There are no State Transition Diagrams for the MultiMedia Call Control Service package.

8 Multi-Media Call Control Data Definitions

This clause provides the Multi-Media call control data definitions necessary to support the API specification.

The general format of a data definition specification is described below.

- Data Type

This shows the name of the data type.

- Description

This describes the data type.

- Tabular Specification

This specifies the data types and values of the data type.

- Example

If relevant, an example is shown to illustrate the data type.

All data types referenced in the present document but not defined in this clause are defined either in the common call control data definitions in ES 202 915-4-1 or in the common data definitions which may be found in ES 202 915-2.

8.1 Event Notification Data Definitions

8.1.1 TpMediaStreamRequestSet

Defines a `Numbered Set of Data Elements` of `TpMediaStreamRequest`.

8.1.2 TpMediaStreamRequest

Defines the `Sequence of Data Elements` that specify the type of media stream.

Sequence Element Name	Sequence Element Type
Direction	TpMediaStreamDirection
DataTypeRequest	TpMediaStreamDataTypeRequest
MediaMonitorMode	TpCallMonitorMode

8.1.3 TpMediaStreamDirection

Defines the direction in which the media stream is established (as seen from the leg).

Name	Value	Description
P_SEND_ONLY	0	Indicates that the offerer is only willing to send this media stream
P_RECEIVE_ONLY	1	Indicates that the offerer is only willing to receive this media stream
P_SEND_RECEIVE	2	Indicates that the offerer is willing to send and receive this media stream

8.1.4 TpMediaStreamDataTypeRequest

Defines the `Tagged Choice of Data Elements` that specify the media type and associated codecs that are of interest.

	Tag Element Type	
	TpMediaType	

Tag Element Value	Choice Element Type	Choice Element Name
P_AUDIO	TpAudioCapabilitiesType	Audio
P_VIDEO	TpVideoCapabilitiesType	Video
P_DATA	TpDataCapabilities	Data

8.1.5 TpAudioCapabilitiesType

Defines the audio codec. The requested capabilities can be indicated by adding the values together (i.e. a logical OR function). e.g. 28 indicates interest in all ITU-T Recommendation G.722 codes (4+8+16).

Name	Value	Description
P_G711_64K	1	ITU-T Recommendation G.711 on 64k, both alaw and ulaw
P_G711_56K	2	ITU-T Recommendation G.711 on 56k, both alaw and ulaw
P_G722_64K	4	
P_G722_56K	8	
P_G722_48K	16	
P_G7231	32	
P_G728	64	
P_G729	128	
P_G729_ANNEX_A	256	
P_IS1172	512	
P_IS1318	1024	
P_G729_ANNEXB	2048	
P_G729_ANNEX_A_AND_B	4096	
P_G7231_ANNEX_C	8192	
P_GSM_FULLRATE	16384	
P_GSM_HALFRATE	32768	
P_GSM_ENHANCED	65536	

8.1.6 TpVideoCapabilitiesType

Defines the video codec. The requested capabilities can be indicated by adding the values together (i.e. a logical OR function). e.g. 3 indicates both ITU-T Recommendations H.261 and H.262 codecs.

Name	Value	Description
P_H261	1	
P_H262	2	
P_H263	4	
P_IS11172	8	

8.1.7 TpDataCapabilities

A TpInt32 defining the minimum maxBitRate in bit/s. I.e. all data media streams whose maxBitRate exceeds this number are reported.

8.1.8 TpMediaStreamEventType

Defines the action performed on the media stream.

Name	Value	Description
P_MEDIA_STREAM_ADDED	0	The media stream is added
P_MEDIA_STREAM_SUBTRACTED	1	The media stream is subtracted.

8.1.9 TpMediaStreamSet

Defines a `Numbered Set of Data Elements` of `Tp`MediaStream.

8.1.10 TpMediaStream

Defines the `Sequence of Data Elements` that specify the type of media stream.

Sequence Element Name	Sequence Element Type
Direction	TpMediaStreamDirection
DataType	TpMediaStreamDataType
ChannelSessionID	TpSessionID
MediaStream	IpMultiMediaStream

8.1.11 TpMediaStreamDataType

Defines the type of the reported media stream. It is identical to `TpMediaStreamDataTypeRequest`, only now the values are not used as a mask, but as the actual codec should be indicated for audio and video. For data the actual maximum bit rate is indicated.

8.2 Multi-Media Call Control Data Definitions

8.2.1 IpMultiMediaCall

Defines the address of an `IpMultiMediaCall` Interface.

8.2.2 IpMultiMediaCallRef

Defines a `Reference` to type IpMultiMediaCall.

8.2.3 IpAppMultiMediaCall

Defines the address of an `IpAppMultiMediaCall` Interface.

8.2.4 IpAppMultiMediaCallRef

Defines a `Reference` to type IpAppMultiMediaCall.

8.2.5 IpMultiMediaCallLeg

Defines the address of an `IpMultiMediaCallLeg` Interface.

8.2.6 IpMultiMediaCallLegRef

Defines a `Reference` to type IpMultiMediaCallLeg.

8.2.7 IpAppMultiMediaCallLeg

Defines the address of an `IpAppMultiMediaCallLeg` Interface.

8.2.8 IpAppMultiMediaCallLegRef

Defines a `Reference` to type IpAppMultiMediaCallLeg.

8.2.9 TpAppMultiMediaCallLegRefSet

Defines a `Numbered Set of Data Elements of IpAppMultiMediaCallLegRef`.

8.2.10 TpMultiMediaCallIdentifier

Defines the Sequence of Data Elements that unambiguously specify the MultiMediaCall object.

Sequence Element Name	Sequence Element Type	Sequence Element Description
MMCallReference	IpMultiMediaCallRef	This element specifies the interface reference for the call object.
MMCallSessionID	TpSessionID	This element specifies the call session ID of the call created.

8.2.11 TpMultiMediaCallIdentifierSet

Defines a Numbered Set of Data Elements of TpMultiMediaCallIdentifier.

8.2.12 TpMultiMediaCallLegIdentifier

Defines the Sequence of Data Elements that unambiguously specify the Call Leg object.

Sequence Element Name	Sequence Element Type	Sequence Element Description
MMCallLegReference	IpMultiMediaCallLegRef	This element specifies the interface reference for the callLeg object.
MMCallLegSessionID	TpSessionID	This element specifies the callLeg session ID of the call created.

8.2.13 IpAppMultiMediaCallControlManager

Defines the address of an `IpAppMultiMediaCallControlManager` Interface.

8.2.14 IpAppMultiMediaCallControlManagerRef

Defines a `Reference` to type IpAppMultiMediaCallControlManager.

8.2.15 TpAppMultiMediaCallBack

Defines the Tagged Choice of Data Elements that references the application callback interfaces.

	Tag Element Type	
	TpAppMultiMediaCallBackRefType	

Tag Element Value	Choice Element Type	Choice Element Name
P_APP_CALLBACK_UNDEFINED	NULL	Undefined
P_APP_MULTIMEDIA_CALL_CALLBACK	IpAppMultiMediaCallRef	AppMultiMediaCall
P_APP_CALL_LEG_CALLBACK	IpAppMultiMediaCallLegRef	AppMultiMediaCallLeg
P_APP_CALL_AND_CALL_LEG_CALLBACK	TpAppMultiMediaCallLegCallBack	AppMultiMediaCallAndCallLeg

8.2.16 TpAppMultiMediaCallBackRefType

Defines the type application call back interface.

Name	Value	Description
P_APP_CALLBACK_UNDEFINED	0	Application Call back interface undefined
P_APP_MULTIMEDIA_CALL_CALLBACK	1	Application Multi-Media Call interface referenced
P_APP_CALL_LEG_CALLBACK	2	Application Multi-Media CallLeg interface referenced
P_APP_CALL_AND_CALL_LEG_CALLBACK	3	Application Multi-Media Call and CallLeg interface referenced

8.2.17 TpAppMultiMediaCallLegCallBack

Defines the Sequence of Data Elements that references a call and a call leg application interface.

Sequence Element Name	Sequence Element Type	Description
AppMultiMediaCall	IpAppMultiMediaCallRef	
AppCallLegSet	TpAppMultiMediaCallLegRefSet	Specifies the set of all call leg call back references. First in the set is the reference to the call back of the originating callLeg. In case there is a call back to a destination call leg this will be second in the set.

8.2.18 TpCallSuperviseVolume

Defines the Sequence of Data Elements that specify the amount of volume that is allowed to be transmitted for the specific connection.

Sequence Element Name	Sequence Element Type	Sequence Element Description
VolumeQuantity	TpInt32	This data type is identical to a TpInt32, and defines the quantity of the granted volume that can be transmitted for the specific connection.
VolumeUnit	TpInt32	This data type is identical to a TpInt32, and defines the unit of the granted volume that can be transmitted for the specific connection. Unit must be specified as 10^n number of bytes, where n denotes the power. When the unit is for example in kilobytes, VolumeUnit must be set to 3.

8.2.19 TpNotificationMediaRequest

Defines the Sequence of Data Elements that specify the criteria for a media stream notification

Sequence Element Name	Sequence Element Type	Description
MediaNotificationScope	TpCallNotificationScope	Defines the scope of the notification request.
MediaStreamsRequested	TpMediaStreamRequestSet	Defines the media stream events which are requested

8.2.20 TpMediaNotificationRequested

Defines the Sequence of Data Elements that specify the criteria relating to event requests.

Sequence Element Name	Sequence Element Type
AppNotificationMediaRequest	TpNotificationMediaRequest
AssignmentID	TpInt32

8.2.21 TpMediaNotificationsRequestedSet

Defines a numbered Set of Data Elements of TpMediaNotificationRequested.

Annex A (normative): OMG IDL Description of Multi-Media Call Control SCF

The OMG IDL representation of this interface specification is contained in a text file (mmccs.idl contained in archive es_2029150404v010101p0.ZIP) which accompanies the present document.

Annex B (informative): W3C WSDL Description of Multi-Media Call Control SCF

The W3C WSDL representation of this interface specification is contained in text files (mmccs.wsdl contained in archive es_2029150404v010101p0.ZIP) which accompanies the present document.

Annex C (informative): Java API Description of the Call Control SCFs

The Java API representation of this interface specification can be obtained from the following URL:

- Java Call Control (http://jcp.org/jsr/detail/21.jsp)

Each JSR webpage contains a table identifying the relationships between the different versions of the Parlay, ETSI/OSA, 3GPP/OSA and JAIN SPA specifications. In addition, each JAIN SPA specification version indicates to which Parlay, ETSI/OSA and 3GPP/OSA specification versions it corresponds to.

Annex D (informative): Contents of 3GPP OSA Rel-5 Call Control

All items in Multi-Media Call Control are relevant for TS 129 198-4-4 V5 (Release 5).

Annex E (informative): Record of changes

The following is a list of the changes made to the present document for each release. The list contains the names of all changed, deprecated, added or removed items in the specifications and not the actual changes. Any type of change information that is important to the reader is put in the final clause of this annex.

Changes are specified as changes to the prior major release, but every minor release will have its own part of the table allowing the reader to know when the actual change was made.

E.1 Interfaces

E.1.1 New

Identifier	Comments
Interfaces added in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.1.2 Deprecated

Identifier	Comments
Interfaces deprecated in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.1.3 Removed

Identifier	Comments
Interfaces removed in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.2 Methods

E.2.1 New

Identifier	Comments
Methods added in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.2.2 Deprecated

Identifier	Comments
Methods deprecated in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.2.3 Modified

Identifier	Comments
Methods modified in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.2.4 Removed

Identifier	Comments
Methods removed in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.3 Data Definitions

E.3.1 New

Identifier	Comments
Data Definitions added in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.3.2 Modified

Identifier	Comments
Data Definitions modified in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.3.3 Removed

Identifier	Comments
Data Definitions removed in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.4 Service Properties

E.4.1 New

Identifier	Comments
Service Properties added in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.4.2 Deprecated

Identifier	Comments
Service Properties deprecated in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.4.3 Modified

Identifier	Comments
Service Properties modified in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.4.4 Removed

Identifier	Comments
Service Properties removed in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.5 Exceptions

E.5.1 New

Identifier	Comments
Exceptions added in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.5.2 Modified

Identifier	Comments
Exceptions modified in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.5.3 Removed

Identifier	Comments
Exceptions removed in ES 202 915-4-4 version 1.1.1 (Parlay 4.0)	

E.6 Others

History

Document history		
V1.1.1	November 2002	Membership Approval Procedure MV 20030117: 2002-11-19 to 2003-01-17
V1.1.1	January 2003	Publication