

# ETSI TS 129 198-11 V5.8.0 (2005-12)

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*Technical Specification*

**Universal Mobile Telecommunications System (UMTS);  
Open Service Access (OSA)  
Application Programming Interface (API);  
Part 11: Account management  
Service Capability Feature (SCF)  
(3GPP TS 29.198-11 version 5.8.0 Release 5)**

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Reference

RTS/TSGC-0529198-11v580

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Keywords

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## Foreword

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# Contents

Intellectual Property Rights .....	2
Foreword.....	2
Foreword.....	5
Introduction .....	5
1 Scope .....	7
2 References .....	7
3 Definitions and abbreviations.....	8
3.1 Definitions .....	8
3.2 Abbreviations .....	8
4 Account Management SCF .....	8
4.1 General requirements on support of methods.....	8
5 Sequence Diagrams .....	8
5.1 Standard Transaction History Retrieval .....	8
5.2 Standard Query Handling .....	9
5.3 Standard Notification handling.....	10
5.4 Network Controlled Notifications .....	11
6 Class Diagrams.....	12
7 The Service Interface Specifications .....	14
7.1 Interface Specification Format .....	14
7.1.1 Interface Class .....	14
7.1.2 Method descriptions.....	14
7.1.3 Parameter descriptions.....	14
7.1.4 State Model.....	15
7.2 Base Interface.....	15
7.2.1 Interface Class IpInterface .....	15
7.3 Service Interfaces .....	15
7.3.1 Overview .....	15
7.4 Generic Service Interface .....	15
7.4.1 Interface Class IpService .....	15
7.4.1.1 Method setCallback().....	15
7.4.1.2 Method setCallbackWithSessionID().....	16
8 Account Management Interface Classes .....	16
8.1 Interface Class IpAccountManager .....	16
8.1.1 Method createNotification().....	17
8.1.2 Method destroyNotification() .....	18
8.1.3 Method queryBalanceReq() .....	18
8.1.4 Method changeNotification().....	18
8.1.5 Method getNotification() .....	19
8.1.6 Method retrieveTransactionHistoryReq().....	19
8.1.7 Method <<new>> enableNotifications().....	19
8.1.8 Method <<new>> disableNotifications().....	20
8.2 Interface Class IpAppAccountManager .....	20
8.2.1 Method reportNotification().....	21
8.2.2 Method queryBalanceRes() .....	21
8.2.3 Method queryBalanceErr() .....	21
8.2.4 Method retrieveTransactionHistoryRes() .....	22
8.2.5 Method retrieveTransactionHistoryErr() .....	22
9 State Transition Diagrams .....	22
9.1 State Transition Diagrams for IpAccountManager.....	22
9.1.1 Active State.....	23

9.1.2	Notifications created State .....	23
10	Account Management Service Properties .....	23
11	Data Definitions .....	24
11.1	Account Management Data Definitions .....	24
11.1.1	IpAppAccountManager .....	24
11.1.2	IpAppAccountManagerRef .....	24
11.1.3	IpAccountManager .....	24
11.1.4	IpAccountManagerRef .....	25
11.1.5	TpBalanceQueryError .....	25
11.1.6	TpChargingEventName .....	25
11.1.7	TpBalanceInfo .....	25
11.1.8	TpChargingEventInfo .....	26
11.1.9	TpChargingEventCriteria .....	26
11.1.10	TpChargingEventNameSet .....	26
11.1.11	TpChargingEventCriteriaResult .....	26
11.1.12	TpChargingEventCriteriaResultSet .....	26
11.1.13	TpBalance .....	27
11.1.14	TpBalanceSet .....	27
11.1.15	TpTransactionHistory .....	27
11.1.16	TpTransactionHistorySet .....	27
11.1.17	TpTransactionHistoryStatus .....	27
12	Exception Classes .....	27
<b>Annex A (normative):</b>	<b>OMG IDL Description of Account Management SCF .....</b>	<b>29</b>
<b>Annex B (informative):</b>	<b>W3C WSDL Description of Account Management SCF .....</b>	<b>30</b>
<b>Annex C (informative):</b>	<b>Java™ API Description of the Account Management SCF .....</b>	<b>31</b>
<b>Annex D (informative):</b>	<b>Change history .....</b>	<b>32</b>
History .....		33

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## Foreword

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

The present document is part 11 of a multi-part TS covering the 3<sup>rd</sup> Generation Partnership Project: Technical Specification Group Core Network; Open Service Access (OSA); Application Programming Interface (API), as identified below. The **API specification** (3GPP TS 29.198) is structured in the following Parts:

Part 1:	"Overview";	
Part 2:	"Common Data Definitions";	
Part 3:	"Framework";	
Part 4:	"Call Control";	
	Sub-part 1: "Call Control Common Definitions";	(new in 3GPP Release 5)
	Sub-part 2: "Generic Call Control SCF";	(new in 3GPP Release 5)
	Sub-part 3: "Multi-Party Call Control SCF";	(new in 3GPP Release 5)
	Sub-part 4: "Multi-Media Call Control SCF";	(new in 3GPP Release 5)
	Sub-part 5: "Conference Call Control SCF";	(not part of 3GPP Release 5)
Part 5:	"User Interaction SCF";	
Part 6:	"Mobility SCF";	
Part 7:	"Terminal Capabilities SCF";	
Part 8:	"Data Session Control SCF";	
Part 9:	"Generic Messaging SCF";	(not part of 3GPP Release 5)
Part 10:	"Connectivity Manager SCF";	(not part of 3GPP Release 5)
<b>Part 11:</b>	<b>"Account Management SCF";</b>	
Part 12:	"Charging SCF".	
Part 13:	"Policy Management SCF";	(new in 3GPP Release 5)
Part 14:	"Presence and Availability Management SCF";	(new in 3GPP Release 5)

The **Mapping specification of the OSA APIs and network protocols** (3GPP TR 29.998) is also structured as above. A mapping to network protocols is however not applicable for all Parts, but the numbering of Parts is kept. Also in case a Part is not supported in a Release, the numbering of the parts is maintained.

Table: Overview of the OSA APIs &amp; Protocol Mappings 29.198 &amp; 29.998-family

OSA API specifications 29.198-family					OSA API Mapping - 29.998-family	
29.198-01	Overview				29.998-01	Overview
29.198-02	Common Data Definitions				29.998-02	<i>Not Applicable</i>
29.198-03	Framework				29.998-03	<i>Not Applicable</i>
Call Control (CC) SCF	29.198-04-1	29.198-04-2	29.198-04-3	29.198-04-4	29.998-04-1	Generic Call Control – CAP mapping
	Common CC data definitions	Generic CC SCF	Multi-Party CC SCF	Multi-media CC SCF	29.998-04-2	<i>Generic Call Control – INAP mapping</i>
					29.998-04-3	<i>Generic Call Control – Megaco mapping</i>
					29.998-04-4	Multiparty Call Control – SIP mapping
29.198-05	User Interaction SCF				29.998-05-1	User Interaction – CAP mapping
					29.998-05-2	<i>User Interaction – INAP mapping</i>
					29.998-05-3	<i>User Interaction – Megaco mapping</i>
					29.998-05-4	User Interaction – SMS mapping
29.198-06	Mobility SCF				29.998-06	User Status and User Location – MAP mapping
29.198-07	Terminal Capabilities SCF				29.998-07	<i>Not Applicable</i>
29.198-08	Data Session Control SCF				29.998-08	Data Session Control – CAP mapping
29.198-09	<i>Generic Messaging SCF</i>				29.998-09	<i>Not Applicable</i>
29.198-10	<i>Connectivity Manager SCF</i>				29.998-10	<i>Not Applicable</i>
<b>29.198-11</b>	<b>Account Management SCF</b>				29.998-11	<i>Not Applicable</i>
29.198-12	Charging SCF				29.998-12	<i>Not Applicable</i>
29.198-13	Policy Management SCF				29.998-13	<i>Not Applicable</i>
29.198-14	Presence & Availability Management SCF				29.998-14	<i>Not Applicable</i>

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# 1 Scope

The present document is Part 11 of the Stage 3 specification for an Application Programming Interface (API) for Open Service Access (OSA).

The OSA specifications define an architecture that enables application developers to make use of network functionality through an open standardised interface, i.e. the OSA APIs. The concepts and the functional architecture for the OSA are contained in 3GPP TS 23.127 [3]. The requirements for OSA are contained in 3GPP TS 22.127 [2].

The present document specifies the Account Management Service Capability Feature (SCF) aspects of the interface. All aspects of the Account Management SCF are defined here, these being:

- Sequence Diagrams
- Class Diagrams
- Interface specification plus detailed method descriptions
- State Transition diagrams
- Data definitions
- IDL Description of the interfaces
- WSDL Description of the interfaces

The process by which this task is accomplished is through the use of object modelling techniques described by the Unified Modelling Language (UML).

This specification has been defined jointly between 3GPP TSG CT WG5, ETSI TISPAN and the Parlay Group, in co-operation with a number of JAIN™ Community member companies.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- 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 5)".
- [3] 3GPP TS 23.127: "Virtual Home Environment (Release 5)".
- [4] ISO 4217: "Codes for the representation of currencies and funds".



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## 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.

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## 4 Account Management SCF

The following clauses describe each aspect of the Account Management Service Capability Feature (SCF).

The order is as follows:

- The Sequence diagrams give the reader a practical idea of how each of the SCFs is implemented.
- The Class relationships clause shows how each of the interfaces applicable to the SCF, relate to one another
- The Interface specification clause describes in detail each of the interfaces shown within the Class diagram part.
- The State Transition Diagrams (STD) show the progression of internal processes either in the application, or Gateway.
- The Data definitions section shows a detailed expansion of each of the data types associated with the methods within the classes. Note that some data types are used in other methods and classes and are therefore defined within the Common Data types part of this specification.

### 4.1 General requirements on support of methods

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

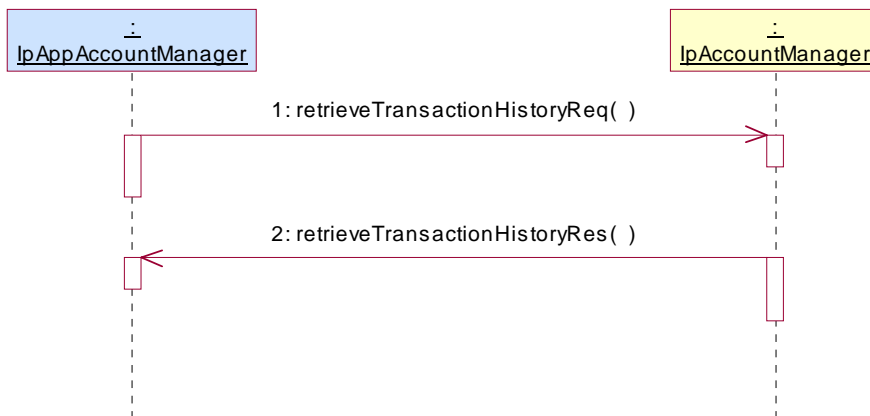
Where a method is not supported by an implementation of a Service interface, the exception `P_METHOD_NOT_SUPPORTED` shall be returned to any call of that method.

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

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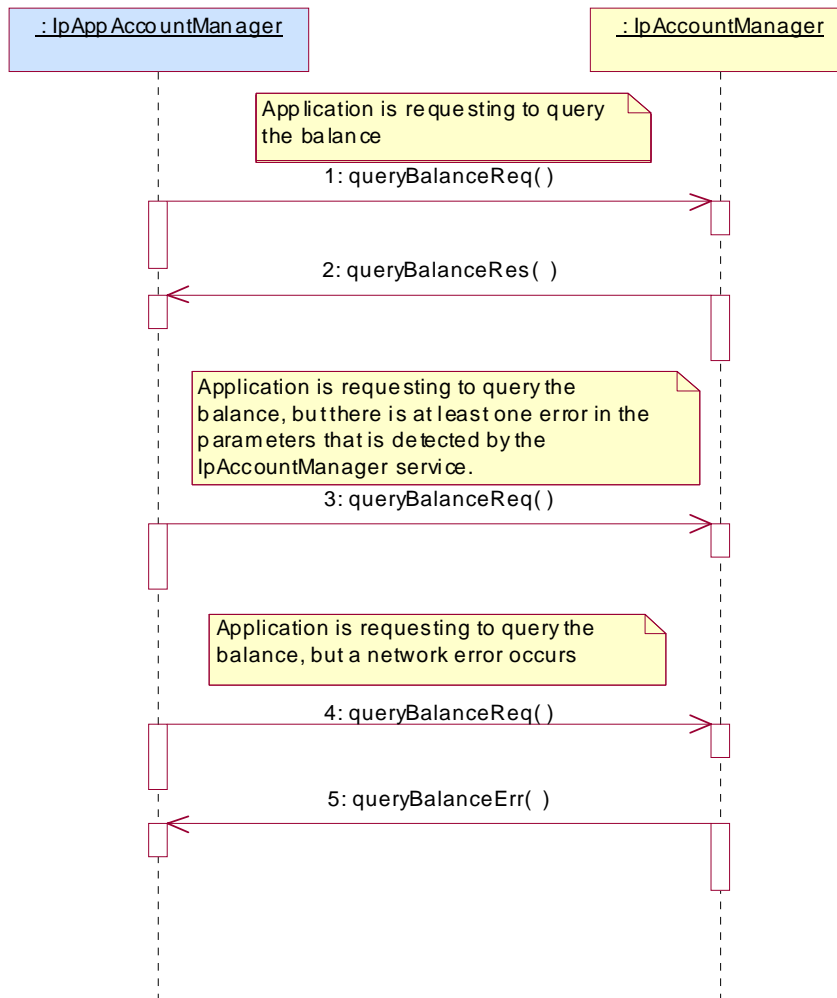
## 5 Sequence Diagrams

### 5.1 Standard Transaction History Retrieval



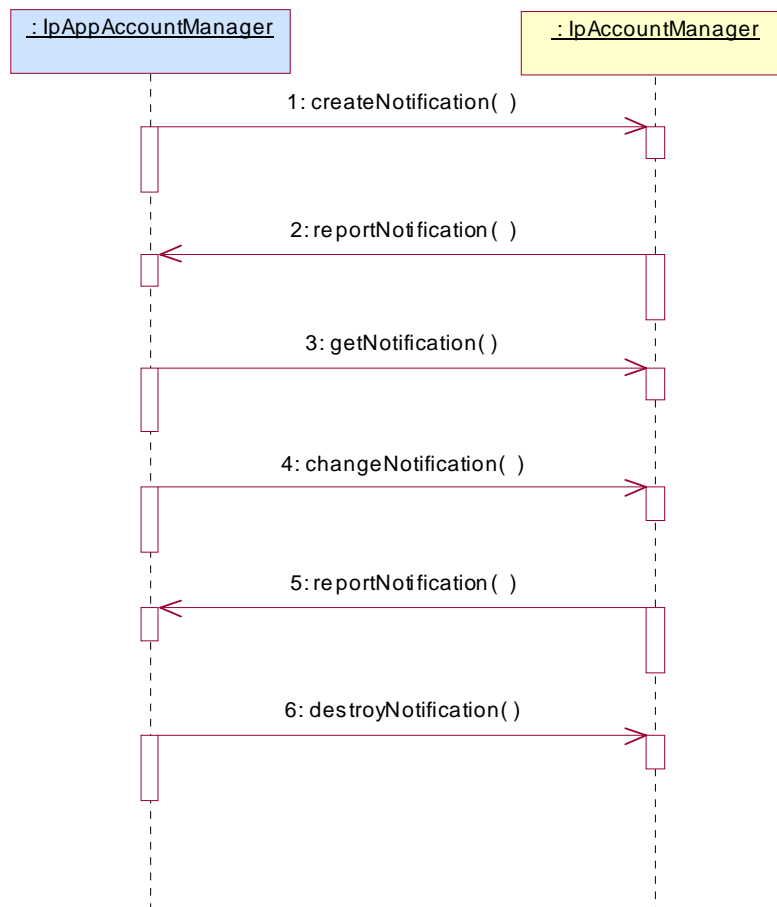
- 1: This message is used by the application to retrieve a transaction history for a certain subscriber's account.
- 2: This method passes the result of the transaction history retrieval request for a specific user to its callback object.

## 5.2 Standard Query Handling



- 1: This message is used to query the balance of the account of one or several users.
- 2: This message passes the result of the balance query for one or several users to its callback object.
- 3: This scenario shows the case where at least one error in the parameters of the message is detected by the IpAccountManager object. An exception will be thrown.
- 4: This scenario shows the case where a network error occurs.
- 5: This message passes the error of the balance query. No exception is thrown.

### 5.3 Standard Notification handling



1: This message is used by the application to request notifications from the IpAccountManager service on certain criteria for one or several users.

2: This message is used by the IpAccountManager service to report a charging event that meets the criteria set in the createNotification message.

3: The application can request the current criteria set in the IpAccountManager service by invoking the getNotification method.

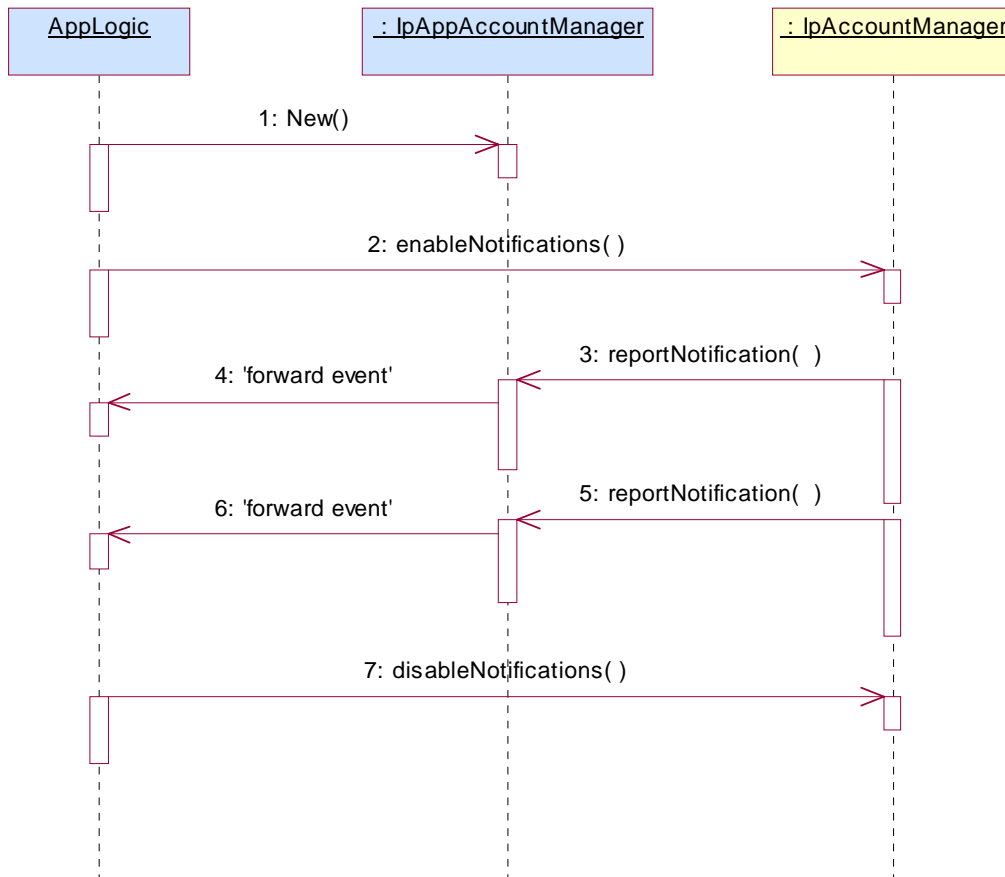
4: This message is used by the application to change the criteria initially created by createNotification, and previously obtained by getNotification.

5: This message is used by the IpAccountManager service to report a charging event that meets the new criteria.

6: This method is used by the application to disable the charging notifications.

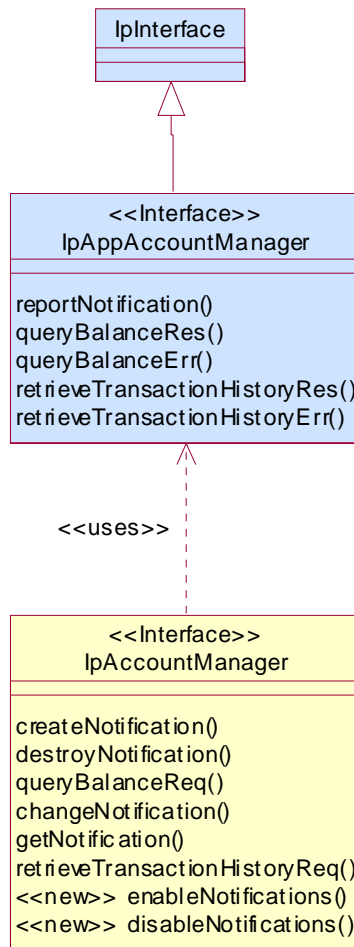
## 5.4 Network Controlled Notifications

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



- 1: The application is started. The application creates a new IpAppAccountManager to handle callbacks.
- 2: The enableNotifications method is invoked on the IpAccountManager interface to indicate that the application is ready to receive notifications that are created in the network. For illustrative purposes we assume notifications of type "B" are created in the network.
- 3: When a network created trigger occurs the application is notified on the callback interface.
- 4: The event is forwarded to the application.
- 5: When a network created trigger occurs the application is notified on the callback interface.
- 6: The event is forwarded to the application.
- 7: When the application does not want to receive notifications created in the network anymore, it invokes disableNotifications on the IpMultiPartyCallControlManager interface. From now on the gateway will not send any notifications to the application that are created in the network. The application will still receive notifications that it has created himself until the application removes them.

## 6 Class Diagrams



**Figure: Application Interfaces**

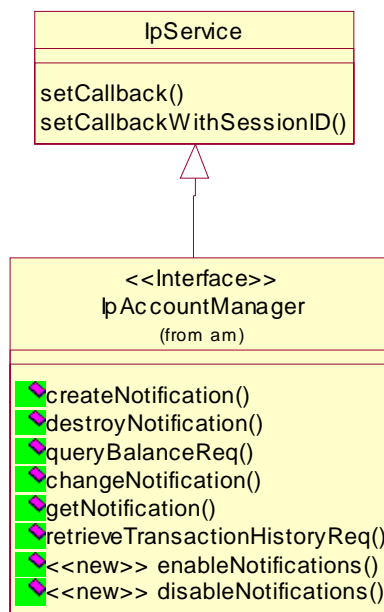


Figure: Service Interfaces

## 7 The Service Interface Specifications

### 7.1 Interface Specification Format

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

#### 7.1.1 Interface Class

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

#### 7.1.2 Method descriptions

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

#### 7.1.3 Parameter descriptions

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

## 7.1.4 State Model

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

## 7.2 Base Interface

### 7.2.1 Interface Class IpInterface

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

<<Interface>> IpInterface

## 7.3 Service Interfaces

### 7.3.1 Overview

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

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

## 7.4 Generic Service Interface

### 7.4.1 Interface Class IpService

Inherits from: IpInterface

All service interfaces inherit from the following interface.

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

#### 7.4.1.1 Method setCallback()

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



*Parameters***appInterface : in IpInterfaceRef**

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

*Raises***TpCommonExceptions, P\_INVALID\_INTERFACE\_TYPE**

#### 7.4.1.2 Method setCallbackWithSessionID()

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

*Parameters***appInterface : in IpInterfaceRef**

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

**sessionID : in TpSessionID**

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

*Raises***TpCommonExceptions, P\_INVALID\_SESSION\_ID, P\_INVALID\_INTERFACE\_TYPE**

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## 8 Account Management Interface Classes

### 8.1 Interface Class IpAccountManager

Inherits from: IpService.

The account manager interface provides methods for monitoring accounts. Applications can use this interface to enable or disable charging-related event notifications and to query account balances.

This interface shall be implemented by an Account Management SCF. The queryBalanceReq() method, or the retrieveTransactionHistoryReq() method, or both the createNotification() and destroyNotification methods, or both the enableNotifications and disableNotifications methods shall be implemented as a minimum requirement.

<<Interface>> IpAccountManager
createNotification (appAccountManager : in IpAppAccountManagerRef, chargingEventCriteria : in TpChargingEventCriteria) : TpAssignmentID destroyNotification (assignmentId : in TpAssignmentID) : void queryBalanceReq (users : in TpAddressSet) : TpAssignmentID changeNotification (assignmentId : in TpAssignmentID, eventCriteria : in TpChargingEventCriteria) : void getNotification () : TpChargingEventCriteriaResultSet retrieveTransactionHistoryReq (user : in TpAddress, transactionInterval : in TpTimeInterval) : TpAssignmentID <<new>> enableNotifications (appAccountManager : in IpAppAccountManagerRef) : TpAssignmentID <<new>> disableNotifications () : void

### 8.1.1 Method createNotification()

This method is used by the application to enable charging event notifications to be sent to the application.

If the same application requests two notifications with exactly the same criteria but different callback references, the second callback will be treated as an additional callback. Both notifications will share the same assignmentID. The gateway will always use the most recent callback. In case this most recent callback fails the second most recent is used. In case the enableCallNotification contains no callback, at the moment the application needs to be informed the gateway will use as callback the callback that has been registered by setCallback().

Returns assignmentId : Specifies the ID assigned by the account management object for this newly enabled event notification.

#### Parameters

**appAccountManager : in IpAppAccountManagerRef**

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

**chargingEventCriteria : in TpChargingEventCriteria**

Specifies the event specific criteria used by the application to define the charging event required. Individual addresses or address ranges may be specified for subscriber accounts. Example of events are "charging" and "recharging".

#### Returns

**TpAssignmentID**

#### Raises

**TpCommonExceptions, P\_INVALID\_ADDRESS, P\_INVALID\_CRITERIA, P\_INVALID\_EVENT\_TYPE, P\_UNKNOWN\_SUBSCRIBER**

### 8.1.2 Method destroyNotification()

This method is used by the application to disable charging notifications. This method only applies to notifications created with createNotification().

#### *Parameters*

**assignmentId : in TpAssignmentID**

Specifies the assignment ID that was given by the account management object when the application enabled the charging notification.

#### *Raises*

**TpCommonExceptions, P\_INVALID\_ASSIGNMENT\_ID**

### 8.1.3 Method queryBalanceReq()

This method is used by the application to query the balance of an account for one or several users.

Returns queryId : Specifies the ID of the balance query request.

#### *Parameters*

**users : in TpAddressSet**

Specifies the user(s) for which the balance is queried.

#### *Returns*

**TpAssignmentID**

#### *Raises*

**TpCommonExceptions, P\_UNKNOWN\_SUBSCRIBER, P\_UNAUTHORIZED\_APPLICATION**

### 8.1.4 Method changeNotification()

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

#### *Parameters*

**assignmentID : in TpAssignmentID**

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

**eventCriteria : in TpChargingEventCriteria**

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

*Raises*

**TpCommonExceptions, P\_INVALID\_ASSIGNMENT\_ID, P\_INVALID\_CRITERIA,  
P\_INVALID\_EVENT\_TYPE, P\_UNKNOWN\_SUBSCRIBER, P\_INVALID\_ADDRESS**

### 8.1.5 Method getNotification()

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

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

*Parameters*

No Parameters were identified for this method

*Returns*

**TpChargingEventCriteriaResultSet**

*Raises*

**TpCommonExceptions**

### 8.1.6 Method retrieveTransactionHistoryReq()

This asynchronous method is used by the application to retrieve a transaction history of a subscriber's account. The history is a set of Detailed Records.

Returns retrievalID : Specifies the retrieval ID of the transaction history retrieval request.

*Parameters*

**user : in TpAddress**

Specifies the subscriber for whose account the transaction history is to be retrieved.

**transactionInterval : in TpTimeInterval**

Specifies the time interval for which the application history is to be retrieved.

*Returns*

**TpAssignmentID**

*Raises*

**TpCommonExceptions, P\_UNKNOWN\_SUBSCRIBER, P\_UNAUTHORIZED\_APPLICATION,  
P\_INVALID\_TIME\_AND\_DATE\_FORMAT**

### 8.1.7 Method <<new>> enableNotifications()

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

notifications provisioned for this application are created or changed, the application is unaware of this until the notification is reported.

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

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

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

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

#### *Parameters*

**appAccountManager : in IpAppAccountManagerRef**

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

#### *Returns*

**TpAssignmentID**

#### *Raises*

**TpCommonExceptions**

### 8.1.8 Method <<new>> `disableNotifications()`

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

#### *Parameters*

No Parameters were identified for this method

#### *Raises*

**TpCommonExceptions**

## 8.2 Interface Class `IpAppAccountManager`

Inherits from: `IpInterface`.

The account manager application interface is implemented by the client application developer and is used to handle charging event notifications and query balance responses.

<<Interface>> IpAppAccountManager
reportNotification (chargingEventInfo : in TpChargingEventInfo, assignmentId : in TpAssignmentID) : void queryBalanceRes (queryId : in TpAssignmentID, balances : in TpBalanceSet) : void queryBalanceErr (queryId : in TpAssignmentID, cause : in TpBalanceQueryError) : void retrieveTransactionHistoryRes (retrievalId : in TpAssignmentID, transactionHistory : in TpTransactionHistorySet) : void retrieveTransactionHistoryErr (retrievalId : in TpAssignmentID, transactionHistoryError : in TpTransactionHistoryStatus) : void

### 8.2.1 Method reportNotification()

This method is used to notify the application of a charging event.

#### *Parameters*

**chargingEventInfo : in TpChargingEventInfo**

Specifies data associated with this charging event. These data include the charging event being notified, the current value of the balance after the notified event occurred, and the time at which the charging event occurred.

**assignmentId : in TpAssignmentID**

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

### 8.2.2 Method queryBalanceRes()

This method indicates that the request to query the balance was successful and it reports the requested balance of an account to the application.

#### *Parameters*

**queryId : in TpAssignmentID**

Specifies the ID of the balance query request.

**balances : in TpBalanceSet**

Specifies the balance for one or more user accounts.

### 8.2.3 Method queryBalanceErr()

This method indicates that the request to query the balance failed and it reports the cause of failure to the application.

#### *Parameters*

**queryId : in TpAssignmentID**

Specifies the ID of the balance query request.

**cause : in TpBalanceQueryError**

Specifies the error that led to the failure.

## 8.2.4 Method retrieveTransactionHistoryRes()

This method indicates that the request to retrieve the transaction history was successful and it returns the requested transaction history.

### *Parameters*

**retrievalID : in TpAssignmentID**

Specifies the retrievalID of the transaction history retrieval request.

**transactionHistory : in TpTransactionHistorySet**

Specifies the requested transaction history.

## 8.2.5 Method retrieveTransactionHistoryErr()

This method indicates that the request to retrieve the transaction history failed and it reports the cause of failure to the application.

### *Parameters*

**retrievalID : in TpAssignmentID**

Specifies the retrievalID of the transaction history retrieval request.

**transactionHistoryError : in TpTransactionHistoryStatus**

Specifies the error that occurred while retrieving the transaction history.

---

# 9 State Transition Diagrams

## 9.1 State Transition Diagrams for IpAccountManager

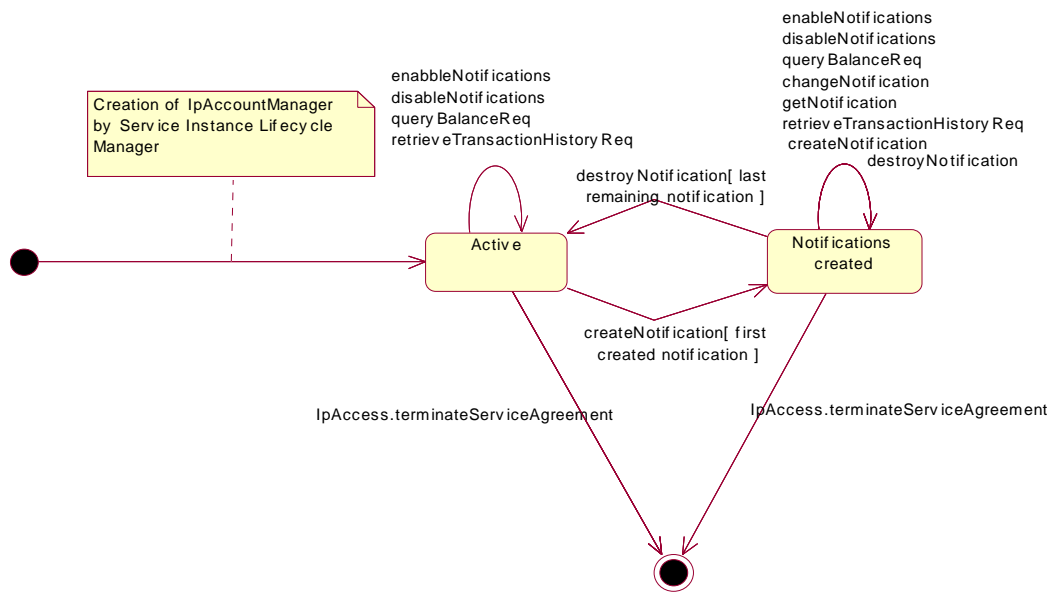


Figure : Application view on the IpAccountManager

### 9.1.1 Active State

In this state a relation between the Application and the Account Management has been established. The state allows the application to indicate that it is interested in charging related events, by calling createNotification/enableNotifications. In case such an event occurs, Account Manager will inform the application by invoking the operation reportNotification() on the IpAppAccountManager interface. The application can also indicate it is no longer interested in certain charging related events by calling destroyNotification/disableNotifications.

### 9.1.2 Notifications created State

When the Account Manager is in the Notifications created state, events requested with createNotification/enableNotifications will be forwarded to the application. In this state the application can request to change the notifications or query the Account Manager for the notifications currently set.

## 10 Account Management Service Properties

The following table lists properties relevant for the Account Management API.

Property	Type	Description/Interpretation
P_EVENT_TYPES	INTEGER_SET	Indicates the event types supported by the SCS. Static events are the events by which applications are initiated.
P_ADDRESSPLAN	INTEGER_SET	Indicates the supported address plans (defined in TpAddressPlan.) E.g. {P_ADDRESS_PLAN_E164, P_ADDRESS_PLAN_IP}). Note that more than one address plan may be supported.



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

Property	Type	Description/Interpretation
P_TRIGGERING_ADDRESSES (Deprecated)	ADDRESSRANGE_SET	Indicates for which numbers the notification may be set. For terminating notifications it applies to the terminating number, for originating notifications it applies only to the originating number.
P_NOTIFICATION_ADDRESS_RANGES	XML_ADDRESS_RANGE_SET	Indicates for which numbers notifications may be set. More than one range may be present. For terminating notifications they apply to the terminating number, for originating notifications they apply only to the originating number.
P_CURRENCY_ALLOWED	STRING_SET	Indicates the currencies that can be returned in the queryBalanceRes. The valid values for the string set are according to ISO-4217. E.g. {'EUR', 'NLG'}.
P_HISTORY_ALLOWED	STRING_SET	Indicates the length of the transaction history interval that is allowed to be retrieved by the application. The valid values for the string are according to TpDateAndTime. The string-set will be of format {"lower_start_time", "upper_stop_time"}, e.g. {"1998-12-04 10:30", "1999-12-04 10:30"}
P_MAX_ADDRESSES_PER_QUERY	INTEGER_SET	Indicates the maximum number of addresses which can be included in a queryBalanceReq.

---

## 11 Data Definitions

### 11.1 Account Management Data Definitions

This clause provides the Account Management specific data definitions necessary to support the OSA interface specification.

The general format of a data definition specification is the following:

- Data type, that shows the name of the data type.
- Description, that describes the data type.
- Tabular specification, that specifies the data types and values of the data type.
- Example, if relevant, shown to illustrate the data type.

All data types referenced in this document but not defined in this clause are common data definitions which may be found in 3GPP TS 29.198-2.

#### 11.1.1 IpAppAccountManager

Defines the address of an IpAppAccountManager Interface.

#### 11.1.2 IpAppAccountManagerRef

Defines a Reference to type IpAppAccountManager

#### 11.1.3 IpAccountManager

Defines the address of an IpAccountManager Interface.

### 11.1.4 IpAccountManagerRef

Defines a Reference to type IpAccountManager

### 11.1.5 TpBalanceQueryError

Defines an error that is reported by the Charging service capability feature as a result of a balance query request.

Name	Value	Description
P_BALANCE_QUERY_OK	0	No error occurred while processing the request
P_BALANCE_QUERY_ERROR_UNDEFINED	1	General error, unspecified
P_BALANCE_QUERY_UNKNOWN_SUBSCRIBER	2	Subscriber for which balance is queried is unknown
P_BALANCE_QUERY_UNAUTHORIZED_APPLICATION	3	Application is not authorized to query balance
P_BALANCE_QUERY_SYSTEM_FAILURE	4	System failure. The request could not be handled

### 11.1.6 TpChargingEventName

Defines the charging event for which notifications can be requested by the application.

Name	Value	Description
P_AM_CHARGING	0	End user's account has been charged by an application
P_AM_RECHARGING	1	End user has recharged the account
P_AM_ACCOUNT_LOW	2	Account balance is below the balance threshold
P_AM_ACCOUNT_ZERO	3	Account balance is at zero
P_AM_ACCOUNT_DISABLED	4	Account has been disabled

### 11.1.7 TpBalanceInfo

Defines the structure of data elements that specifies detailed balance info.

Structured Member Name	Structured Member Type	Description
Currency	TpString	Currency unit according to ISO-4217 [4]
ValuePartA	TpInt32	This data type is identical to a TpInt32 and specifies the most significant part of the composed value. A currency amount is composed as follows: ( (ValuePartA*2 <sup>32</sup> + ValuePartB) * 0,0001 )
ValuePartB	TpInt32	This data type is identical to a TpInt32 and specifies the least significant part of the composed value.
Exponent	TpInt32	Specifies the position of the decimal point in the currency amount made up of the ValuePartA and the ValuePartB, as described above. E.g. an exponent of 4 means a pure integer value, whereas an exponent of 2 means an accuracy of 0,01.
AdditionalInfo	TpString	Descriptive string, containing additional information, which is sent to the application without prior evaluation.

As an example, the currency amount composed of a Currency of EUR, a ValuePartA of 0, a ValuePartB of 10 000, and an exponent of 2 yields a currency amount of € 100,00.

Valid Currencies are:

ADP, AED, AFA, ALL, AMD, ANG, AON, AOR, ARS, ATS, AUD, AWG, AZM, BAM, BBD, BDT, BEF, BGL, BGN, BHD, BIF, BMD, BND, BOB, BOV, BRL, BSD, BTN, BWP, BYB, BZD, CAD, CDF, CHF, CLF, CLP, CNY, COP, CRC, CUP, CVE, CYP, CZK, DEM, DJF, DKK, DOP, DZD, ECS, ECV, EEK, EGP, ERN, ESP, ETB, EUR, FIM, FJD, FKP, FRF, GBP, GEL, GHC, GIP, GMD, GNF, GRD, GTQ, GWP, GYD, HKD, HNL, HRK, HTG, HUF, IDR, IEP, ILS, INR, IQD, IRR, ISK, ITL, JMD, JOD, JPY, KES, KGS, KHR, KMF, KPW, KRW, KWD, KYD, KZT, LAK, LBP, LKR,

LRD, LSL, LTL, LUF, LVL, LYD, MAD, MDL, MGF, MKD, MMK, MNT, MOP, MRO, MTL, MUR, MVR, MWK, MXN, MXV, MYR, MZM, NAD, NGN, NIO, NLG, NOK, NPR, NZD, OMR, PAB, PEN, PGK, PHP, PKR, PLN, PTE, PYG, QAR, ROL, RUB, RUR, RWF, SAR, SBD, SCR, SDD, SEK, SGD, SHP, SIT, SKK, SLL, SOS, SRG, STD, SVC, SYP, SZL, THB, TJR, TMM, TND, TOP, TPE, TRL, TTD, TWD, TZS, UAH, UGX, USD, USN, USS, UYU, UZS, VEB, VND, VUV, WST, XAF, XAG, XAU, XBA, XBB, XBC, XBD, XCD, XDR, XFO, XFU, XOF, XPD, XPF, XPT, XTS, XXX, YER, YUM, ZAL, ZAR, ZMK, ZRN, ZWD.

XXX is used for transactions where no currency is involved.

### 11.1.8 TpChargingEventInfo

Defines the structure of data elements that specifies charging event information.

Structured Member Name	Structured Member Type	Description
ChargingEventName	TpChargingEventName	The charging event for which notifications can be requested by the application
CurrentBalanceInfo	TpBalanceInfo	The current balance of the user's account
ChargingEventTime	TpTime	The time at which the charging event occurred.

### 11.1.9 TpChargingEventCriteria

Defines the structure of data elements that specifies charging event criteria.

Structured Member Name	Structured Member Type	Description
ChargingEvents	TpChargingEventNameSet	Specifies the specific charging event criteria used by the application to define the event required.
Users	TpAddressSet	Specifies the user(s) for which the charging events are requested to be reported.

### 11.1.10 TpChargingEventNameSet

Defines a collection of TpChargingEventName elements.

### 11.1.11 TpChargingEventCriteriaResult

Defines the Sequence of Data Elements that specify the criteria relating to event requests.

Sequence Element Name	Sequence Element Type
ChargingEventCriteria	TpChargingEventCriteria
AssignmentID	TpAssignmentID

### 11.1.12 TpChargingEventCriteriaResultSet

Defines a collection of TpChargingEventCriteriaResult elements.

### 11.1.13 TpBalance

Defines the structure of data elements that specifies a balance.

Structured Member Name	Structured Member Type	Description
UserID	TpAddress	Specifies the user to whom the account belongs.
StatusCode	<a href="#">TpBalanceQueryError</a>	Specifies the status code for the balance query request.
BalanceInfo	<a href="#">TpBalanceInfo</a>	Specifies the balance information for the user.

### 11.1.14 TpBalanceSet

Defines a collection of TpBalance elements.

### 11.1.15 TpTransactionHistory

This data type is a sequence of data elements that describes the transaction history.

Sequence Element Name	Sequence Element Type	Description
TransactionID	TpAssignmentID	Specifies the ID of the specific transaction
TimeStamp	TpDateAndTime	Specifies the date and time when the specific transaction was processed.
AdditionalInfo	TpString	Specifies a free format string providing additional information on the specific transaction. This could be the applicationDescription provided with the actual transaction.

### 11.1.16 TpTransactionHistorySet

Defines a collection of TpTransactionHistory elements.

### 11.1.17 TpTransactionHistoryStatus

Defines a status code that is reported by the Account Manager service capability feature as a result of a transaction history retrieval request.

Name	Value	Description
P_AM_TRANSACTION_ERROR_UNSPECIFIED	0	General error, unspecified
P_AM_TRANSACTION_INVALID_INTERVAL	1	An invalid interval for the transaction history was specified.
P_AM_TRANSACTION_UNKNOWN_ACCOUNT	2	No account for the specified user is known.
P_AM_TRANSACTION_UNAUTHORIZED_APPLICATION	3	Application is not authorized to query balance.
P_AM_TRANSACTION_PROCESSING_ERROR	4	A processing error occurred while compiling the transaction history.
P_AM_TRANSACTION_SYSTEM_FAILURE	5	System failure. The request could not be handled

## 12 Exception Classes

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

Name	Description
P_UNAUTHORIZED_APPLICATION	Application is not authorized to perform charging operations

Each exception class contains the following structure:

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

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## Annex A (normative): OMG IDL Description of Account Management SCF

The OMG IDL representation of this interface specification is contained in a text file (am.idl contained in archive 2919811V580IDL.ZIP) which accompanies the present document.

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## Annex B (informative): W3C WSDL Description of Account Management SCF

Significant changes have occurred in Web Services technologies and understanding of how to best apply Web Services as a realisation of OSA. These changes are not reflected and therefore this realisation is removed. A future activity may provide a replacement for the content of this annex, reflective of current technology and usage expected.

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## Annex C (informative): Java™ API Description of the Account Management SCF

The Java™ API realisation of this specification is produced in accordance with the Java™ Realisation rules defined in Part 1 of this specification series. These rules aim to deliver for Java™, a developer API, provided as a realisation, supporting a Java™ API that represents the UML specifications. The rules support the production of both J2SE™ and J2EE™ versions of the API from the common UML specifications.

The J2SE™ representation of this specification is provided as Java™ Code, contained in archive 2919811V580J2SE.ZIP that accompanies the present document.

The J2EE™ representation of this specification is provided as Java™ Code, contained in archive 2919811V580J2EE.ZIP that accompanies the present document.



## Annex D (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
Mar 2001	CN_11	NP-010134	047	--	CR 29.198: for moving TS 29.198 from R99 to Rel 4 (N5-010158)	3.2.0	1.0.0
Jun 2001	CN_12	NP-010327	--	--	Approved at TSG CN#12 and placed under Change Control	2.0.0	4.0.0
Sep 2001	CN_13	NP-010472	001	--	Changing references to JAIN	4.0.0	4.1.0
Sep 2001	CN_13	NP-010472	002	--	Missing exceptions for enabling and changing the notifications	4.0.0	4.1.0
Dec 2001	CN_14	NP-010602	003	--	Replace Out Parameters with Return Types	4.1.0	4.2.0
Dec 2001	CN_14	NP-010602	004	--	Replace erroneous use of incorrect data type TpSessionID by TpAssignmentID in Account Management interface	4.1.0	4.2.0
Mar 2002	CN_15	NP-020111	005	--	Add P_INVALID_INTERFACE_TYPE exception to IpService.setCallback() and IpService.setCallbackWithSessionID()	4.2.0	4.3.0
Mar 2002	CN_15	NP-020111	006	--	Correction of parameter name in IpAccountManager.createNotification()	4.2.0	4.3.0
Mar 2002	CN_15	NP-020111	007	--	Correction of result parameter of getNotification, set in stead of single result	4.2.0	4.3.0
Jun 2002	CN_16	NP-020193	008	--	Change to new Service Property P_MAX_ADDRESSES_PER_QUERY for Account Management	4.3.0	5.0.0
Jun 2002	CN_16	NP-020182	009	--	Addition of support for WSDL realisation	4.3.0	5.0.0
Jun 2002	CN_16	NP-020183	010	--	Addition of Support for Network Controlled Notifications AM	4.3.0	5.0.0
Sep 2002	CN_17	NP-020436	011	--	Correction of IpAccountManager STD to permit multiple notifications	5.0.0	5.1.0
Sep 2002	CN_17	NP-020436	012	--	Add text to clarify requirements on support of methods	5.0.0	5.1.0
Sep 2002	CN_17	NP-020436	013	--	Add missing callback interface for notifications in Account Management	5.0.0	5.1.0
Sep 2002	CN_17	NP-020395	014	--	Add text to clarify relationship between 3GPP and ETSI/Parlay OSA specifications	5.0.0	5.1.0
Mar 2003	CN_19	NP-030025	016	--	Correction to TpChargingEventCriteria in Account Management	5.1.0	5.2.0
Mar 2003	CN_19	NP-030025	018	--	Addition of status of methods to Account Management interfaces	5.1.0	5.2.0
Mar 2003	CN_19	NP-030035	019	--	Inconsistent description of use of secondary callback	5.1.0	5.2.0
Sep 2003	CN_21	NP-030352	020	--	Correction to Java Realisation Annex	5.2.0	5.3.0
Apr 2004	CN_23bis	NP-040155	023	--	Correct Java Code to conform with Java Rulebook in TS 29.198-01 and to remove errors	5.3.0	5.4.0
Jun 2004	CN_24	NP-040256	026	--	Correct the P_TRIGGERING_ADDRESSES service property	5.4.0	5.5.0
Sep 2004	CN_25	NP-040355	029	--	Correct J2EE source	5.5.0	5.6.0
Dec 2004	CN_26	NP-040485	033	--	Removal of OSA API SCFs description in W3C WSDL	5.6.0	5.7.0
Dec 2004	--	--	--	--	Added missing code attachments	5.7.0	5.7.1
Dec 2005	CT-30	CP-050562	0036	--	Correct references to ISO 4217 to make them undated	5.7.1	5.8.0

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## History

<b>Document history</b>		
V5.0.0	June 2002	Publication
V5.1.0	September 2002	Publication
V5.2.0	March 2003	Publication
V5.3.0	September 2003	Publication
V5.4.0	April 2004	Publication
V5.5.0	August 2004	Publication
V5.6.0	September 2004	Publication
V5.7.0	December 2004	Publication (Withdrawn)
V5.7.1	December 2004	Publication
V5.8.0	December 2005	Publication