Technical Specification Group Services and System Aspects **TSGS#11(01) 0163**
Meeting #11, Palm Springs, CA, USA, 19-22 March 2001

Source: **SA1 OSA ad hoc**

Title: **Various CRs to 22.127**

Document for: **Approval**

Agenda Item: **7.1.3**

Meeting-1st-Level	Doc-1st-Level	Spec	CR	Rev	Phase	Cat	Subject	Version-Current	Version-New	Doc-2nd-Level
SP-11	SP-010163	22.127	003		Rel-4	D	Clarify the situation when a user becomes available	4.0.0	4.1.0	S1-010274
SP-11	SP-010163	22.127	004		Rel-4	D	Terminal capabilities	4.0.0	4.1.0	S1-010275
SP-11	SP-010163	22.127	005		Rel-4	D	Make the Scope more precise description of 22.127	4.0.0	4.1.0	S1-010276
SP-11	SP-010163	22.127	006		Rel-4	D	Clarify charging requirements	4.0.0	4.1.0	S1-010277
SP-11	SP-010163	22.127	007		Rel-4	D	OSA consistency within stage1 specification	4.0.0	4.1.0	S1-010278

TSG-SA WG 1 (Services) meeting #12
Helsinki, Finland, 7-11 May 2001

TSG S1 (01) 0274
Agenda Item:

3GPP TSG SA1 – OSA ad-hoc
Tempe, Arizona, US
March 6-7, 2001

S1O01010

CR-Form-v3

CHANGE REQUEST

⌘ **TS 22.127** **CR** **003** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Clarify the situation when a user becomes available
Source:	⌘	SIEMENS AG
Work item code:	⌘	OSA
Date:	⌘	04/03/01
Category:	⌘	**D**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The relation between a subscriber related event and the circumstance when a user becomes available is not clear
Summary of change:	⌘	References of the relevant chapters are introduced
Consequences if not approved:	⌘	Misinterpretation of TS 22.127 possible

Clauses affected:	⌘	11.1.
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

11.1 Subscriber Related events:

- A new network service or network service capability registers,
  when a new network service capability feature registers with the Registration Function and this event is armed by an application, that application shall be notified.
- A user becomes available.
  when a subscriber registers to a network and this event is armed by an application, that application shall be notified. Registration in this sense is further detailed in chapter 12.3.1. Attach and detach applies for CS and PS.
- An initial call processing event occurs.
  when a call to or from a given user is created and this event is armed by an application, that application shall be notified.
- A message is sent or received.
  when a message to or from a given user is sent or received and this event is armed by an application, that application shall be notified.
- A chargeable event happens.
  when a chargeable event occurs for a given user and this event is armed by an application, that application shall be notified.
- The user´s status is changed.
  when a given user changes her status (e.g. from idle to busy) and this event is armed by an application, that application shall be notified.

- The user´s location is changed.
  when a given user changes her location (e.g. leaving a certain area which is “identifiable” by the network) and this event is armed by an application, that application shall be notified.

- The Terminal Capabilities are changed.
  when a given user changes her terminal capabilities (e.g. from non MExE to a MExE capable terminal) and this event is armed by an application, that application shall be notified.

TSG-SA WG 1 (Services) meeting #12
Helsinki, Finland, 7-11 May 2001

TSG S1 (01) 0275
Agenda Item:

3GPP TSG SA1 – OSA ad-hoc
Tempe, Arizona, US
March 6-7, 2001

S1O01021

CR-Form-v3

CHANGE REQUEST

⌘ **22.127** **CR** **004** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Terminal capabilities
Source:	⌘	OSA ad hoc
Work item code:	⌘	OSA
Date:	⌘	07/03/2001
Category:	⌘	**D**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Clarification of the support of terminal capabilities
Summary of change:	⌘	OSA functions which are dependent on the ability of a terminal to notify its terminal capabilities, can only be supported for terminals actually capable of notifying its terminal capabilities. Notes are added to clearly state this limitiation. A reference to the definition of terminal is also included.
Consequences if not approved:	⌘	11.1, 12.3.5

Clauses affected:	⌘	
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

11 Event Notification Function

The Event Notification Function shall allow an application to specify the initial point of contact which it is interested in. It provides the necessary mechanisms which enables an application to request a notification if a subscriber or network related event occurs.

For all subscriber Related Events the application shall always specify the subscriber for which the Event Notification Function is valid.

The Event Notification Function includes the availability of offering additional criteria to be specified by the application. The set of criteria is individual and may vary for the event requested. The detailed set of criteria available for each of the events above are described in [6].

11.1 Subscriber Related events:

- A new network service or network service capability registers,

  when a new network service capability feature registers with the Registration Function and this event is armed by an application, that application shall be notified.

- A user becomes available.

  when a subscriber registers to a network and this event is armed by an application, that application shall be notified.

- An initial call processing event occurs.

  when a call to or from a given user is created and this event is armed by an application, that application shall be notified.

- A message is sent or received.

  when a message to or from a given user is sent or received and this event is armed by an application, that application shall be notified.

- A chargeable event happens.

  when a chargeable event occurs for a given user and this event is armed by an application, that application shall be notified.

- The user´s status is changed.

  when a given user changes her status (e.g. from idle to busy) and this event is armed by an application, that application shall be notified.

- The user´s location is changed.

  when a given user changes her location (e.g. leaving a certain area which is “identifiable” by the network) and this event is armed by an application, that application shall be notified.

- The Terminal Capabilities are changed.

  when ~~a given user changes her terminal~~ the capabilities of a terminal change (e.g. ~~from non MExE to a MExE capable terminal~~a keyboard is attached) and this event is armed by an application, that application shall be notified. Refer to [3] for a definition of terminal.

  Note: The ability to support this function is dependent on the ability of a terminal (i.e MExE or WAP terminal) to notify changes in its capabilities. Therefore this function will *not* be able to supply event notifications for terminals not supporting notification of their terminal capabilities.

12.3.5 Terminal Capabilities functions

The Terminal Capabilities functions enable the application to ~~find out what~~determine the capabilities of the user's terminal ~~supports~~ (Refer to [3] for a definition of terminal~~note: "terminal" covers both (mobile) equipment and USIM~~).

Note: The ability to support this function is dependent on the ability of a terminal (i.e MExE or WAP terminal) to notify its terminal capabilities. Therefore this function will *not* be able to supply terminal capabilities for terminals not supporting notification of their terminal capabilities.

The following functions shall be provided:

- **retrieval of Terminal Capabilities:**
  - the application shall be able to retrieve the capabilities of the terminal. This includes:
    - the media that the terminal is capable to deal with (e.g. audio, video, ; this information is needed by the application e.g. when the user wants to download messages from the mailbox);
    - the number of calls/sessions that the terminal can deal with simultaneously.

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TSG S1 (01) 276
Agenda Item:

3GPP TSG SA1 – OSA ad-hoc
Tempe, Arizona, US
March 6-7, 2001

S1O01022

CR-Form-v3

CHANGE REQUEST

⌘ **22.127** **CR** **005** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Make the Scope more precise description of 22.127
Source:	⌘	OSA ad hoc
Work item code:	⌘	OSA
Date:	⌘	04/03/01
Category:	⌘	**D**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Seek for consistency in OSA stage 1 (22.127 Version 4.0.0) .
Summary of change:	⌘	Remove repeated facts in the Scope.
Consequences if not approved:	⌘	Inconsistency within TS 22.127

Clauses affected:	⌘	1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

1 Scope

This document specifies the stage 1 requirements for realisation of an Open Service Access (OSA).

~~OSA realises the standardised interface towards the network that is required for the Framework for Services in the VHE stage 1 description [1].~~

~~This document is only applicable to OSA release 4. In Release 99 Service requirements are described in the VHE stage 1 description [1].~~

~~Within the concept of VHE~~ OSA enables ~~operator- and third party services~~applications to make use of network functionality through an open standardised interface (the OSA API). OSA provides the glue between ~~services~~ applications and network functionality. In this way applications implementing the services become independent from the underlying network technology.

Applications which make use of network functionality offered through the OSA interface~~. Services using OSA APIs~~ are not standardised by 3GPP.

OSA is one toolkit~~, the others being MExE, CAMEL and USAT amongst others~~ amongst otherss, that enables certain aspects of the requirements of the Virtual Home Environment (VHE) concept to be realised.

This document is only applicable to OSA release 4. In Release 99 Service requirements are described in the VHE stage 1 description [1].

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TSG S1 (01) 277
Agenda Item:

3GPP TSG SA1 – OSA ad-hoc
Tempe, Arizona, US
March 6-7, 2001

S1O01023

CR-Form-v3

CHANGE REQUEST

⌘ **22.127** **CR** **006** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Clarify charging requirements
Source:	⌘	OSA ad hoc
Work item code:	⌘	OSA
Date:	⌘	04/03/01
Category:	⌘	**D**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Seek for consistency in OSA stage 1 (22.127 Version 4.0.0) .
Summary of change:	⌘	Clarification of the terms in the charging description
Consequences if not approved:	⌘	Inconsistency within TS 22.127

Clauses affected:	⌘	8.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

8.1 Charging ~~r~~Requirements

The charging functionality of OSA allows an application to raise a charge against a subscriber's account for goods and services provided to her. It enables the invoiceing, by the operator, of soft (e.g. download of software, music,...) and hard goods (e.g. CDs, books,...), ~~(~~which potentially are provided by third parties~~) to the operator~~.

Additionally, the charging functionality of OSA shall provide for the maintenance of non-monetary subscriber accounts. The operator (or possibly third parties) may add or deduct non-monetary units to or from these accounts.

The responsibility for the subscriber accounts can be assigned to either the home network or elsewhere.:

- If the home network does not handle the accounts itself, charging requests are sent from the home network (and possible other applications) to a dedicated charging OSA client application, typically a charging centre. This case is out of scope of OSA.
- If the accounts are handled by the home network, the operator takes care of them.
  They may be used to charge for network resource usage (*call charging*, as it is done today) as well as any non-telecommunication related activity (any *E-commerce activity like service usage, online purchases*...)

OSA shall provide sufficient functions to support charging when the accounts are handled by the home network.

Two cases need to be considered in more detail:

Call Charging: Within OSA Call Control, an OSA application shall be able to control the charging of a call that is under supervision of this application. OSA shall allow for the following options:

- The service provider defines how much is charged to the subscriber for the usage of the service.
- The charges for the call are split between the involved parties (subscriber and service provider)
- The revenue for the call is split between the network operator and the service provider.
- Allow services to add information to network based charging records

Service Usage (e.g. Online Purchases): On the other hand, OSA shall allow to employ the charging and billing capabilities of the network to charge subscribers for any kind of service or even online purchases. This includes:

- Enable the operator to add charges to a subscriber's account for any (non-telecommunication) related service
- Enable the operator to provide charging/billing as a service to 3rd parties, typically service providers. In this case, the operator will charge subscribers for service usage on behalf of the service provider. The charged amounts may be shared between to the service provider and the network operator, but this is outside the scope of the specification.
- Enable the operator to add non-monetary units to a subscriber's account.
- Enable the operator to deduct non-monetary units from a subscriber's account.
- Enable the operator to provide non-monetary accounting capabilities to 3rd parties, typically application providers.
- Enable the operator to reverse a completed charge transaction, e.g. after repudiation.
- Enable the operator to provide charge reversal capabilities to 3rd parties.

Beyond this, there are **general operations** on subscriber accounts (monetary and non-monetary) that shall be available via OSA:

- Query the current account balance and current reservations.
- Monitor account access (send notifications if charges or recharges are applied to a subscriber’s account).

TSG-SA WG 1 (Services) meeting #12
Helsinki, Finland, 7-11 May 2001

TSG S1 (01) 0278
Agenda Item:

3GPP TSG SA1 – OSA ad-hoc
Tempe, Arizona, US
March 6-7, 2001

S1O01024

CR-Form-v3

CHANGE REQUEST

⌘ **22.127** **CR** **007** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	OSA consistency within stage1 specification
Source:	⌘	OSA ad hoc
Work item code:	⌘	OSA — ***Date:*** ⌘ 04/03/01
Category:	⌘	**D** — ***Release:*** ⌘ REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Seek for consistency in OSA stage 1 (22.127 Version 4.0.0) .
Summary of change:	⌘	1. Remove unused terminology and correct typos 2. Correct typos and remove misleading text 3. Clarify the Charging description in 8.1 and keep it consistent with charging in 12.2.4 section 4. Correct the Call control (CS and PS) 5. Harmonise charging functions with earlier chapters and correct the charging functions in 12.2.4
Consequences if not approved:	⌘	Inconsistency within TS 22.127 and inconsistency to stage 2 description

Clauses affected:	⌘	3, 4, 8.1, 12.2.1, 12.2.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

First Change:

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Applications: software components providing services to users by utilising service capability features.

Application Interface: standardised Interface used by applications to access service capability features.

~~**Billing:** A function whereby CDRs generated by the charging function are transformed into bills requiring payment.~~

Call: A logical association between several users (this could be connection oriented or connection less).

Charging: A function whereby information related to a chargeable event is formatted and transferred in order to make it possible to determine usage for which the charged party may be billed.

HE-VASP: Home Environment Value Added Service Provider. For the definition see [1]

Home Environment: For the definition see [1]

Local Service: For the definition see [1]

Personal Service Environment: For the definition see [1]

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

Service Capability Feature: functionality offered by service capabilities that are accessible via the standardised application interface.

~~**Service Execution Environment:** For the definition see [1]~~

Service Provider: an organisation which delivers services to the subscriber. This can be e.g. the operator of the subscriber's Home Environment or an authorised VASP.
Note: In the context of this specification it is assumed, that at least one application providing the services of the Service Provider makes use of OSA functions

Services: a service is the user experience provided by one or more applications.

User: For the definition see [1]

Virtual Home Environment: For the definition see [1]

~~**Value Added Service Provider:** For the definition see [1]~~

Further ~~3G~~3G related definitions are given in 3G TS 21.905 [3].

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
HE	Home Environment
PSE	Personal Service Environment
VHE	Virtual Home Environment
OSA	Open Service Access

SCF	Service Capability Feature
MExE	Mobile Execution Environment

Further GSM related abbreviations are given in GSM 01.04.
Further ~~3G~~3G related abbreviations are given in ~~3G~~3G TS 21.905 [3].

Second Change:

4 General Description of OSA

In order to be able to implement future applications/end user services that are not yet known today, a highly flexible Framework for Services [1] is required. The Open Service Access (OSA) enables applications implementing the services to make use of network functionality. Network functionality offered to applications is defined in terms of a set of Service Capability Features (SCFs). These SCFs provide functionality of network capabilities which is accessible to applications through the standardised OSA interface upon which service developers can rely when designing new services (or enhancements/variants of already existing ones).

The aim of OSA is to provide a standardised, extens~~d~~ible and scalable interface that allows for inclusion of new functionality in the network ~~and/or by third party service providers in future releases~~ with a minimum impact on the applications using the OSA interface.

Third Change:

8.1 Charging requirements

The charging functionality of OSA allows an application to charge a subscriber's account for the services provided to her. It enables the invoice of soft (e.g. download of software, music,...) and hard goods (e.g. CDs, books,...) (which potentially are provided by third parties) to the operator.

Additionally, the charging functionality of OSA shall provide for the maintenance of non-monetary subscriber accounts. ~~The operator (or possibly third parties)~~ An application may add or deduct non-monetary units to or from these accounts.

The responsibility for the subscriber accounts can be assigned to either the home network or elsewhere.:

- If the home network does not handle the accounts itself, charging requests are sent from the home network (and possible other applications) to a dedicated charging ~~OSA client~~ application, typically a charging centre. This case is out of scope of OSA.
- If the accounts are handled by the home network, the operator takes care of them.
  They may be used to charge for network resource usage (*call charging*, as it is done today) as well as any non-telecommunication related activity (any *E-commerce activity like service usage, online purchases*...)

OSA shall provide sufficient functions to support charging when the accounts are handled by the home network.

Two cases need to be considered in more detail:

Call and Event Charging: ~~Within OSA Call Control, an~~ OSA ~~application~~ shall ~~be able~~enable applications to control the charge ~~ing~~ of a call and / or an event that is under supervision of this application. OSA shall allow an application to ~~for the following options:~~

~~The service provider defines how much is charged to the subscriber for the usage of the service.~~

~~The charges for the call are split between the involved parties (subscriber and service provider)~~

~~The revenue for the call is split between the network operator and the service provider.~~

- ~~Allow services to add~~ provide additional charging information to ~~network based~~the network~~charging records~~

~~A Service Provider may define the charge, may split it over several parties and may define to share the revenue among others, but the Service Provider behavior is outside the scope of this TS.~~

Service Usage (e.g. Online Purchases): On the other hand, OSA shall allow to employ the charging ~~and billing~~ capabilities of the network to charge subscribers for any kind of service or even online purchases. Calculation of the charge may be based on monetary and/or non monetary grounds.

~~This includes:~~

~~Enable the operator to add charges to a subscriber's account for any (non-telecommunication) related service~~

~~Enable the operator to provide charging/billing as a service to 3rd parties, typically service providers. In this case, the operator will charge subscribers for service usage on behalf of the service provider. The charged amounts may be shared between to the service provider and the network operator, but this is outside the scope of the specification.~~

~~Enable the operator to add non-monetary units to a subscriber's account.~~

~~Enable the operator to deduct non-monetary units from a subscriber's account.~~

~~Enable the operator to provide non-monetary accounting capabilities to 3rd parties, typically application providers.~~

~~Enable the operator to reverse a completed charge transaction, e.g. after repudiation.~~

~~Enable the operator to provide charge reversal capabilities to 3rd parties.~~

Beyond this, there are **general ~~operations~~** charging **functions** on subscriber accounts (monetary and non-monetary) that shall be available via OSA:

- Query the current account balance and current reservations.
- Monitor account access (send notifications if charges or recharges are applied to a subscriber's account).
- Retrieve the history of the transactions

Fourth Change:

12.2.1 Call Control functions

This subclause details with Call Control functions. The purpose of this function is to allow applications to control and monitor calls, both circuit and packet switched.

The application may request the quality of service when first negotiated at the start of the call and may also request the network to notify the application of any changes in QoS (conversational, background, interactive and streaming class - see [4]) which take place during the call.

For QoS information, the Call Control Function allows applications to monitor the amount of used traffic channels and bandwidth (e.g. for HSCSD) and used timeslots (e.g. for GPRS).

11.2.1.1 CS Call Control functions

This subclause details with circuit switched call control functions. The purpose of this function is to allow applications to control and monitor calls.

Applications should have the ability to :

- **Create Calls:**

  This provides the ability for an application to initiate a new call on behalf of a subscriber. Once the call has been initiated, the application may apply the functions described in this subclause.

- **Release Calls:**

  This provides the ability for the application to force the release of a call. The application may provide an indication of the reason for release of the call.

- **Control Calls:**

  This provides the ability for an application to modify the information pertaining to the call at the time of establishment of the call. The application may also allow the call to continue with or without the modified information pertaining to the call. The application shall have the ability to request call events of the call under control to be observed by the network and reported back to the application.

- **Request call information:**

  This provides the ability for an application to request information relating to the call of interest specified in advance.~~in progress~~. ~~Such R~~requested information includes at least call duration, call end time.

- **Monitor calls:**

  This provides the ability for an application to monitor for call duration and tariff switching moments.~~:~~ An application may specify a threshold for the duration of a call or a part thereof. The application shall have the ability to grant new thresholds when the expiry of a previously set threshold has been reported to the application. When an event is subject to be monitored and the event is met, the application shall get informed accompanied with sufficient information.

- **Presentation of, or restriction of, information associated with a party involved in a call (e.g. calling line ID, calling name);**

- **Relinquish control over a call**

  This allows an application to relinquish control over a call but still allowing the established call to continue. Once the control of the call has been relinquished, the application may not be able to regain control over that call.

- **Interact with a user**

  This provides the ability for an application to interact with a user. An application may be able to send specific information to the user and may request the collection of data from the user. The information sent to the user may include an indication of an announcement, text or user specific data.

For each call it shall be possible to specify:

- the events on which monitoring is required ([10]).

NOTE: The mapping to service capabilities is for further study (it shall be investigated to which extend the requirements above fit to CAMEL, MEXE and other service capabilities).

12.2.1.2 PS Call Control functions

This subclause details with packet switched call control functions. The purpose of this function is to allow applications to control and monitor GPRS sessions. A GPRS Session may consists of one or more GPRS PDP context.

Applications should have the ability to :

- **Create a PDP context:**

  This provides the ability for an application to initiate a new PDP context on behalf of a subscriber. Once the PDP context has been initiated, the application may apply the functions described in this subclause.

- **Release a PDP context:**

  This provides the ability for the application to force a PDP context to be released. The application may provide an indication of the reason for release of the PDP context.

- **Control a PDP context:**

  This provides the ability for an application to modify the information pertaining to the PDP context at the time of establishment. The application may also allow the PDP context to continue with or without the modified information pertaining to the PDP context. The application shall have the ability to request events to be observed by the network and reported back to the application. .

- **Monitor a PDP context:**

  This provides the ability for an application to monitor for PDP context duration and tariff switching moments.. An application may specify a threshold for the duration of a PDP context or a part thereof. The application shall have the ability to grant new thresholds when the expiry of a previously set threshold has been reported to the application.

- **Monitor a GPRS session:**

  This provides the ability for an application to monitor for GPRS session data volume. An application may specify a threshold for the amount of data allowed to be transferred within a GPRS session. The application shall have the ability to grant new thresholds when the expiry of a previously set threshold has been reported to the application.

Fifth Change:

12.2.4 Charging functions

Call- and Event Charging

The Call- and Event Charging functions enable the application to instruct the network and inform the user with charging information and to add some additional charging information to the network generated Call Detail Records. Some of the following charging facilities are available only if the network either controls the account or has access to it.

The following functions shall be providedThe OSA Call- and Event Charging function shall enable an application to:

- define and manage the thresholds (e.g. session duration, data volume) for the required servicea call;
- - send charging dataprovide additional charging information to be included in the Call Detail Record., Thisit may contain information transparent to the network.

(this data is included in a "free format" field in the network generated Call Detail Records. It may contain information like a application generated Call Id, used by the application to relate application generated charging information to the network generated charging information);

- transfer of Advice of Charge data (as defined in [5]) to the terminal.

Service Usage

These OSA charging functions shall enable service providersapplications to use augment subscriber accounts maintained by the network and to charge subscribers for using their applicationservices. Services provided by these service providersThese applications are not necessarily telecommunication related. In addition to charging subscribers for service usage, these operations functions could also be used for payments in an online purchase scenario.

Provided, that these functions are supported by the underlying network an application providing a service to the subscriber shall be able to:

- Check, if – for the service to be provided by the application – the charge is covered by the subscribers account or credit limit
- Reserve – for the service to be provided by the application – a charge in the subscribers account, that can be deduced from the account after service delivery.
- Deduct an amount from the subscriber's account. If a reservation has been made earlier, this amount should be taken from the reserved amount.
- Release a reservation acquired earlier. If part of a reservation has been deducted already, just release the remaining reservation.
- Add non-monetary units to a subscriber's account.
- Deduct non-monetary units from a subscriber's account.
- Reverse a completed charge transaction, e.g. after repudiation.

The operations functions for charging application usage shall meet the following general requirements:

- Hide payment policy (e.g. prepaid/postpaid) from applications
- Hide payment type (credit card, cash, bank withdrawal) from applications
- Hide subscriber's identity towards the application. This would provide anonymity (like for prepaid customers).
- Support prepaid subscribers. This requires that the application immediately gets informed if the subscriber's account covers the service usage costs. If not, the application may reject serving the subscriber.
- Allow for Multi-currency support. This shall allow service providers to request charging in their preferred currency

general Account Operationsfunctions

These ~~operations~~ functions provide access to sensitive data. They shall be restricted to client applications that had been granted additional privileges via suitable means, i.e. as authorised by the framework function.

The OSA general Account function shall enable an application to:

- ~~The OSA application shall be able to~~ retrieve a transaction history of a subscriber's account
- ~~The OSA application shall be able to~~ check a subscriber's current account balance.
- monitor the subscribers account and may request to get informed of any change.