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Open Service Access (OSA); Application Programming Interface (API); Part 5: User Interaction SCF (Parlay 3)

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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 5 of a multi-part deliverable covering Open Service Access (OSA); Application Programming Interface (API), as identified below. The API specification (ES 201 915) is structured in the following parts:

Part 1: "Overview";

Part 2: "Common Data Definitions";

Part 3: "Framework";

Part 4: "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".

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 3.3 set of specifications.

The present document is equivalent to 3GPP TS 29.198-5 V4.6.0 (Release 4).

1 Scope

The present document is part 5 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

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 201 915-1 contain provisions which, through reference in this text, constitute provisions of the present document.

ETSI ES 201 915-1: "Open Service Access (OSA); Application Programming Interface (API); Part 1: Overview (Parlay 3)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ES 201 915-1 apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations defined in ES 201 915-1 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.

Table 1 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	

Table 2 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 of this specification.

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.

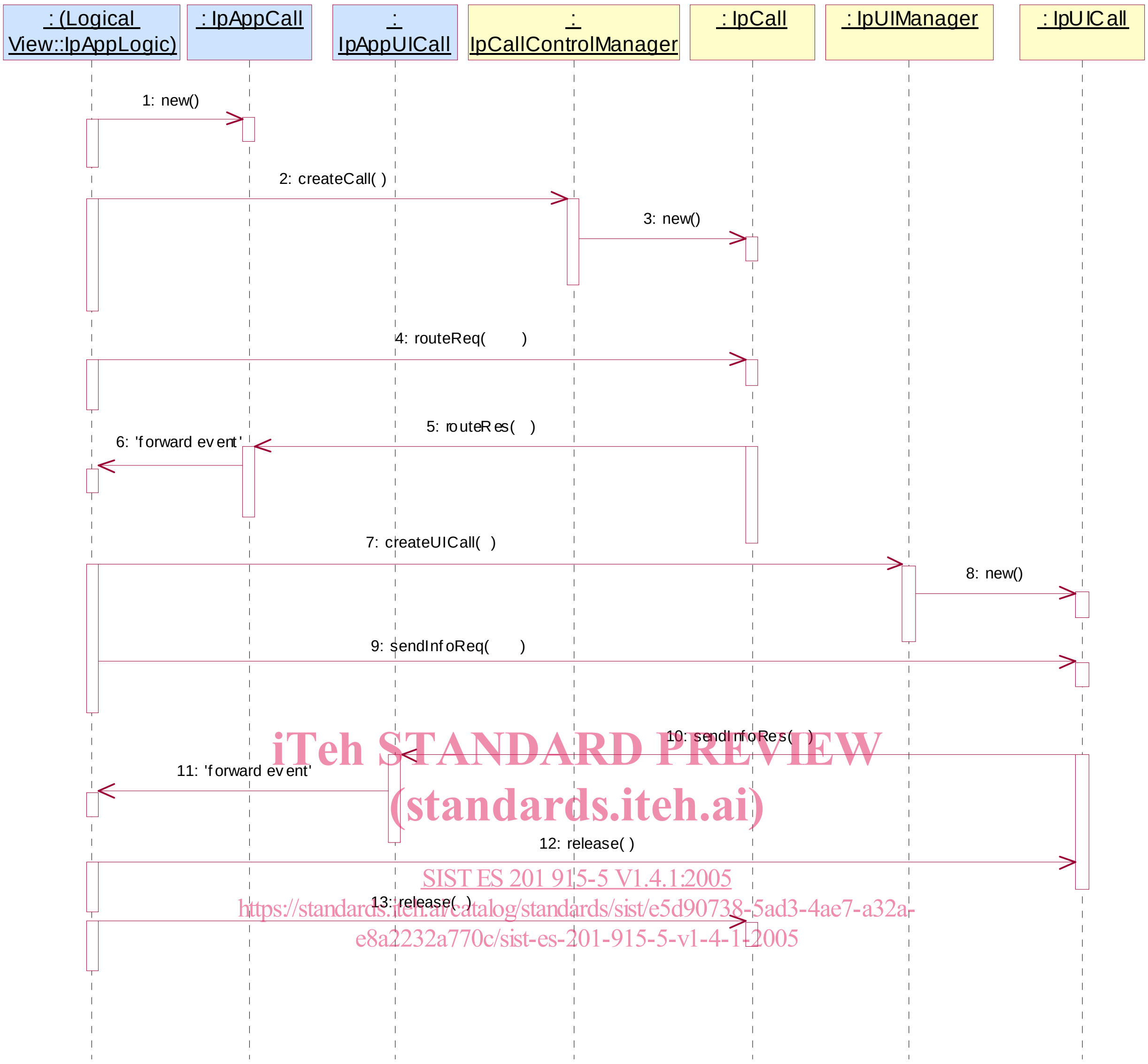
Where a method is not supported by an implementation of a Service interface, the exception P_METHOD_NOT_SUPPORTED shall be returned to any call of that method.

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.

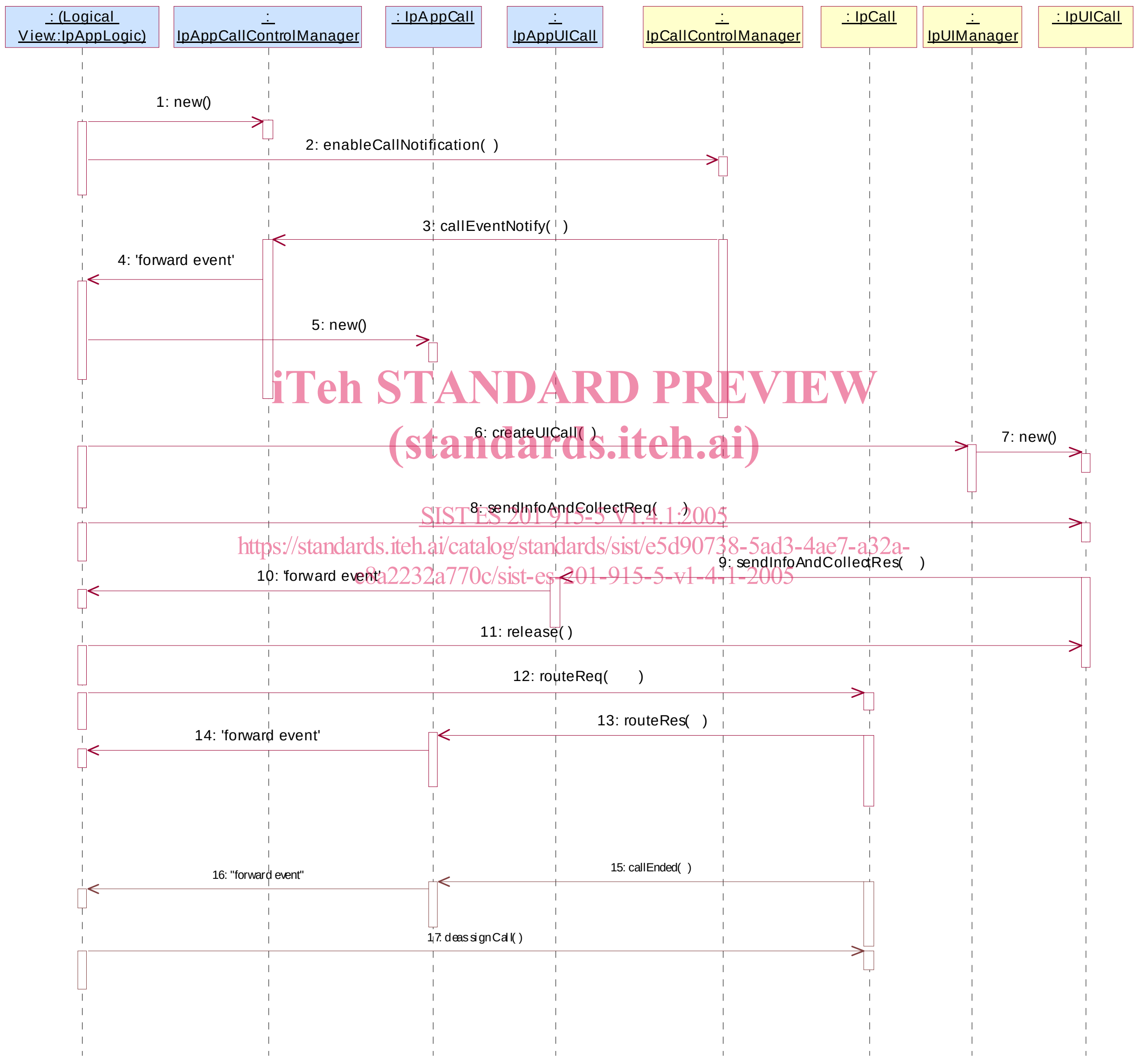
11: The event is forwarded to the application logic.

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

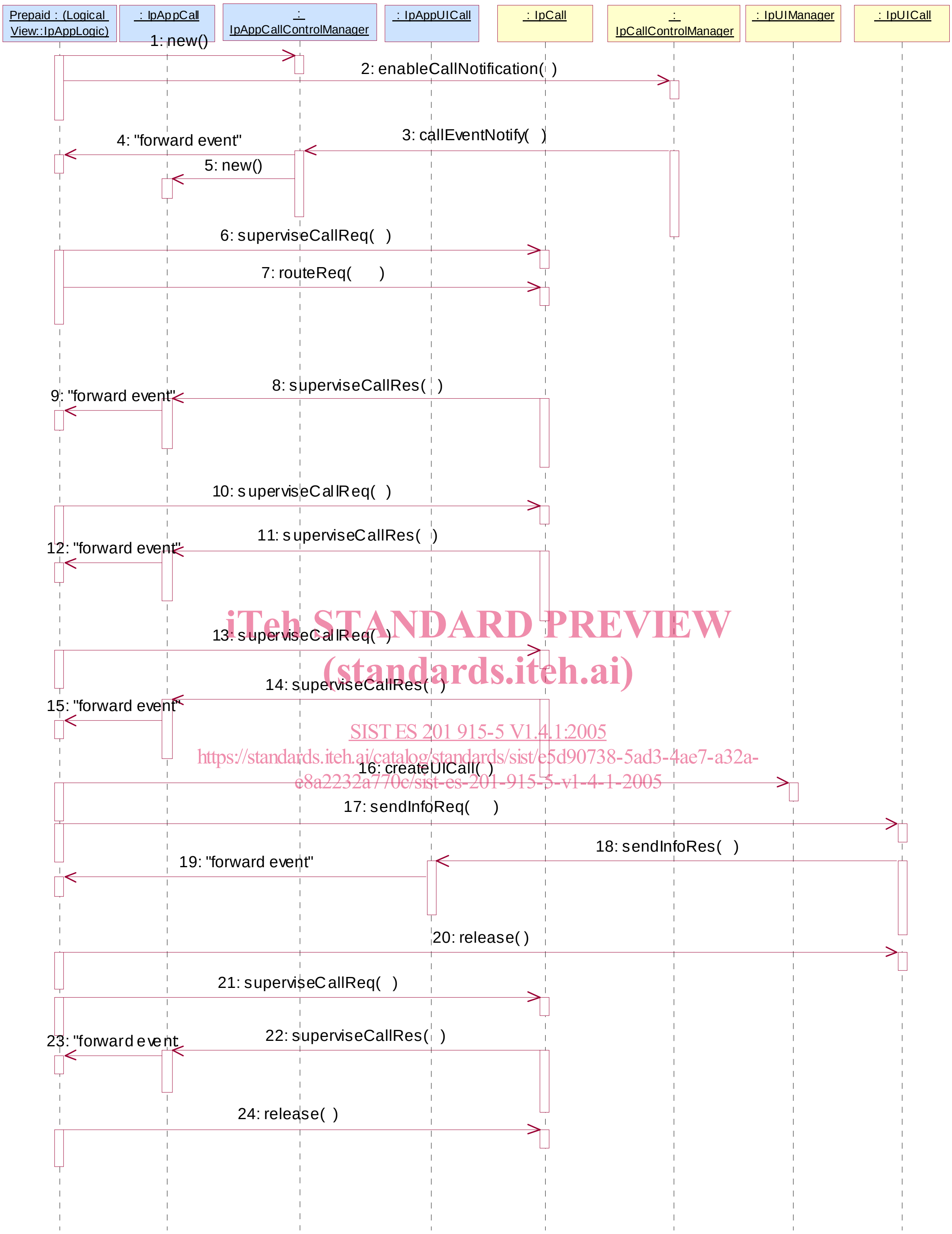
15: When the call is terminated in the network, the application will receive a notification. This notification will always be received when the call is terminated by the network in a normal way, the application does not have to request this event explicitly.

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 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.



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.

5.4 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.