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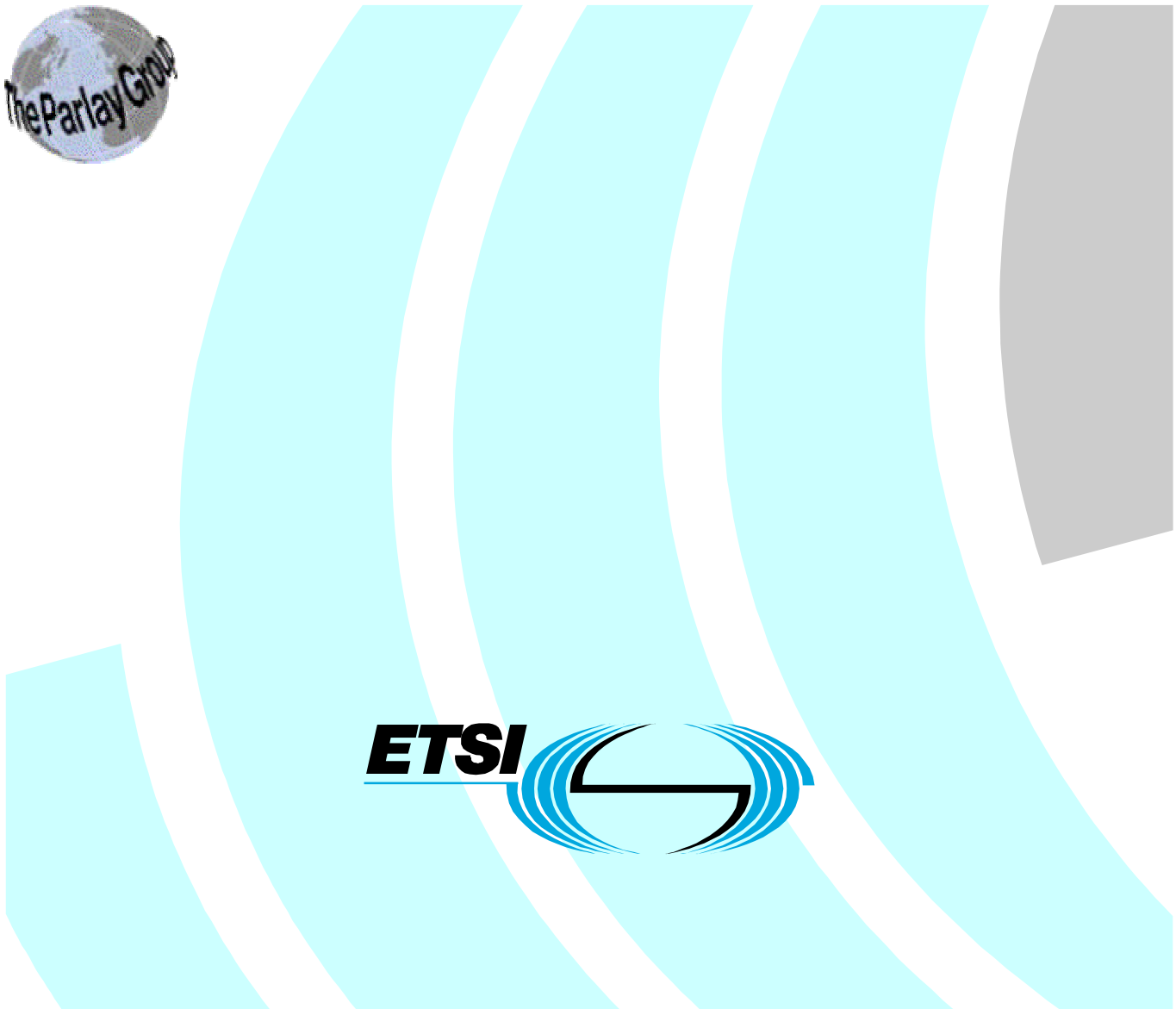
ETSI Standard

Open Service Access (OSA); Application Programming Interface (API); Part 5: User Interaction SCF



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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN), and is now submitted for the ETSI standards Membership Approval Procedure.

The present document is part 5 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";

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 4.1 set of specifications.

The present document is equivalent to 3GPP TS 29.198-5 V5.2.0 (Release 5).

1 Scope

The present document is 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 User Interaction (UI) Service Capability Feature (SCF) aspects of the interface. All aspects of the User Interaction 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 202 915-4-2: "Open Service Access (OSA); Application Programming Interface (API); Part 4: Call Control; Sub-part 2: Generic Call Control SCF".

ETSI ES 202 915-4-3: "Open Service Access (OSA); Application Programming Interface (API); Part 4: Call Control; Sub-part 3: Multi-Party Call Control SCF".

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 Generic and Call User Interaction SCF

The Generic User Interaction service capability feature is used by applications to interact with end users. It consists of three interfaces:

1) User Interaction Manager, containing management functions for User Interaction related issues;

2) Generic User Interaction, containing methods to interact with an end-user.

3) Call User Interaction, containing methods to interact with an end-user engaged in a call.

The Generic User Interaction service capability feature is described in terms of the methods in the Generic User Interaction interfaces.

The following table gives an overview of the Generic User Interaction methods and to which interfaces these methods belong.

Table 1: Overview of Generic User Interaction interfaces and their methods

User Interaction Manager	Generic User Interaction
createUI	sendInfoReq
createUICall	sendInfoRes
createNotification	sendInfoErr
destroyUINotification	sendInfoAndCollectReq
reportNotification	sendInfoAndCollectRes
userInteractionAborted	sendInfoAndCollectErr
userInteractionNotificationInterrupted	release
userInteractionNotificationContinued	UserInteractionFaultDetected
changeNotification	
getNotification	
enableNotifications	
disableNotifications	

The following table gives an overview of the Call User Interaction methods and to which interfaces these methods belong.

Table 2: Overview of Call User Interaction interfaces and their methods

User Interaction Manager	Call User Interaction
As defined for the Generic User Interaction SCF	Inherits from Generic User Interaction and adds:
	recordMessageReq
	recordMessageRes
	recordMessageErr
	deleteMessageReq
	deleteMessageRes
	deleteMessageErr
	abortActionReq
	abortActionRes
	abortActionErr

The IpUI Interface provides functions to send information to, or gather information from the user, i.e. this interface allows applications to send SMS and USSD messages. An application can use this interface independently of other SCFs. The IpUICall Interface provides functions to send information to, or gather information from the user (or call party) attached to a call.

The following clauses describe each aspect of the Generic User Interaction Service Capability Feature (SCF).

The order is as follows:

- The Sequence diagrams give the reader a practical idea of how each of the SCFs is implemented.
- The Class relationships clause show how each of the interfaces applicable to the SCF, relate to one another.
- The Interface specification clause describes in detail each of the interfaces shown within the Class diagram part. This clause also includes Call User interaction.
- The State Transition Diagrams (STD) show the transition between states in the SCF. The states and transitions are well-defined; either methods specified in the Interface specification or events occurring in the underlying networks cause state transitions.
- The Data Definitions clause show a detailed expansion of each of the data types associated with the methods within the classes. Note that some data types are used in other methods and classes and are therefore defined within the Common Data types part ES 202 915-2.

4.1 General requirements on support of methods

An implementation of this API which supports or implements a method described in the present document, shall support or implement the functionality described for that method, for at least one valid set of values for the parameters of that method.

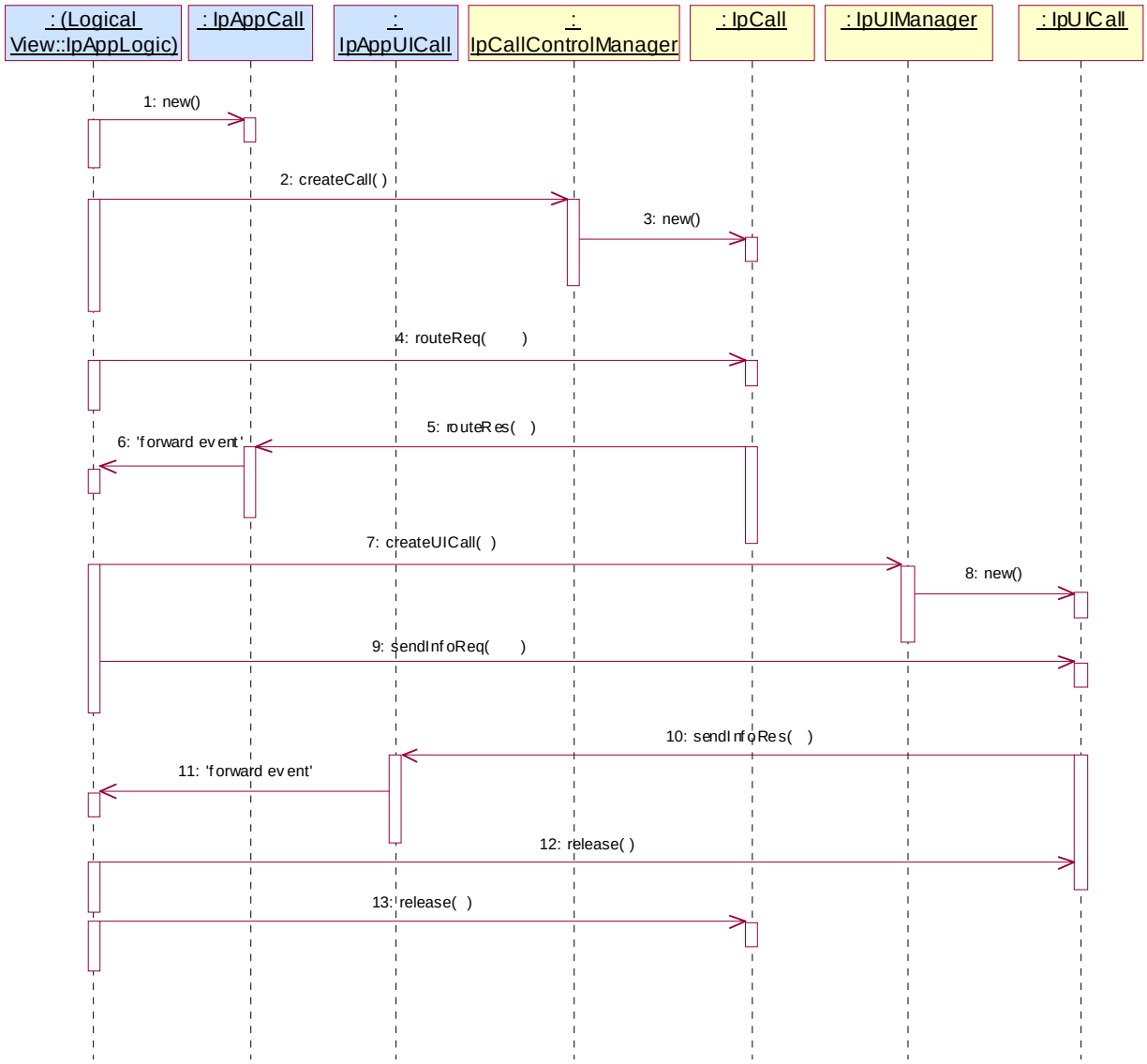
Where a method is not supported by an implementation of a Service interface, the exception P_METHOD_NOT_SUPPORTED shall be returned to any call of that method.

Where a method is not supported by an implementation of an Application interface, a call to that method shall be possible, and no exception shall be returned.

5 Sequence Diagrams

5.1 Alarm Call

The following sequence diagram shows a 'reminder message', in the form of an alarm, being delivered to a customer as a result of a trigger from an application. Typically, the application would be set to trigger at a certain time, however, the application could also trigger on events.



1: This message is used to create an object implementing the IpAppCall interface.

2: This message requests the object implementing the IpCallControlManager interface to create an object implementing the IpCall interface.

3: Assuming that the criteria for creating an object implementing the IpCall interface (e.g. load control values not exceeded) are met it is created.

4: This message instructs the object implementing the IpCall interface to route the call to the customer destined to receive the 'reminder message'

5: This message passes the result of the call being answered to its callback object.

6: This message is used to forward the previous message to the IpAppLogic.

7: The application requests a new UICall object that is associated with the call object.

8: Assuming all criteria are met, a new UICall object is created by the service.

9: This message instructs the object implementing the IpUICall interface to send the alarm to the customer's call.

10: When the announcement ends this is reported to the call back interface.

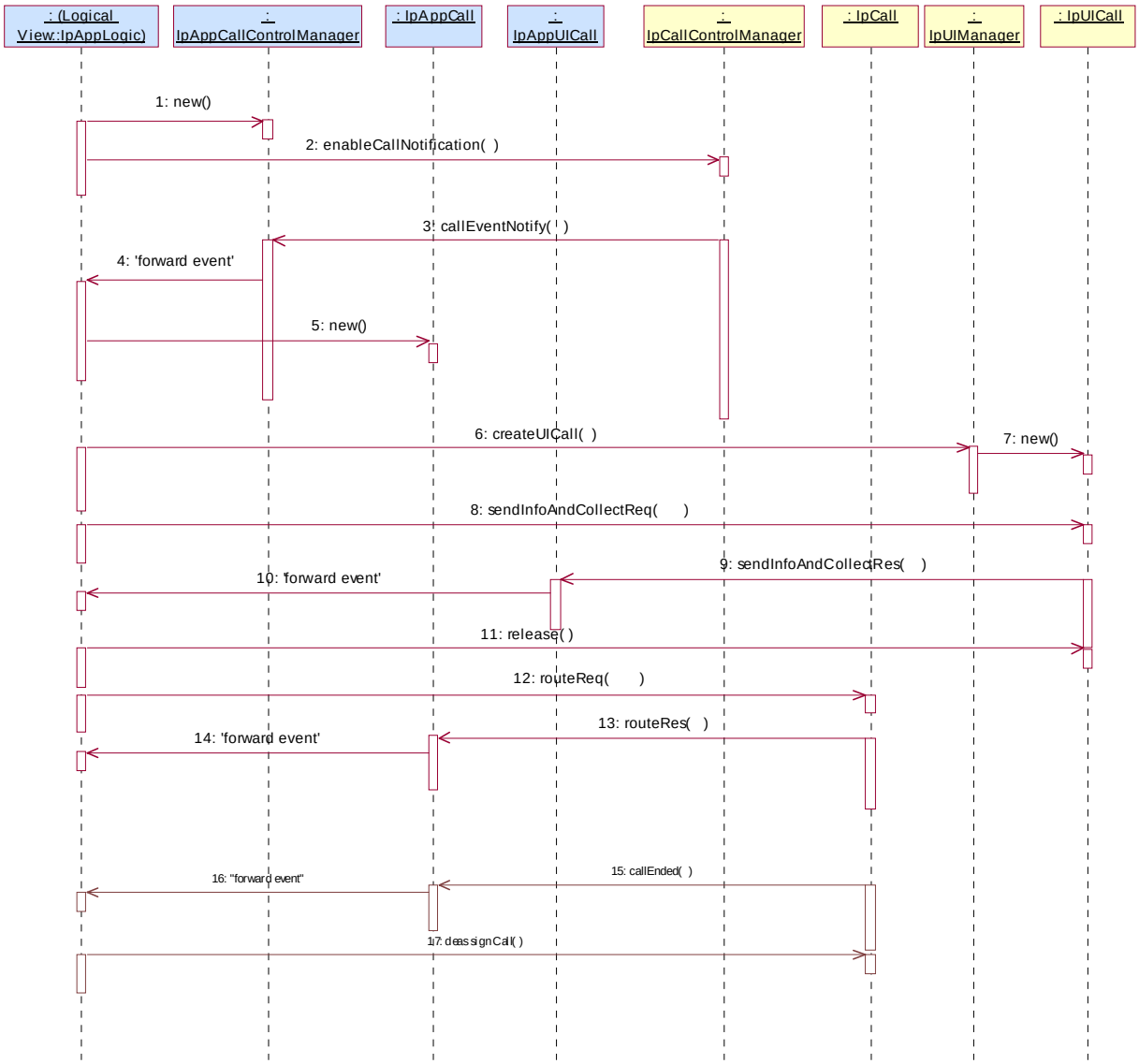
11: The event is forwarded to the application logic.

12: The application releases the UICall object, since no further announcements are required. Alternatively, the application could have indicated P_FINAL_REQUEST in the sendInfoReq in which case the UICall object would have been implicitly released after the announcement was played.

13: The application releases the call and all associated parties.

5.2 Call Barring 1

The following sequence diagram shows a call barring service, initiated as a result of a prearranged event being received by the call control service. Before the call is routed to the destination number, the calling party is asked for a PIN code. The code is accepted and the call is routed to the original called party.



1: This message is used by the application to create an object implementing the IpAppCallControlManager interface.

2: This message is sent by the application to enable notifications on new call events. As this sequence diagram depicts a call barring service, it is likely that all new call events destined for a particular address or address range prompted for a password before the call is allowed to progress. When a new call, that matches the event criteria set, arrives, a message (not shown) is directed to the object implementing the IpCallControlManager. Assuming that the criteria for creating an object implementing the IpCall interface (e.g. load control values not exceeded) are met, other messages (not shown) are used to create the call and associated call leg object.

3: This message is used to pass the new call event to the object implementing the IpAppCallControlManager interface.

4: This message is used to forward the previous message to the IpAppLogic.

5: This message is used by the application to create an object implementing the IpAppCall interface. The reference to this object is passed back to the object implementing the IpCallControlManager using the return parameter of the callEventNotify.

6: This message is used to create a new UICall object. The reference to the call object is given when creating the UICall.

7: Provided all the criteria are fulfilled, a new UICall object is created.

8: The call barring service dialogue is invoked.

9: The result of the dialogue, which in this case is the PIN code, is returned to its callback object.

10: This message is used to forward the previous message to the IpAppLogic.

11: This message releases the UICall object.

12: Assuming the correct PIN is entered, the call is forward routed to the destination party.

13: This message passes the result of the call being answered to its callback object.

14: This message is used to forward the previous message to the IpAppLogic

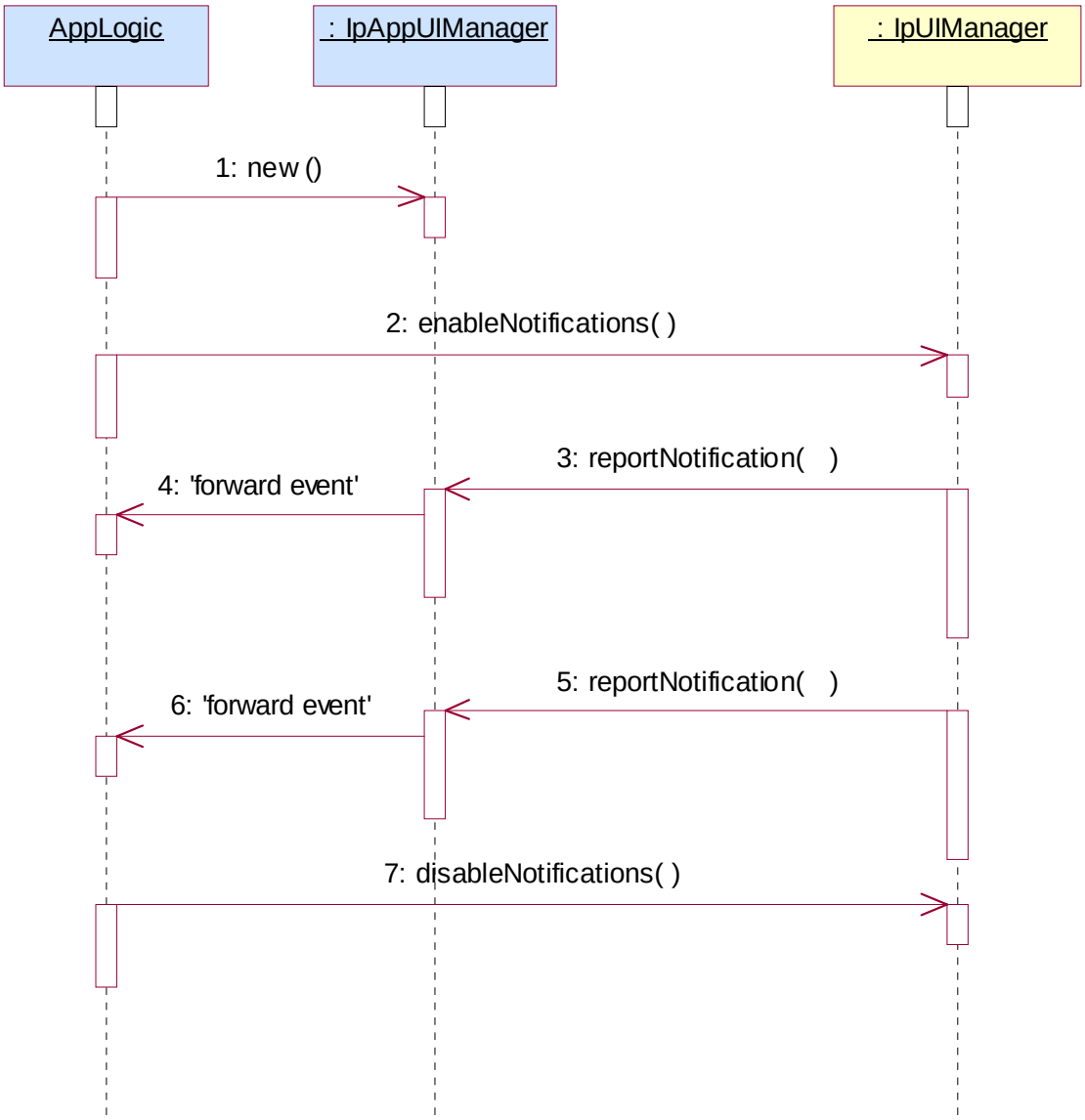
15: When the call is terminated in the network, the application will receive a notification. This notification will always be received when the call is terminated by the network in a normal way, the application does not have to request this event explicitly.

16: The event is forwarded to the application.

17: The application must free the call related resources in the gateway by calling deassignCall.

5.3 Network Controlled Notifications

The following sequence diagram shows how an application can receive notifications that have not been created by the application, but are provisioned from within the network.



1: The application is started. The application creates a new IpAppUIManager to handle callbacks.

2: The enableNotifications method is invoked on the IpUIManager interface to indicate that the application is ready to receive notifications that are created in the network. For illustrative purposes we assume notifications of type "B" are created in the network.

3: When a network created trigger occurs the application is notified on the callback interface.

4: The event is forwarded to the application.

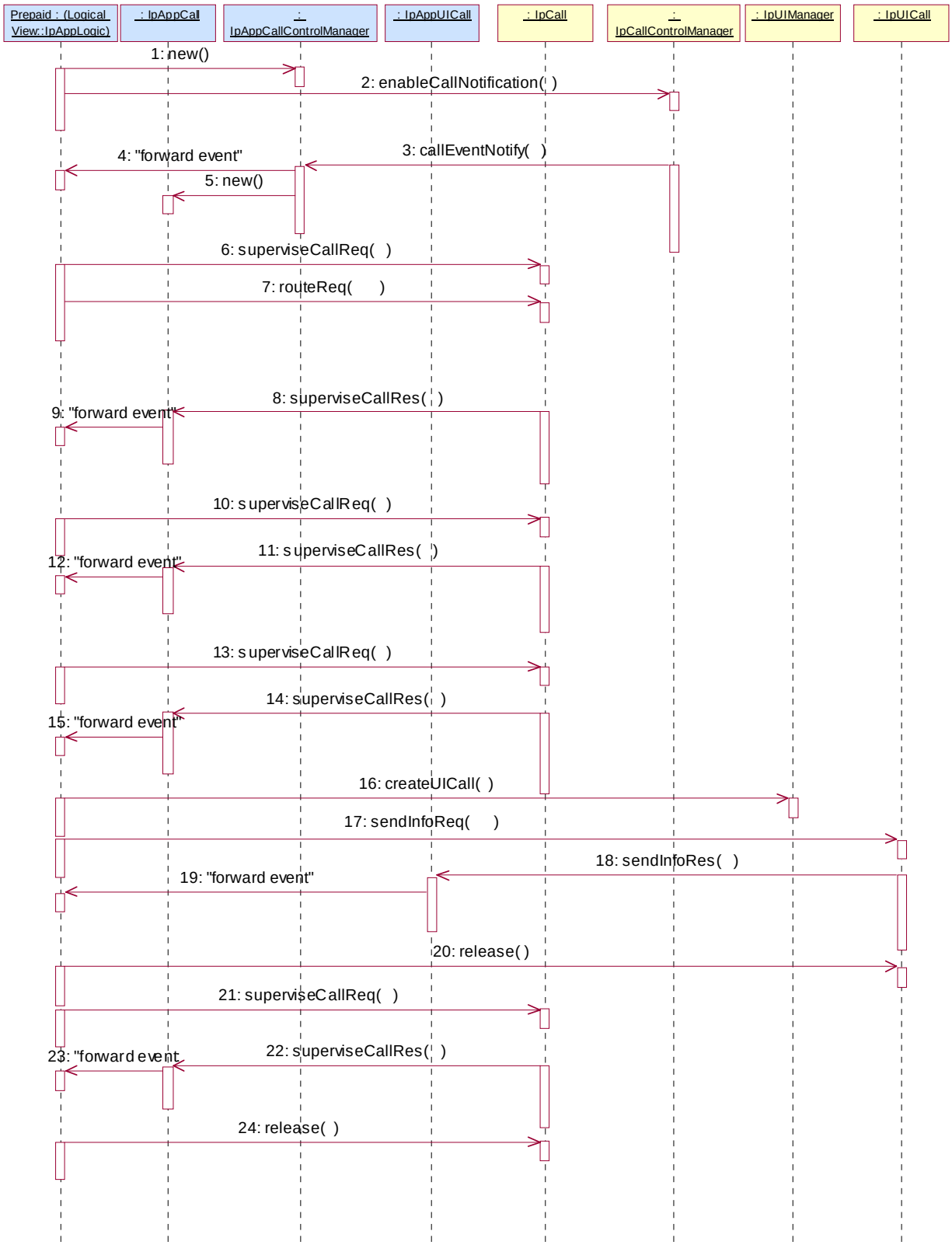
5: When a network created trigger occurs the application is notified on the callback interface.

6: The event is forwarded to the application.

7: When the application does not want to receive notifications created in the network anymore, it invokes disableNotifications on the IpMultiPartyCallConrolManager interface. From now on the gateway will not send any notifications to the application that are created in the network.

5.4 Prepaid

This sequence shows a Pre-paid application. The subscriber is using a pre-paid card or credit card to pay for the call. The application each time allows a certain timeslice for the call. After the timeslice, a new timeslice can be started or the application can terminate the call. In the following sequence the end-user will received an announcement before his final timeslice.


Prepaid : (Logical View::IpAppLogic)
: IpAppCall
: IpAppCallControlManager
: IpAppUICall
: IpCall
: IpCallControlManager
: IpUIManager
: IpUICall
1: new()
2: enableCallNotification( )
4: "forward event"
3: callEventNotify( )
5: new()
6: superviseCallReq( )
7: routeReq( )
8: superviseCallRes( )
9: "forward event"
10: superviseCallReq( )
11: superviseCallRes( )
12: "forward event"
13: superviseCallReq( )
14: superviseCallRes( )
15: "forward event"
16: createUICall( )
17: sendInfoReq( )
18: sendInfoRes( )
19: "forward event"
20: release( )
21: superviseCallReq( )
22: superviseCallRes( )
23: "forward event"
24: release( )

1: This message is used by the application to create an object implementing the IpAppCallControlManager interface.

2: This message is sent by the application to enable notifications on new call events. As this sequence diagram depicts a pre-paid service, it is likely that only new call events within a certain address range will be enabled. When a new call, that matches the event criteria, arrives a message (not shown) is directed to the object implementing the IpCallControlManager. Assuming that the criteria for creating an object implementing the IpCall interface (e.g. load control values not exceeded) are met, other messages (not shown) are used to create the call and associated call leg object.

3: The incoming call triggers the Pre-Paid Application (PPA).

4: The message is forwarded to the application.

5: A new object on the application side for the Generic Call object is created

6: The Pre-Paid Application (PPA) requests to supervise the call. The application will be informed after the period indicated in the message. This period is related to the credits left on the account of the pre-paid subscriber.

7: Before continuation of the call, PPA sends all charging information, a possible tariff switch time and the call duration supervision period, towards the GW which forwards it to the network.

8: At the end of each supervision period the application is informed and a new period is started.

9: The message is forwarded to the application.

10: The Pre-Paid Application (PPA) requests to supervise the call for another call duration.

11: At the end of each supervision period the application is informed and a new period is started.

12: The message is forwarded to the application.

13: The Pre-Paid Application (PPA) requests to supervise the call for another call duration. When the timer expires it will indicate that the user is almost out of credit.

14: When the user is almost out of credit the application is informed.

15: The message is forwarded to the application.

16: The application decides to play an announcement to the parties in this call. A new UICall object is created and associated with the call.

17: An announcement is played informing the user about the near-expiration of his credit limit.

18: When the announcement is completed the application is informed.

19: The message is forwarded to the application.

20: The application releases the UICall object.

21: The user does not terminate so the application terminates the call after the next supervision period.

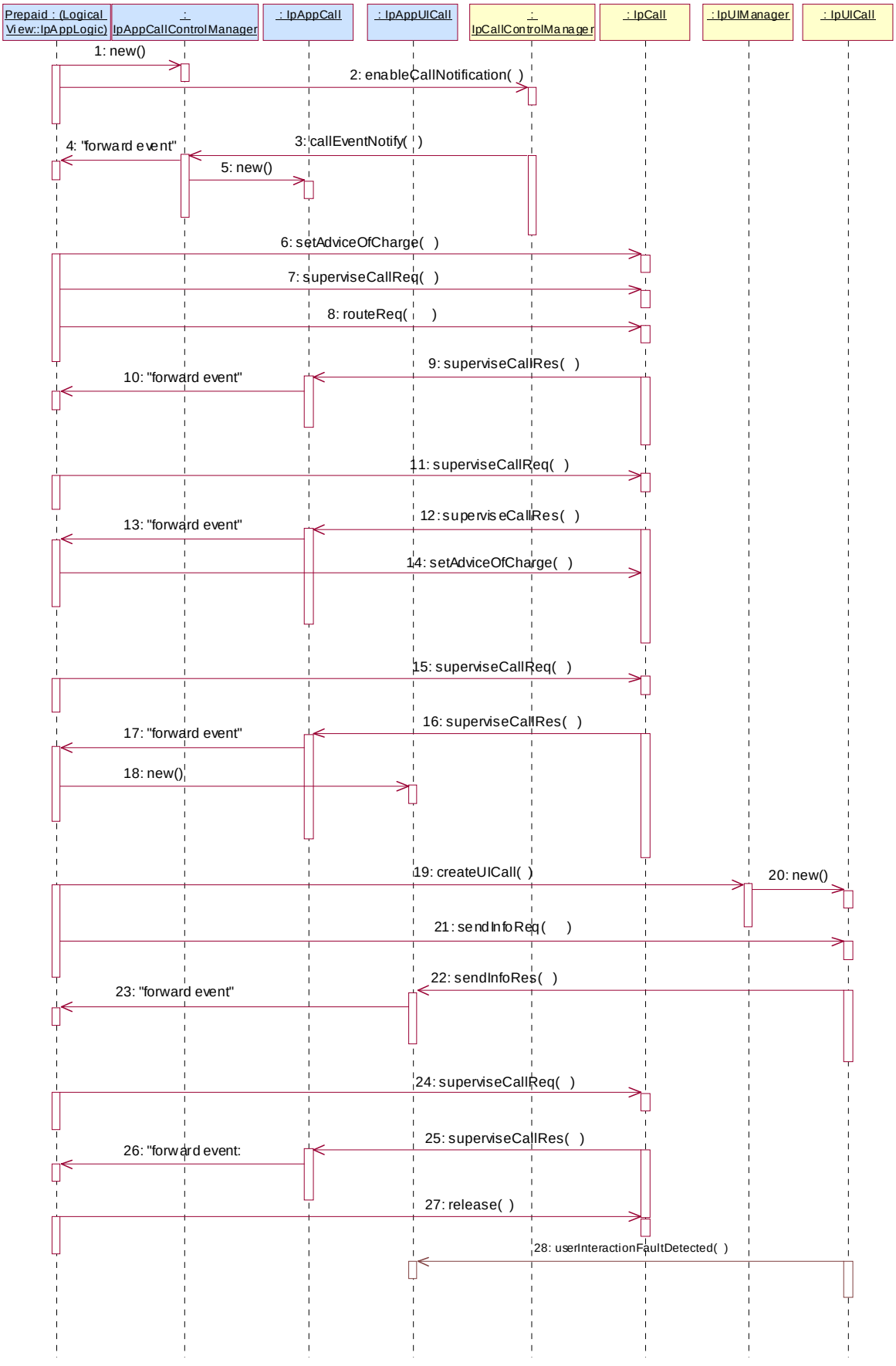
22: The supervision period ends

23: The event is forwarded to the logic.

24: The application terminates the call. Since the user interaction is already explicitly terminated no userInteractionFaultDetected is sent to the application.

5.5 Pre-Paid with Advice of Charge (AoC)

This sequence shows a Pre-paid application that uses the Advice of Charge feature. The application will send the charging information before the actual call setup and when during the call the charging changes new information is sent in order to update the end-user. Note that the Advice of Charge feature requires an application in the end-user terminal to display the charges for the call, depending on the information received from the application.


Prepaid : (Logical View::IpAppLogic)
: IpAppCallControlManager
: IpAppCall
: IpAppUICall
: IpCallControlManager
: IpCall
: IpUIManager
: IpUICall
1: new()
2: enableCallNotification( )
3: callEventNotify( )
4: "forward event"
5: new()
6: setAdviceOfCharge( )
7: superviseCallReq( )
8: routeReq( )
9: superviseCallRes( )
10: "forward event"
11: superviseCallReq( )
12: superviseCallRes( )
13: "forward event"
14: setAdviceOfCharge( )
15: superviseCallReq( )
16: superviseCallRes( )
17: "forward event"
18: new()
19: createUICall( )
20: new()
21: sendInfoReq( )
22: sendInfoRes( )
23: "forward event"
24: superviseCallReq( )
25: superviseCallRes( )
26: "forward event:
27: release( )
28: userInteractionFaultDetected( )

1: This message is used by the application to create an object implementing the IpAppCallControlManager interface.

2: This message is sent by the application to enable notifications on new call events. As this sequence diagram depicts a pre-paid service, it is likely that only new call events within a certain address range will be enabled. When a new call, that matches the event criteria, arrives a message (not shown) is directed to the object implementing the IpCallControlManager. Assuming that the criteria for creating an object implementing the IpCall interface (e.g. load control values not exceeded) are met, other messages (not shown) are used to create the call and associated call leg object.

3: The incoming call triggers the Pre-Paid Application (PPA).

4: The message is forwarded to the application.

5: A new object on the application side for the Call object is created

6: The Pre-Paid Application (PPA) sends the AoC information (e.g. the tariff switch time). (it shall be noted the PPA contains ALL the tariff information and knows how to charge the user).

During this call sequence 2 tariff changes take place. The call starts with tariff 1, and at the tariff switch time (e.g. 18:00 hours) switches to tariff 2. The application is not informed about this (but the end-user is!)

7: The Pre-Paid Application (PPA) requests to supervise the call. The application will be informed after the period indicated in the message. This period is related to the credits left on the account of the pre-paid subscriber.

8: The application requests to route the call to the destination address.

9: At the end of each supervision period the application is informed and a new period is started.

10: The message is forwarded to the application.

11: The Pre-Paid Application (PPA) requests to supervise the call for another call duration.

12: At the end of each supervision period the application is informed and a new period is started.

13: The message is forwarded to the application.

14: Before the next tariff switch (e.g., 19:00 hours) the application sends a new AOC with the tariff switch time. Again, at the tariff switch time, the network will send AoC information to the end-user.

15: The Pre-Paid Application (PPA) requests to supervise the call for another call duration. When the timer expires it will indicate that the user is almost out of credit.

16: When the user is almost out of credit the application is informed.

17: The message is forwarded to the application.

18: The application creates a new call back interface for the User interaction messages.

19: A new UI Call object that will handle playing of the announcement needs to be created

20: The Gateway creates a new UI call object that will handle playing of the announcement.

21: With this message the announcement is played to the parties in the call.

22: The user indicates that the call should continue.

23: The message is forwarded to the application.

24: The user does not terminate so the application terminates the call after the next supervision period.

25: The user is out of credit and the application is informed.

26: The message is forwarded to the application.

27: With this message the application requests to release the call.

28: Terminating the call which has still a UICall object associated will result in a userInteractionFaultDetected. The UICall object is terminated in the gateway and no further communication is possible between the UICall and the application.

6 Class Diagrams

The application generic user interaction service package consists of one IpAppUIManager interface, zero or more IpAppUI interfaces and zero or more IpAppUICall interfaces.

The generic user interaction service package consists of one IpUIManager interface, zero or more IpUI interfaces and zero or more IpUICall interfaces.

The class diagram in the following figure shows the interfaces that make up the application generic user interaction service package and the generic user interaction service package. Communication between these packages is done via the <<uses>> relationships.

The IpUICall implements call related user interaction and it inherits from the non call related IpUI interface. The same holds for the corresponding application interfaces.

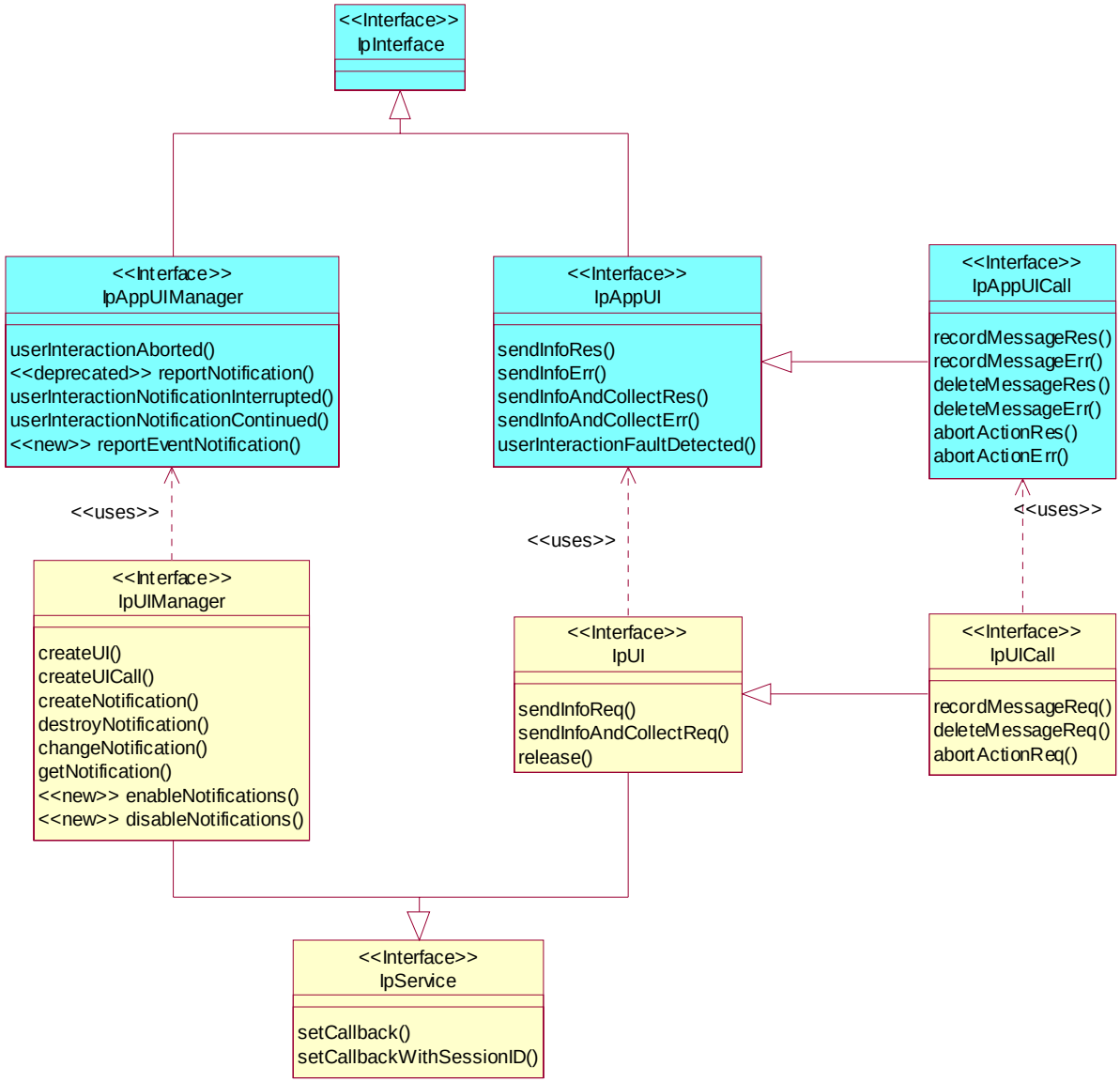


Figure 1: Generic User Interaction Package Overview

7 The Service Interface Specifications

7.1 Interface Specification Format

This clause defines the interfaces, methods and parameters that form a part of the API specification. The Unified Modelling Language (UML) is used to specify the interface classes. The general format of an interface specification is described below.

7.1.1 Interface Class

This shows a UML interface class description of the methods supported by that interface, and the relevant parameters and types. The Service and Framework interfaces for enterprise-based client applications are denoted by classes with name Ip<name>. The callback interfaces to the applications are denoted by classes with name IpApp<name>. For the interfaces between a Service and the Framework, the Service interfaces are typically denoted by classes with name IpSvc<name>, while the Framework interfaces are denoted by classes with name IpFw<name>

7.1.2 Method descriptions

Each method (API method 'call') is described. Both synchronous and asynchronous methods are used in the API. Asynchronous methods are identified by a 'Req' suffix for a method request, and, if applicable, are served by asynchronous methods identified by either a 'Res' or 'Err' suffix for method results and errors, respectively. To handle responses and reports, the application or service developer must implement the relevant IpApp<name> or IpSvc<name> interfaces to provide the callback mechanism.

7.1.3 Parameter descriptions

Each method parameter and its possible values are described. Parameters described as 'in' represent those that must have a value when the method is called. Those described as 'out' are those that contain the return result of the method when the method returns.

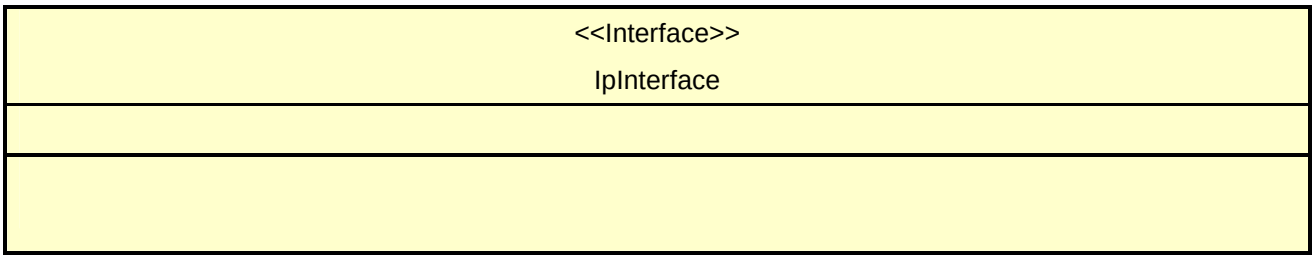
7.1.4 State Model

If relevant, a state model is shown to illustrate the states of the objects that implement the described interface.

7.2 Base Interface

7.2.1 Interface Class IpInterface

All application, framework and service interfaces inherit from the following interface. This API Base Interface does not provide any additional methods.



7.3 Service Interfaces

7.3.1 Overview

The Service Interfaces provide the interfaces into the capabilities of the underlying network - such as call control, user interaction, messaging, mobility and connectivity management.

The interfaces that are implemented by the services are denoted as 'Service Interface'. The corresponding interfaces that must be implemented by the application (e.g. for API callbacks) are denoted as 'Application Interface'.

7.4 Generic Service Interface

7.4.1 Interface Class IpService

Inherits from: IpInterface;

All service interfaces inherit from the following interface.

<<Interface>> IpService
setCallback (appInterface : in IpInterfaceRef) : void setCallbackWithSessionID (appInterface : in IpInterfaceRef, sessionID : in TpSessionID) : void

7.4.1.1 Method setCallback()

This method specifies the reference address of the callback interface that a service uses to invoke methods on the application. It is not allowed to invoke this method on an interface that uses SessionIDs.

Parameters

appInterface : in IpInterfaceRef

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

Raises

TpCommonExceptions, P_INVALID_INTERFACE_TYPE

7.4.1.2 Method setCallbackWithSessionID()

This method specifies the reference address of the application's callback interface that a service uses for interactions associated with a specific session ID: e.g. a specific call, or call leg. It is not allowed to invoke this method on an interface that does not use SessionIDs.

Parameters

appInterface : in IpInterfaceRef

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

sessionID : in TpSessionID

Specifies the session for which the service can invoke the application's callback interface.

Raises

TpCommonExceptions, P_INVALID_SESSION_ID, P_INVALID_INTERFACE_TYPE

8 Generic User Interaction Interface Classes

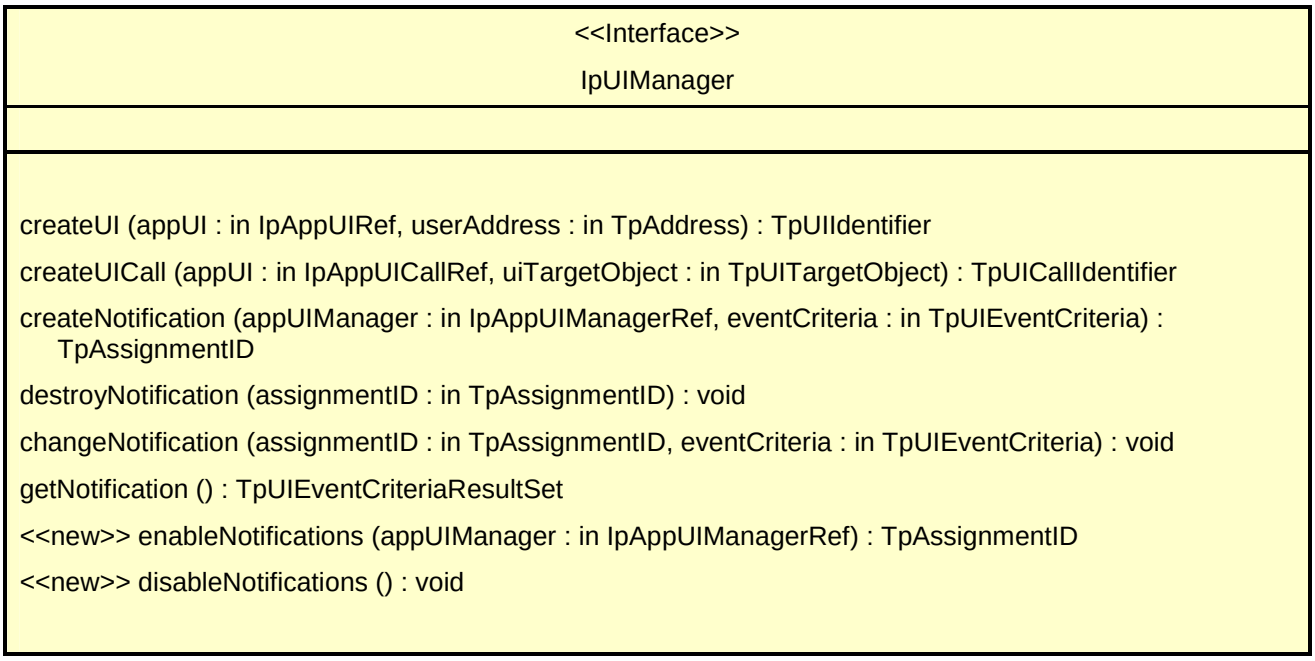
The Generic User Interaction Service interface (GUIS) is used by applications to interact with end users. The GUIS is represented by the IpUIManager, IpUI and IpUICall interfaces that interface to services provided by the network. To handle responses and reports, the developer must implement IpAppUIManager and IpAppUI interfaces to provide the callback mechanism.

8.1 Interface Class IpUIManager

Inherits from: IpService.

This interface is the 'service manager' interface for the Generic User Interaction Service and provides the management functions to the Generic User Interaction Service.

This interface shall be implemented by a Generic User Interaction SCF. The createUI() method, or the createUICall() method, or both the createNotification() and destroyNotification methods, or both the enableNotifications() and disableNotifications() methods shall be implemented as a minimum requirement.



8.1.1 Method createUI()

This method is used to create a new user interaction object for non-call related purposes

Results: userInteraction

Specifies the interface and sessionID of the user interaction created.

Parameters

appUI : in IpAppUIRef

Specifies the application interface for callbacks from the user interaction created.

userAddress : in TpAddress

Indicates the end-user with whom to interact.

Returns

TpUIIdentifier

Raises

TpCommonExceptions, P_INVALID_NETWORK_STATE, P_INVALID_INTERFACE_TYPE

8.1.2 Method createUICall()

This method is used to create a new user interaction object for call related purposes.

The user interaction can take place to the specified party or to all parties in a call. Note that for certain implementation user interaction can only be performed towards the controlling call party, which shall be the only party in the call.

Returns: userInteraction

Specifies the interface and sessionID of the user interaction created.

Parameters

appUI : in IpAppUICallRef

Specifies the application interface for callbacks from the user interaction created.

uiTargetObject : in TpUITargetObject

Specifies the object on which to perform the user interaction. This can either be a Call, Multi-party Call or call leg object.

Returns

TpUICallIdentifier

Raises

TpCommonExceptions, P_INVALID_NETWORK_STATE, P_INVALID_INTERFACE_TYPE

8.1.3 Method createNotification()

This method is used by the application to install specified notification criteria, for which the reporting is implicitly activated. If some application already requested notifications with criteria that overlap the specified criteria, or the specified criteria overlap with criteria already present in the network (when provisioned from within the network), 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 and the same servicecode 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. The gateway will always use the most recent callback. In case this most recent callback fails the second most recent is used.

Returns: assignmentID

Specifies the ID assigned by the generic user interaction manager interface for this newly installed notification criteria.

Parameters

appUIManager : in IpAppUIManagerRef

If this parameter is set (i.e. not NULL) it specifies a reference to the application interface, which is used for callbacks. If set to NULL, the application interface defaults to the interface specified via the setCallback() method.

eventCriteria : in TpUIEventCriteria

Specifies the event specific criteria used by the application to define the event required, like user address and service code.

Returns

TpAssignmentID

Raises

TpCommonExceptions, P_INVALID_CRITERIA, P_INVALID_INTERFACE_TYPE

8.1.4 Method destroyNotification()

This method is used by the application to destroy previously installed notification criteria via the createNotification method.

Parameters

assignmentID : in TpAssignmentID

Specifies the assignment ID given by the generic user interaction manager interface when the previous createNotification() was called. If the assignment ID does not correspond to one of the valid assignment IDs, the framework will return the error code P_INVALID_ASSIGNMENT_ID.

Raises

TpCommonExceptions, P_INVALID_ASSIGNMENT_ID

8.1.5 Method changeNotification()

This method is used by the application to change the event criteria introduced with createNotification method. Any stored notification request associated with the specified assignmentID will be replaced with the specified events requested.

Parameters

assignmentID : in TpAssignmentID

Specifies the ID assigned by the manager interface for the event notification.

eventCriteria : in TpUIEventCriteria

Specifies the new set of event 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

8.1.6 Method getNotification()

This method is used by the application to query the event criteria set with createNotification or changeNotification.

Returns: eventCriteria

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

Parameters
No Parameters were identified for this method.

Returns

`TpUIEventCriteriaResultSet`

Raises

`TpCommonExceptions`

8.1.7 Method <<new>> enableNotifications()

This method is used to indicate that the application is able to receive notifications which are provisioned from within the network (i.e. these notifications are NOT set using createNotification() but via, for instance, a network management system). If notifications provisioned for this application are created or changed, the application is unaware of this until the notification is reported.

If the same application requests to enable notifications for a second time with a different IpAppUIManager reference (i.e. without first disabling them), the second callback will be treated as an additional callback. The gateway will always use the most recent callback. In case this most recent callback fails the second most recent is used.

When this method is used, it is still possible to use createNotification() for service provider provisioned notifications on the same interface as long as the criteria in the network and provided by createNotification() do not overlap. However, it is NOT recommended to use both mechanisms on the same service manager.

The methods changeNotification(), getNotification(), and destroyNotification() do not apply to notifications provisioned in the network and enabled using enableNotifications(). These only apply to notifications created using createNotification().

Returns assignmentID: Specifies the ID assigned by the manager interface for this operation. This ID is contained in any reportNotification() that relates to notifications provisioned from within the network.

Parameters

`appUIManager : in IpAppUIManagerRef`

If this parameter is set (i.e. not NULL) it specifies a reference to the application interface, which is used for callbacks. If set to NULL, the application interface defaults to the interface specified via the setCallback() method.

Returns

TpAssignmentID

Raises

TpCommonExceptions

8.1.8 Method <<new>> disableNotifications()

This method is used to indicate that the application is not able to receive notifications for which the provisioning has been done from within the network. (i.e. these notifications that are NOT set using createNotification() but via, for instance, a network management system). After this method is called, no such notifications are reported anymore.

Parameters

No Parameters were identified for this method.

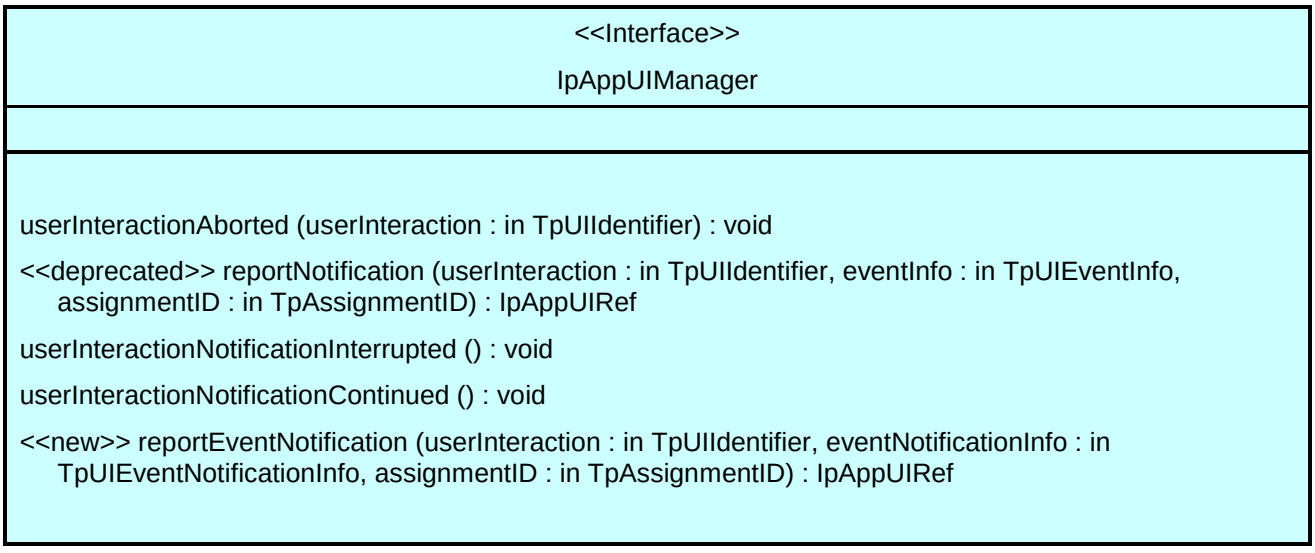
Raises

TpCommonExceptions

8.2 Interface Class IpAppUIManager

Inherits from: IpInterface.

The Generic User Interaction Service manager application interface provides the application callback functions to the Generic User Interaction Service.



8.2.1 Method userInteractionAborted()

This method indicates to the application that the User Interaction service instance has terminated or closed abnormally. No further communication will be possible between the User Interaction service instance and application.

Parameters

`userInteraction : in TpUIIdentifier`

Specifies the interface and sessionID of the user interaction service that has terminated.

8.2.2 Method <<deprecated>> reportNotification()

This method is deprecated and replaced by reportEventNotification(). It will be removed in a later release.

This method notifies the application of an occurred network event which matches the criteria installed by the createNotification method.

Returns: appUI

Specifies a reference to the application interface, which implements the callback interface for the new user interaction.

Parameters

`userInteraction : in TpUIIdentifier`

Specifies the reference to the interface and the sessionID to which the notification relates.

`eventInfo : in TpUIEventInfo`

Specifies data associated with this event.

`assignmentID : in TpAssignmentID`

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

Returns

`IpAppUIRef`

8.2.3 Method userInteractionNotificationInterrupted()

This method indicates to the application that all event notifications have been temporarily interrupted (for example, due to faults detected). Note that more permanent failures are reported via the Framework (integrity management).

Parameters

No Parameters were identified for this method.

8.2.4 Method userInteractionNotificationContinued()

This method indicates to the application that event notifications will again be possible.

Parameters

No Parameters were identified for this method.

8.2.5 Method <<new>> reportEventNotification()

This method notifies the application of an occurred network event which matches the criteria installed by the createNotification method.

Returns: appUI

Specifies a reference to the application interface, which implements the callback interface for the new user interaction.

Parameters

`userInteraction : in TpUIIdentifier`

Specifies the reference to the interface and the sessionID to which the notification relates.

`eventNotificationInfo : in TpUIEventNotificationInfo`

Specifies data associated with this event.

`assignmentID : in TpAssignmentID`

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

Returns

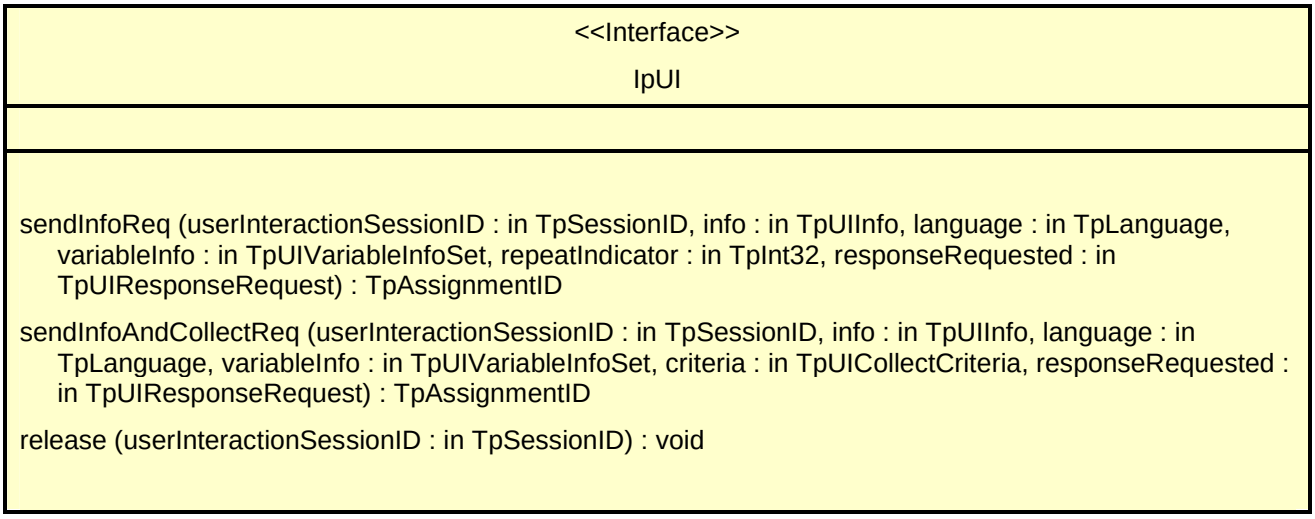
`IpAppUIRef`

8.3 Interface Class IpUI

Inherits from: IpService.

The User Interaction Service Interface provides functions to send information to, or gather information from the user. An application can use the User Interaction Service Interface independently of other services.

This interface, or the IpUICall interface, shall be implemented by a Generic User Interaction SCF as a minimum requirement. The release() method, and at least one of the sendInfoReq() or the sendInfoAndCollectReq() methods shall be implemented as a minimum requirement.



8.3.1 Method sendInfoReq()

This asynchronous method plays an announcement or sends other information to the user.

Returns: assignmentID

Specifies the ID assigned by the generic user interaction interface for a user interaction request.

Parameters

userInteractionSessionID : in TpSessionID

Specifies the user interaction session ID of the user interaction.

info : in TpUIInfo

Specifies the information to send to the user. This information can be:

- an infoID, identifying pre-defined information to be sent (announcement and/or text);

- a string, defining the text to be sent;

- a URL , identifying pre-defined information or data to be sent to or downloaded into the terminal.

language : in TpLanguage

Specifies the Language of the information to be sent to the user.

variableInfo : in TpUIVariableInfoSet

Defines the variable part of the information to send to the user.

repeatIndicator : in TpInt32

Defines how many times the information shall be sent to the end-user. A value of zero (0) indicates that the announcement shall be repeated until the call or call leg is released or an abortActionReq() is sent.

responseRequested : in TpUIResponseRequest

Specifies if a response is required from the call user interaction service, and any action the service should take.

Returns

TpAssignmentID

Raises

TpCommonExceptions,P_INVALID_SESSION_ID,P_INVALID_NETWORK_STATE, P_ILLEGAL_ID,P_ID_NOT_FOUND

8.3.2 Method sendInfoAndCollectReq()

This asynchronous method plays an announcement or sends other information to the user and collects some information from the user. The announcement usually prompts for a number of characters (for example, these are digits or text strings such as "YES" if the user's terminal device is a phone).

Returns: assignmentID

Specifies the ID assigned by the generic user interaction interface for a user interaction request.

Parameters

userInteractionSessionID : in TpSessionID

Specifies the user interaction session ID of the user interaction.

info : in TpUIInfo

Specifies the ID of the information to send to the user. This information can be:

- an infoID, identifying pre-defined information to be sent (announcement and/or text);

- a string, defining the text to be sent;

- a URL , identifying pre-defined information or data to be sent to or downloaded into the terminal

language : in TpLanguage

Specifies the Language of the information to be sent to the user.

variableInfo : in TpUIVariableInfoSet

Defines the variable part of the information to send to the user.

criteria : in TpUICollectCriteria

Specifies additional properties for the collection of information, such as the maximum and minimum number of characters, end character, first character timeout and inter-character timeout.

responseRequested : in TpUIResponseRequest

Specifies if a response is required from the call user interaction service, and any action the service should take. For this case it can especially be used to indicate e.g. the final request.

Returns

TpAssignmentID

Raises

TpCommonExceptions, P_INVALID_SESSION_ID, P_INVALID_NETWORK_STATE, P_ILLEGAL_ID, P_ID_NOT_FOUND, P_ILLEGAL_RANGE, P_INVALID_COLLECTION_CRITERIA

8.3.3 Method release()

This method requests that the relationship between the application and the user interaction object be released. It causes the release of the used user interaction resources and interrupts any ongoing user interaction.

Parameters

userInteractionSessionID : in TpSessionID

Specifies the user interaction session ID of the user interaction created.

Raises

TpCommonExceptions, P_INVALID_SESSION_ID

8.4 Interface Class IpAppUI

Inherits from: IpInterface.

The User Interaction Application Interface is implemented by the client application developer and is used to handle generic user interaction request responses and reports.

<<Interface>> IpAppUI
sendInfoRes (userInteractionSessionID : in TpSessionID, assignmentID : in TpAssignmentID, response : in TpUIReport) : void sendInfoErr (userInteractionSessionID : in TpSessionID, assignmentID : in TpAssignmentID, error : in TpUIError) : void sendInfoAndCollectRes (userInteractionSessionID : in TpSessionID, assignmentID : in TpAssignmentID, response : in TpUIReport, collectedInfo : in TpString) : void sendInfoAndCollectErr (userInteractionSessionID : in TpSessionID, assignmentID : in TpAssignmentID, error : in TpUIError) : void userInteractionFaultDetected (userInteractionSessionID : in TpSessionID, fault : in TpUIFault) : void

8.4.1 Method sendInfoRes()

This asynchronous method informs the application about the completion of a sendInfoReq(). This response is called only if the responseRequested parameter of the sendInfoReq() method was set to P_UICALL_RESPONSE_REQUIRED.

Parameters

`userInteractionSessionID : in TpSessionID`

Specifies the user interaction session ID of the user interaction.

`assignmentID : in TpAssignmentID`

Specifies the ID assigned by the generic user interaction interface for a user interaction request.

`response : in TpUIReport`

Specifies the type of response received from the user.

8.4.2 Method sendInfoErr()

This asynchronous method indicates that the request to send information was unsuccessful.

Parameters

`userInteractionSessionID : in TpSessionID`

Specifies the user interaction session ID of the user interaction.

`assignmentID : in TpAssignmentID`

Specifies the ID assigned by the generic user interaction interface for a user interaction request.

error : in TpUIError
Specifies the error which led to the original request failing.

8.4.3 Method sendInfoAndCollectRes()

This asynchronous method returns the information collected to the application.

Parameters

userInteractionSessionID : in TpSessionID
Specifies the user interaction session ID of the user interaction.

assignmentID : in TpAssignmentID
Specifies the ID assigned by the generic user interaction interface for a user interaction request.

response : in TpUIReport
Specifies the type of response received from the user.

collectedInfo : in TpString
Specifies the information collected from the user.

8.4.4 Method sendInfoAndCollectErr()

This asynchronous method indicates that the request to send information and collect a response was unsuccessful.

Parameters

userInteractionSessionID : in TpSessionID
Specifies the user interaction session ID of the user interaction.

assignmentID : in TpAssignmentID
Specifies the ID assigned by the generic user interaction interface for a user interaction request.

error : in TpUIError
Specifies the error which led to the original request failing.

8.4.5 Method userInteractionFaultDetected()

This method indicates to the application that a fault has been detected in the user interaction.

Parameters

userInteractionSessionID : in TpSessionID
Specifies the interface and sessionID of the user interaction service in which the fault has been detected.

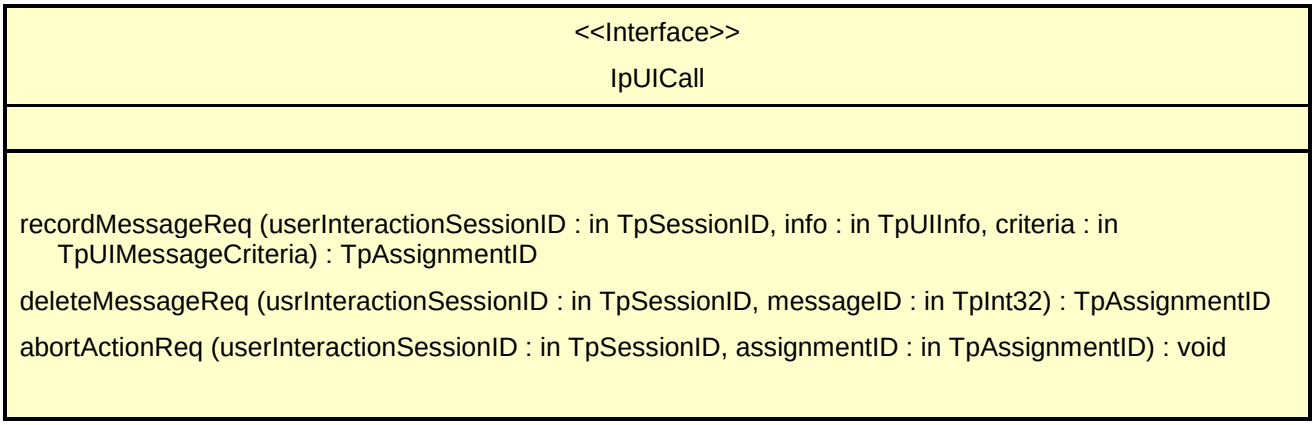
fault : in TpUIFault
Specifies the fault that has been detected.

8.5 Interface Class IpUICall

Inherits from: IpUI.

The Call User Interaction Service Interface provides functions to send information to, or gather information from the user (or call party) to which a call leg is connected. An application can use the Call User Interaction Service Interface only in conjunction with another service interface, which provides mechanisms to connect a call leg to a user. At present, only the Call Control service supports this capability.

This interface, or the IpUI interface, shall be implemented by a Generic User Interaction SCF as a minimum requirement. The minimum required methods of interface IpUI shall be implemented.



8.5.1 Method recordMessageReq()

This asynchronous method allows the recording of a message. The recorded message can be played back at a later time with the sendInfoReq() method.

Returns: assignmentID

Specifies the ID assigned by the generic user interaction interface for a user interaction request.

Parameters

`userInteractionSessionID : in TpSessionID`

Specifies the user interaction session ID of the user interaction.

`info : in TpUIInfo`

Specifies the information to send to the user. This information can be either an ID (for pre-defined announcement or text), a text string, or an URL (indicating the information to be sent, e.g. an audio stream).

`criteria : in TpUIMessageCriteria`

Defines the criteria for recording of messages

Returns

`TpAssignmentID`

Raises

`TpCommonExceptions,P_INVALID_SESSION_ID,P_INVALID_NETWORK_STATE,P_ILLEGAL_ID,P_ID_NOT_FOUND,P_INVALID_CRITERIA`

8.5.2 Method deleteMessageReq()

This asynchronous method allows to delete a recorded message.

Returns: assignmentID

Specifies the ID assigned by the generic user interaction interface for a user interaction request.

Parameters

`usrInteractionSessionID : in TpSessionID`

Specifies the user interaction session ID of the user interaction.

`messageID : in TpInt32`

Specifies the message ID.

Returns

`TpAssignmentID`

Raises

`TpCommonExceptions,P_INVALID_SESSION_ID,P_ILLEGAL_ID,P_ID_NOT_FOUND`

8.5.3 Method abortActionReq()

This asynchronous method aborts a user interaction operation, e.g. a sendInfoReq(), from the specified call leg. The call and call leg are otherwise unaffected. The user interaction call service interrupts the current action on the specified leg.

Parameters

`userInteractionSessionID : in TpSessionID`

Specifies the user interaction session ID of the user interaction.

`assignmentID : in TpAssignmentID`

Specifies the user interaction request to be cancelled.

Raises

`TpCommonExceptions,P_INVALID_SESSION_ID,P_INVALID_ASSIGNMENT_ID`

8.6 Interface Class IpAppUICall

Inherits from: IpAppUI.

The Call User Interaction Application Interface is implemented by the client application developer and is used to handle call user interaction request responses and reports.

<<Interface>> IpAppUICall
recordMessageRes (userInteractionSessionID : in TpSessionID, assignmentID : in TpAssignmentID, response : in TpUIReport, messageID : in TpInt32) : void recordMessageErr (userInteractionSessionID : in TpSessionID, assignmentID : in TpAssignmentID, error : in TpUIError) : void deleteMessageRes (usrInteractionSessionID : in TpSessionID, response : in TpUIReport, assignmentID : in TpAssignmentID) : void deleteMessageErr (usrInteractionSessionID : in TpSessionID, error : in TpUIError, assignmentID : in TpAssignmentID) : void abortActionRes (userInteractionSessionID : in TpSessionID, assignmentID : in TpAssignmentID) : void abortActionErr (userInteractionSessionID : in TpSessionID, assignmentID : in TpAssignmentID, error : in TpUIError) : void

8.6.1 Method recordMessageRes()

This method returns whether the message is successfully recorded or not. In case the message is recorded, the ID of the message is returned.

Parameters

`userInteractionSessionID : in TpSessionID`

Specifies the user interaction session ID of the user interaction.

`assignmentID : in TpAssignmentID`

Specifies the ID assigned by the call user interaction interface for a user interaction request.

`response : in TpUIReport`

Specifies the type of response received from the device where the message is stored.

`messageID : in TpInt32`

Specifies the ID that was assigned to the message by the device where the message is stored.

8.6.2 Method recordMessageErr()

This method indicates that the request for recording of a message was not successful.

Parameters

`userInteractionSessionID : in TpSessionID`

Specifies the user interaction session ID of the user interaction.

`assignmentID : in TpAssignmentID`

Specifies the ID assigned by the call user interaction interface for a user interaction request.

error : in TpUIError

Specifies the error which led to the original request failing.

8.6.3 Method deleteMessageRes()

This method returns whether the message is successfully deleted or not.

Parameters

usrInteractionSessionID : in TpSessionID

Specifies the user interaction session ID of the user interaction.

response : in TpUIReport

Specifies the type of response received from the device where the message was stored.

assignmentID : in TpAssignmentID

Specifies the ID assigned by the call user interaction interface for a user interaction request.

8.6.4 Method deleteMessageErr()

This method indicates that the request for deleting a message was not successful.

Parameters

usrInteractionSessionID : in TpSessionID

Specifies the user interaction session ID of the user interaction.

error : in TpUIError

Specifies the error which led to the original request failing.

assignmentID : in TpAssignmentID

Specifies the ID assigned by the call user interaction interface for a user interaction request.

8.6.5 Method abortActionRes()

This asynchronous method confirms that the request to abort a user interaction operation on a call leg was successful.

Parameters

userInteractionSessionID : in TpSessionID

Specifies the user interaction session ID of the user interaction.

assignmentID : in TpAssignmentID

Specifies the ID assigned by the call user interaction interface for a user interaction request.

8.6.6 Method abortActionErr()

This asynchronous method indicates that the request to abort a user interaction operation on a call leg resulted in an error.

Parameters

`userInteractionSessionID : in TpSessionID`

Specifies the user interaction session ID of the user interaction.

`assignmentID : in TpAssignmentID`

Specifies the ID assigned by the call user interaction interface for a user interaction request.

`error : in TpUIError`

Specifies the error which led to the original request failing.

9 State Transition Diagrams

9.1 State Transition Diagrams for IpUIManager

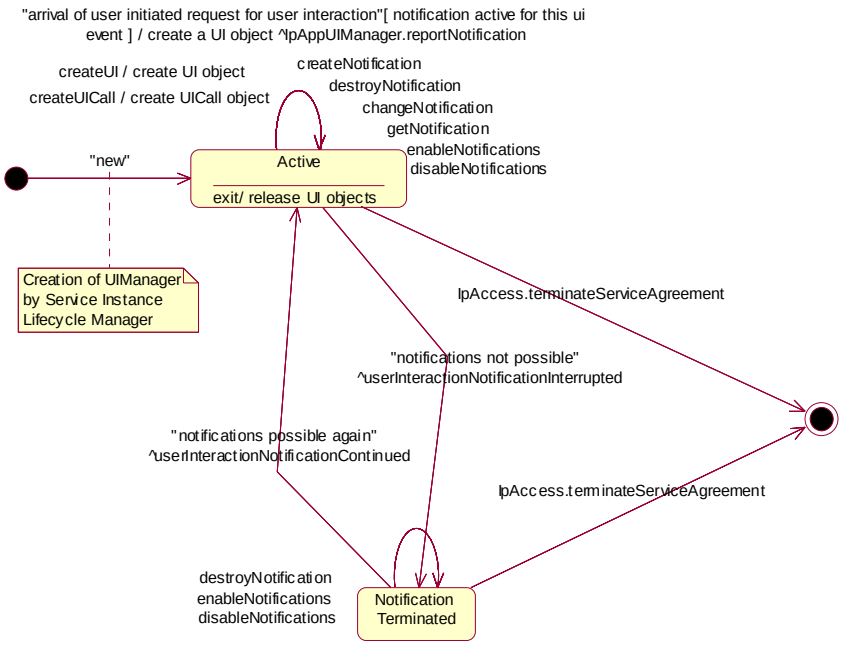


Figure 2: Application view on the UI Manager

9.1.1 Active State

In this state a relation between the Application and a User Interaction Service Capability Feature (Generic User Interaction or Call User Interaction) has been established. The application is now able to request creation of UI and/or UICall objects.

9.1.2 Notification Terminated State

When the UI manager is in the Notification terminated state, events requested with createNotification()/enableNotifications() will not be forwarded to the application. There can be multiple reasons for this: for instance it might be that the application receives more notifications than defined in the Service Level Agreement. Another example is that the SCS has detected it receives no notifications from the network due to e.g. a link failure. In this state no requests for new notifications will be accepted.

9.2 State Transition Diagrams for IpUI

The state transition diagram shows the application view on the User Interaction object.

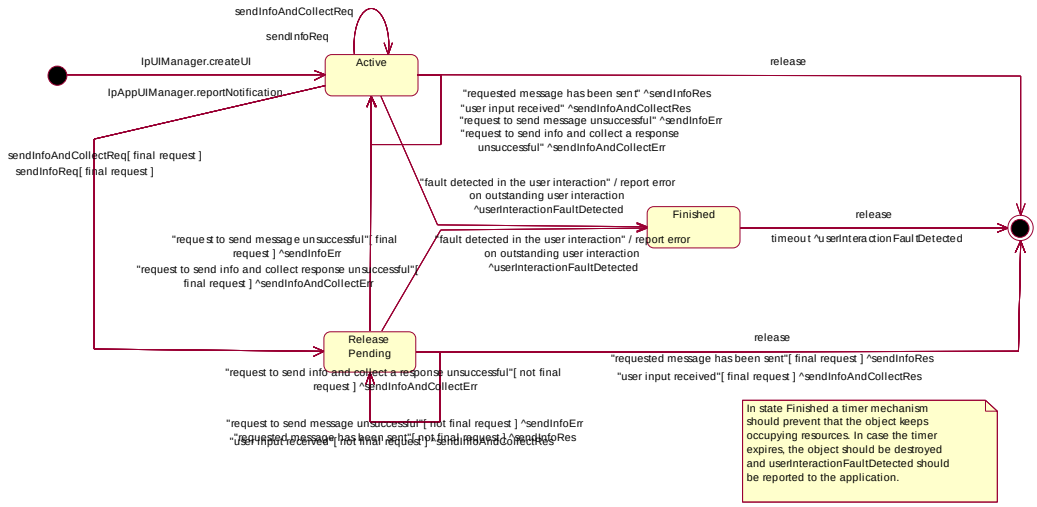


Figure 3: Application view on the UI object

9.2.1 Active State

In this state the UI object is available for requesting messages to be sent to the network.

In case a fault is detected on the user interaction (e.g. a link failure to the IVR system), userInteractionFaultDetected() will be invoked on the application and an error will be reported on all outstanding requests.

9.2.2 Release Pending State

A transition to this state is made when the Application has indicated that after a certain message no further messages need to be sent to the end-user. There are, however, still a number of messages that are not yet completed. When the last message is sent or when the last user interaction has been obtained, the UI object is destroyed.

In case the final request failed or the application requested to abort the final request, a transition is made back to the Active state.

In case a fault is detected on the user interaction (e.g. a link failure to the IVR system), userInteractionFaultDetected() will be invoked on the application and an error will be reported on all outstanding requests.

9.2.3 Finished State

In this state the user interaction has ended. The application can only release the UI object. Note that the application has to release the object itself as good Object Oriented practice requires that when an object is created on behalf of a certain entity, this entity is also responsible for destroying it when the object is no longer needed.

9.3 State Transition Diagrams for IpUICall

The state transition diagram shows the application view on the Call User Interaction object.

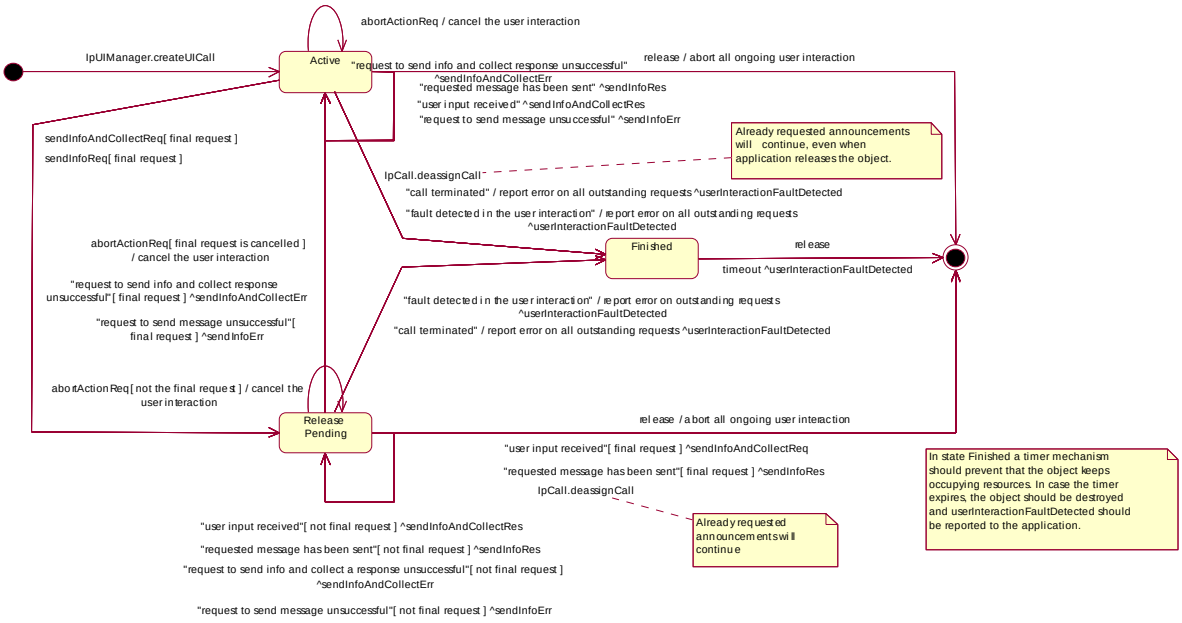


Figure 4: Application view on the UICall object

9.3.1 Active State

In this state a UICall object is available for announcements to be played to an end-user or obtaining information from the end-user.

When the application de-assigns the related Call or CallLeg object, a transition is made to the Finished state. However, all requested announcements will continue, even when the application releases the UICall object.

When the related call or call leg is terminated due to some reason, a transition is made to the Finished state, the operation userInteractionFaultDetected() will be invoked on the application and an error will be reported on all outstanding requests.

In case a fault is detected on the user interaction (e.g. a link failure to the IVR system), userInteractionFaultDetected() will be invoked on the application and an error will be reported on all outstanding requests.

9.3.2 Release Pending State

A transition to this state is made when the Application has indicated that after a certain announcement no further announcements need to be played to the end-user. There are, however, still a number of announcements that are not yet completed. When the last announcement is played or when the last user interaction has been obtained, the UICall object is destroyed. In case the final request failed or the application requested to abort the final request, a transition is made back to the Active state.

When the application de-assigns the related Call or CallLeg object, the UICall object is destroyed. However, all requested announcements will continue.

When the related call or call leg is terminated due to some reason, a transition is made to the Finished state, the operation userInteractionFaultDetected() will be invoked on the application and an error will be reported on all outstanding requests.

In case a fault is detected on the user interaction (e.g. a link failure to the IVR system), userInteractionFaultDetected() will be invoked on the application and an error will be reported on all outstanding requests.

9.3.3 Finished State

In this state the user interaction has ended. The application can only release the UICall object. Note that the application has to release the object itself as good Object Oriented practice requires that when an object is created on behalf of a certain entity, this entity is also responsible for destroying it when the object is no longer needed.

10 Service Properties

10.1 User Interaction Service Properties

The following table lists properties relevant for the User Interaction API.

Property	Type	Description
P_INFO_TYPE	INTEGER_SET	Specifies whether the UI SCS supports text or URLs etc. Allowed value set: {P_INFO_ID, P_URL, P_TEXT}

The previous table lists properties related to capabilities of the SCS itself. The following table lists properties that are used in the context of the Service Level Agreement, e.g. to restrict the access of applications to the capabilities of the SCS.

Property	Type	Description
P_TRIGGERING_ADDRESSES	ADDRESS_RANGE_SET	Specifies which numbers the notification may be set.
P_SERVICE_CODE	INTEGER_SET	Specifies the service codes that may be used for notification requests.

11 Data Definitions

The following data type referenced in this clause is defined in ES 202 915-4-2:

`TpCallIdentifier`

The following data types referenced in this clause are defined in ES 202 915-4-3:

`TpMultiPartyCallIdentifier`
`TpCallLegIdentifier`

All other data types referenced but not defined in this clause are common data definitions which may be found in ES 202 915-2.

11.1 TpUIFault

Defines the cause of the UI fault detected.

Name	Value	Description
P_UI_FAULT_UNDEFINED	0	Undefined.
P_UI_CALL_ENDED	1	The related Call object has been terminated. Therefore, the UICall object is also terminated. No further interaction is possible with this object.

11.2 IpUI

Defines the address of an `IpUI` Interface.

11.3 IpUIRef

Defines a `Reference` to type `IpUI`.

11.4 IpAppUI

Defines the address of an `IpAppUI` Interface.

11.5 IpAppUIRef

Defines a `Reference` to type `IpAppUI`.

11.6 IpAppUIManager

Defines the address of an `IpAppUIManager` Interface.

11.7 IpAppUIManagerRef

Defines a `Reference` to type `IpAppUIManager`.

11.8 TpUICallIdentifier

Defines the `Sequence of Data Elements` that unambiguously specify the UICall object.

Structure Element Name	Structure Element Type	Structure Element Description
UICallRef	IpUICallRef	This element specifies the interface reference for the UICall object.
UserInteractionSessionID	TpSessionID	This element specifies the User Interaction session ID.

11.9 TpUICollectCriteria

Defines the `Sequence of Data Elements` that specify the additional properties for the collection of information, such as the end character, first character timeout, inter-character timeout, and maximum interaction time.

Structure Element Name	Structure Element Type
MinLength	TpInt32
MaxLength	TpInt32
EndSequence	TpString
StartTimeout	TpDuration
InterCharTimeout	TpDuration

The structure elements specify the following criteria:

`MinLength:` Defines the minimum number of characters (e.g. digits) to collect.

`MaxLength:` Defines the maximum number of characters (e.g. digits) to collect.

`EndSequence:` Defines the character or characters which terminate an input of variable length, e.g. phone numbers.

`StartTimeout:` specifies the value for the first character time-out timer. The timer is started when the announcement has been completed or has been interrupted. The user should enter the start of the response (e.g. first digit) before the timer expires. If the start of the response is not entered before the timer expires, the input is regarded to be erroneous. After receipt of the start of the response, which may be valid or invalid, the timer is stopped.

`InterCharTimeOut:` specifies the value for the inter-character time-out timer. The timer is started when a response (e.g. digit) is received, and is reset and restarted when a subsequent response is received. The responses may be valid or invalid. the announcement has been completed or has been interrupted.

Input is considered successful if the following applies:

If the `EndSequence` is not present (i.e. an empty string):

- when the `InterCharTimeOut` timer expires; or
- when the number of valid digits received equals the `MaxLength`.

If the `EndSequence` is present:

- when the `InterCharTimeOut` timer expires; or
- when the `EndSequence` is received; or
- when the number of valid digits received equals the `MaxLength`.

In the case the number of valid characters received is less than the `MinLength` when the `InterCharTimeOut` timer expires or when the `EndSequence` is received, the input is considered erroneous.

The collected characters (including the `EndSequence`) are sent to the client application when input has been successful.

11.10 TpUIError

Defines the UI error codes.

Name	Value	Description
P_UI_ERROR_UNDEFINED	0	Undefined error
P_UI_ERROR_ILLEGAL_INFO	1	The specified information (InfoId, InfoData, or InfoAddress) is invalid
P_UI_ERROR_ID_NOT_FOUND	2	A legal InfoId is not known to the User Interaction service
P_UI_ERROR_RESOURCE_UNAVAILABLE	3	The information resources used by the User Interaction service are unavailable, e.g. due to an overload situation.
P_UI_ERROR_ILLEGAL_RANGE	4	The values for minimum and maximum collection length are out of range
P_UI_ERROR_IMPROPER_USER_RESPONSE	5	Improper user response
P_UI_ERROR_ABANDON	6	The specified leg is disconnected before the send information completed
P_UI_ERROR_NO_OPERATION_ACTIVE	7	There is no active User Interaction for the specified leg. Either the application did not start any User Interaction or the User Interaction was already finished when the abortActionReq() was called.
P_UI_ERROR_NO_SPACE_AVAILABLE	8	There is no more storage capacity to record the message when the recordMessageReq() operation was called
P_UI_ERROR_RESOURCE_TIMEOUT	9	The request has been accepted by the resource but it did not report a result.

The call User Interaction object will be automatically de-assigned if the error P_UI_ERROR_ABANDON is reported, as a corresponding call or call leg object no longer exists.

11.11 TpUIEventCriteria

Defines the `Sequence of Data Elements` that specify the additional criteria for receiving a UI notification.

Structure Element Name	Structure Element Type	Description
OriginatingAddress	TpAddressRange	Defines the originating address for which the notification is requested.
DestinationAddress	TpAddressRange	Defines the destination address or address range for which the notification is requested.
ServiceCode	TpString	Defines a 2-digit code indicating the UI to be triggered. The value is operator specific.

11.12 TpUIEventCriteriaResultSet

Defines a set of TpUIEventCriteriaResult.

11.13 TpUIEventCriteriaResult

Defines a `sequence of data elements` that specify a requested event notification criteria with the associated assignmentID.

Structure Element Name	Structure Element Type	Structure Element Description
EventCriteria	TpUIEventCriteria	The event criteria that were specified by the application.
AssignmentID	TpInt32	The associated assignmentID. This can be used to disable the notification.

11.14 TpUIEventInfo

Defines the `Sequence of Data Elements` that specify a UI notification.

Structure Element Name	Structure Element Type	Structure Element Description
OriginatingAddress	TpAddress	Defines the originating address.
DestinationAddress	TpAddress	Defines the destination address.
ServiceCode	TpString	Defines a 2-digit code indicating the UI to be triggered. The value is operator specific.
DataTypeIndication	TpUIEventInfoDataType	Identifies the type of contents in DataString.
DataString	TpString	Freely defined data string with a limited length e.g. 160 bytes according to the network policy.

11.15 TpUIEventInfoDataType

Defines the type of the dataString parameter in the method userInteractionEventNotify.

Name	Value	Description
P_UI_EVENT_DATA_TYPE_UNDEFINED	0	Undefined (e.g. binary data)
P_UI_EVENT_DATA_TYPE_UNSPECIFIED	1	Unspecified data
P_UI_EVENT_DATA_TYPE_TEXT	2	Text
P_UI_EVENT_DATA_TYPE_USSD_DATA	3	USSD data starting with coding scheme

11.16 TpUIIdentifier

Defines the `Sequence of Data Elements` that unambiguously specify the UI object.

Structure Element Name	Structure Element Type	Structure Element Description
UIRef	IpUIRef	This element specifies the interface reference for the UI object.
UserInteractionSessionID	TpSessionID	This element specifies the User Interaction session ID.

11.17 TpUIInfo

Defines the `Tagged Choice of Data Elements` that specify the information to send to the user.

	Tag Element Type	
	TpUIInfoType	

Tag Element Value	Choice Element Type	Choice Element Name
P_UI_INFO_ID	TpInt32	InfoId
P_UI_INFO_DATA	TpString	InfoData
P_UI_INFO_ADDRESS	TpURL	InfoAddress
P_UI_INFO_BIN_DATA	TpOctetSet	InfoBinData

The choice elements represent the following:

`InfoID:` defines the ID of the user information script or stream to send to an end-user. The values of this data type are operator specific.

`InfoData:` defines the data to be sent to an end-user's terminal. The data is free-format and the encoding is depending on the resources being used.

`InfoAddress:` defines the URL of the text or stream to be sent to an end-user's terminal.

`InfoBinData:` defines the binary data to be sent to an end-user's terminal. The data is a free-format, 8-bit quantity that is guaranteed not to undergo any conversion when transmitted.

11.18 TpUIInfoType

Defines the type of the information to be sent to the user.

Name	Value	Description
P_UI_INFO_ID	0	The information to be sent to an end-user consists of an ID.
P_UI_INFO_DATA	1	The information to be sent to an end-user consists of a data string.
P_UI_INFO_ADDRESS	2	The information to be sent to an end-user consists of a URL.
P_UI_INFO_BIN_DATA	3	The information to be sent to an end-user consists of a 8 bit binary data set.

11.19 TpUIMessageCriteria

Defines the `Sequence of Data Elements` that specify the additional properties for the recording of a message.

Structure Element Name	Structure Element Type
EndSequence	TpString
MaxMessageTime	TpDuration
MaxMessageSize	TpInt32

The structure elements specify the following criteria:

`EndSequence:` Defines the character or characters which terminate an input of variable length, e.g. phone numbers.

`MaxMessageTime:` specifies the maximum duration in seconds of the message that is to be recorded.

`MaxMessageSize:` If this parameter is non-zero, it specifies the maximum size in bytes of the message that is to be recorded.

11.20 TpUIReport

Defines the UI reports if a response was requested.

Name	Value	Description
P_UI_REPORT_UNDEFINED	0	Undefined report.
P_UI_REPORT_INFO_SENT	1	Confirmation that the information has been sent.
P_UI_REPORT_INFO_COLLECTED	2	Information collected., meeting the specified criteria.
P_UI_REPORT_NO_INPUT	3	No information collected. The user immediately entered the delimiter character. No valid information has been returned.
P_UI_REPORT_TIMEOUT	4	No information collected. The user did not input any response before the input timeout expired.
P_UI_REPORT_MESSAGE_STORED	5	A message has been stored successfully.
P_UI_REPORT_MESSAGE_NOT_STORED	6	The message has not been stored successfully.
P_UI_REPORT_MESSAGE_DELETED	7	A message has been deleted successfully.
P_UI_REPORT_MESSAGE_NOT_DELETED	8	A message has not been deleted successfully.

11.21 TpUIResponseRequest

Defines the situations for which a response is expected following the User Interaction.

Name	Value	Description
P_UI_RESPONSE_REQUIRED	1	The User Interaction Call shall send a response when the request has completed.
P_UI_LAST_ANNOUNCEMENT_IN_A_ROW	2	This is the final announcement within a sequence. It might, however, be that additional announcements will be requested at a later moment. The User Interaction Call service may release any used resources in the network. The UI object will not be released.
P_UI_FINAL_REQUEST	4	This is the final request. The UI object will be released after the information has been presented to the user.

This parameter represents a so-called bitmask, i.e. the values can be added to derive the final meaning.

11.22 TpUITargetObjectType

Defines the type of object where User Interaction should be performed upon.

Name	Value	Description
P_UI_TARGET_OBJECT_CALL	0	User-interaction will be performed on a complete Call.
P_UI_TARGET_OBJECT_MULTI_PARTY_CALL	1	User-interaction will be performed on a complete Multi-party Call.
P_UI_TARGET_OBJECT_CALL_LEG	2	User-interaction will be performed on a single Call Leg. The media of this call leg should be detached at the moment any user interaction is done.

11.23 TpUITargetObject

Defines the `Tagged Choice of Data Elements` that specify the object to perform User Interaction on.

	Tag Element Type	
	TpUITargetObjectType	

Tag Element Value	Choice Element Type	Choice Element Name
P_UI_TARGET_OBJECT_CALL	TpCallIdentifier	Call
P_UI_TARGET_OBJECT_MULTI_PARTY_CALL	TpMultiPartyCallIdentifier	MultiPartyCall
P_UI_TARGET_OBJECT_CALL_LEG	TpCallLegIdentifier	CallLeg

11.24 TpUIVariableInfo

Defines the `Tagged Choice of Data Elements` that specify the variable parts in the information to send to the user.

	Tag Element Type	
	TpUIVariablePartType	

Tag Element Value	Choice Element Type	Choice Element Name
P_UI_VARIABLE_PART_INT	TpInt32	VariablePartInteger
P_UI_VARIABLE_PART_ADDRESS	TpString	VariablePartAddress
P_UI_VARIABLE_PART_TIME	TpTime	VariablePartTime
P_UI_VARIABLE_PART_DATE	TpDate	VariablePartDate
P_UI_VARIABLE_PART_PRICE	TpPrice	VariablePartPrice

11.25 TpUIVariableInfoSet

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

11.26 TpUIVariablePartType

Defines the type of the variable parts in the information to send to the user.

Name	Value	Description
P_UI_VARIABLE_PART_INT	0	Variable part is of type integer
P_UI_VARIABLE_PART_ADDRESS	1	Variable part is of type address
P_UI_VARIABLE_PART_TIME	2	Variable part is of type time
P_UI_VARIABLE_PART_DATE	3	Variable part is of type date
P_UI_VARIABLE_PART_PRICE	4	Variable part is of type price

11.27 TpUIEventNotificationInfo

Defines the `Sequence of Data Elements` that specify a UI event notification

Structure Element Name	Structure Element Type	Structure Element Description
OriginatingAddress	TpAddress	Defines the originating address.
DestinationAddress	TpAddress	Defines the destination address.
ServiceCode	TpString	Defines a 2-digit code indicating the UI to be triggered. The value is operator specific.
DataTypeIndication	TpUIEventInfoDataType	Identifies the type of contents in UIEventData
UIEventData	TpOctetSet	Freely defined data according to the network policy. e.g 7 bit USSD encoded

12 Exception Classes

The following are the list of exception classes which are used in this interface of the API.

Name	Description
P_ILLEGAL_ID	Information id specified is invalid.
P_ID_NOT_FOUND	Information id unknown.
P_ILLEGAL_RANGE	The values for minimum and maximum collection length are out of range.
P_INVALID_COLLECTION_CRITERIA	Invalid collection criteria specified.

Each exception class contains the following structure:

Structure Element Name	Structure Element Type	Structure Element Description
ExtraInformation	TpString	Carries extra information to help identify the source of the exception, e.g. a parameter name.

Annex A (normative): OMG IDL Description of User Interaction SCF

The OMG IDL representation of this interface specification is contained in text files (ui_data.idl and ui_interfaces.idl contained in archive es_20291505v010201m0.ZIP) which accompanies the present document.

Annex B (informative): W3C WSDL Description of User Interaction SCF

The W3C WSDL representation of this interface specification is contained in text files (ui interfaces, wsdl and ui_data.wsdl contained in archive es_20291505v010201m0.ZIP) which accompanies the present document.

Annex C (informative): Java API Description of User Interaction SCF

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

- JAIN User Interaction (http://jcp.org/jsr/detail/103.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 R4 User Interaction

All of the present document is relevant for TS 129 198-5 V4 (Release 4).

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 202 915-5 version 1.1.1 (Parlay 4.0)	
Interfaces added in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.1.2 Deprecated

Identifier	Comments
Interfaces deprecated in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Interfaces deprecated in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.1.3 Removed

Identifier	Comments
Interfaces removed in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Interfaces removed in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.2 Methods

E.2.1 New

Identifier	Comments
Methods added in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
IpUIManager.enableNotifications	Enable network controlled notifications
IpUIManager.disableNotifications	Disable network controlled notifications
Methods added in ES 202 915-5 version 1.2.1 (Parlay 4.1)	
IpAppUIManager.reportEventNotification()	replaces reportNotification()

E.2.2 Deprecated

Identifier	Comments
Methods deprecated in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Methods deprecated in ES 202 915-5 version 1.2.1 (Parlay 4.1)	
IpAppUIManager.reportNotification()	replaced by reportEventNotification()

E.2.3 Modified

Identifier	Comments
Methods modified in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Methods modified in ES 202 915-5 version 1.2.1 (Parlay 4.1)	
IpUIManager.getNotification()	exception P_INVALID_CRITERIA removed

E.2.4 Removed

Identifier	Comments
Methods removed in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Methods removed in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.3 Data Definitions

E.3.1 New

Identifier	Comments
Data Definitions added in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Data Definitions added in ES 202 915-5 version 1.2.1 (Parlay 4.1)	
TpUIEventNotificationInfo	

E.3.2 Modified

Identifier	Comments
Data Definitions modified in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
TpUIInfoType	P_UI_INFO_BIN_DATA added
TpUIInfo	InfoBinData added
Data Definitions modified in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.3.3 Removed

Identifier	Comments
Data Definitions removed in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Data Definitions removed in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.4 Service Properties

E.4.1 New

Identifier	Comments
Service Properties added in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Service Properties added in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.4.2 Deprecated

Identifier	Comments
Service Properties deprecated in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Service Properties deprecated in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.4.3 Modified

Identifier	Comments
Service Properties modified in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Service Properties modified in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.4.4 Removed

Identifier	Comments
Service Properties removed in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Service Properties removed in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.5 Exceptions

E.5.1 New

Identifier	Comments
Exceptions added in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Exceptions added in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.5.2 Modified

Identifier	Comments
Exceptions modified in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
P_ID_NOT_FOUND	Description updated
Exceptions modified in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.5.3 Removed

Identifier	Comments
Exceptions removed in ES 202 915-5 version 1.1.1 (Parlay 4.0)	
Exceptions removed in ES 202 915-5 version 1.2.1 (Parlay 4.1)	

E.6 Others

New annex B - WSDL description of SCF.

New annex C - JAVA API description of SCF.

History

Document history		
V1.1.1	January 2003	Publication
V1.2.1	June 2003	Membership Approval Procedure MV 20030801: 2003-06-03 to 2003-08-01