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Title: **TR 29.998, OPEN SERVICE ARCHITECTURE, API – PART 2 (Version 1.0.0)**

Agenda item: **5.5**

Document for: **APPROVAL**

Attached to this cover sheet is the new Technical Specification TS29.998, ***"Open Service Architecture, Application Programming Interface; Part 2"***. The following issues are remained open:

- For a number of parameters (bearer capabilities, tele services, service code, network interworking indicators, call party category) needs further specification of their formats.

- Charging functionality is addressed within the Call Control Service Capability Feature. The functionality is specified but specifics of a limited set of parameters must be modified. These are GSM specific (i.e. GSM AoC parameters) and require updates.

Both issues will be resolved in the near term and appropriate CRs can be expected to the next TSG CN#08 Plenary

3G TR 29.998 1.0.0 (2000-03)

Technical Report

3rd Generation Partnership Project; Technical Specification Group Core Networks; Open Services Architecture - API - Part 2;

(3G TR 29.9xx version 1.0.0)

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Contents

Foreword

This Technical Report has been produced by the 3GPP.
The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 Indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document investigates how the OSA Interface Class methods can be mapped onto CAMEL Application Part operations and MAP Application Part operations. The mapping of the OSA API to the CAP and relevant MAP operations is considered informative, and not normative.

The Open Service Architecture (OSA) defines an architecture that enables operator and third party applications to make use of network functionality through an open standardized interface (the OSA Interface). OSA provides the glue between applications and service capabilities provided by the network. In this way applications become independent from the underlying network technology. The applications constitute the top level of the Open Service Architecture (OSA). This level is connected to the Service Capability Servers (SCSs) via the OSA interface. The SCSs map the OSA interface onto the underlying telecommunications specific protocols (e.g. MAP, CAP, etc.) and are therefore hiding the network complexity from the applications.

The specific Service Capability Server under consideration in this technical report is the CSE. In this case, the OSA API provides the operator or third party applications access to the CAMEL Application Part protocol operations, via the OSA Interface Class methods. On the gsmSCF, the OSA Interface Class methods need to be mapped, or translated, onto the relevant CAP and/or MAP operations. Only the non-framework Service Capability Features will be taken into account for the mapping. This document is not exhaustive in covering all the mappings that can be expected. It provides several examples, but it should be noted that several other possibilities exist. In particular, only general cases of normal operations are covered and exception scenarios are not within the scope of the document.

The OSA API to CAP and MAP mapping is part of Release99.

2 References

2.1 Normative references

[1] 3G TR 22.905: ” 3GPP Vocabulary”

[2] 3G TS 29.1xx: “Open Service Architecture; Application Programming Interface

[3] 3G TS 29.002: “Digital cellular telecommunications system (Phase2+); Mobile Application Part (MAP) specification

[4] 3G TS 29.078: “Digital cellular telecommunications system (Phase2+); CAMEL Application Part (CAP) specification – Phase 3”

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this TR, the following definitions apply:

Service Capabilities: Bearers defined by parameters, and/or mechanisms needed to realize services. These are within networks and under network control.

Service Capability Feature: Functionality offered by service capabilities that are accessible via the standardized OSA interface

Service Capability Server: Functional Entity providing OSA interfaces towards an application

Services: Services are made up of different service capability features.

Applications: Services, which are designed using service capability features.

OSA Interface: Standardized Interface used by application to access service capability features.

Virtual Home Environment: A concept for personal service environment portability across network boundaries and between terminals.

Further UMTS related definitions are given in 3G TS 22.101.

3.2 Abbreviations

For the purposes of this TS the following abbreviations apply:

API	Application Programming Interface
CAMEL	Customised Application for Mobile network Enhanced Logic
CAP	CAMEL Application Part
CSE	Camel Service Environment
HE	Home Environment
HE-VASP	Home Environment Value Added Service Provider
HLR	Home Location Register
IDL	Interface Description Language
MAP	Mobile Application Part
ME	Mobile Equipment
MExE	Mobile Station (Application) Execution Environment
MS	Mobile Station
MSC	Mobile Switching Centre
OSA	Open Service Architecture
PLMN	Public Land Mobile Network
PSE	Personal Service Environment
SAT	SIM Application Tool-Kit
SCP	Service Control Point
SRF	Specialised Resource Function
SIM	Subscriber Identity Module
SMS	Short Message Service
USIM	User Service Identity Module
VASP	Value Added Service Provider
VHE	Virtual Home Environment
WAP	Wireless Application Protocol
WGP	WAP Gateway Proxy
WPP	WAP Push Proxy

Further GSM related abbreviations are given in GSM 01.04. Further UMTS related abbreviations are given in 3G T 22.905.

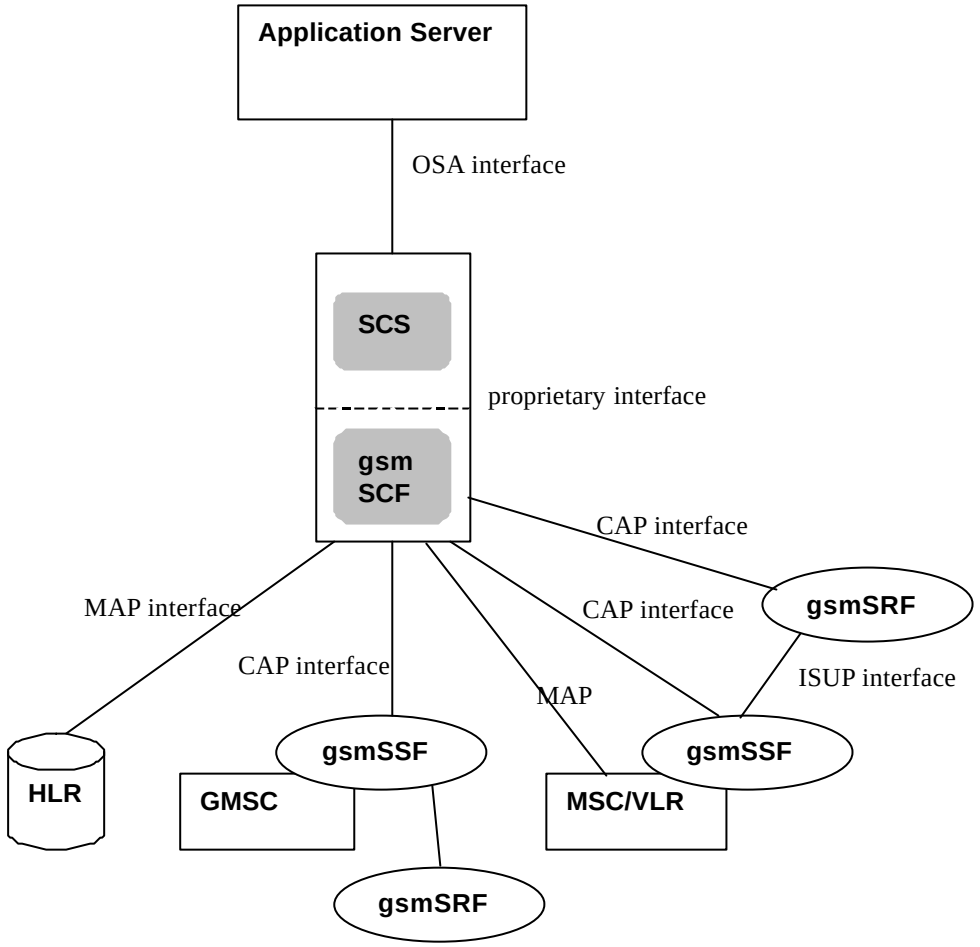
4 Virtual Home Environment and Open Service Architecture

The Open Service Architecture (OSA) is the architecture enabling applications to make use of network capabilities. The applications will access the network through the OSA interface that is specified in TS23.127.

The access to network functionality is offered by different Service Capability Servers (SCSs) and appear as service capability features in the OSA interface. These are the capabilities that the application developers have at their hands when designing new applications (or enhancements/variants of already existing ones). The different features of the different SCSs can be combined as appropriate. The service logic executes toward the OSA interfaces, while the underlying core network functions use their specific protocols. This technical report specifically considers the CSE SCS and the CAMEL Phase3 capabilities. An informative mapping of OSA API methods onto CAP and relevant MAP operations is provided.

4.1 The Interface

The OSA API interface and the protocol onto which the Interface Class methods are mapped, are depicted in Figure 1. The applications are executed on an Application Server. The OSA API interface allows the application access to the functionality provided by the Service Capability Server. The OSA interface resides between the Application Server and the SCS, while the CAP and MAP interfaces reside in the network domain as illustrated in Figure 1 below.



Key

CAP	CAMEL Application Part
CSE	CAMEL Service Environment
GMSC	Gateway Mobile Switching Center
gsmSSF	GSM Service Switching Function
gsmSRF	GSM Specialised Resource Function
HLR	Home Location Register
OSA	Open Services Architecture
SCS	Service Capability Server

Figure 1: The Interface under consideration

The SCS uses network capabilities through an undefined proprietary interface. The actual implementation of the SCS is not defined. However, the mapping is independent of the implementation option for the SCS and the gsmSCF , i.e. independent of the fact whether SCS and gsmSCF are implemented in the same physical entity or separate physical entities. The network may include non-CAMEL capabilities to implement the API, but these capabilities are not shown in the figure and are without the scope of this technical report.

5 Generic Call Control Service CAMEL Call Flows

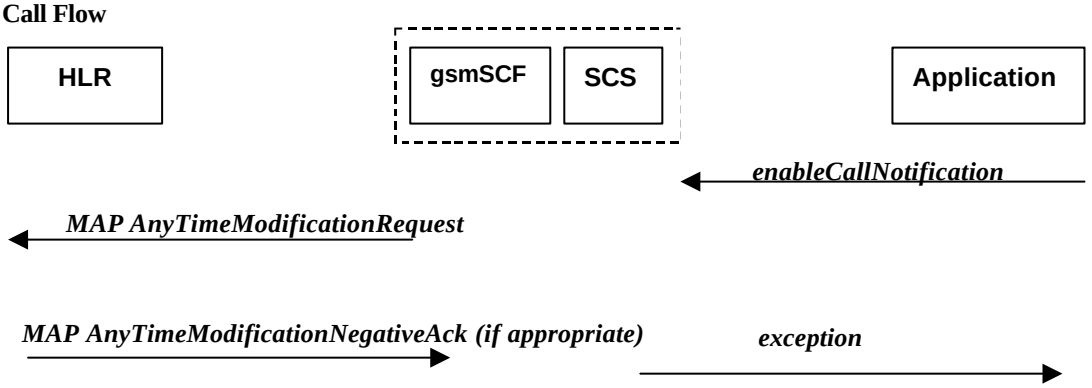
5.1 Call Manager

The generic call manager interface class provides the management functions to the generic call Service Capability Features. The application programmer can use this interface to create call objects and to enable or disable call-related event notifications.

5.1.1 enableCallNotification

enableCallNotification is used to enable call notifications to be sent to the application.

Call Flow



Normal Operation

Pre-conditions	An agreement is established between the network operator and the service provider for the event notification to be enabled
1	The application invokes the ***enableCallNotification*** method
2	The gsmSCF sends a MAP AnyTimeModificationRequest to the HLR in order to Activate the necessary CAMEL Subscription Information (O-CSI, D-CSI, T-CSI, VT-CSI) Note : CAMEL phase 3 only allows for activation/deactivation of the CSI and not modification of the contents of the CSIs. The O-CSI and D-CSI will be activated if the originating address is present and the T-CSI and VT-CSI will be activated if the destination address is present

Error condition

1. HLR rejects CSI updates

Pre-conditions	gsmSCF had previously sent a MAP AnyTimeModificationRequest messge to the HLR as a result of an *enableCallNotification* request from the application
1	HLR rejects the request to update the CSI
2	The gsmSCF sends an internal message to the SCS to indicate the up date failure
3	The SCS invokes the exception on enableCallNotification

Parameter Mapping

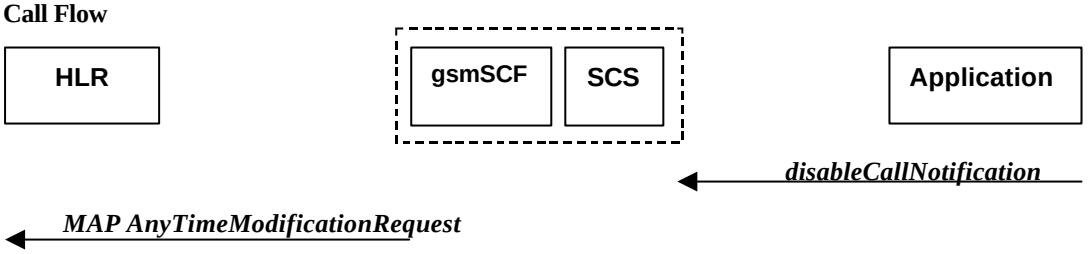
From: ***enableCallNotification***	To: MAP AnyTimeModificationRequest
appInterface	
eventCriteria	**Subscriber Identity** **CAMEL Subscription Information** - **T-CSI** - **VT-CSI**

	- **O-CSI** - **D-CSI**
assignmentID	
	gsmSCF address

5.1.2 disableCallNotification

disableCallNotification is used by the application to disable call notifications.

Call Flow



Normal Operation

Pre-conditions	An agreement is established between the network operator and the service provider for the event notification to be disabled
1	The application invokes the ***disableCallNotification*** method
2	The gsmSCF sends a MAP AnyTimeModificationRequest to the HLR in order to de-activate the CAMEL subscription Information (O-CSI, T-CSI, VT-CSI). Note that CAMEL Phase 3 only allows the capability to activate/deactivate CSI and not to modify the triggering information. The O-CSI and D-CSI will be deactivated if the originating address is present and the T-CSI and VT-CSI will be deactivated if the destination address is present

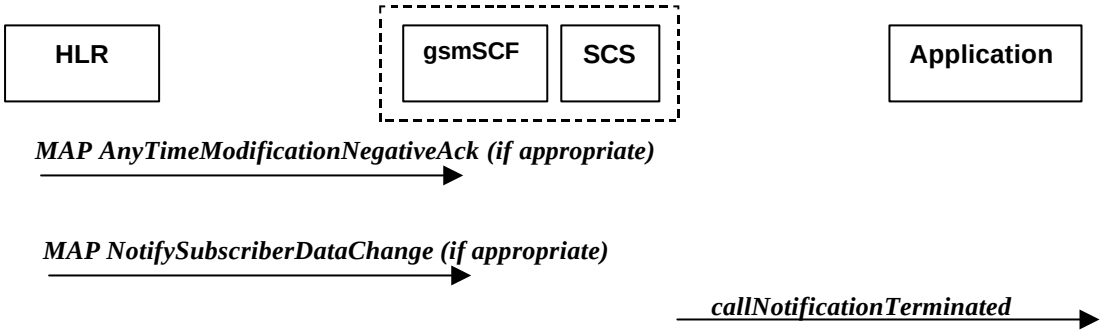
Parameter Mapping

From: ***disableCallNotification***	To: MAP AnyTimeModificationRequest
eventCriteria	**Subscriber Identity** **CAMEL Subscription Information** - **T-CSI** - **VT-CSI** - **O-CSI** - **D-CSI**
assignmentID	
	gsmSCFAddress

5.1.3 callNotificationTerminated

callNotificationTerminated indicates to the application that all event notifications have been terminated, for example due to faults detected.

Call Flow



Normal Operation

Two alternatives have been identified

2. Error detected in SCS or gsmSCF

Pre-conditions	Call notifications have been enabled using the ***enableNotification*** method on the Call Manager interface
1	The SCS has detected, or has been informed of, a fault which prevents further events from being notified
2	The SCS invokes the ***callNotificationTerminated*** method

3. HLR notifies the gsmSCF a deactivation of the CSI

Pre-conditions	Call notifications have been enabled using the ***enableNotification*** method on the Call Manager interface
1	The HLR sends a MAP *NotifySubscriberDataChange* indicating that a CSI for a subscriber has been deactivated. The gsmSCF detects that all call related CSIs for that subscriber have been deactivated and sends an internal message to the SCS to this effect
2	The SCS receives an indication that all call related CSI have been deactivated and invokes the ***callNotificationTerminated*** method

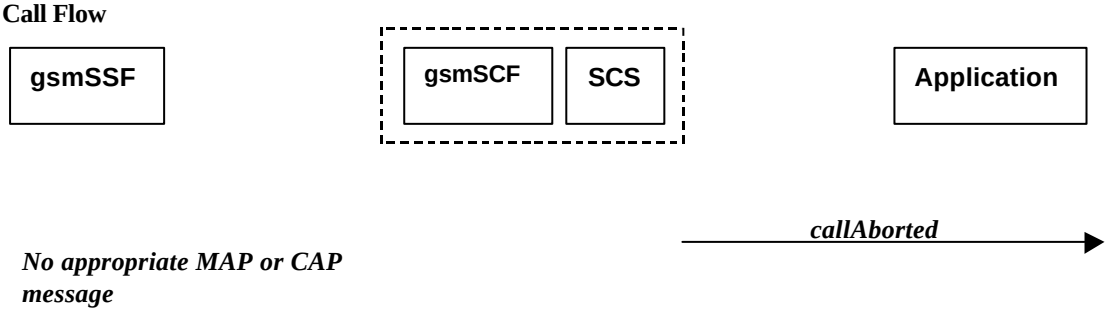
Parameter Mapping

None.

5.1.4 callAborted

callAborted indicates to the application that the call object has aborted or terminated abnormally. No further communication will be possible between the call and the application.

Call Flow



Normal Operation

Pre-conditions	
1	The SCS detect a catastrophic failure in its communication with the gsmSCF
2	The SCS, invokes the ***callAborted*** method. The call running in the network may continue and will not have been affected by this failure betweeen the gsmSCF and the SCS

5.1.5 callEventNotify

callEventNotify notifies the application of the arrival of a call-related event.

Call Flow

Normal Operation

Pre-conditions	Call notifications have been enabled using the ***enableCallNotification*** method on the Call Manager interface
1	A call arrives at the gsmSSF causing initial triggering to the gsmSCF CAP InitialDP
2	The gsmSCF recognizes the need for an API service and passes the triggering information to the SCS
3	The SCS identifies the application responsible for handling the call and invokes the ***callEventNotify*** method

Parameter Mapping

From: CAP InitialDP	To: ***callEventNotify***
	call
Additional Calling Party Number	**eventInfo**
Original Calling Party ID	
Redirection Party ID	
Service Interaction Indicators Two	
Bearer Capability	
Called Party Number	
Called Party Number BCD	
Calling Party Number	
Calling Party Category	
Call Reference Number	
Cause	
Event Type BCSM	
High Layer Compatibility	
IMSI	
IP SSP Capabilities	
Location Information	
Location Number	
MSC Address	
GMSC Address	
NA Carrier Information	

Redirection Information	
Service Key	
Subscriber State	
Time and Timezone	
GSM Forwarding Pending	
CUG Information	
CUG Index	
Location Number	
CellIdOrLAI	
Geographical Information	
Geodetic Information	
Age of Location Information	
VLR Number	
Selected LSA Identity	
	assignmentID
	appInterface

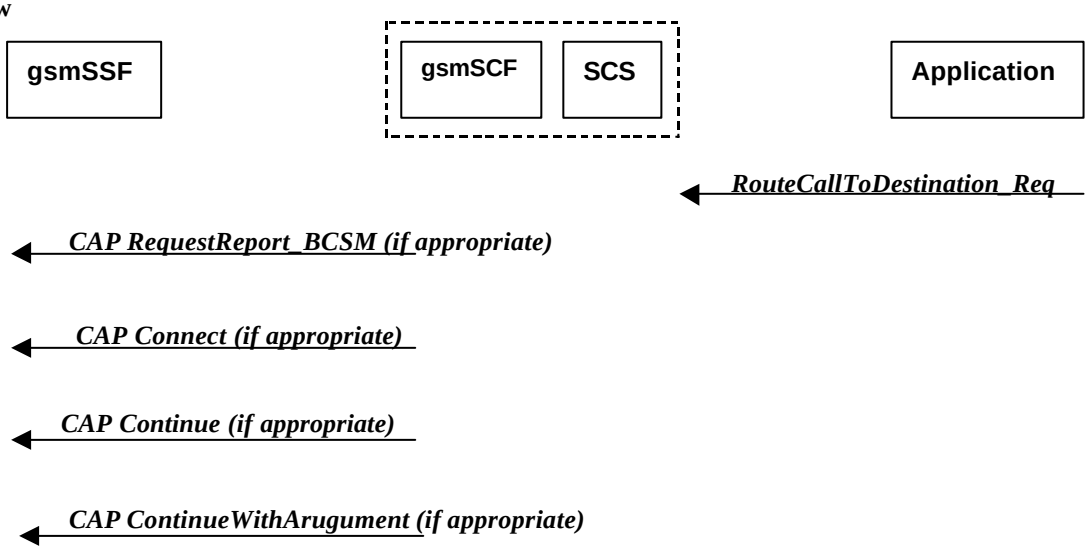
5.2 Call

The generic call interface represents the interface to the generic call Service Capability Feature. It provides a structure to allow simple and complex call behaviour.

5.2.1 RouteCallToDestination_Req

routeCallToDestination_Req is an asynchronous method which requests routing of the call (and inherently attached parties) to the destination party, via a passive call leg. Subsequent invocations of the ***routeCallToDestination_Req*** method are not allowed. This implies that all triggers, required by the application throughout the life time of the call, need to be armed in the parameter **responseRequested**.

Call Flow



Normal Operation

Three alternatives have been identified

1. The application changes the destination number

Pre-conditions	The application has been notified of a new call and the call object exists. The ***setCallChargePlan***

	and ***getCallInfo_Req*** methods may have been invoked
1	The application invokes the ***routeCallToDestination_Req*** method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP RequestReportBSCM if the application needs to be informed about the outcome of the request
4	The gsmSCF sends a CAP Connect message

Parameter Mapping

From: ***routeCallToDestination_Req***	To: ***CAP RequestReport_BCSM***
callSessionID	
responseRequested	**BCSMEvent**
targetAddress	
originalDestinationAddress	
redirectingAddress	
appInfo	

From: ***routeCallToDestination_Req***	To: ***CAP Connect***
callSessionID	
responseRequested	
targetAddress	**Destination Routing Address**
originatingAddress	
originalDestinationAddress	**Original Called Party ID**
redirectingAddress	**Redirecting Party ID**
	NA Carrier Information
	NA Originating Line Information
	NA Charge Number
	Suppression Of Announcements
	Service Interaction Indicators Two
	CUG Interlock Code
	Outgoing Access Indicator
	O-CSI Applicable
appInfo	**Calling Partys Category** Generic Number **Redirection Information** **Alerting Pattern**

2. The application does not modify the destination address and does not provide any Application Information

Pre-conditions	The application has been notified of a new call and the call object exists. The ***setCallChargePlan*** and ***getCallInfo_Req*** methods may have been invoked
1	The application invokes the ***routeCallToDestination_Req*** method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP RequestReportBSCM if the application needs to be informed about the outcome of the request
4	The gsmSCF sends a CAP Continue message

Parameter Mapping

From: ***routeCallToDestination_Req***	To: ***CAP RequestReport_BCSM***
callSessionID	
responseRequested	**BCSMEvent**
targetAddress	
originalDestinationAddress	
redirectingAddress	
appInfo	

From: ***routeCallToDestination_Req***	To: ***CAP Continue***
callSessionID	
responseRequested	
targetAddress	
originatingAddress	
originalDestinationAddress	
redirectingAddress	
appInfo	

3. The application does not modify the destination party number but modifies Application information

Pre-conditions	The application has been notified of a new call and the call object exists. The ***setCallChargePlan*** and ***getCallInfo_Req*** methods may have been invoked
1	The application invokes the ***routeCallToDestination_Req*** method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP ***RequestReportBSCM*** if the application needs to be informed about the outcome of the request
4	The gsmSCF sends a CAP ***ContinueWithArgument*** message

Parameter Mapping

From: ***routeCallToDestination_Req***	To: ***CAP RequestReport_BCSM***
callSessionID	
responseRequested	**BCSMEvent**
targetAddress	
originalDestinationAddress	
redirectingAddress	
appInfo	

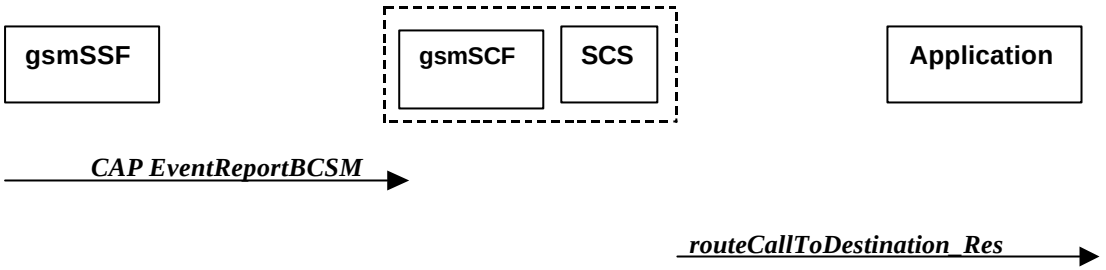
From: ***routeCallToDestination_Req***	To: ***CAP ContinueWithArgument***
callSessionID	
responseRequested	
targetAddress	
originatingAddress	
originalDestinationAddress	**Original Called Party ID**
redirectingAddress	**Redirecting Party ID**
appInfo	**Alerting Pattern** **Generic Number** **Service Interaction Indicators Two** **CUG Interlock Code** **Outgoing Access Indicator** O-CSI Applicable Calling Partys Category **Redirection Information**
	NA Carrier Information
	NA Charge Number
	NA Charge Number
	Suppression Of Announcements

5.2.2 RouteCallToDestination_Res

routeCallToDestination_Res is an asynchronous method which indicates that the request to route the call to the detination was successful, and indicates the response of the destination party (for example, the call was answered, not

answered, refused due to busy, etc.). For every trigger that was armed in the parameter responseRequested of the ***routeCallToDestination_Req*** a ***routeCallToDestination_Res*** method may be invoked.

Call Flow



Normal Operation

Pre-conditions	Call routing attempted
1	If event reports have been requested, the gsmSSF sends a CAP EventReportBCSM to the gsmSCF
2	The gsmSCF sends an equivalent message to the SCS
3	The SCS invokes the ***routeCallToDestination_Res*** method

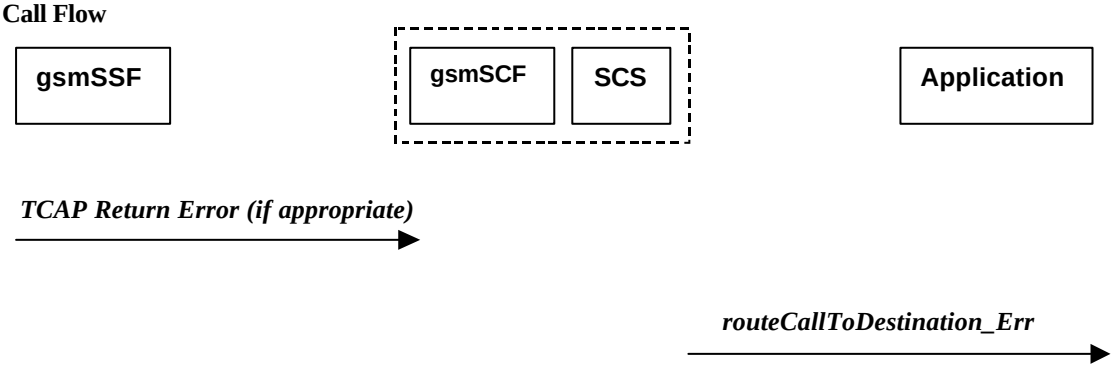
Parameter Mapping

From: CAP ***EventReportBCSM***	To: ***routeCallToDestination_Res***
	callSessionID
EventTypeBCSM **EventSpecificInformationBCSM** **Misc Call Info**	**eventReport**

5.2.3 RouteCallToDestination_Err

routeCallToDestination_Err is an asynchronous method which indicates that the request to route the call to the destination party was unsuccessful – the call could not be routed to the destination party (for example, the network was unable to route the call, parameters were incorrect, the request was refused, etc).

Call Flow



Normal Operation

Two scenarios are possible

1. The gsmSCF receives a message from the gsmSSF indicating an error

Pre-conditions	**Call routing attempted**
1	The gsmSSF detects a call routing failure and sends an appropriate TCAP message returning an error to the gsmSCF
2	The gsmSCF sends an equivalent message to the SCS

3	The SCS detects an error with the ***routeCallToDestination_Req*** method, or receives a TCAP Return Error, and invokes the ***routeCallToDestination_Err*** method

2. The gsmSCF detects there is an error in the message from the SCS

Pre-conditions	**Call routing attempted**
1	The gsmSCF detects an error in the parameters of the internal message from the SCS requesting a routeCallToDestination_Req
2	The gsmSCF sends an equivalent message to the SCS
3	The SCS invokes the routeCallToDestination_Err method

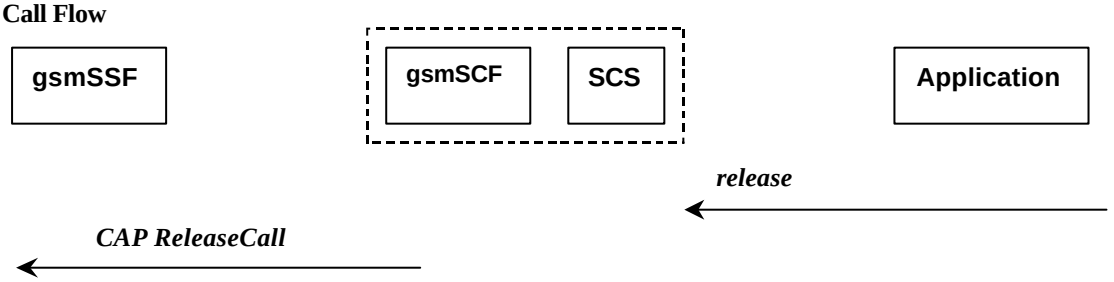
Parameter Mapping

From: TCAP Return Error	To: ***routeCallToDestination_Err***
	callSessionID
TC-U-ERROR TC-U-REJECT	**error**

5.2.4 release

release is a method used to request the release of the call and associated objects.

Call Flow



Normal Operation

Pre-conditions	**Call is in progress**
1	The application invokes the ***releaseCall*** method

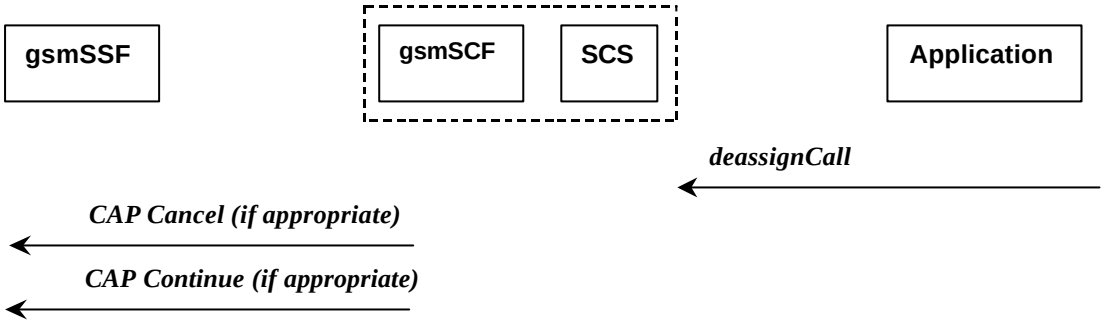
Parameter Mapping

From: ***releaseCall***	To: ***CAP ReleaseCall***
callSessionID	
cause	**ReleaseCause**

5.2.5 deassignCall

deassignCall is a method that requests that the relationship between the application and the call and associated objects be de-assigned. It leaves the call in progress, however, it purges the specified call object so that the application has no further control of call processing. If a call is de-assigned that has event reports or call information reports requested, then these reports will be disabled and any related information discarded.

Call Flow



Normal Operation

Pre-conditions	
1	The application invokes the ***deassignCall*** method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP ***Cancel*** operation to the gsmSSF if there are any reports pending.
4	The gsmSCF may send a CAP Continue to allow the interrupted call processing to continue. This is not sent if the call has already been established.

Parameter Mapping

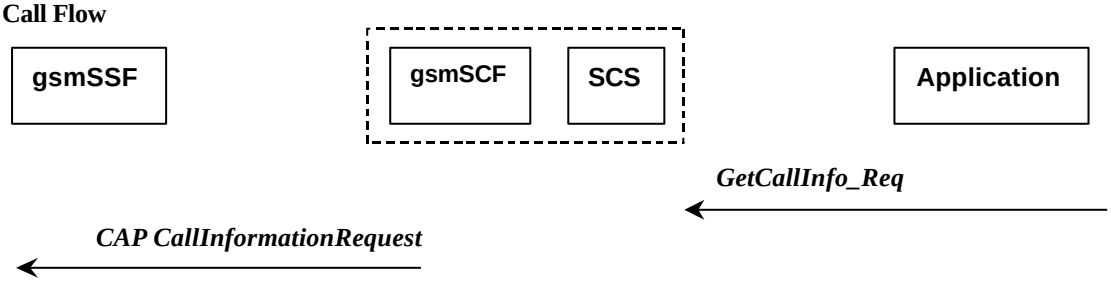
From: ***deassignCall***	To: ***CAP Cancel***
	AllRequests
callSessionID	

From: ***deassignCall***	To: ***CAP Continue***
callSessionID	

5.2.6 getCallInfo_Req

getCallInfo_Req is an asynchronous method that requests information associated with the call to be provided at the appropriate time (for example, to calculate charging). This method must be invoked before the call is routed to a target address. The call object will exist after the call is ended if information is required to be sent to the application at the end of the call. The information will be sent after any call event report.

Call Flow



Normal Operation

Pre-conditions	
1	The application invokes the ***getCallInfo_Req*** method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP ***CallInformationRequest*** operation to the gsmSSF

Parameter Mapping

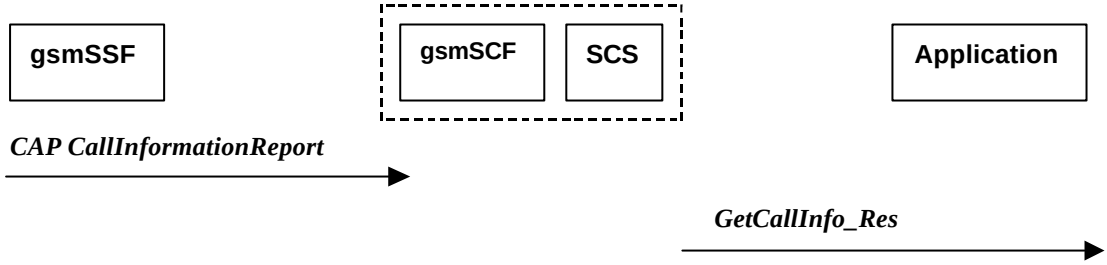
From: ***getCallInfo_Req***	To: CAP ***CallInformationrequest***
callSessionID	
callInfoRequested	**Requested Information Type List** - **Call Attempt Elapsed Time** - **Call Stop Time** - **Call Connected Elapsed Time**

	- **Release Cause**
	Leg ID

5.2.7 getCallInfo_Res

getCallInfo_Res is an asynchronous method that reports all the necessary information requested by the application, for example to calculate charging.

Call Flow



Normal Operation

Pre-conditions	Call is in progress
1	The gsmSCF receives a CAP CallInformationReport from the gsmSSF.
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS identifies the correct application and invokes the ***getCallInfo_Res*** method

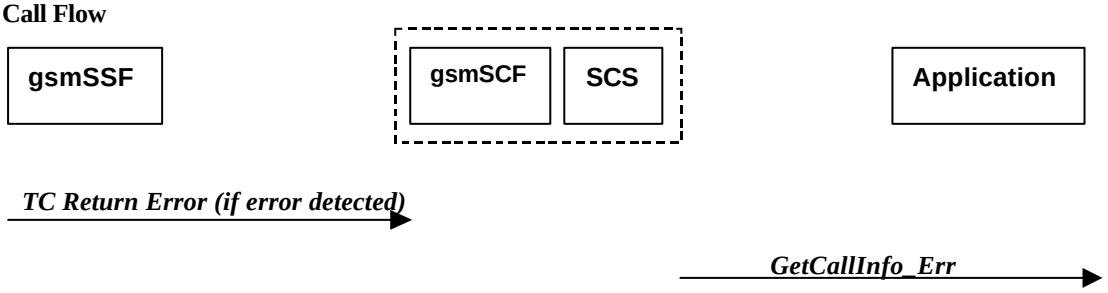
Parameter Mapping

From: CAP ***CallInformationReport***	To: ***getCallInfo_Res***
	callSessionID
Requested Information Type List - **Call Attempt Elapsed Time** - **Call Stop Time** - **Call Connected Elapsed Time** - **Release Cause**	**callInfoReport**
Leg ID	

5.2.8 getCallInfo_Err

getCallInfo_Err is an asynchronous method that reports that the original request was erroneous, or resulted in an error condition.

Call Flow



Normal Operation

Pre-conditions	The application has requested information associated with a call via the ***getCallInfo_Req*** method
1	A call terminates abnormally and the gsmSSF sends an error in a TCAP message to the gsmSCF , or aborts the TCAP dialogue
2	The gsmSCF sends an equivalent message to the SCS

3	The SCS identifies the correct applications that requested the call information and invokes the ***getCallInfo_Err*** method.

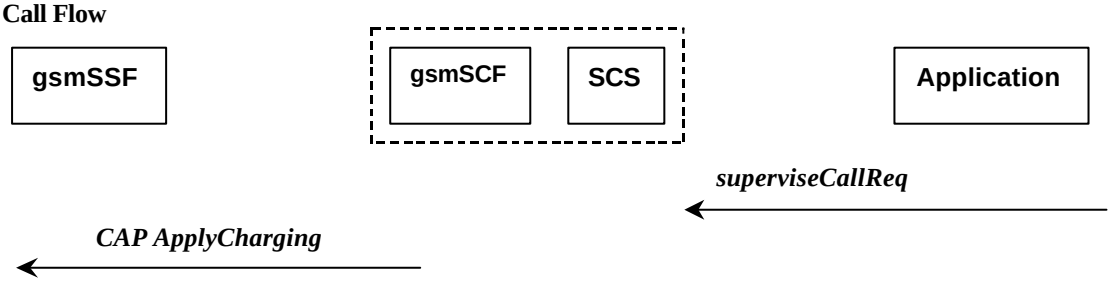
Parameter Mapping

From:	To: ***getCallInfo_Err***
	callSessionID
TC Primitives TC-U-ABORT TC-P-ABORT TC-NOTICE TC-U-ERROR TC-L-CANCEL TC-U-CANCEL TC-L-REJECT TC-R-REJECT TC-U-REJECT	**error**

5.2.9 superviseCall_Req

superviseCall_Req is a method that is called by the application to supervise a call. The application can set a granted connection time for this call. If an application calls this method before it calls a ***routeCallToDestination_Req()*** or a user interaction method the time measurement will start as soon as the call is answered by the B-party or the user interaction system.

Call Flow



Normal Operation

Pre-conditions	
1	The application invokes the ***superviseCall_Req*** method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP ApplyCharging message to the gsmSSF

Parameter Mapping

From: ***superviseCall_Req***	To: CAP ***ApplyCharging***
callSessionID	
	PartyToCharge
	AchBillingCharging Characteristics
duration	**Time Duration Charging** - **Max Call Period Duration**
tarrifSwitch	**Time Duration Charging** - **Tarrif Switch Interval**
treatment	**Time Duration Charging** - **Release if Duration Exceeded** - **Play Tone**

5.2.10 superviseCall_Res

superviseCall_Res is an asynchronous method that reports a call supervision event to the application.

Call Flow

Normal Operation

Pre-conditions	The application has invoked the supervise Call method
1	The gsmSCF receives an CAP ***ApplyChargingReport*** from the gsmSSF
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS identifies the correct application and invokes the ***superviseCall_Res*** method.

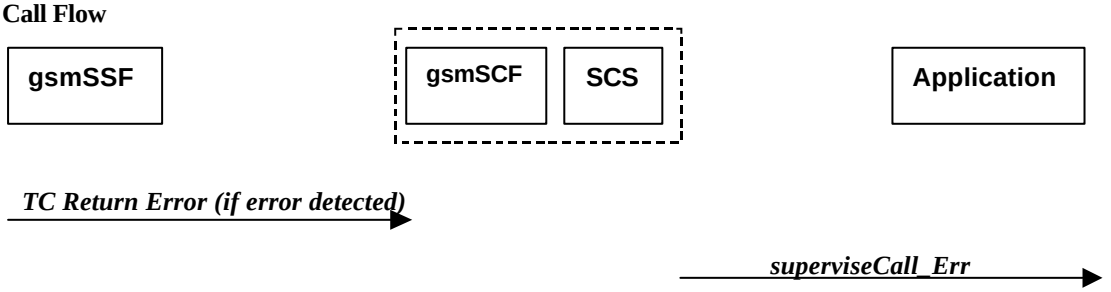
Parameter Mapping

From: CAP ***ApplyChargingReport***	To: ***superviseCall_Res***
	callSessionID
CallResult - **PartyToCharge** - **CallActive** - **Call Released at Tcp Expiry**	**report**
CallResult - **TimeInformation**	**usedTime**

5.2.11 superviseCall_Err

superviseCall_Err is an asynchronous method that reports a call supervision error to the application.

Call Flow



Normal Operation

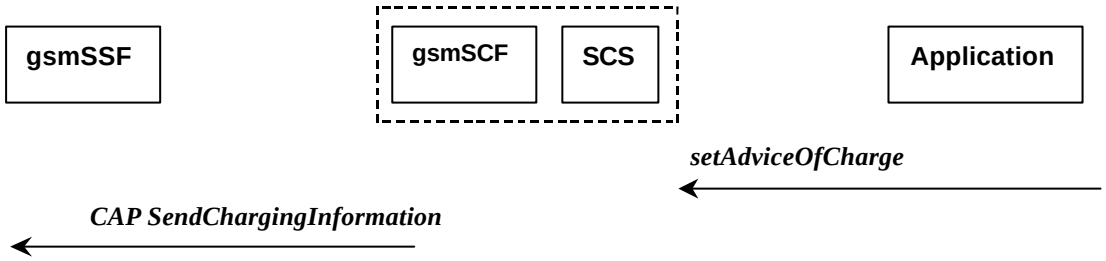
Pre-conditions	The application has requested information associated with a call via the ***superviseCall_Req*** method
1	A call terminates abnormally and the gsmSSF sends an error in a TCAP message to the gsmSCF , or aborts the TCAP dialogue
2	The gsmSCF sends an equivalent message to the SCS
3	The SCS identifies the correct applications that requested the call information and invokes the ***superviseCall_Req*** method.

Parameter Mapping

From:	To: ***superviseCall_Err***
	callSessionID
TC Primitives TC-U-ABORT TC-P-ABORT TC-NOTICE TC-U-ERROR TC-L-CANCEL TC-U-CANCEL TC-L-REJECT TC-R-REJECT TC-U-REJECT	**error**

5.2.12 setAdviceOfCharge

setAdviceOfCharge is a method that allows the application to determine the charging information that will be send to the end-usersterminal.



Normal Operation

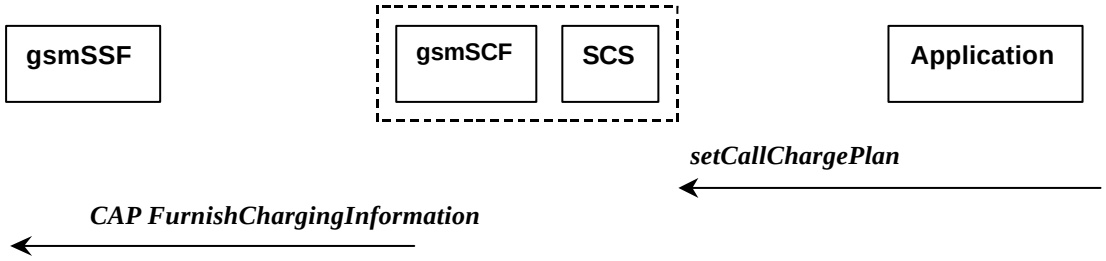
Pre-conditions	
1	The application invokes the setAdviceOfCharge
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP SendChargingInformation message to the SSF

Parameter Mapping

From: ***setAdviceOfCharge***	To: CAP ***SendChargingInformation***
callSessionID	
aOCInfo	**SCIBillingChargingCharateristics** **AOC After Answer** **AOC Before Answer**
tarrifSwitch	**AOC Initial** **AOC Subsequent**
	LegID

5.2.13 setCallChargePlan

setCallChargePlan is a method that allows the application to include charging information in network generated CDR.



Normal Operation

Pre-conditions	
1	The application invokes the setCallDetailRecordInformation
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP FurnishChargingInformation message to the SSP

Parameter Mapping

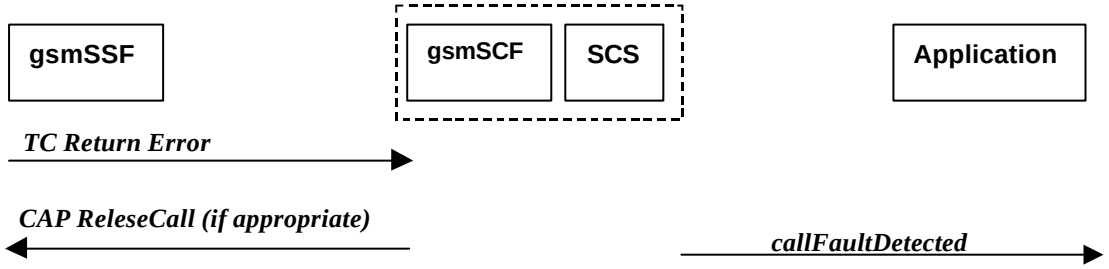
From: ***setCallChargePlan***	To: CAP ***FurnishChargingInformation***
callSessionID	
callChargePlan	**FreeFormatData**
	PartyToCharge
	AppendFreeFormatData

An alternative scenario would be to map setCallChargePlan to the CAP ApplyCharging protocol operation.

5.2.14 callFaultDetected

callFaultDetected indicates to the application that a fault has been detected in the call.

Call Flow



Normal Operation

Pre-conditions	A call exists and the SCS detects an error. No routeCallToDestination_Req method has been invoked yet.
1	The gsmSSF may detect a fault and sends an appropriate dialogue error message to the gsmSCF
2	The gsmSCF may detect a fault an send an error message to the SCS
3	The SCS detects a fault and invokes the ***callFaultDetected*** method
4	The SCS sends an equivalent message to the gsmSCF if appropriate
5	The gsmSCF sends a CAP ReleaseCall if appropriate

Parameter Mapping

From:***Dialogue Error***	To: ***callFaultDetected***
	call
	callSessionID
TC_U_ABORT	**fault**

6 Generic Message Transfer Service CAMEL Call Flows

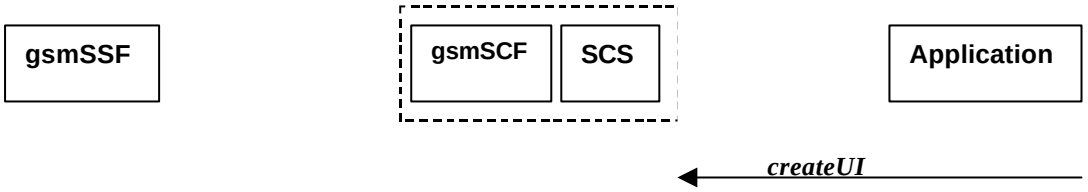
6.1 User Interaction

The User Interaction interface calls is used by applications to interact with end users. The API only supports Call User Interaction.

6.1.1 createUI

createUI is a method that is used to create a new (non call related) user interaction object.

Call Flow



Note: There are no associated CAP call flows

Normal Operation

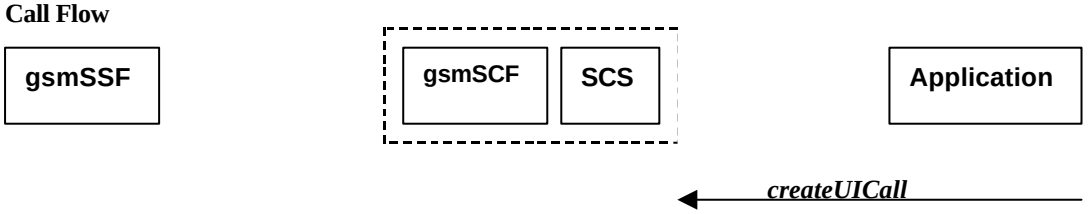
Pre-conditions	The application has been instructed to initiate a non call related User Interaction
1	The application invokes the ***createUI*** method
2	The SCS creates a new UI object

Parameter Mapping
None.

6.1.2 createUICall

createUICall is a method that is used to create a new call related user interaction object.

Call Flow



Note: There are no associated CAP call flows

Normal Operation

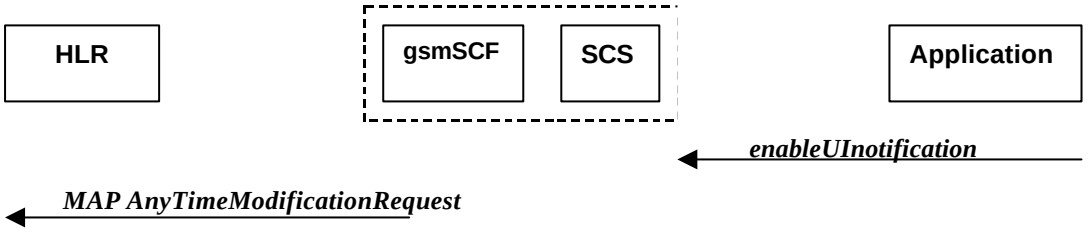
Pre-conditions	The application has been requested to initiate a call related User Interaction
1	The application invokes the ***createUICall*** method
2	The SCS creates a new UICall object

Parameter Mapping
None.

6.1.3 enableUINotification

enableUINotification is a method that enables the reception of a user initiated user interaction.

Call Flow



Normal Operation

Pre-conditions	An agreement is established between the network operator and the service provider for the event notification to be enabled
1	The application invokes the ***enableUINotification*** method
2	The gsmSCF sends a MAP AnyTimeModificationRequest to the HLR in order to Activate the USSD CAMEL Subscription Information

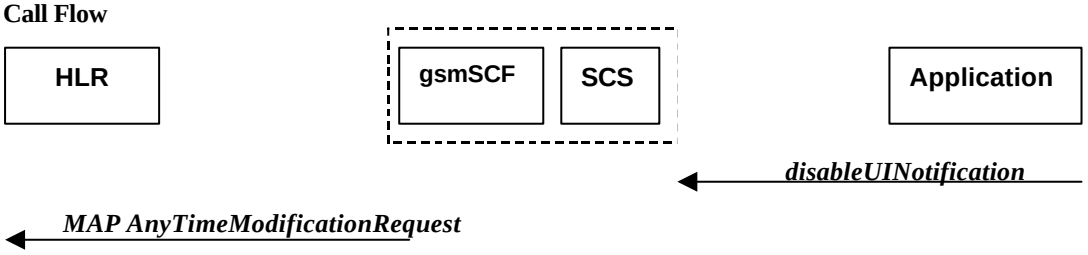
Parameter Mapping

From: ***enableUINotification***	To: MAP AnyTimeModificationRequest
appInterface	
eventCriteria	**Subscriber Identity** **CAMEL Subscription Information**
assignmentID	
	gsmSCF address

6.1.4 disableUINotification

disableUINotification is a method that allows the application to remove notification for UI related actions previously set.

Call Flow



Normal Operation

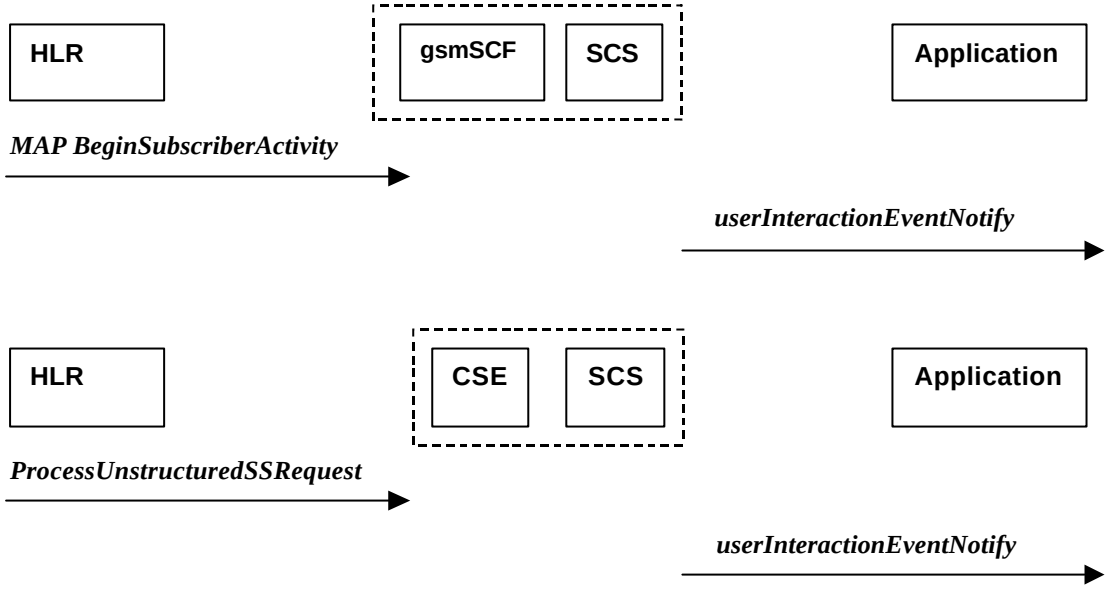
Pre-conditions	An agreement is established between the network operator and the service provider for the event notification to be disabled
1	The application invokes the ***disableUIlNotification*** method
2	The gsmSCF sends a MAP AnyTimeModificationRequest to the HLR in order to de-activate the USSD CAMEL subscription Information

Parameter Mapping

From: ***disableUINotification***	To: MAP AnyTimeModificationRequest
assignmentID	
eventCriteria	**Subscriber Identity** **CAMEL Subscription Information**
	gsmSCFAddress

6.1.5 userInteractionEventNotify

userInteractionEventNotify is a method that notifies the application of a user initiated request for user interaction.



Two alternative scenarios have been identified.

1. Normal Operation

Pre-conditions	
1	The gsmSCF receives a MAP BeginSubsciberActivity message from the HLR
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS identified the correct application that enable the notification request from the subscriber and invokes the userInteractionEventNotify method

Parameter Mapping

From: **MAP *BeginSubscriberActivity***	To: ***userInteractionEventNotify***
	ui
Originating Entity Number	**eventInfo**
	assignmentID
	appInterface
IMSI	

2. Normal Operation

Pre-conditions	A BeginSubscriberActivity has already been received by the gsmSCF
1	The gsmSCF receives a MAP processUnstructuredSSRequest message from the HLR
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS identified the correct application that enable the notification request from the subscriber and invokes the userInteractionEventNotify method

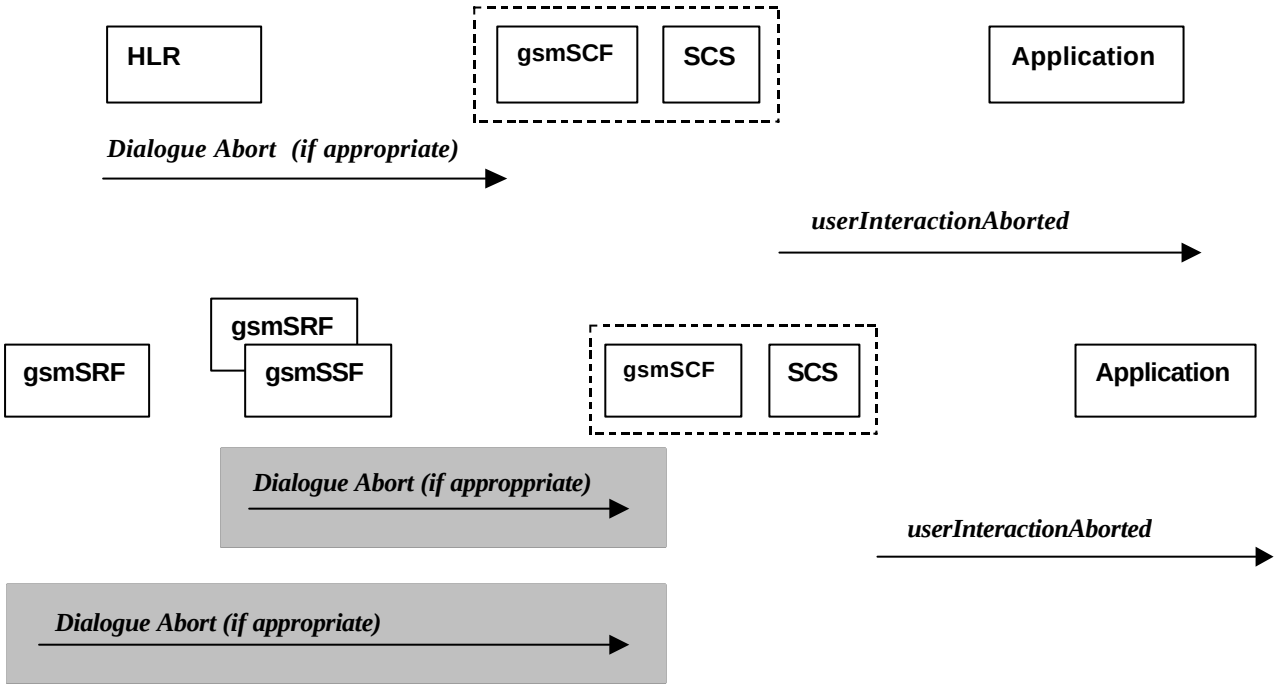
Parameter Mapping

From: **MAP *ProcessUnstructuredSSRequest***	To: ***userInteractionEventNotify***
	ui
ussdString **datacoding** **originalentitynumber**	**eventInfo**
	assignmentID

	appInterface
IMSI	
MSISDN	

6.1.6 userInteractionAborted

userInteractionAborted is a method that 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 the application.



Normal Operation

Three Alternatives have been identified

1 USSD based interaction between the MS and the gsmSCF

Pre-conditions	USSD interaction is in progress and a dialogue is running between the HLR and gsmSCF
1	The gsmSCF receives an indication that the dialogue between the gsmSCF and the HLR has been aborted by some failure in the gsmSCF or the HLR
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS invokes the userInteractionAborted method to the appropriate application

2. Interaction between a gsmSRF internal to the gsmSSF and the gsmSCF

Pre-conditions	User interaction is in progress between the gsmSRF and the gsmSCF
1	The gsmSCF receives an indication that the dialogue between the gsmSCF and the gsmSRF/gsmSSF has been aborted by some failure in the gsmSCF or the gsmSRF/gsmSSF
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS invokes the userInteractionAborted method to the appropriate application

3. Interaction between a gsmSRF and the gsmSCF

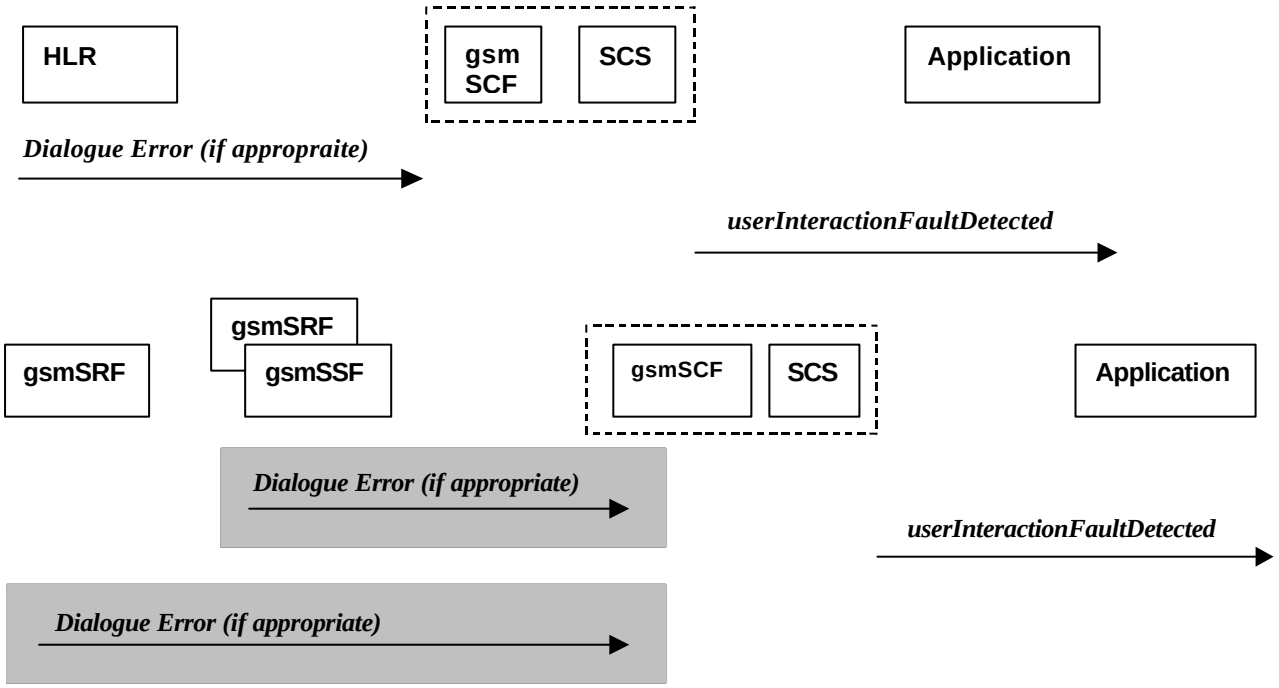
Pre-conditions	User interaction is in progress between the gsmSRF and the gsmSCF
1	The gsmSCF receives an indication that the dialogue between the gsmSCF and the gsmSRF has been aborted by some failure in the gsmSCF or the gsmSR
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS invokes the userInteractionAborted method to the appropriate application

Parameter Mapping

From: Dialogue Error	To: ***userInteractionAborted***
	userInteractionIdentifier
TC-U-ABORT **TC-P-ABORT**	

6.1.7 userInteractionFaultDetected

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



Normal Operation

Three Alternatives have been identified

1 USSD based interaction between the MS and the gsmSCF

Pre-conditions	USSD interaction is in progress and a dialogue is running between the HLR and gsmSCF
1	The gsmSCF detects or receives an indication that the there is an error in the user interaction request message
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS invokes the userInteractionFaultDetected method to the appropriate application

2. Interaction between a gsmSRF internal to the gsmSSF and the gsmSCF

Pre-conditions	User interaction is in progress between the gsmSRF and the gsmSCF
1	The gsmSCF detects or receives an indication that there is an error in the user interaction request message
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS invokes the userInteractionFaultDetected method to the appropriate application

3. Interaction between a gsmSRF and the gsmSCF

Pre-conditions	User interaction is in progress between the gsmSRF and the gsmSCF
1	The gsmSCF detects or receives an indication that the there is an error in the user interaction request message

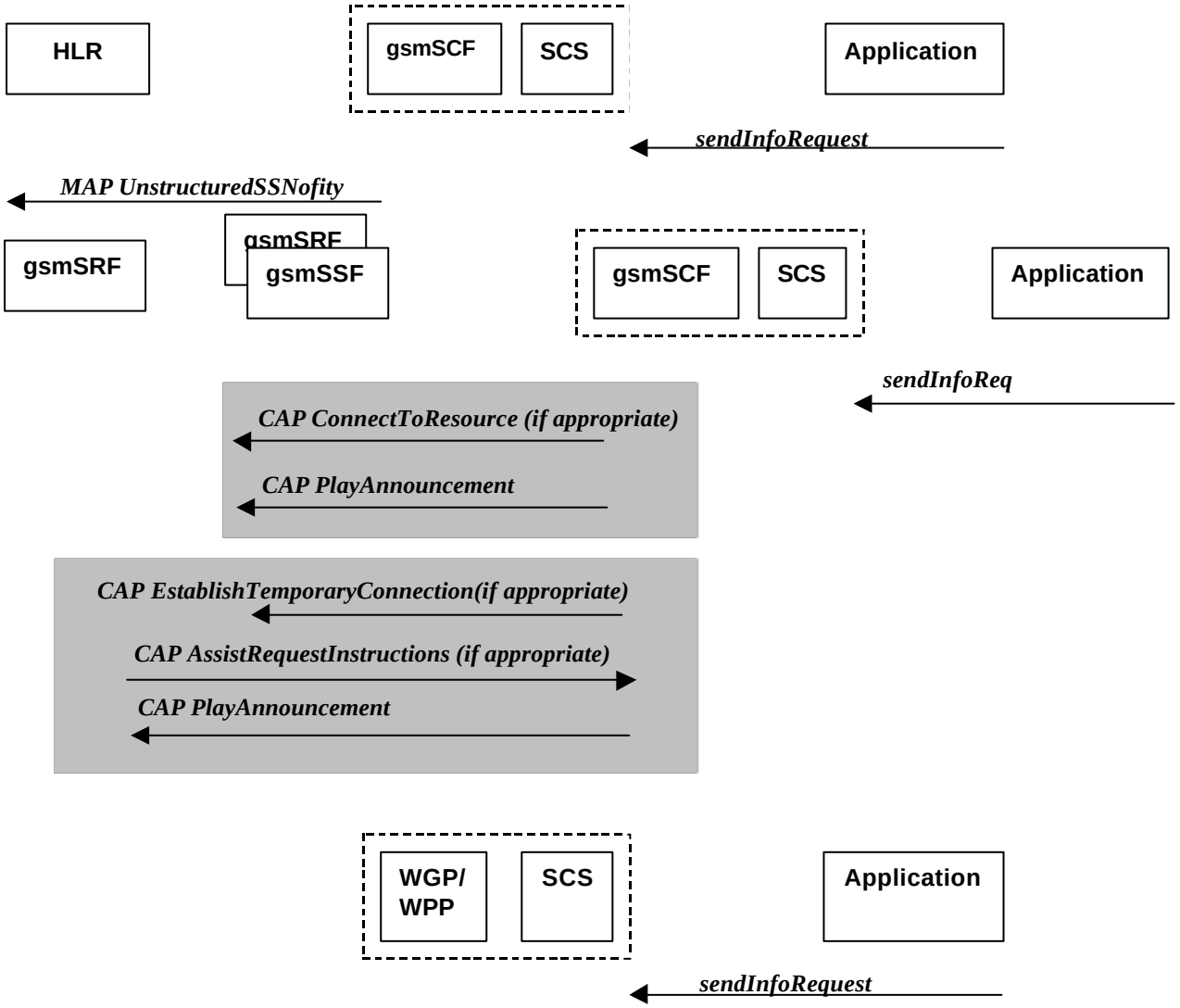
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS invokes the userInteractionFaultDetected method to the appropriate application

Parameter Mapping

From: Dialogue Error	To: ***userInteractionFaultDetected***
	userInteractionIdentifier
ReturnError	**fault**

6.1.8 sendInfoReq

sendInfoReq is an asynchronous method that sends information to the user.



Normal Operation

Four Alternatives have been identified

1 USSD based interaction between the MS and the gsmSCF

Pre-conditions	USSD interaction
1	The application invokes the sendInfo method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a MAP Unstructured SS Notify message to the HLR

2. Interaction between a gsmSRF internal to the gsmSSF and the gsmSCF

Pre-conditions	
1	The application invokes the sendInfo method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF is aware of a gsmSFR internal to the gsmSSF. The gsmSCF sends CAP ConnectToResource, and CAP PlayAnnouncement messages the the gsmSSF

3. Interaction between a gsmSRF internal to the gsmSSF and the gsmSCF

Pre-conditions	
1	The application invokes the sendInfo method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF is aware of an external gsmSRF. The gsmSCF sends CAP EstablishTemporaryConnection message the the gsmSSF.
4	On receipt of the CAP AssistRequestInstructions message from the gsmSRF, the gsmSCF sends the CAP PlayAnnouncement message to the gsmRF

4. Sending of messages via the WGP/WPP

Pre-conditions	
1	The application invokes the sendInfo method
2	The SCS sends an equivalent internal message to the WGP/WPP

No mapping of parameters is defined for the case where the sending of information is realised via WGP/WPP. The reason for this is that the WAP Forum does not specify a mapping either from the Push Access Protocol (used between Application Server and WGP/WPP) onto the Push Over-the-Air Protocol (used between WGP/WPP and terminal).

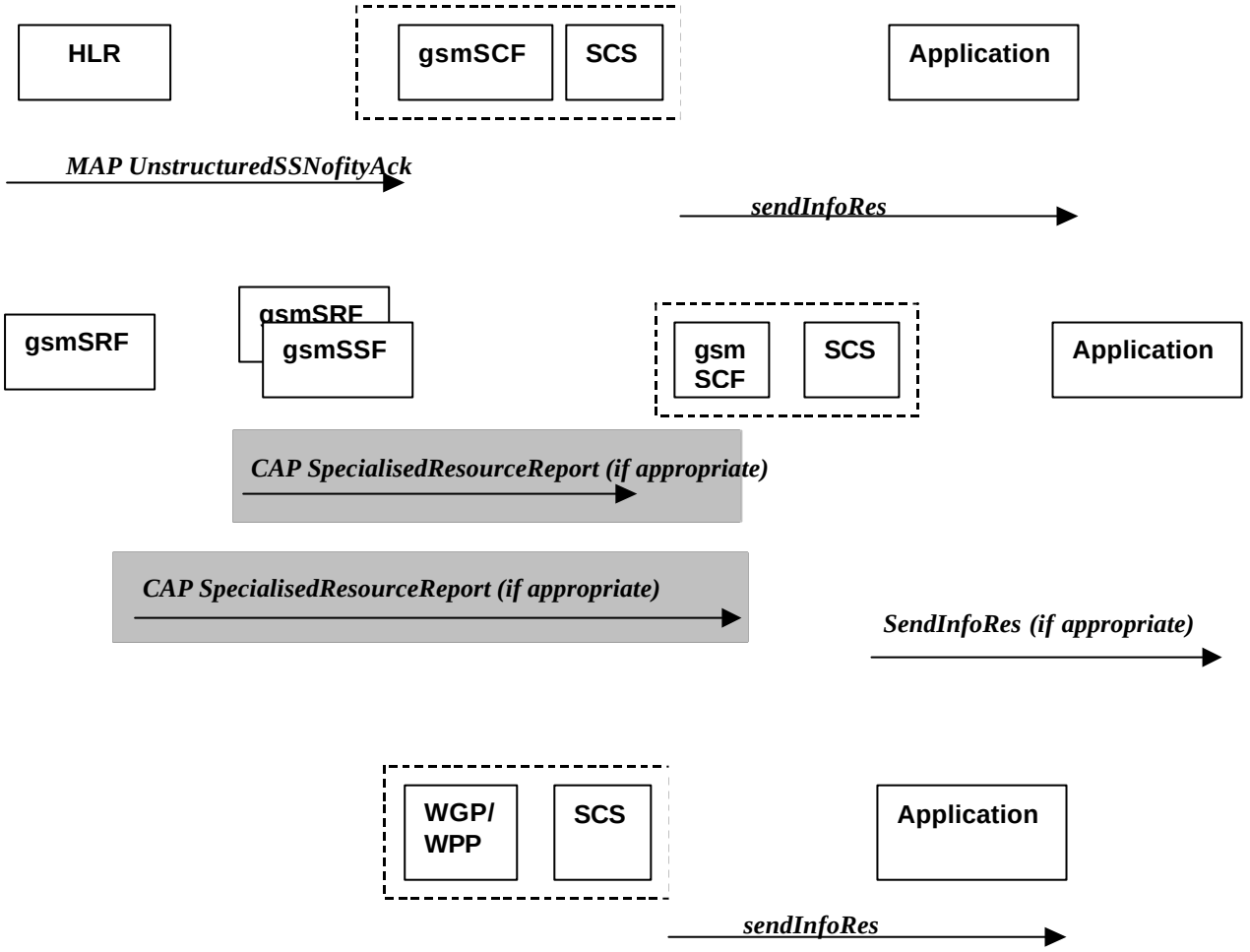
Parameter Mapping

From: ***sendInfoReq***	To: MAP ***UnstructuredSSNotify***
userInteractionSessionID	
info	**USSD String** **Data Coding Scheme** **Alerting Pattern**
variableInfo	
repeatIndicator	
responseRequested	
assignmentID	
	IMSI

From: ***sendInfoReq***	To: CAP PlayAnnouncement
userInteractionSessionID	
info	Information To Send Tone InbandInfo MessageID Number of Repetitions Duration Interval
variableInfo	
repeatIndicator	
responseRequested	Request Announcement Complete
assignmentID	
	Disconnect From IP Forbidden

6.1.9 sendInfoRes

sendInfoRes is an asynchronous method that informs the application about the start or the completion of a ***sendInfoReq()***. This response is called only if the application has requested a response.



Normal Operation

Four Alternatives have been identified
1 USSD based interaction between the MS and the gsmSCF

Pre-conditions	The application has previously invoked the sendInfo method and has requested a notification
1	The gsmSCF receives an MAP Unstructured SSNotifyAck message from the HLR
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS identifies the correct application and invokes the sendInfoRes method

2. Interaction between a gsmSRF internal to the gsmSSF and the gsmSCF

Pre-conditions	The application has previously invoked the sendInfo method and has requested a notification
1	The gsmSCF receives a CAP SpecialisedResourceReprt message form the gsmSSFindicating that the announcement has been played to the subscriber
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS identifies the correct application and invokes the sendInfoRes method

3. Interaction between a gsmSRF internal to the gsmSSF and the gsmSCF

Pre-conditions	The application has previously invoked the sendInfo method and has requested a notification
1	
2	The gsmSCF receives a CAP SpecialisedResourceReprt message form the gsmSRF indicating that the announcement has been played to the subscriber

3	The gsmSCF sends an equivalent internal message to the SCS
4	The SCS identifies the correct application and invokes the sendInfoRes method

4. Sending of messages via the WGP/WPP

Pre-conditions	The application has previously invoked the sendInfo method and has requested a notification
1	The SCS receives an internal message from the WGP/WPP
2	The SCS identifies the correct application and invokes the sendInfoRes method

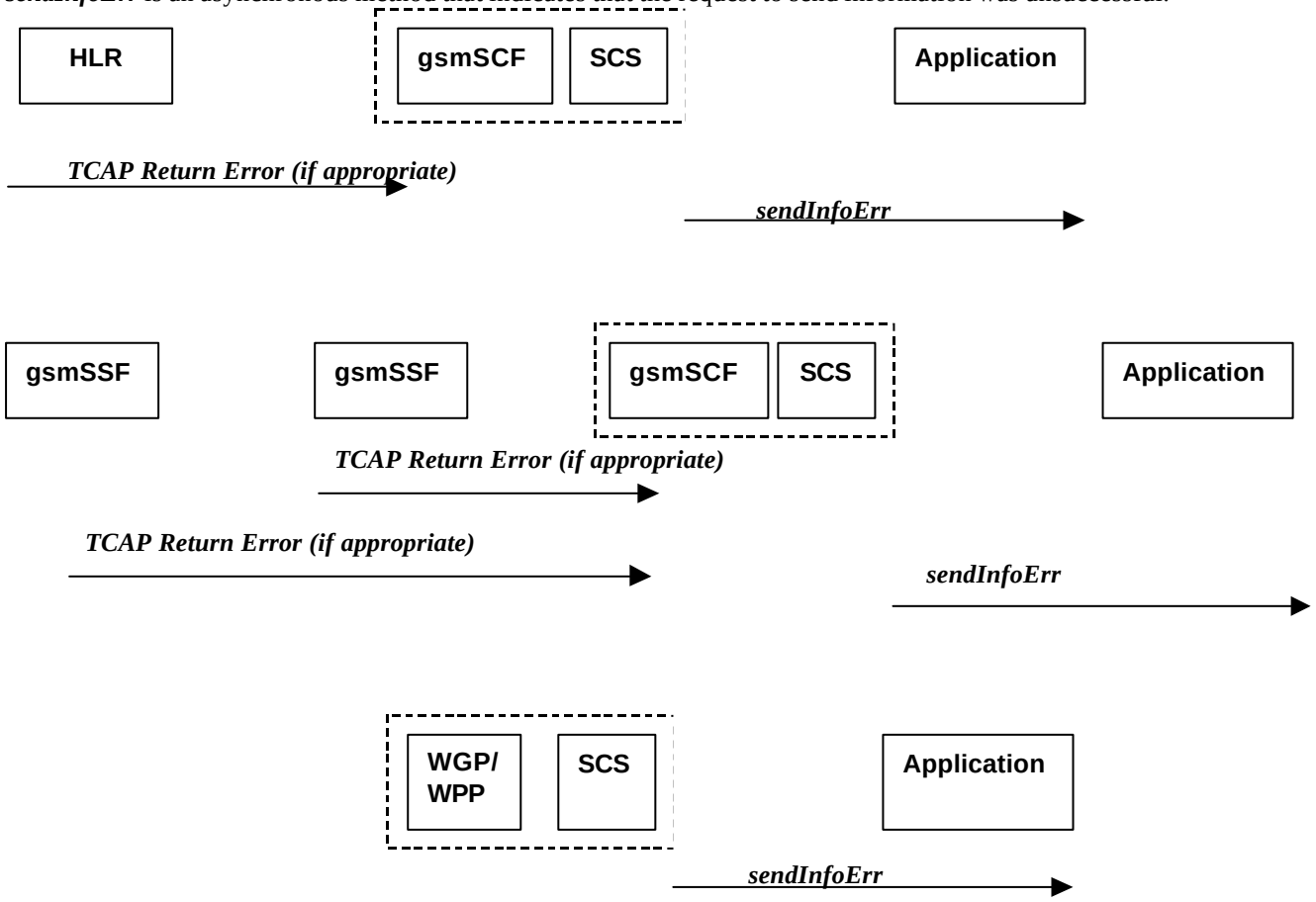
Parameter Mapping

From: CAP SpecialisedResouceReport	To: ***sendInfoRes***
	userInteractionSessionID
	assignmentID
	response

No mapping of parameters is defined for the case where the sending of information is realised via WGP/WPP. The reason for this is that the WAP Forum does not specify a mapping either from the Push Access Protocol (used between Application Server and WGP/WPP) onto the Push Over-the-Air Protocol (used between WGP/WPP and terminal).

6.1.10 sendInfoErr

sendInfoErr is an asynchronous method that indicates that the request to send information was unsuccessful.



Normal Operation

For:

1. USSD based interaction between the MS and the CSE
2. Interaction between a gsmSRF internal to the gsmSSF and the CSE
3. Interaction between a gsmSRF internal to the gsmSSF and the CSE

Pre-conditions	The application has previously invoked the sendInfo method
1	The gsmSCF receives an message from the either the HLR, the gsmSSF or the gsmSRF indicating an error in the previous sendInfo method. Alternatively the gsmSCF may internal detect that the application has incorrectly sent the information
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS identifies the correct application and invokes the sendInfoErr method

4. Sending of messages via the WGP/WPP

Pre-conditions	The application has previously invoked the sendInfo method
1	The WGP/WPP sends an internal message to the SCS
2	The SCS identifies the correct application and invokes the sendInfoErr method

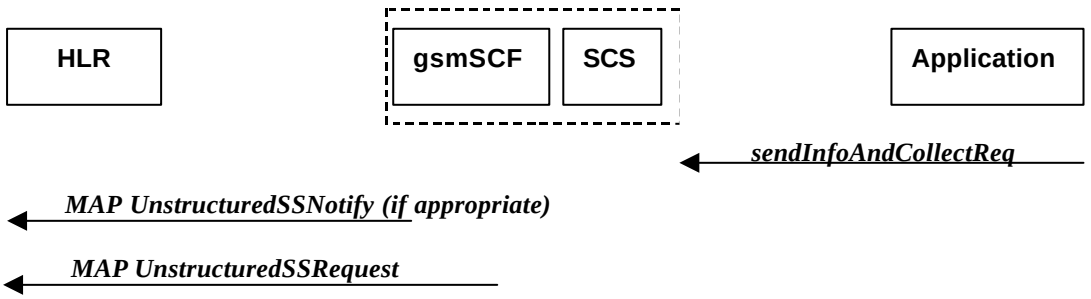
Parameter Mapping

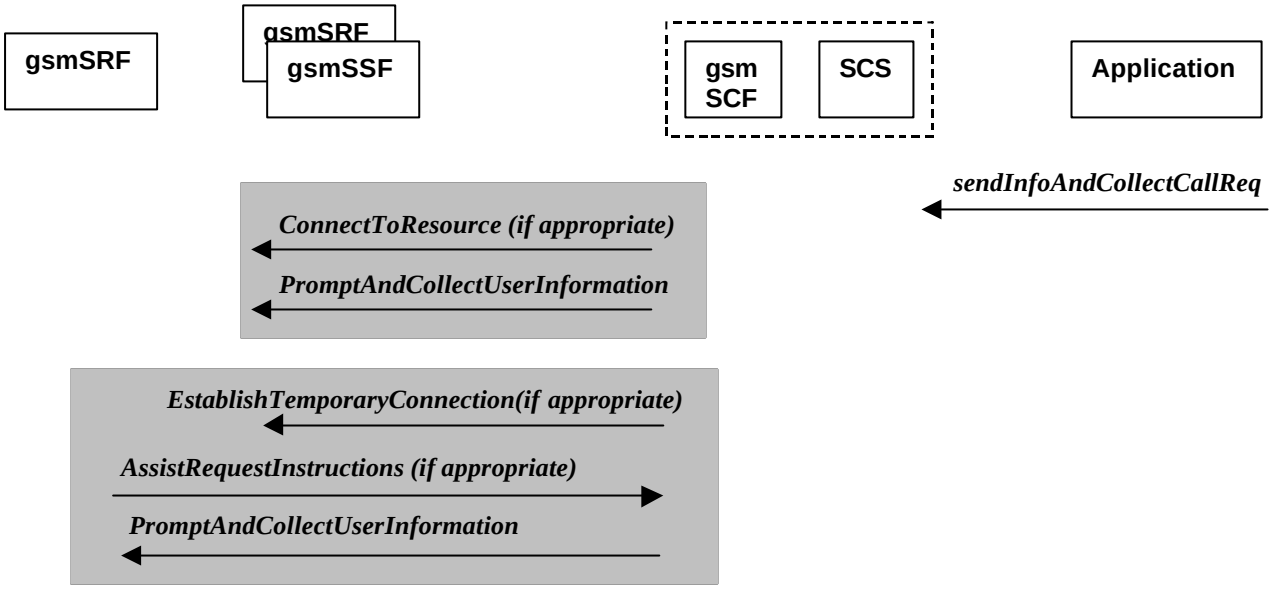
From: ***TCAP Return Error***	To: ***sendInfoErr***
	userInteractionSessionID
InvokeID	**assignmentID**
Error	**error**

No mapping of parameters is defined for the case where the sending of information is realised via WGP/WPP. The reason for this is that the WAP Forum does not specify a mapping either from the Push Access Protocol (used between Application Server and WGP/WPP) onto the Push Over-the-Air Protocol (used between WGP/WPP and terminal).

6.1.11 sendInfoAndCollectCallReq

sendInfoAndCollectCallReq is an asynchronous method that 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).





Normal Operation

Three Alternatives have been identified

1 USSD based interaction between the MS and the gsmSCF

Pre-conditions	USSD interaction
1	The application invokes the sendInfoAndCollect method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a MAP Unstructured SS Notify message to the HLR (if appropriate) followed by a MAP UnstructuredSSRequest

2. Interaction between a gsmSRF internal to the gsmSSF and the gsmSCF

Pre-conditions	
1	The application invokes the sendInfoAndCollect method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF is aware of a gsmSFR internal to the gsmSSF. The gsmSCF sends CAP ConnectToResource and PromptAndCollectUserInformation messages the the gsmSSF

3. Interaction between a gsmSRF internal to the gsmSSF and the gsmSCF

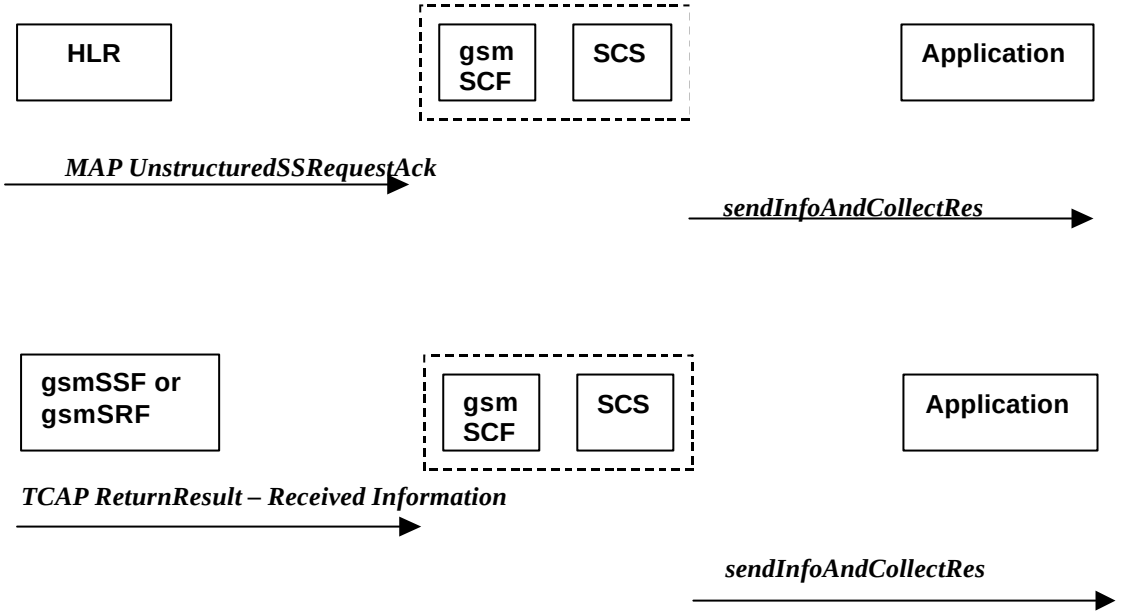
Pre-conditions	
1	The application invokes the sendInfoAndCollect method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF is aware of an external gsmSRF. The gsmSCF sends CAP EstablishTemporaryConnection, message the the gsmSSF.
4	On receipt of the CAP AssistRequestInstructions message from the gsmSRF, the gsmSCF sends the CAP PromptAndCollectUser message to the gsmSRF

Parameter Mapping

From: ***sendInfoAndCollectReq***	To: CAP ***PromptAndCollectInformation***
userInteractionSessionID	
infoID	**Collected Info** **InformationToSend**
variableInfo	
criteria	
	Disconnect From IP Forbidden
assignmentID	

6.1.12 sendInfoAndCollectRes

sendInfoAndCollectCallRes is an asynchronous method that returns the information collected to the application.



Normal Operation

Two Alternatives have been identified

1 USSD based interaction between the MS and the gsmSCF

Pre-conditions	The application has invoked a ***sendInfoAndCollectCallReq***()
1	The gsmSCF receives a MAP UnstructuredSSRequestAck message form the HLR
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS invokes the sendInfoAndCollectCallRes methohd to the correct applications

2. Interaction with an gsmSRF internal to gsmSSF or external

Pre-conditions	The application has invoked a ***sendInfoAndCollectCallReq***()
1	The gsmSCF receives a *TCAP ReturnResult* from the gsmSSF or (the gsmSRF depending on whether a direct or indirect gsmSRF is used containing the Received Information.
2	The gsmSCF sends an equivalent internal operation to the SCS
3	The SCS identifies the correct application instance and invokes the *sendinfoAndCollectCallRes* method

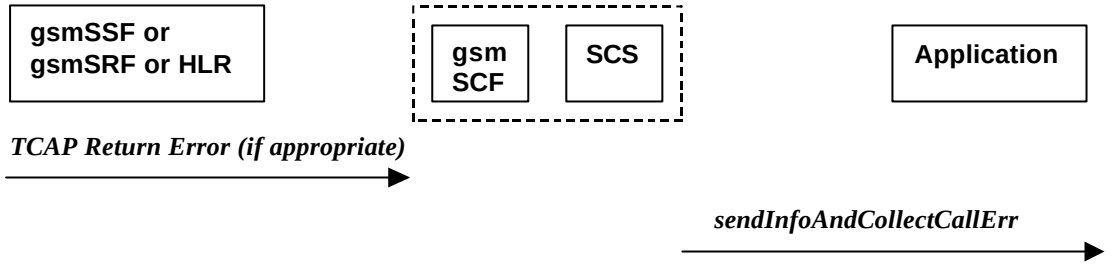
Parameter Mapping

From: MAP ***unstructuredSRequestAck***	To: ***sendInfoAndCollectRes***
	userInteractionSessionID
	assignmentID
	response
USSD String **Data Coding Scheme**	**info**

From: ***TCAP Return Result (Received Information)***	To: ***sendInfoAndCollectRes***
	userInteractionSessionID
	assignmentID
	response
DigitsResponse	**info**

6.1.13 sendInfoAndCollectCallErr

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



Normal Operation

Two Alternatives have been identified

1 USSD based interaction between the MS and the gsmSCF

Pre-conditions	The application has invoked a ***sendInfoAndCollectCallReq***()
1	The gsmSCF detects an error in the sendInfoAndCollectCallReq() or receives a message form the HLR indicating an error that there is an error in SendInfoAndCollectCallReq method
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS invokes the sendInfoAndCollectCallErr method to the correct application

2. Interaction with an gsmSRF internal to gsmSSF or external

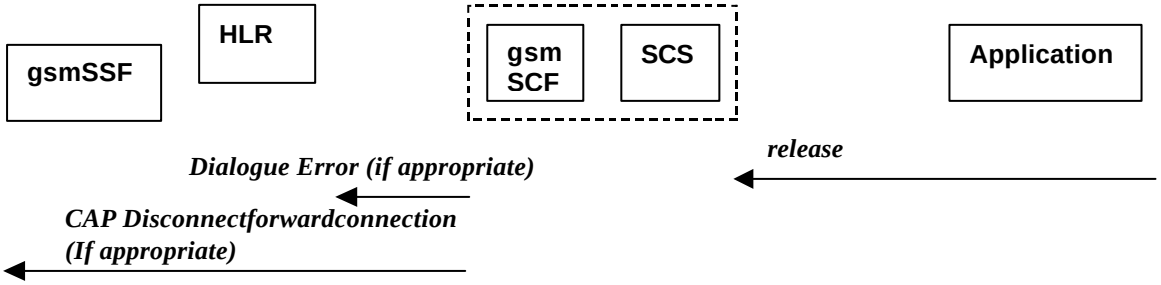
Pre-conditions	The application has invoked a ***sendInfoAndCollectCallReq***()
1	The gsmSCF either detects and error or receives a *TCAP Error* from the gsmSSF or (the gsmSRF depending on whether a direct or indirect gsmSRF is used
2	The gsmSCF sends an equivalent internal operation to the SCS
3	The SCS identifies the correct application instance and invokes the *sendinfoAndCollectCallErr* method

Parameter Mapping

From: TCAP Return Error	To: ***sendInfoAndCollectErr***
	userInteractionSessionID
	assignmentID
error	**error**

6.1.14 release

release is a method that 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.



Normal Operation

Two Alternatives have been identified

1. USSD based interaction

Pre-conditions	The gsmSCF has an open dialogue with the HLR
1	The application invokes a release
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a TCAP Abort message to the HLR

2. **Interaction with a gsmS SR internal to gsmSSF or external gsmSRF**

Pre-conditions	The application has previously invoked the sendInfoAndCollectCallErr. The gsmSCF is waiting for a response form the user
1	The application invokes a release
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP Disconnectforwardconnection to the gsmSSF

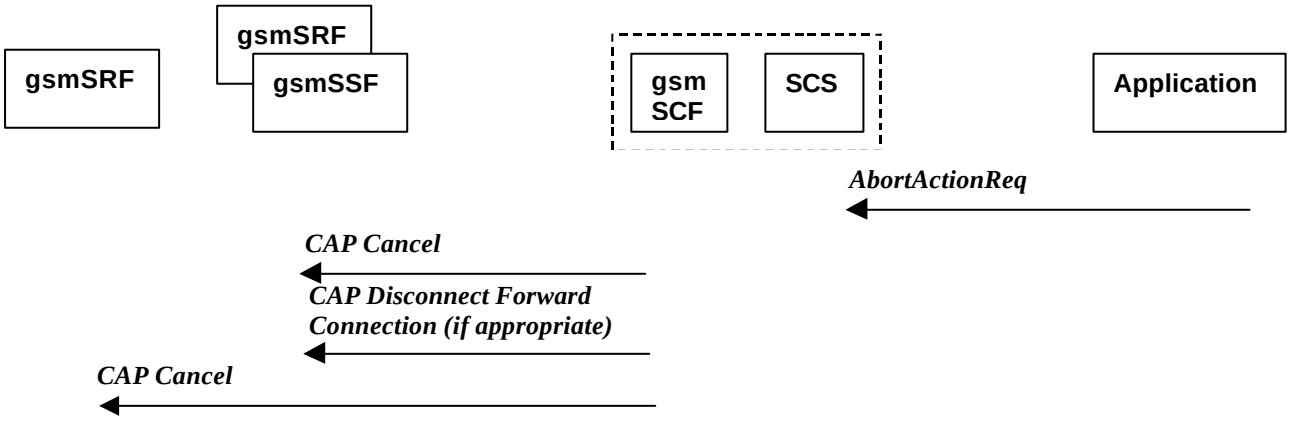
Parameter Mapping

From: ***release***	To: Dialogue Error
userInteractionSessionID	
	TC Primitives **TC-U-ABORT** **TC-P-ABORT**

From: ***release***	To: CAP disconnectforwardconnection
userInteractionSessionID	

6.1.15 abortActionReq

abortActionReq is an asynchronous method that aborts a user interaction operation, e.g. a sendInfoCall_Req(), from the specified call. The call remainsotherwise unaffected. The user interaction call service interrupts the current action on the specified call.



Normal Operation

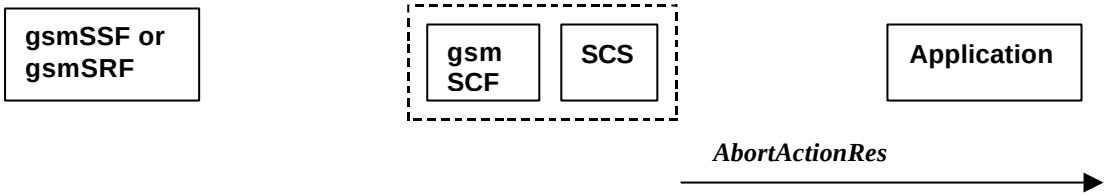
Pre-conditions	The application has previously invoked the sendInfoAndCollectCallErr. The gsmSCF is waiting for a response form the user
1	The application invokes a AbortActionReq
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP Cancel message to the gsmSSF or the gsmSRF as appropriate and may send a CAP Disconnect Forward Connection to the gsmSSF if appropriate

Parameter Mapping

From: ***abortActionReq***	To: Cancel
userInteractionSessionID	
assignmentID	**InvokeID**

6.1.16 abortActionRes

abortActionRes is an asynchronous method that confirms that the request to abort a user interaction operation on a call was successful.



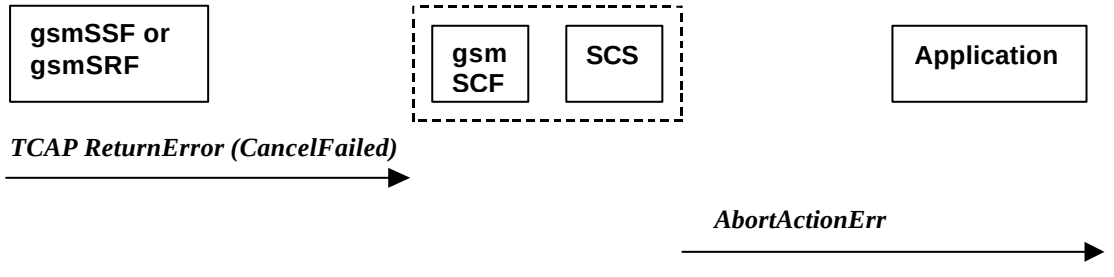
There is no equivalent CAP/MAP mapping message

Normal Operation

Pre-conditions	The application has previously invoked the AbortActionRes. The gsmSCF has sent the necessary instruction to the gsmSSF or the gsmSRF and is running a timer awaiting for any possible error return message. This timer expires and no errors are returned
2	The gsmSCF determines that the CAP Cancel operation was successful. The gsmSCF sends an equivalent internal message to the SCS
3	The SCS invokes the AbortActionRes method to the appropriate application.

6.1.17 abortActionErr

abortActionErr is an asynchronous method that indicates that the request to abort a user interaction on a call resulted in an error.



Parameter Mapping

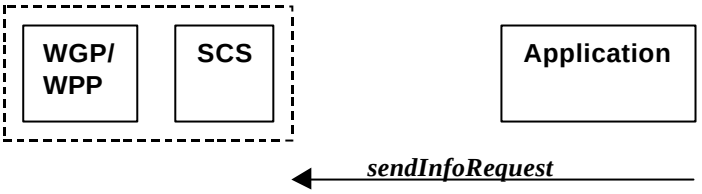
From:	To: ***abortActionErr***
	userInteractionSessionID
	assignmentID
TC Primitive **TC U ERROR**	**error**

7 Generic Message Transfer Service WAP Call Flows

7.1 User Interaction

7.1.1 sendInfoRequest

When the sendInfoReq is used to send a text message (e.g. URL or textual notification) to the terminal, the SCS can use the WAP Gateway/Push Proxy (WGP/WPP) as underlying mechanism to deliver the message to the terminal.



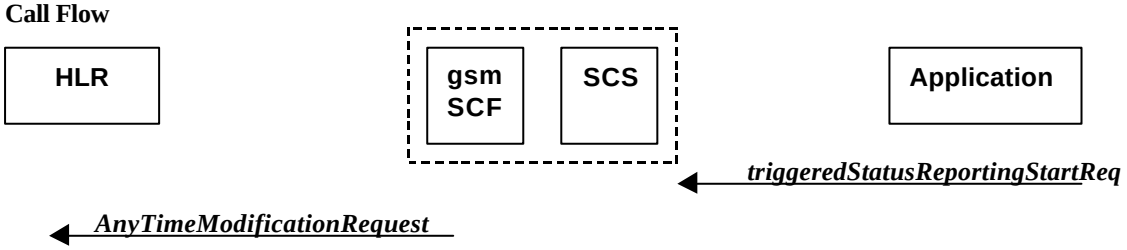
8 User Status Service CAMEL Flows

The User Status (US) interface class allows applications to obtain the status of mobile telephony users.

8.1.1 triggeredStatusReportingStartReq

TriggeredStatusReportingStartReq is a method that is used to subscribe to triggered user status notifications so that events can be sent to the application.

Call Flow



Normal Operation

Pre-conditions	**An agreement is established between the network operator and the service provider for the event notification to be enabled**
1	The application invokes the ***triggeredStatusReportingStartReq*** method
2	The gsmSCF sends a MAP AnyTimeModificationRequest to the HLR in order to activate the CAMEL subscription Information (M-CSI).

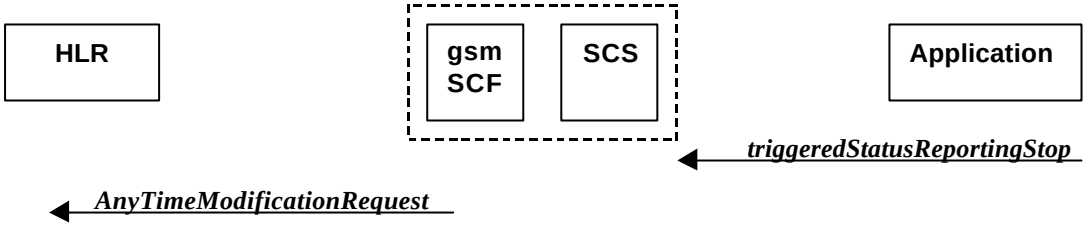
Parameter Mapping

From: ***triggeredStatusReportingStartReq***	To: MAP AnyTimeModificationRequest
appStatus	
users	**Subscriber Identity** **modificationInstruction in ModificationRequestFor-CSI has value 'activate', for M-CSI** **(Mobility CAMEL Subscription Information)**
assignmentID	
	gsmSCF Address

8.1.2 triggeredStatusReportingStop

triggeredStatusReportingStop is a method that is used by the application to disable triggered user status notifications.

Call Flow



Normal Operation

Pre-conditions	**An agreement is established between the network operator and the service provider for the status notification to be disabled**
1	The application invokes the ***triggeredStatusReportingStop*** method
2	The gsmSCF sends a MAP AnyTimeModificaitonRequest to the HLR in order to de-activate the CAMEL Subscription Information (M-CSI).

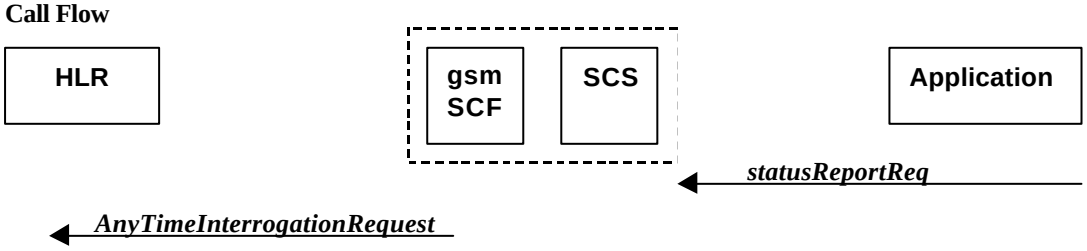
Parameter Mapping

From: ***triggeredStatusReportingStop***	To: MAP AnyTimeModificationRequest
stopRequest	**Subscriber Identity** **modificationInstruction in ModificationRequestFor-CSI has value 'deactivate', for M-CSI (Mobility CAMEL Subscription Information)**
	gsmSCF Address

8.1.3 statusReportReq

statusReportReq is a method that is used by the application to request a user status report. Note that this can be requested for multiple users at the same time.

Call Flow



Normal Operation

Pre-conditions	
1	The application invokes the ***statusReportReq*** method
2	The gsmSCF sends a MAP ***AnyTimeInterrogateRequest*** to the HLR in order to request the subscriber status In case the Status Report is requested for multiple users, multiple ATI requests are sent to the HLR.

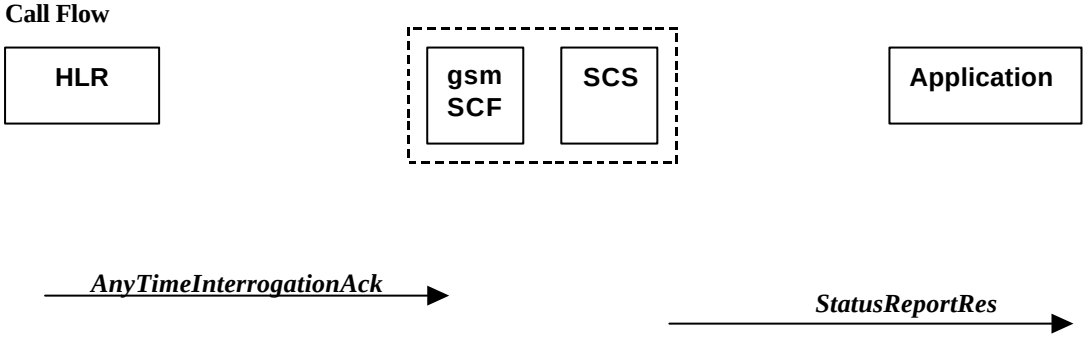
Parameter Mapping

From: ***statusReportReq***	To: MAP ***AnyTimeInterrogationRequest***
appStatus	
users	**Subscriber Identity**
	RequestedInfo – SubscriberState
	gsmSCFAddress
assignmentID	

8.1.4 statusReportRes

statusReportRes is a method that is used by the HLR/SCS towards the application, in response to an earlier request for a user status report. Note that this can be requested for multiple users at the same time.

Call Flow



Normal Operation

Pre-conditions	The application has invoked a ***statusReportReq*** method, and this request has been forwarded to the HLR.
1	The HLR sends a MAP ***AnyTimeInterrogationAck*** to the HLR/SCS in response to the earlier request.
2	The gsmSCF/SCS respond to the application via ***StatusReportRes***. In case the Status Report was requested for multiple users, multiple ATI ack's are collected in the gsmSCF/SCS before a response is sent back to the Application.

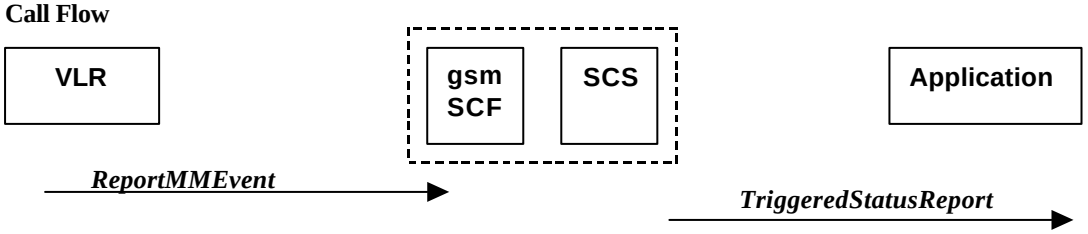
Parameter Mapping

To: ***statusReportRes***	From: MAP ***AnyTimeInterrogationAck***
assignmentID	
status	**SubscriberState**

8.1.5 triggeredStatusReport

triggeredStatusReport is a method that is used to notify the application of the arrival of a requested user status report event.

Call Flow



Normal Operation

Pre-conditions	The Application has requested triggeredStatusReporting
1	The VLR sends a MAP ReportMMEvent message to the CSE/SCS
2	The SCS sends a ***triggeredStatusReport*** to the Application

Parameter Mapping

To ***triggeredStatusReport***	From: MAP ***ReportMMEvent***
status	**Event Met**
	ServiceKey
	IMSI
	Basic MSISDN
	Supported CAMEL Phases
assignmentID	

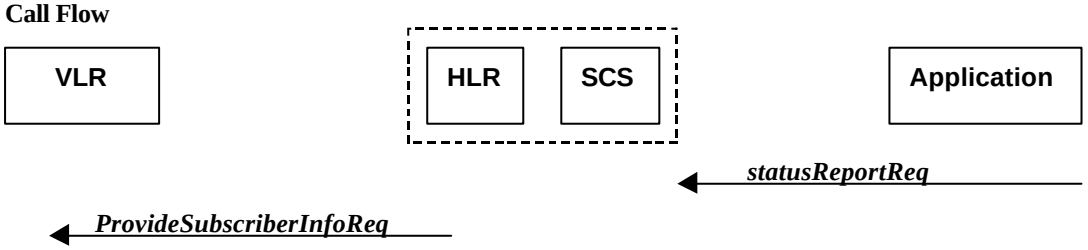
9 User Status Service core-MAP Flows

The User Status (US) interface class allows applications to obtain the status of mobile telephony users.

9.1.1 statusReportReq

statusReportReq is a method that is used by the application to request a user status report. Note that this can be requested for multiple users at the same time

Call Flow



Normal Operation

Pre-conditions	
1	The application invokes the ***statusReportReq*** method
2	The HLR sends a MAP ***ProvideSubscriberInfoRequest*** to the VLR in order to request the subscriber status In case the Status Report is requested for multiple users, multiple PSI requests are sent to the VLR.

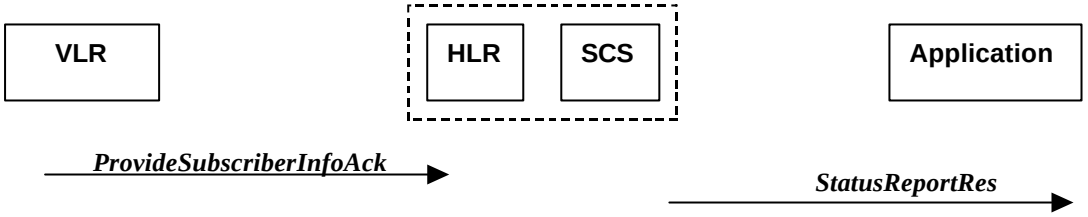
Parameter Mapping

From: ***statusReportReq***	To: MAP ***ProvideSubscriberInfo***
appStatus	
users	**Subscriber Identity**
	RequestedInfo – SubscriberState
	gsmSCFAddress
assignmentID	

9.1.2 statusReportRes

statusReportRes is a method that is used by the HLR/SCS towards the application, in response to an earlier request for a user status report. Note that this can be requested for multiple users at the same time

Call Flow



Normal Operation

Pre-conditions	The application has invoked a ***statusReportReq*** method, and this request has been forwarded to the VLR.
1	The VLR sends a MAP ***ProvideSubscriberInfoAck*** to the HLR/SCS in response to the earlier request.
2	The HLR/SCS respond to the application via ***StatusReportRes***. In case the Status Report was requested for multiple users, multiple PSI ack's are collected in the HLR/SCS before a response is sent back to the Application.

Parameter Mapping

To: ***statusReportRes***	From: MAP ***ProvideSubscriberInfoAck***
assignmentID	
status	**SubscriberState**

10 Network User Location Call Flows

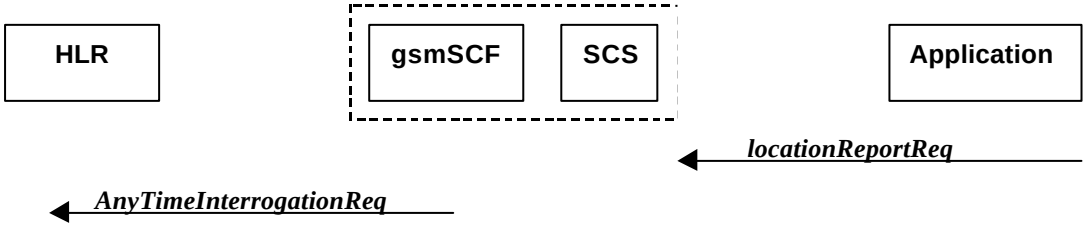
The Network User Location (NUL) provides location information, based on network-related information

Using the NUL functions, an application programmer can request the VLR number, the Location Area Identifier, geodatic Location Information and the Cell Global Identification and other mobile telephony specific location information, if the network is able to support the corresponding capability

10.1 locationReportReq

locationReportReq is a method used by the application to request for mobile-related location information on one or several users[1].

Call Flow



Normal Operation

[1] note that a request of location information for several users has to be mapped to several MAP-operation-requests

Pre-conditions	**An agreement is established between the network operator and the service provider for the *locationReportReq* to be enabled**
1	The application invoked the ***locationReportReq*** method
2	The gsmSCF sends a MAP AnyTimeInterrogationReq to the HLR.

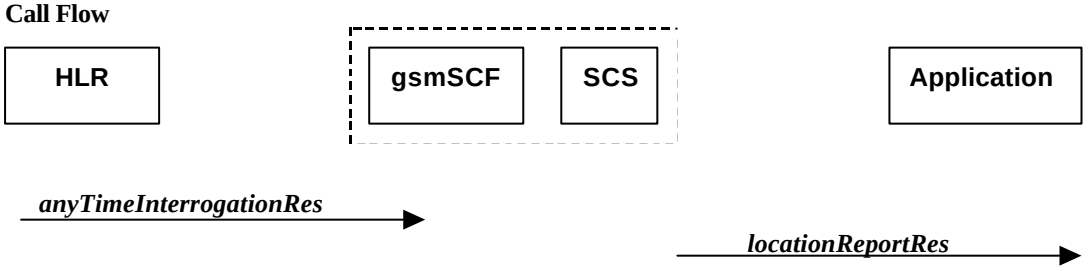
Parameter Mapping

From: ***locationReportReq***	To: MAP ***AnyTimeInterrogationReq***
appLocationCamel	
users	**SubscriberIdentity**
	gsmSCFAddress
	requestedInfo
assignmentID	

10.2 locationReportRes

locationReportRes is a method that delivers a mobile location report towards the application. The report contains mobile-related location information for one or several users[2].

Call Flow



Normal Operation

Pre-conditions	
1	The application invoked the ***locationReportReq*** method

Parameter Mapping

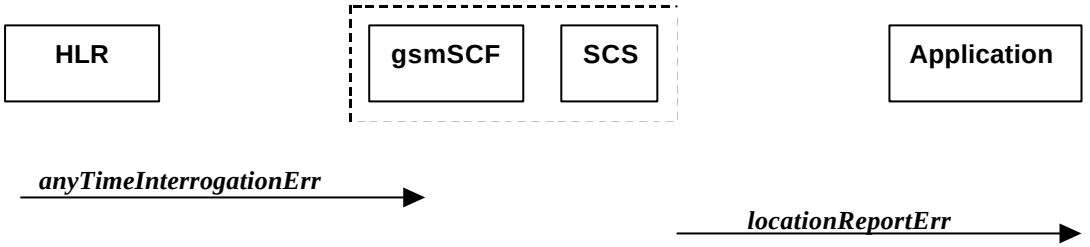
From: MAP ***AnyTimeInterrogationAck***	To: ***locationReportRes***
	assignmentID
subscriberInfo	**locations**

10.3 locationReportErr

locationReportErr is a method that indicates that the location report request has failed.

Call Flow

[2] note that a request of location information for several users has to be mapped to several MAP-operation-requests



Normal Operation

Pre-conditions	
1	The application invoked the ***locationReportReq*** method

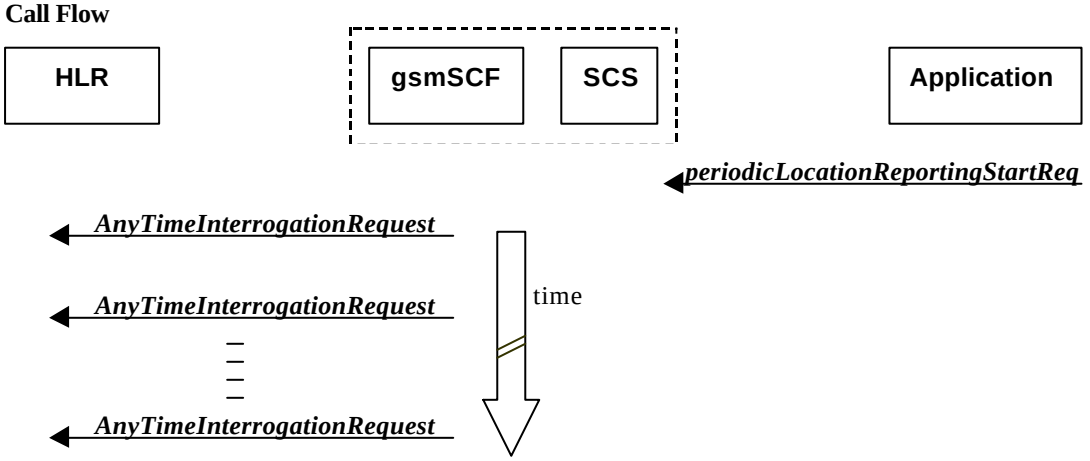
Parameter Mapping

From: MAP ***anyTimeInterrogationErr***	To: ***locationReportErr***
	assignmentID
SystemFailure **ATI-NotAllowed** **DataMissing** **UnexpectedDataValue** **UnknownSubscriber**	**cause**
	diagnostic

10.4 periodicLocationReportingStartReq

periodicLocationReportingStartReq is a method used by the application to request for periodic mobile location reports on one or several users[3].

Call Flow



Normal Operation

Pre-conditions	**An agreement is established between the network operator and the service provider for the *periodicLocationReportingStartReq* to be enabled**
1	The application invoked the ***periodicLocationReportingStartReq*** method
2	The gsmSCF sends a MAP AnyTimeModificationReq to the HLR in order to activate the CAMEL subscription Information (M-CSI).

Parameter Mapping

From: ***periodicLocationReportingStartReq***	To: MAP ***AnyTimeInterrogationReq***

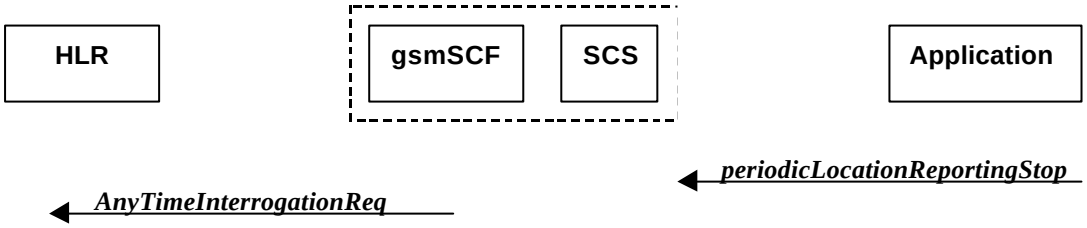
[3] note that a request of location information for several users has to be mapped to several MAP-operation-requests

appLocation	
users	**SubscriberIdentity**
	gsmSCFAddress
	requestedInfo
reportingInterval	
assignmentID	

10.5 periodicLocationReportingStop

periodicLocationReportingStop is a method used by the application to stop the sending of periodic mobile location reports for one or several users[4].

Call Flow



Normal Operation

Pre-conditions	
1	The application invoked the ***periodicLocationReportingStartReq*** method
2	The gsmSCF sends a MAP AnyTimeModificationReq to the HLR in order to activate the CAMEL subscription Information (M-CSI).

Parameter Mapping

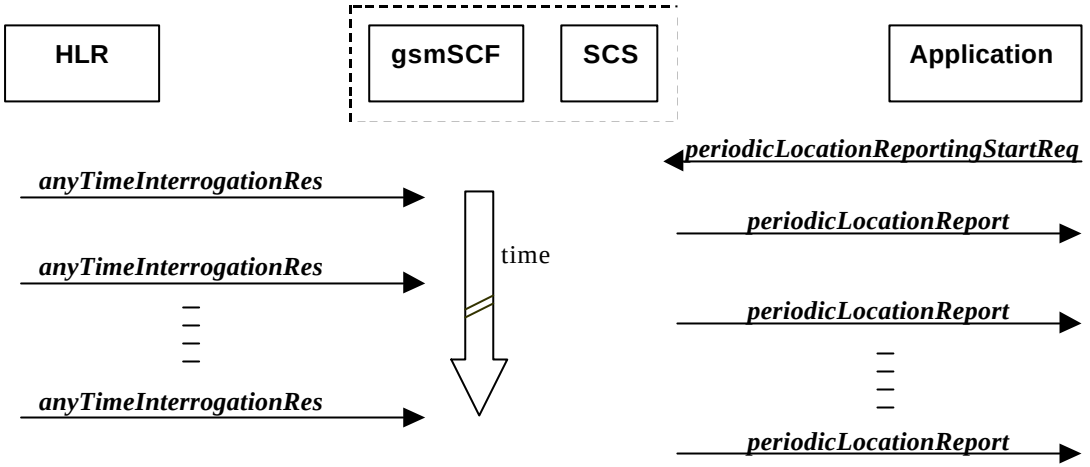
From: ***periodicLocationReportingStop***	To: MAP ***AnyTimeInterrogationReq***
	SubscriberIdentity
	gsmSCFAddress
stopRequest	**requestedInfo**

10.6 periodicLocationReport

periodicLocationReport is a method that provides periodic delivery of mobile location reports. The reports are containing mobile-related location information for one or several users[5].

Call Flow

[4] note that a request of location information for several users has to be mapped to several MAP-operation-requests
[5] note that a request of location information for several users has to be mapped to several MAP-operation-requests



Normal Operation

Pre-conditions	
1	The application invoked the ***periodicLocationReportingStartReq*** method

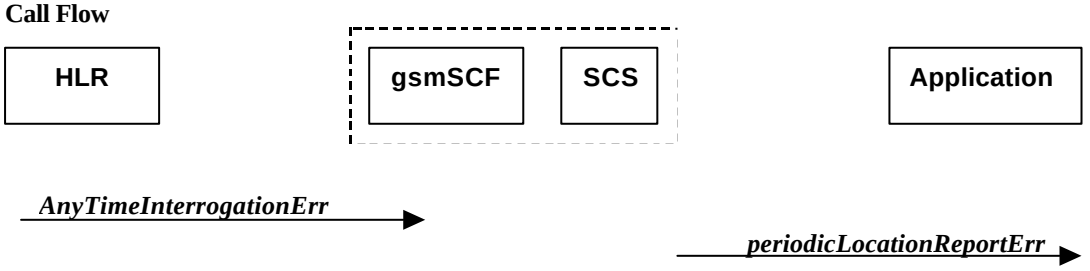
Parameter Mapping

From: MAP ***AnyTimeInterrogationAck***	To: ***locationReportRes***
	assignmentID
subscriberInfo	**locations**

10.7 periodicLocationReportErr

periodicLocationReportErr is a method that indicates that the requested periodic location report has failed. Note that errors only concerning individual users are reported in the ordinary periodicLocationReport() message.

Call Flow



Normal Operation

Pre-conditions	
1	The application invoked the ***periodicLocationReportingStartReq*** method

Parameter Mapping

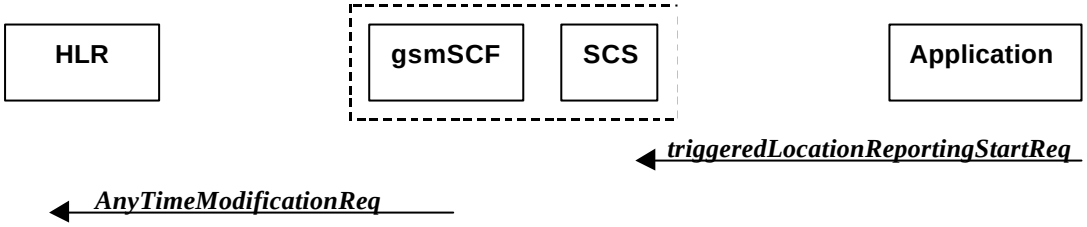
From: MAP ***anyTimeInterrogationErr***	To: ***periodicLocationReportErr***
	assignmentID
SystemFailure **ATI-NotAllowed** **DataMissing** **UnexpectedDataValue** **UnknownSubscriber**	**cause**

	diagnostic
GsmSCFAddress	

10.8 triggeredLocationReportingStartReq

triggeredLocationReportingStartReq is a method used by the application to request for user location reports, containing mobile related information, when the location is changed (the report is triggered by the location change, e.g. change of VLR number, change of Global Cell Identification or other location information if available).

Call Flow



Normal Operation

Pre-conditions	**An agreement is established between the network operator and the service provider for the *triggeredLocationReportingStartReq* to be disabled**
1	The application invoked the ***triggeredLocationReportingStartReq*** method
2	The gsmSCF sends a MAP AnyTimeModificationReq to the HLR in order to activate the CAMEL subscription Information (M-CSI).

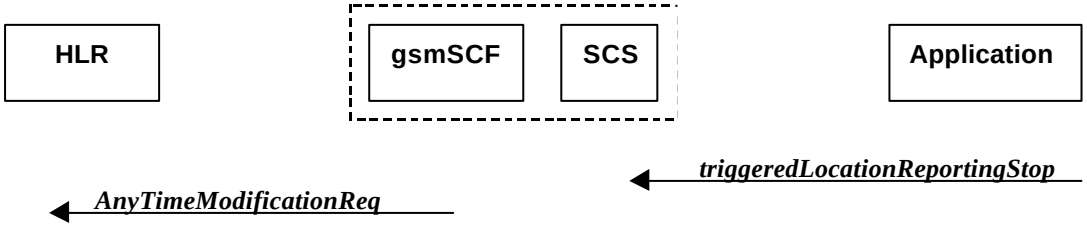
Parameter Mapping

From: ***triggeredLocationReportingStartReq***	To: MAP ***AnyTimeModificationReq***
appLocation	
users	**subscriberIdentity**
	modificationRequestFor-CSI
	gsmSCF-Address
triggers	

10.9 triggeredLocationReportingStop

triggeredLocationReportingStop is a method used by the application to request that triggered mobile location reporting should stop.

Call Flow



Normal Operation

Pre-conditions	

1	The application has initiated a **triggered Location Report *assignment*** method
2	The gsmSCF sends a MAP AnyTimeModificationReq to the HLR in order to activate the CAMEL subscription Information (M-CSI).

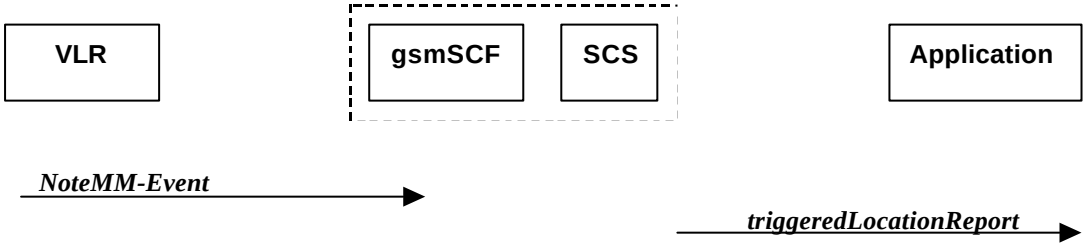
Parameter Mapping

From: ***triggeredLocationReportingStop***	To: MAP ***AnyTimeModificationReq***
	subscriberIdentity
stopRequest	**modificationRequestFor-CSI**
	gsmSCF-Address

10.10 triggeredLocationReport

triggeredLocationReport is a method providing the delivery of a report that is indicating that one or several user's mobile location has changed.

Call Flow



Normal Operation

Pre-conditions	**An agreement is established between the network operator and the service provider for the *periodicLocationReport* to be disabled**
1	The application invoked the ***triggeredLocationReportingStartReq*** method

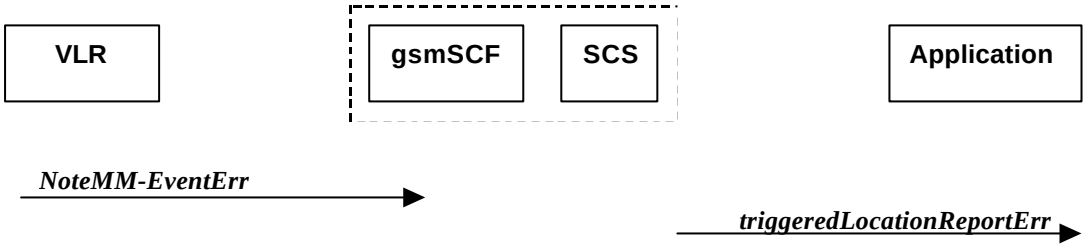
Parameter Mapping

From: MAP ***NoteMM-Event***	To: ***triggeredLocationReport***
	assignmentID
serviceKey	
locationInformation	**location**
eventMet	**criterion**

10.11 triggeredLocationReportErr

triggeredLocationReportErr is a method indicates that a requested triggered location report has failed. Note that errors only concerning individual users are reported in the ordinary triggeredLocationReport() message.

Call Flow



Normal Operation

Pre-conditions	
1	The application invoked the ***triggeredLocationReportingStartReq*** method
2	The gsmSCF sends a MAP ***AnyTimeModificationReq*** to the HLR

Parameter Mapping

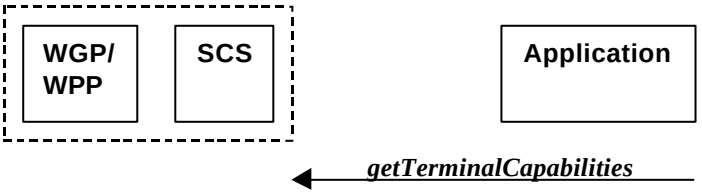
From: MAP ***NoteMM-EventErr***	To: ***triggeredLocationReportErr***
	assignmentID
dataMissing **unexpectedDataValue** **unknownSubscriber** **MM-EventNotSupported**	**cause**
	diagnostic

11 Terminal Capabilities WAP Call Flows

The Terminal Capabilities SCF allows the application to request Terminal Capabilities.

11.1 getTerminalCapabilities

getTerminalCapabilities is a method that will result in the SCS asking the WAP Gateway/Push Proxy (WGP/WPP) to return the terminal capabilities. The ***getTerminalCapabilities*** method is a synchronous method and therefore no arrow is shown from SCS towards Application.



Parameter mapping

No mapping of parameters is defined. The reason for this is that the WAP Forum does not specify a mapping either from the Push Access Protocol (used between Application Server and WGP/WPP) onto the Push Over-the-Air Protocol (used between WGP/WPP and terminal).

Annex A:

Change history

Change history		
Date	**Version**	**Comment**
January 2000	0.1.0	Initial Draft presented in Sophia Antipolis, France (OSA-00032)
February 2000	0.2.0	Version presented to OSA AdHoc#5 in Antwerp, Belgium (OSA-00082)
March 2000	0.3.0	Output from OSA AdHoc#5 in Antwerp, Belgium. Incorporates OSA-00112 and OSA-00118.
March 2000	0.3.1	Output from the e-mail approval process prior to the CN Plenary TSG-CN#7 and the editor´s drafting telephone conference 09-Mar-2000.
March 2000	1.0.0	Conform the decision on the email exploder (dd. 10-03-2000) version has been raised to 1.0.0

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