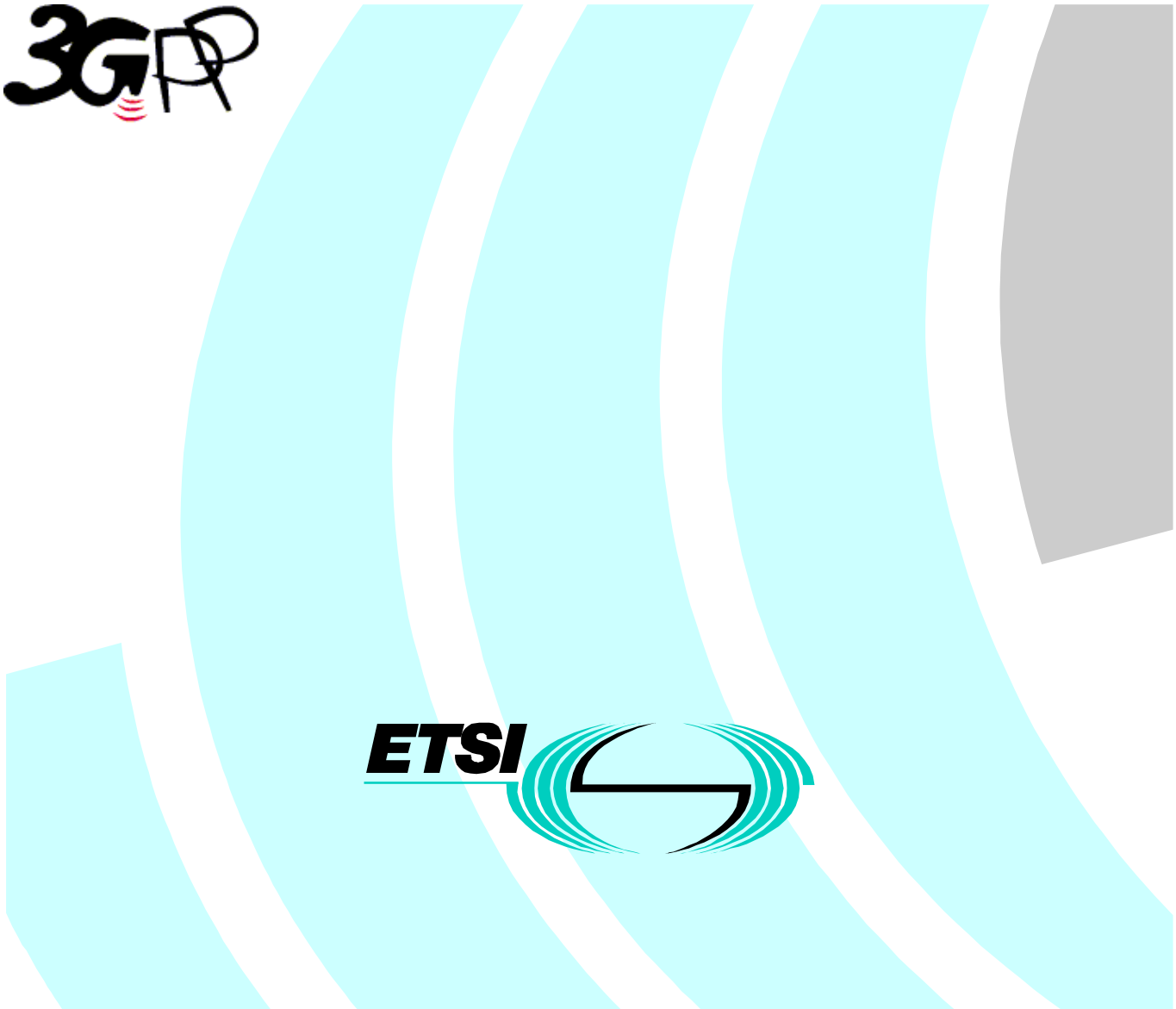
ETSI TR 129 998-8 V4.0.0 (2001-03)

Technical Report

Universal Mobile Telecommunications System (UMTS);
Open Service Access (OSA);
Application Programming Interface (API) Mapping for OSA;
Part 8: Data Session Control Service Mapping to CAP
(3GPP TR 29.998-8 version 4.0.0 Release 4)



Reference
RTR/TSGN-0529998-8Uv4

Keywords
UMTS

ETSI

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Foreword

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The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under www.etsi.org/key .

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Foreword

This Technical Report has been produced by the 3rd Generation Partnership Project (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 the present document, 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

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  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
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- 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.

Introduction

Structure of the OSA API Mapping (3GPP TR 29.998)

The Technical Report 3GPP TR 29.998 consists of a series of parts and subparts. An effort has been made to ensure that the part numbers used in the mapping TR correspond to the part numbers of the base OSA specification in 3GPP TS 29.198. For this reason, certain parts, for which no suitable mapping could be suggested, have not been delivered. At a later stage a mapping to a new protocol may become evident, in which case these missing parts will be developed.

The OSA documentation was defined jointly between 3GPP TSG CN WG5, ETSI SPAN 12 and the Parlay Consortium, in co-operation with the JAIN consortium. The 3GPP TR 29.998 is based on a mapping document with a wider scope, developed as part of this co-operation. Certain mappings defined in the course of this joint development are not applicable for 3GPP Release 4, which is why not all sub-parts have been delivered as part of 3GPP Release 4. However, it is expected that some will become applicable within the scope of 3GPP Release 5, which is why a common sub-part numbering is being retained, albeit with gaps for 3GPP Release 4.

If mapping for a certain Part is "Not Applicable" it can either indicate that a mapping does not exist (e.g. Part 2 Common Data), or the API is considered to be implemented directly on a physical entity, or via a proprietary mechanism.

The present document is part 8 of a multi-part TR covering the 3rd Generation Partnership Project: Technical Specification Group Core Network; Open Service Access (OSA); Application Programming Interface (API) Mapping for OSA, as identified below.

29.998-1: General Issues on API Mapping
29.998-2: Not Applicable
29.998-3: Not Applicable
29.998-4-1: Call Control Service Mapping; Subpart: API to CAP Mapping
29.998-4-2: Call Control Service Mapping; Subpart 2 generic call control INAP (not Rel-4)
29.998-4-3: Call Control Service Mapping; Subpart 3 multiparty call control INAP (not Rel-4)
29.998-4-4: Call Control Service Mapping; Subpart 4 multiparty call control SIP (not Rel-4)
29.998-4-5: Call Control Service Mapping; Subpart 5 multimedia call control extensions mapping to SIP (not Rel-4)
29.998-5-1: User Interaction Service Mapping; Subpart 1: API to CAP Mapping
29.998-5-2: User Interaction Service Mapping; Subpart 2 user interaction INAP (not Rel-4)
29.998-5-3: User Interaction Service Mapping; Subpart 3 user interaction Megacop (not Rel-4)

29.998-5-4: User Interaction Service Mapping; Subpart 4: API to SMS Mapping
29.998-6: User Location – User Status Service Mapping to MAP
29.998-7: Not Applicable
29.998-8: Data Session Control Service Mapping to CAP

OSA API specifications 29.198-family		OSA API Mapping - 29.998-family	
29.198-1	**Part 1: Overview**	**29.998-1**	**Part 1: Overview**
29.198-2	**Part 2: Common Data Definitions**	29.998-2	Not Applicable
29.198-3	**Part 3: Framework**	29.998-3	Not Applicable
29.198-4	**Part 4: Call Control SCF**	**29.998-4-1**	**Subpart 1: Generic Call Control – CAP mapping**
		29.998-4-2	
29.198-5	**Part 5: User Interaction SCF**	**29.998-5-1**	**Subpart 1: User Interaction – CAP mapping**
		29.998-5-2	
		29.998-5-3	
		29.998-5-4	**Subpart 4: User Interaction – SMS mapping**
29.198-6	**Part 6: Mobility SCF**	**29.998-6**	**User Status and User Location – MAP mapping**
29.198-7	**Part 7: Terminal Capabilities SCF**	29.998-7	Not Applicable
29.198-8	**Part 8: Data Session Control SCF**	**29.998-8**	**Data Session Control – CAP mapping**
29.198-9	Part 9: Generic Messaging SCF	29.998-9	Not Applicable
29.198-10	Part 10: Connectivity Manager SCF	29.998-10	Not Applicable
29.198-11	**Part 11: Account Management SCF**	29.998-11	Not Applicable
29.198-12	**Part 12: Charging SCF**	29.998-12	Not Applicable

1 Scope

The present document investigates how the OSA Data Session Control Interface Class methods defined in 3GPP TS 29.198-8 [5] can be mapped onto CAMEL Application Part operations and Mobile Application Part operations. The mapping of the OSA API to the CAP and relevant MAP operations is considered informative, and not normative. An overview of the mapping TR is contained in the introduction of the present document as well as in 3GPP TR 29.998-1 [10].

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 API specification is contained in the 3GPP TS 29.198 series of specifications. An overview of these is available in the introduction of the present document as well as in 3GPP TS 29.198-1 [1]. The concepts and the functional architecture for the Open Service Access (OSA) are described by 3GPP TS 23.127 [3]. The requirements for OSA are defined in 3GPP TS 22.127 [2].

The present document has been defined jointly between 3GPP TSG CN WG5, ETSI SPAN 12 and the Parlay Consortium, in co-operation with the JAIN consortium.

2 References

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] 3GPP TS 29.198-1: "Open Service Access; Application Programming Interface; Part 1: Overview".

[2] 3GPP TS 22.127: "Stage 1 Service Requirement for the Open Service Access (OSA) (Release 4)".

[3] 3GPP TS 23.127: "Virtual Home Environment (Release 4)".

[4] 3GPP TR 22.905: "3GPP Vocabulary".

[5] 3GPP TS 29.198-8: "Open Service Access; Application Programming Interface - Part 8: Data Session Control".

[6] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[7] 3GPP TS 29.078: "CAMEL Application Part (CAP) specification – Phase 3".

[8] 3GPP TS 22.101: "Universal Mobile Telecommunications System (UMTS): Service Aspects; Service Principles".

[9] ITU-T Q.850: “Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN User Part".

[10] 3GPP TR 29.998-1: "API Mapping for Open Service Access; Part 1: General Issues on API Mapping".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TS 29.198-1 [1] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TS 29.198-1 [1] apply.

4 Data Session Control Service CAMEL Call Flows

4.1 Data Session Manager

The session manager interface provides the management functions to the data session service capability features. The application programmer can use this interface to enable or disable data session-related event notifications.

In order to ensure that the mobility events are transparent to the Data Session SCF, the same gsmSCF address shall be used in the GPRS-CSI for the detection points: PDP Context Establishment, PDP Context Establishment Acknowledge and Change of Position.

4.1.1 enableDataSessionNotification

enableDataSessionNotification is used to enable data session-related notifications to be sent to the application.

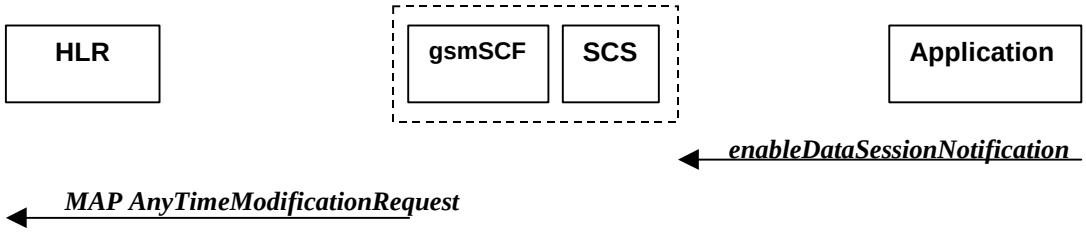

Figure 4-1: Call Flow for enableDataSessionNotification

Table 4-1: 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 ***enableDataSessionNotification*** method
2	The gsmSCF sends a MAP ***AnyTimeModification*** to the HLR in order to activate the necessary CAMEL Subscription Information (GPRS-CSI) Note : CAMEL phase 3 only allows for activation/deactivation of the CSI and not modification of the contents of the CSIs.

Table 4-2: Parameter Mapping

From: enableDataSessionNotification	To: MAP AnyTimeModification
appInterface	
	-
eventCriteria OriginatingAddress	GPRS CAMEL Subscription Information GPRS-CSI gsmSCF Address
assignmentID	

4.1.2 disableDataSessionNotification

disableDataSessionNotification is used by the application to disable data session notifications.

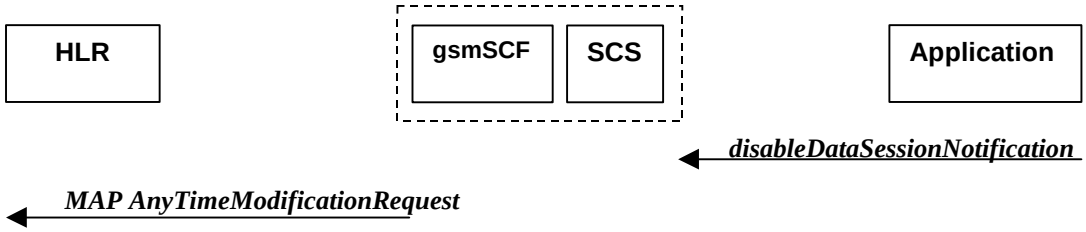

Figure 4-2: Call Flow for disableDataSessionNotification

Table 4-3: 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 ***disableDataSessionNotification*** method
2	The gsmSCF sends a MAP ***AnyTimeModification*** to the HLR in order to de-activate the necessary CAMEL Subscription Information. Note that CAMEL Phase 3 only allows the capability to activate/deactivate CSI and not to modify the triggering information.

Table 4-4: Parameter Mapping

From: disableDataSessionNotification	To: MAP AnyTimeModification
eventCriteria OriginatingAddress	GPRS CAMEL Subscription Information GPRS-CSI gsmSCF Address
assignmentID	

4.1.3 dataSessionEventNotify

dataSessionEventNotify notifies the application of the arrival of a data session-related event.

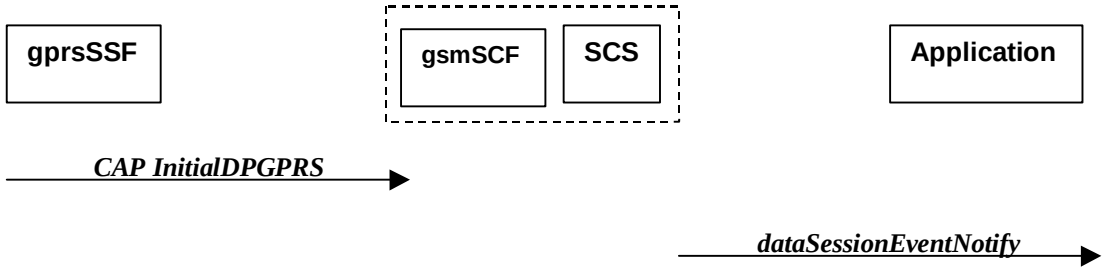

Figure 4-3: Call Flow for dataSessionEventNotify

Table 4-5: Normal Operation

Pre-conditions	Call notifications have been enabled using the *enableDataSessionNotification* method on the Data Session Manager interface
1	A data session request arrives at the gsmSSF causing initial triggering to the gsmSCF CAP ***InitialDPGPRS***
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 data session and invokes the ***dataSessionEventNotify*** method

Table 4-6: Parameter Mapping

From: CAP InitialDPGPRS	To: dataSessionlEventNotify
serviceKey	
gPRSEventType	
mSISDN accessPointName	eventInfo OriginatingAddress DestinationAddress
iMSI	
timeAndTimeZone	
gPRSMSClass	
pDPType	
qualityOfService	
routeingAreaIdentity	
chargeID	
sGSNCapabilities	
	assignmentID
	appInterface

4.1.4 dataSessionAborted

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

Figure 4-4: Call Flow for dataSessionAborted

Table 4-7: Normal Operation

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

Parameter Mapping

None.

4.1.5 dataSessionNotificationInterrupted

dataSessionlNotificationInterrupted indicates to the application that event notifications will no longer be sent (for example, due to faults detected).

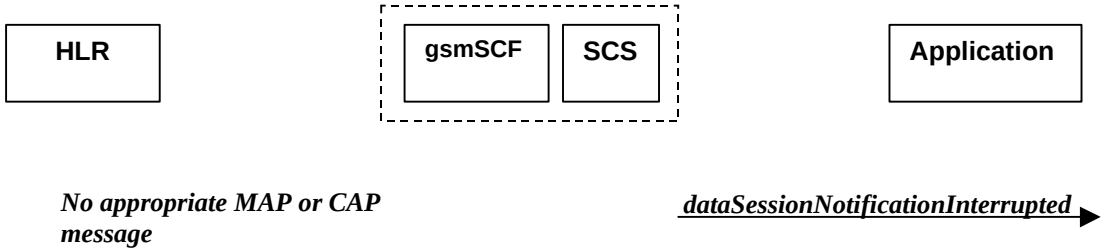

Figure 4-5: Call Flow for dataSessionNotificationInterruptedNormal Operation

Table 4-8:

Pre-conditions	Data session notifications have been enabled using the *enableNotification* method on the Data Session 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 ***dataSessionNotificationInterrupted*** method

Parameter Mapping

None.

4.1.6 dataSessionNotificationContinued

dataSessionNotificationContinued indicates to the application that all event notifications will be sent again.

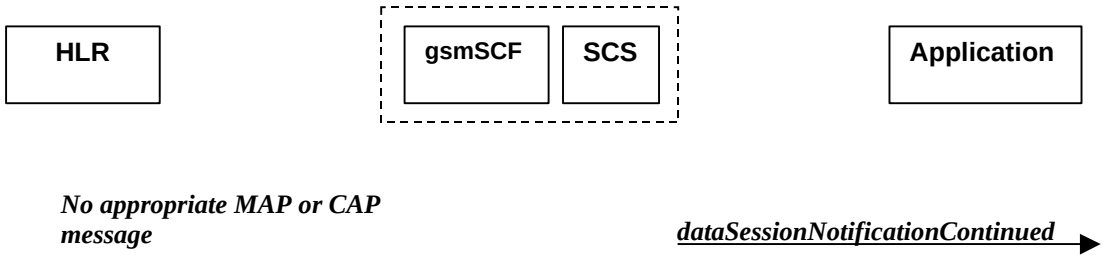

Figure 4-6: Call Flow for dataSessionNotificationContinued

Table 4-9: Normal Operation

Pre-conditions	Data session notifications have been interrupted and *dataSessionNotificationInterrupted* method has been invoked.
1	The SCS detects that data session notifications are again possible.
2	The SCS invokes the ***dataSessionNotificationContinued*** method

Parameter Mapping

None.

4.2 Data Session

The Data Session interface provides basic methods for applications to control data sessions.

4.2.1 ConnectReq

connectReq requests the connection of a data session with the destination party (specified in the parameter TargetAddress). The Data Session object is not automatically deleted if the destination party disconnects from the data session. The mapping to ***continueGPRS*** is also possible.

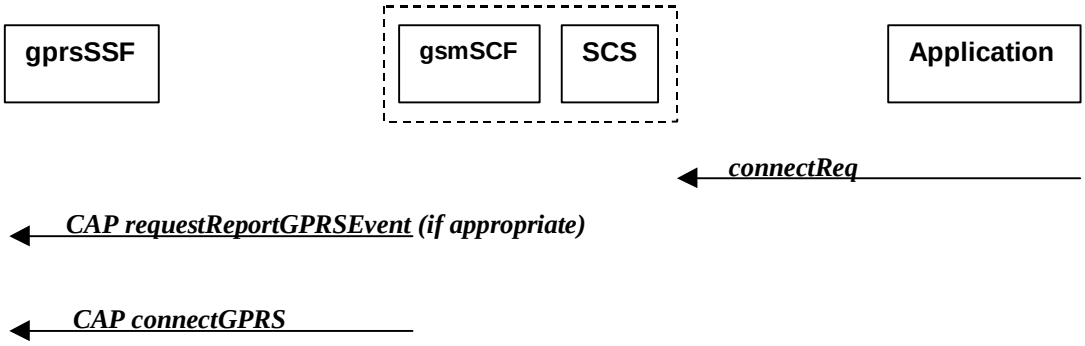

Figure 4-7: Call Flow for connectReq

Table 4-10: Normal Operation

Pre-conditions	The application has been notified of a new data session and the data session object exists.
1	The application invokes the ***connectReq*** method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP ***requestReportGPRSEvent*** if the application needs to be informed about the outcome of the request
4	The gsmSCF sends a CAP ***connectGPRS*** message

Table 4-11: Parameter Mapping

From: connectReq	To: CAP requestReportGPRSEvent
	gPRS-ReferenceNumber
dataSessionID	
responseRequested	gPRSEvent
targetAddress	
	pDPID
assignmentID	

Table 4-12:

From: connectReq	To: CAP connectGPRS
dataSessionID	
responseRequested	
targetAddress	accessPointName
	pdpID
assignmentID	

4.2.2 connectRes

connectRes indicates that the request to connect a data session with the destination party was successful, and indicates the response of the destination party (e.g. connected, disconnected).

Figure 4-8: Call Flow for connectRes

Table 4-13: Normal Operation

Pre-conditions	Data session routing attempted
1	If event reports have been requested, the gprsSSF sends a CAP ***eventReportGPRS*** to the gsmSCF
2	The gsmSCF sends an equivalent message to the SCS
3	The SCS invokes the ***connectRes*** method

Table 4-14: Parameter Mapping

From: CAP eventReportGPRS	To: connectRes
	dataSessionID
gPRS-ReferenceNumber	
gPRSEventType miscGPRSInfo gPRSEventSpecificInformation	eventReport
pDPID	

4.2.3 connectErr

connectErr indicates that the request to connect a data session with the destination party was unsuccessful, e.g. an error detected in the network or the data session was abandoned.

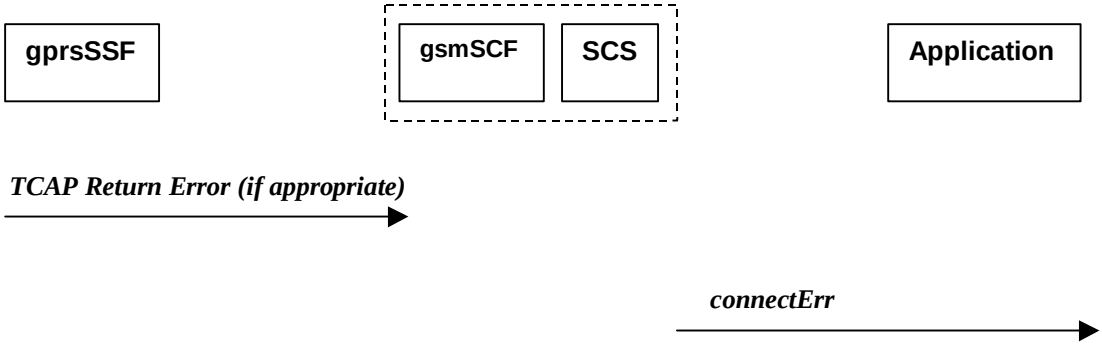

Figure 4-9: Call Flow for connectErr

Table 4-15: Normal Operation

Two scenarios are possible

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

Pre-conditions	Data session routing attempted
1	The gprsSSF 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 ***connectReq*** method, or receives a TCAP Return Error, and invokes the ***connectErr*** method

Table 4-16:

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

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

Table 4-17: Parameter Mapping

From: TCAP Return Error	To: routeCallToDestinationErr
	dataSessionID
TC-U-ERROR TC-U-REJECT	errorIndication

4.2.4 release

release requests the release of the data session.

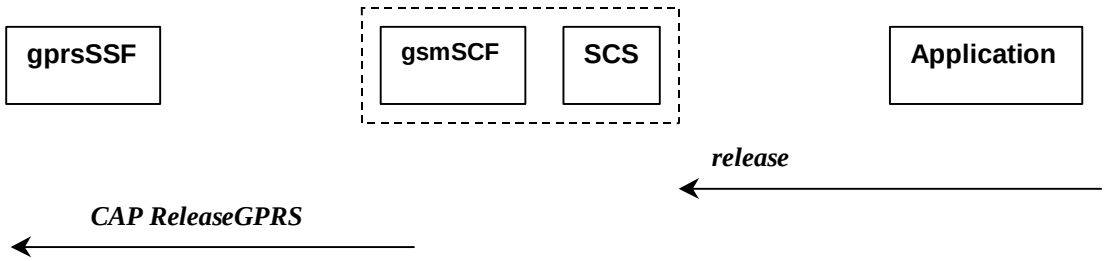

Figure 4-10: Call Flow for release

Table 4-18: Normal Operation

Pre-conditions	Data session is in progress
1	The application invokes the ***release*** method
2	The SCS sends an equivalent message to the gsmSCF
3	The gsmSCF invokes the CAP ***ReleaseGPRS*** operation

Table 4-19: Parameter Mapping

From: release	To: CAP ReleaseGPRS
dataSessionID	
	gPRS-ReferenceNumber
cause	gPRSCause
	pDPID

4.2.5 superviseDataSessionReq

superviseDataSessionReq is called by the application to supervise a data session. The application can set a granted data volume for this data session. If an application calls this function before it calls a `connectReq()` or a user interaction function the time measurement will start as soon as the data session is connected. The Data Session object will exist after the data session has been terminated if information is required to be sent to the application at the end of the data session.

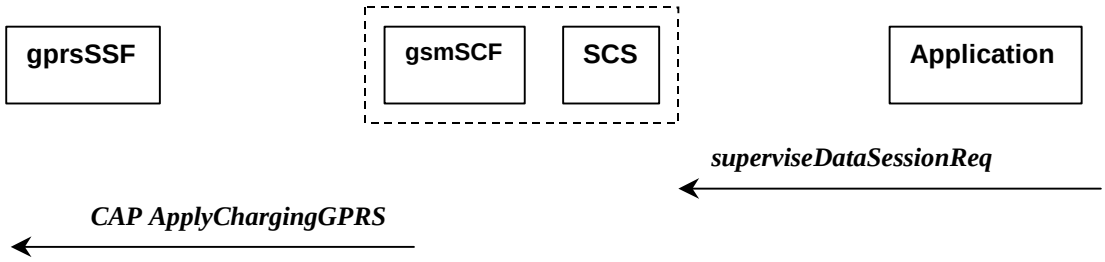

Figure 4-11: Call Flow for superviseDataSessionReq

Table 4-20: Normal Operation

Pre-conditions	
1	The application invokes the ***superviseDataSessionReq*** method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP ApplyChargingGPRS message to the gprsSSF

Table 4-21: Parameter Mapping

From: superviseDataSessionReq	To: CAP ApplyChargingGPRS
dataSessionID	
	gPRS-ReferenceNumber
treatment	
bytes	chargingCharacteristics maxTransferedVolume
	pDPID

4.2.6 superviseDataSessionRes

superviseDataSessionRes is an asynchronous method that reports a data session supervision event to the application.

Figure 4-12: Call Flow for superviseDataSessionRes

Table 4-22: Normal Operation

Pre-conditions	The application has invoked the *superviseDataSessionReq* **method**
1	The gsmSCF receives an CAP ***ApplyChargingReportGPRS*** from the gprsSSF
2	The gsmSCF sends an equivalent internal message to the SCS
3	The SCS identifies the correct application and invokes the ***superviseDataSessionRes*** method.

Table 4-23: Parameter Mapping

From: CAP ApplyChargingReportGPRS	To: superviseDataSessionRes
	dataSessionID
gPRSReferenceNumber	
	report
chargingResult transferedVolume	usedVolume
qualityOfService	
pDPID	
active	

4.2.7 superviseDataSessionErr

superviseDataSessionErr is an asynchronous method that reports a data session supervision error to the application.

Figure 4-13: Call Flow for superviseDataSessionErr

Table 4-24: Normal Operation

Pre-conditions	The application has requested information associated with a call via the *superviseDataSessionReq* **method**
1	A data session terminates abnormally and the gprsSSF 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 data session information and invokes the ***superviseDataSessionErr*** method.

Table 4-25: Parameter Mapping

From: TCAP Return Error	To: superviseCallErr
	dataSessionID
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

4.2.8 dataSessionFaultDetected

dataSessionFaultDetected indicates to the application that a fault in the network has been detected which can't be communicated by a network event, e.g., when the user aborts before any establishment method is called by the application.

The system purges the Data Session object. Therefore, the application has no further control of data session processing. No report will be forwarded to the application.

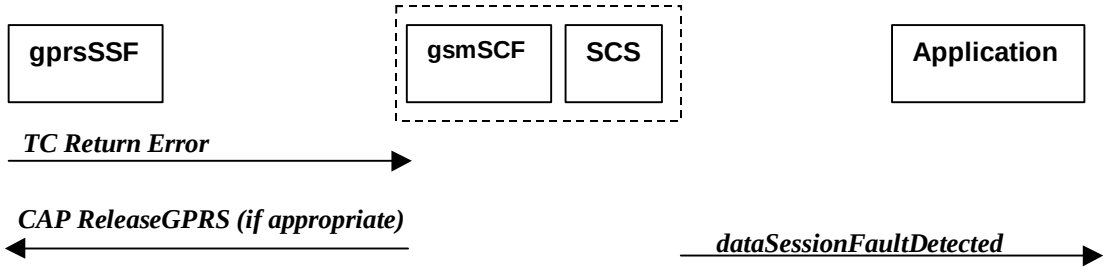

Figure 4-14: Call Flow for dataSessionFaultDetected

Table 4-26: Normal Operation

Pre-conditions	A data session exists and the SCS detects an error. No *connectReq* method has been invoked yet.
1	The gprsSSF 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 ***dataSessionFaultDetected*** method
4	The SCS sends an equivalent message to the gsmSCF if appropriate
5	The gsmSCF sends a CAP ***ReleaseGPRS*** if appropriate

Table 4-27: Parameter Mapping

From:Dialogue Error	To: dataSessionFaultDetected
	dataSessionID
TC_U_ABORT	fault

4.2.9 setAdviceOfCharge

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

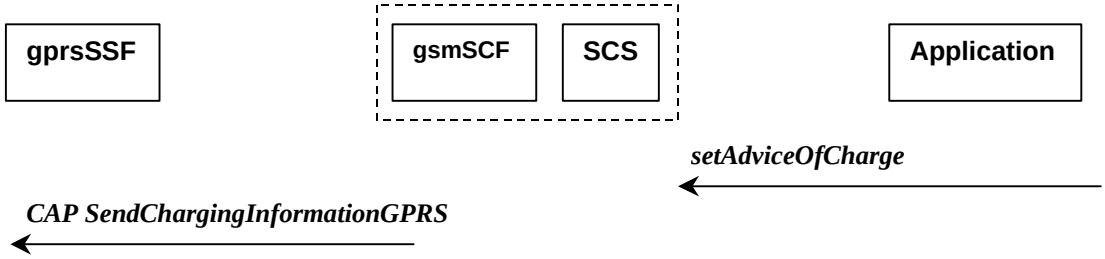

Figure 4-15: Call Flow for setAdviceOfCharge

Table 4-28: Normal Operation

Pre-conditions	
1	The application invokes the ***setAdviceOfCharge*** method
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP ***SendChargingInformationGPRS*** message to the gprsSSF

Table 4-29: Parameter Mapping

From: setAdviceOfCharge	To: CAP SendChargingInformationGPRS
sessionID	
aOCInfo: - CurrentCAI	SCIGPRSBillingChargingCharateristics aOCGPRS aOCInitial
- NextCAI	SCIGPRSBillingChargingCharateristics aOCGPRS aOCSubsequent cAI-GSM0224
tariffSwitch	SCIGPRSBillingChargingCharateristics aOCGPRS aOCSubsequent tariffSwitchInterval
	SCIGPRSBillingChargingCharateristics aOCGPRS pDPID

4.2.10 setDataSessionChargePlan

setDataSessionChargePlan is a method that allows the application to include charging information for data sessions in network generated CDR.

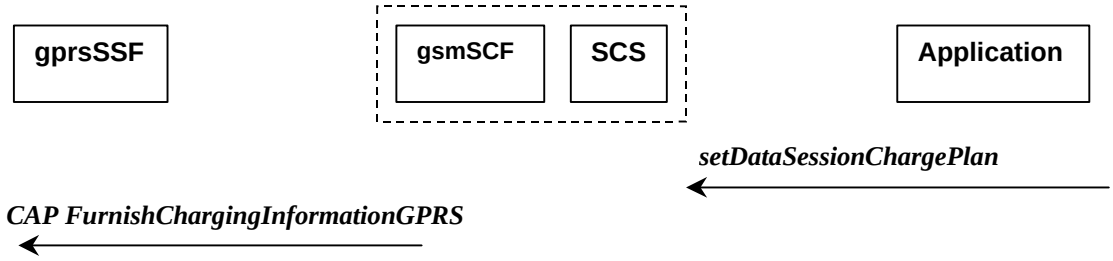

Figure 4-16: Call Flow for setDataSessionChargePlan

Table 4-30: Normal Operation

Pre-conditions	
1	The application invokes the ***setDataSessionChargePlan***
2	The SCS sends an equivalent internal message to the gsmSCF
3	The gsmSCF sends a CAP ***FurnishChargingInformationGPRS*** message to the gprsSSF

Table 4-31: Parameter Mapping

From: setDataSessionPlan	To: CAP FurnishChargingInformationGPRS
dataSessionID	
dataSessionChargePlan	FCIGPRSBillingChargingCharacteritics fCIBCCCAMELsequence1 freeFormatData
	FCIGPRSBillingChargingCharacteritics fCIBCCCAMELsequence1 appendFreeFormatData
	FCIGPRSBillingChargingCharacteritics fCIBCCCAMELsequence1 pDPID

Annex A (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
16 Mar 2001	CN_11	NP-010131	011	-	CR 29.998: for moving TR 29.998 from R99 to Rel 4 (N5-010159)	3.2.0	4.0.0

History

Document history		
V4.0.0	March 2001	Publication