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Technical Specification

3rd Generation Partnership Project;
Technical Specification Group Core Network and Terminals;
Open Service Access (OSA);
Parlay X Web Services;
Part 8: Terminal Status
(Release 9)

GLOBAL SYSTEM FOR
MOBILE COMMUNICATIONS

Keywords

UMTS, network, API, OSA

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

3GPP acknowledges the contribution of the Parlay X web services specifications from The Parlay Group. The Parlay Group is pleased to see 3GPP acknowledge and publish the present document, and the Parlay Group looks forward to working with the 3GPP community to improve future versions of the present document.

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

where:

x   the first digit:

1   presented to TSG for information;

2   presented to TSG for approval;

3   or greater indicates TSG approved document under change control.

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

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

Introduction

The present document is part 8 of a multi-part deliverable covering the 3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Open Service Access (OSA); Parlay X Web Services, as identified below:

Part 1:   "Common"
Part 2:   "Third party call"
Part 3:   "Call Notification"
Part 4:   "Short Messaging"
Part 5:   "Multimedia Messaging"
Part 6:   "Payment"
Part 7:   "Account management"
Part 8:   "Terminal Status"
Part 9:   "Terminal location"
Part 10:   "Call handling"
Part 11:   "Audio call"
Part 12:   "Multimedia conference"
Part 13:   "Address list management"
Part 14:   "Presence"
Part 15:   "Message Broadcast"
Part 16:   "Geocoding"
Part 17:   "Application driven Quality of Service (QoS)"
Part 18:   "Device Capabilities and Configuration"
Part 19:   "Multimedia streaming control"
Part 20:   "Multimedia multicast session management"
Part 21:   "Content management"
Part 22:   "Policy"

1 Scope

The present document is Part 8 of the Stage 3 Parlay X Web Services specification for Open Service Access (OSA).

The OSA specifications define an architecture that enables application developers to make use of network functionality through an open standardized interface, i.e. the OSA APIs. The concepts and the functional architecture for the OSA are contained in 3GPP TS 23.198 [3]. The requirements for OSA are contained in 3GPP TS 22.127 [2].

The present document specifies the Terminal Status Web Service aspects of the interface. All aspects of the Terminal Status Web Service are defined here, these being:

- Name spaces.
- Sequence diagrams.
- Data definitions.
- Interface specification plus detailed method descriptions.
- Fault definitions.
- Service policies.
- WSDL Description of the interfaces.

The present document has been defined jointly between 3GPP TSG CT WG5, ETSI TISPAN and The Parlay Group.

Maintenance of up to 3GPP Rel-8 and new OSA Stage 1, 2 and 3 work beyond Rel-9 was moved to OMA in June 2008.

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 TR 21.905: "Vocabulary for 3GPP Specifications".

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

[3]   3GPP TS 23.198: "Open Service Access (OSA); Stage 2".

[4]   3GPP TS 22.101: "Service aspects; Service principles".

[5]   W3C Recommendation (2 May 2001): "XML Schema Part 2: Datatypes".

NOTE: Available at http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/.

[6]   3GPP TS 29.199-1: "Open Service Access (OSA); Parlay X web services; Part 1: Common".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 29.199-1 [6] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TS 29.199-1 [6] apply.

4 Detailed service description

Terminal Status provides access to the status of a terminal through:

- Request for the status of a terminal.

- Request for the status of a group of terminals.

- Notification of a change in the status of a terminal.

The status of a terminal can be expressed as reachable, unreachable or busy - however not all terminals distinguish a busy status, so applications should be able to adapt to what information is available (using the service properties to determine available information).

When a request for a group of terminals is made, the response may contain a full or partial set of results. This allows the service to provide results based on a number of criteria including number of terminals for which the request is made and amount of time required to retrieve the information. This allows the requester to initiate additional requests for those terminals for which information was not provided.

5 Namespaces

The data types are defined in the namespace:

http://www.csapi.org/schema/parlayx/terminal_status/v4_0

The TerminalStatus interface uses the namespace:

http://www.csapi.org/wsdl/parlayx/terminal_status/v4_0

The TerminalStatusNotificationManager interface uses the namespace:

http://www.csapi.org/wsdl/parlayx/terminal_status/notification_manager/v4_0

The TerminalStatusNotification interface uses the namespace:

http://www.csapi.org/wsdl/parlayx/terminal_status/notification/v4_0

The 'xsd' namespace is used in the present document to refer to the XML Schema data types defined in XML Schema [5]. The use of the name 'xsd' is not semantically significant.

6 Sequence diagrams

6.1 Terminal status query

Pattern: Request / Response.

When an application is interested in determining the status of a terminal device, it may provide a terminal device address, and receive the status for the device requested.
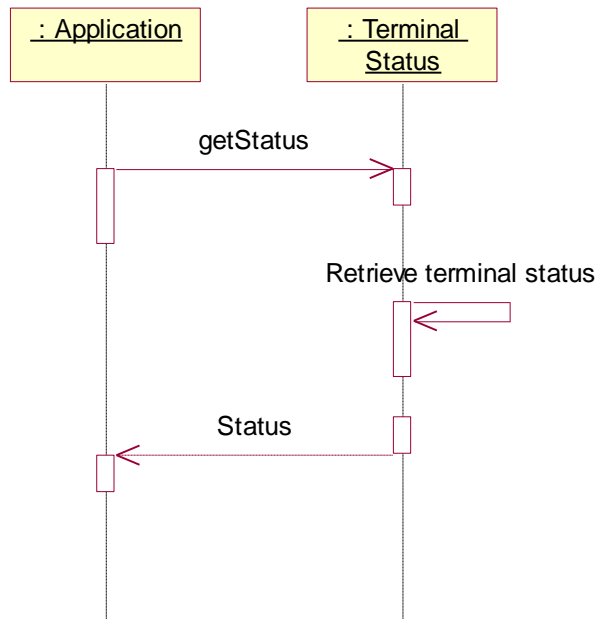
6.2 Terminal status group query

Pattern: Request / Response.

When an application is interested in determining the status of a set of terminal devices, it may provide an array of terminal device addresses, including network managed group addresses, and receive the status for the set of devices requested.

```
    : Application              : Terminal
                                 Status

         getStatusForGroup
    ┌──┐ ─────────────────────▶ ┌──┐
    │  │                        │  │
    └──┘                        └──┘
                          Process groups
                              ┌──┐ ◀──────┐
                              │  │        │
                              └──┘

                       Retrieve terminal status
                              ┌──┐ ◀──────┐
                              │  │        │
                              └──┘
                 Status list
    ┌──┐ ◀──────────────────── │
    │  │
    └──┘
```
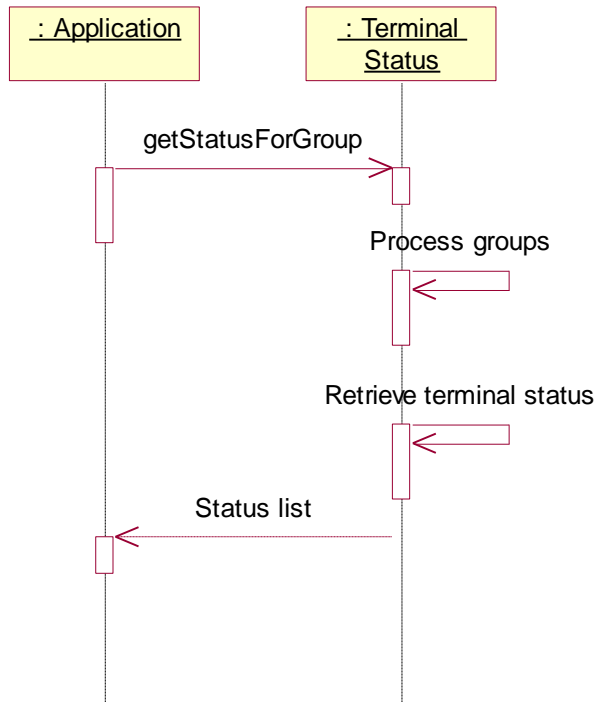
6.3 Terminal status notification

Pattern: Application Correlated Multiple Notification.

An application can be notified of a change in the status of terminal devices. When the status of a terminal device changes, a notification message will be sent to the application.
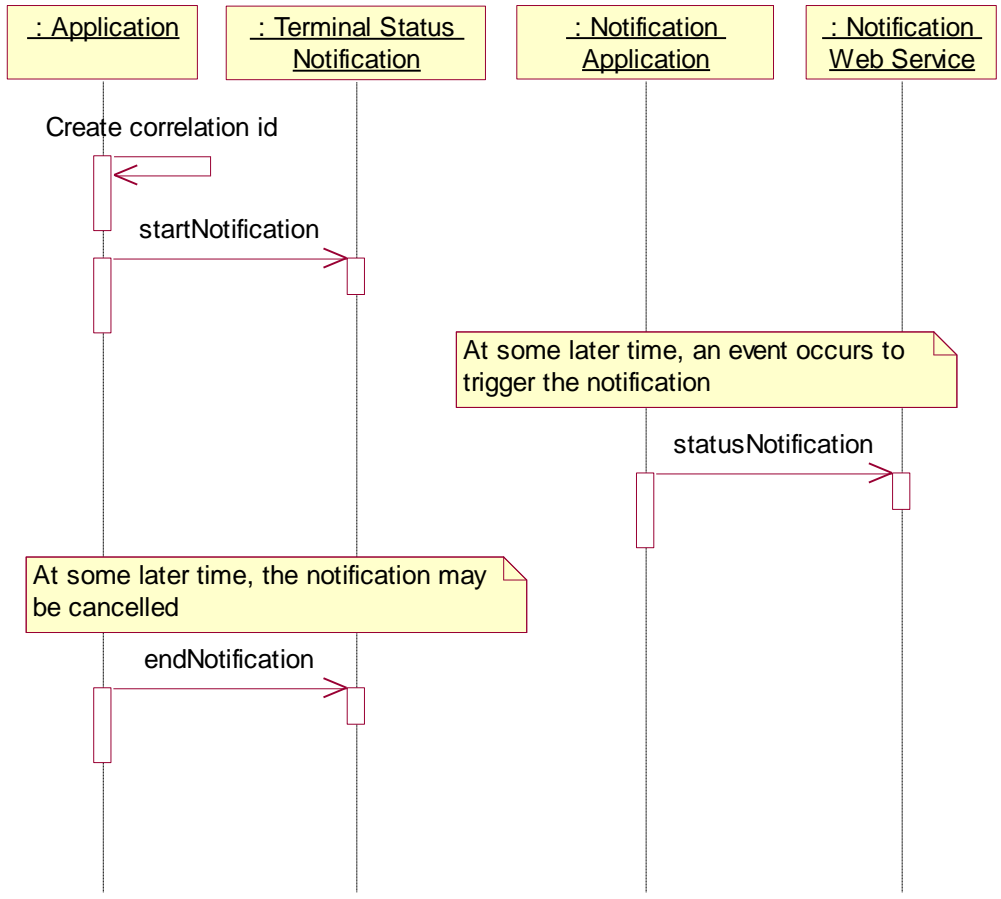
6.4 Terminal Status Notification with Check Immediate

In some applications, the terminal status notification will be used to watch for a specific status change. An example is a 'call when available' service, where the terminal status is checked and determined to be not reachable or busy, and a notification is set up to notify the application when the terminal becomes reachable. Between the time that the original status determination and the time the notification is set up, the terminal status could change to reachable - thus the notification on change to reachable would not be sent.

Using the check immediate flag, after the notification is established, the value of the terminal status will be determined, and if the criteria is matched then a notification will be sent immediately. The following sequence diagram shows this scenario.
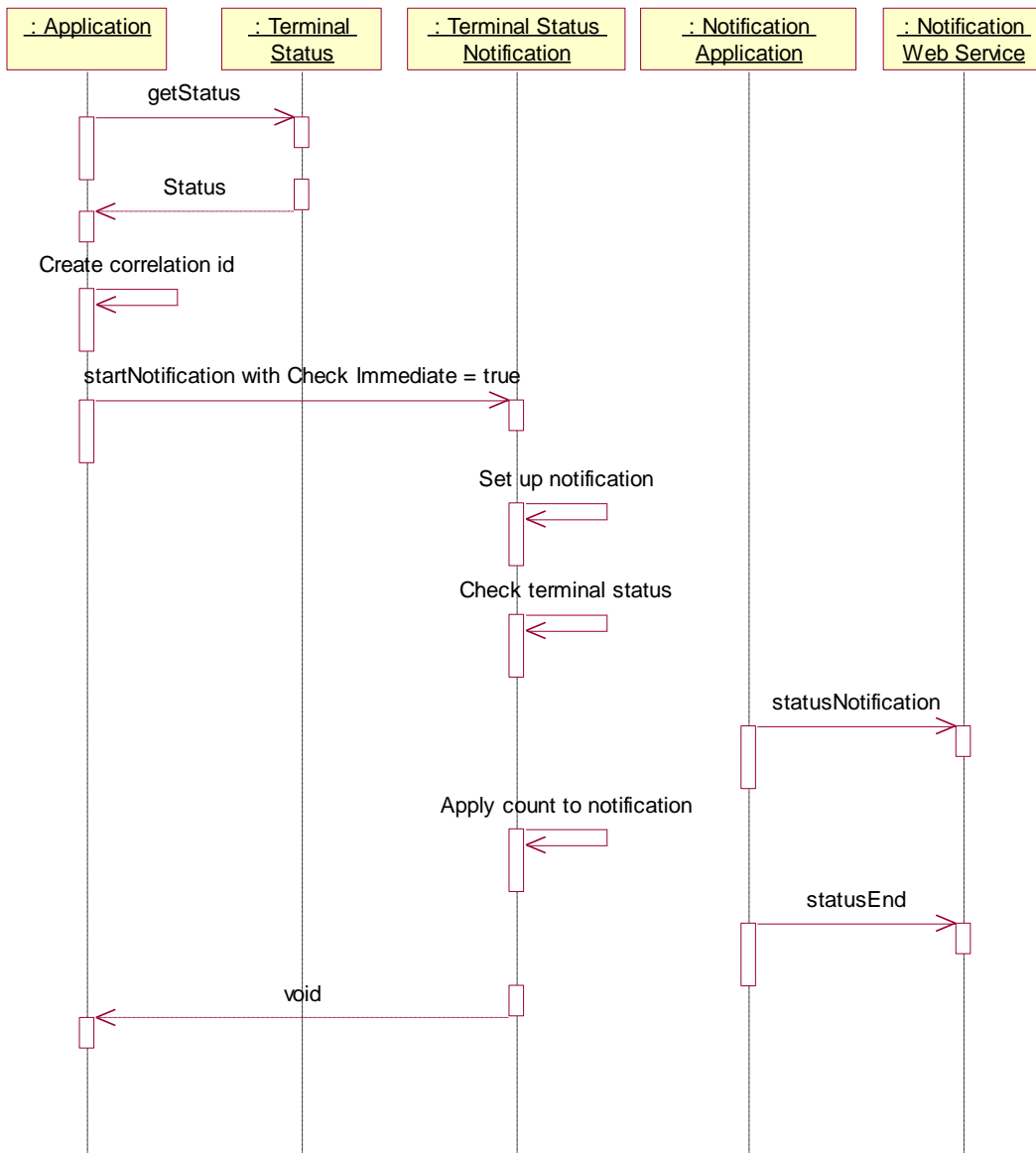
This sequence shows:

- The Enterprise Application checks the status of a terminal, and receives its status (in this scenario receiving Unreachable or Busy.

- The Enterprise Application generates a correlator, and starts a notification with criteria defined to notify the Enterprise Web Service when the terminal state becomes Reachable and the check immediate flag set to true.

- Sets up the notification to monitor terminal status changes.

- Check the current status of the terminal, and determine if the status matches the criteria.

- In this case, the criteria matches, and a notification is delivered to the Enterprise Web Service.

- The count of notifications is incremented and compared to the notification count limit.

- In this case, a single notification was requested, and the end notification message is sent.

- The startNotification operation completes.

This scenario includes the full set of interactions in one sequence, which also shows that the notifications can be received concurrent with the creation of the notification.

7 XML Schema data type definition

7.1 Status enumeration

List of possible status values.

Enumeration	Description
Reachable	Terminal is reachable
Unreachable	Terminal is not reachable
Busy	Terminal is busy

7.2 RetrievalStatus enumeration

Enumeration of the status items that are related to an individual retrieval in a set.

Enumeration	Description
Retrieved	Status retrieved, with result in CurrentStatus element.
NotRetrieved	Status not retrieved, CurrentStatus is not provided (does not indicate an error, no attempt may have been made).
Error	Error retrieving status.

7.3 StatusData structure

Data structure containing device identifier and its status. As this can be related to a query of a group of terminal devices, the ResultStatus element is used to indicate whether the information for the device was retrieved or not, or if an error occurred.

Name	Type	Optional	Description
Address	xsd:anyURI	No	Address of the Terminal Device to which the status information applies.
ReportStatus	RetrievalStatus	No	Status of retrieval for this address.
CurrentStatus	Status	Yes	Status of terminal. It is only provided if ReportStatus=Retrieved.
ErrorInformation	common:ServiceError	Yes	If ReportStatus is Error, this is the reason for the error. Error due to privacy verification will be expressed as POL0002 in the ServiceError.

7.4 StatusInformation structure

Name	Type	Optional	Description
Address	xsd:anyURI	No	Address of the Terminal Device to which the status information applies.
CurrentStatus	Status	No	Status of terminal.

8 Web service interface definition

8.1 Interface: TerminalStatus

Request the status for a terminal or set of terminals.

8.1.1 Operation: GetStatus

This operation is intended to retrieve the status for a single terminal. The URI provided is for a single terminal, not a group URI. If a group URI is provided, a PolicyException will be returned to the application.

8.1.1.1 Input message: GetStatusRequest

Part name	Part type	Optional	Description
Address	xsd:anyURI	No	Terminal to request status for

8.1.1.2 Output message: GetStatusResponse

Part name	Part type	Optional	Description
Result	Status	No	Status for the terminal for which status was requested

8.1.1.3 Referenced faults

ServiceException from 3GPP TS 29.199-1 [6]:

- SVC0001: Service error.

- SVC0002: Invalid input value.

- SVC0004: No valid address(es) – if the address does not exist.

PolicyException from 3GPP TS 29.199-1 [6]:

- POL0001: Policy error.

- POL0002: Privacy error.

- POL0006: Groups not allowed.

8.1.2 Operation: GetStatusForGroup

The getStatusForGroup operation initiates a retrieval activity, where one or more terminals, or groups of terminals, may have their status determined.

The Web Service may return a result set that does not include complete information, allowing the Web Service implementation to choose to deliver a partial set of results to accommodate other conditions, such as avoiding timeouts. In this case, the addresses for which no attempt was made to provide data will be marked NotRetrieved in the result for each address this applies to.

8.1.2.1 Input message: GetStatusForGroupRequest

Part name	Part type	Optional	Description
Addresses	xsd:anyURI [1..unbounded]	No	List of URIs to get status for, including group URIs

8.1.2.2 Output message: GetStatusForGroupResponse

Part name	Part type	Optional	Description
Result	StatusData [1..unbounded]	No	Set of results for the request

8.1.2.3 Referenced faults

ServiceException from 3GPP TS 29.199-1 [6]:

- SVC0001: Service error.

- SVC0002: Invalid input value.

- SVC0004: No valid addresses.

- SVC0006: Invalid group.

PolicyException from 3GPP TS 29.199-1 [6]:

- POL0001: Policy error.

- POL0003: Too many addresses.

- POL0006: Groups not allowed.

- POL0007: Nested groups not allowed.

- POL0013: Addresses duplication.

8.2 Interface: TerminalStatusNotificationManager

Set up notifications for terminal status changes.

8.2.1 Operation: StartNotification

Notifications of status changes are made available to applications. The number and duration of notifications may be requested as part of the setup of the notification or may be governed by service policies, or a combination of the two.

If CheckImmediate is set to true, then the notification will be set up, and then the current value of the terminal status will be checked. If the terminal status meets the criteria provided, a notification will be sent to the application. This notification will count against the count requested. This addresses the case where the status of the device changes during the time the notification is being set up, which may be appropriate in some applications.

The correlator provided in the reference must be unique for this Web Service at the time the notification is initiated, otherwise a ServiceException (SVC0005) will be returned to the application.

If the frequency requested is more often than allowed by the service policy, then the value in the service policy will be used. If the duration requested exceeds the time allowed in the service policy, then the value in the service policy will be used. If the notification period (duration) ends before all of the notifications (count) have been delivered, then the notification terminates. In all cases, when the notifications have run their course (by duration or count), an end of notifications message will be provided to the application.

Service policies may govern what count values can be requested, including maximum number of notifications allowed and whether unlimited notifications can be requested (i.e. either by not specifying the optional Count message part or by specifying it with a value of zero). If the count value requested is not in policy, a PolicyException (POL0004 or POL0005 as appropriate) will be returned.

8.2.1.1 Input message: StartNotificationRequest

Part name	Part type	Optional	Description
Reference	common:SimpleReference	No	Notification endpoint definition
Addresses	xsd:anyURI [1..unbounded]	No	Addresses of terminals to monitor
Criteria	Status [1..unbounded]	No	List of status values to generate notifications for (these apply to all addresses specified)
CheckImmediate	xsd:boolean	No	Check status immediately after establishing notification
Frequency	common:TimeMetric	No	Maximum frequency of notifications (can also be considered minimum time between notifications)
Duration	common:TimeMetric	Yes	Length of time notifications occur for, do not specify to use default notification time defined by service policy
Count	xsd:integer	Yes	Maximum number of notifications. For no maximum, either do not specify this part or specify a value of zero.

8.2.1.2 Output message: StartNotificationResponse

Part name	Part type	Optional	Description
None			

8.2.1.3 Referenced faults

ServiceException from 3GPP TS 29.199-1 [6]:

- SVC0001: Service error.

- SVC0002: Invalid input value.

- SVC0004: No valid addresses.

- SVC0005: Duplicate correlator.

- SVC0006: Invalid group.

PolicyException from 3GPP TS 29.199-1 [6]:

- POL0001: Policy error.

- POL0003: Too many addresses.

- POL0004: Unlimited notifications not supported.

- POL0005: Too many notifications requested.

- POL0006: Groups not allowed.

- POL0007: Nested groups not allowed.

- POL0009: Invalid frequency requested.

- POL0013: Addresses duplication.

- POL0200: Busy criteria not supported.

8.2.2 Operation: EndNotification

The application may end a notification using this operation. Until this operation returns, notifications may continue to be received by the application.

An end of notification (statusEnd) message will not be delivered to the application for a notification ended using this operation.

8.2.2.1 Input message: EndNotificationRequest

Part name	Part type	Optional	Description
Correlator	xsd:string	No	Correlator of request to end

8.2.2.2 Output message: EndNotificationResponse

Part name	Part type	Optional	Description
None			

8.2.2.3 Referenced faults

ServiceException from 3GPP TS 29.199-1 [6]:

- SVC0001: Service error.

- SVC0002: Invalid input value.

PolicyException from 3GPP TS 29.199-1 [6]:

- POL0001: Policy error.

8.3 Interface: TerminalNotification

Notification interface to which notifications are delivered.

8.3.1 Operation: StatusNotification

When the status of monitored devices change, a notification is delivered to the application with the new status information for each of the devices. If a group identifier was used, the terminal device URI is provided, not the group URI.

8.3.1.1 Input message: StatusNotificationRequest

Part name	Part type	Optional	Description
Correlator	xsd:string	No	Correlator provided in request to set up this notification
TerminalStatus	StatusInformation [1..unbounded]	No	List of Statusinformation elements describing address and new terminal status.

8.3.1.2 Output message: StatusNotificationResponse

Part name	Part type	Optional	Description
None			

8.3.1.3 Referenced faults

None.

8.3.2 Operation: StatusError

The status changed error message is sent to the application to indicate that the notification is being cancelled by the Web Service.

8.3.2.1 Input message: StatusErrorRequest

Part name	Part type	Optional	Description
Correlator	xsd:string	No	Correlator provided in request to set up this notification.
Address	xsd:anyURI	Yes	Address of terminal if the error applies to an individual terminal, or not specified if it applies to the whole notification.
Reason	common:ServiceError	No	Reason notification is being discontinued.

8.3.2.2 Output message: StatusErrorResponse

Part name	Part type	Optional	Description
None			

8.3.2.3 Referenced faults

None.

8.3.3 Operation: StatusEnd

The notifications have completed for this correlator. This message will be delivered when the duration or count for notifications have been completed. This message will not be delivered in the case of an error ending the notifications or deliberate ending of the notifications (using endNotification operation).

8.3.3.1 Input message: StatusEndRequest

Part name	Part type	Optional	Description
Correlator	xsd:string	No	Correlator provided in request to set up this notification.

8.3.3.2 Output message: StatusEndResponse

Part name	Part type	Optional	Description
None			

8.3.3.3 Referenced faults

None.

9 Fault definitions

New fault definitions for this service.

9.1 Fault: PolicyException

Busy criteria not supported.

Name	Description
Message Id	<POL0200>
Text	Busy criteria is not supported.
Variables	None.

10 Service policies

Name	Type	Description
BusyAvailable	xsd:boolean	Can busy be returned as a status or be a trigger
MaximumNotificationAddresses	xsd:int	Maximum number of addresses for which a notification can be set up
MaximumNotificationFrequency	common:TimeMetric	Maximum rate of notification delivery (also can be considered minimum time between notifications)
MaximumNotification Duration	common:TimeMetric	Maximum amount of time a notification may be set up for
MaximumCount	xsd:int	Maximum number of notifications that may be requested
UnlimitedCountAllowed	xsd:boolean	Allowed to specify unlimited notification count (i.e. either by not specifying the optional Count message part in StartNotificationRequest or by specifying a value of zero)
GroupSupport	xsd:boolean	Groups may be included with addresses
NestedGroupSupport	xsd:boolean	Are nested groups supported in group definitions
AddressesDuplicationNotAllowed	xsd:boolean	Indicates whether duplication of addresses is allowed for operations

Note: For service policy - "AddressesDuplicationNotAllowed", If alias/group is used,

1. Parlay X GW with Identity Management Framework support can verify that indeed there is a duplicate.

2. If network capability supports alias/group and the Parlay-X GW without Identity Management Framework supporting, then the policy exception of addresses duplication may not have effect fully.

3. If network capability doesn't support alias/group and the Parlay-X GW without Identity Management Framework supporting, the Parlay-X GW should reject the alias/group.

Annex A (normative):
WSDL for Terminal Status

The document/literal WSDL representation of this interface specification is compliant to 3GPP TS 29.199-1 [6] and is contained in text files;

- parlayx_terminal_status_types_4_0.xsd
- parlayx_terminal_status_interface_4_0.wsdl
- parlayx_terminal_status_service_4_0.wsdl
- parlayx_terminal_status_notification_interface_4_0.wsdl
- parlayx_terminal_status_notification_service_4_0.wsdl
- parlayx_terminal_status_notification_manager_interface_4_0.wsdl
- parlayx_terminal_status_notification_manager_service_4_0.wsdl

which accompany the present document.

The WSDL files have been verified using the following files:

- 8_wsdl2Java_axis-1_4.bat

- 8_wsdl2Java_axis2-1_4_1.bat

which accompany the present document.

Annex B (informative):
Description of Parlay X Web Services Part 8: Terminal Status for 3GPP2 cdma2000 networks

This annex is intended to define the OSA Parlay X Web Services Stage 3 interface definitions and it provides the complete OSA specifications. It is an extension of OSA Parlay X Web Services specifications capabilities to enable operation in cdma2000 systems environment. They are in alignment with 3GPP2 Stage 1 requirements and Stage 2 architecture defined in:

[1]   3GPP2 X.S0011-D: "cdma2000 Wireless IP Network Standard ", Version 1.1

[2]   3GPP2 S.R0037-0: "IP Network Architecture Model for cdma2000 Spread Spectrum Systems", Version 3.0

[3]   3GPP2 X.S0013-A: "All-IP Core Network Multimedia Domain"

These requirements are expressed as additions to and/or exclusions from the 3GPP specification.
The information given here is to be used by developers in 3GPP2 cdma2000 network architecture to interpret the 3GPP OSA specifications.

B.1   General Exceptions

The terms 3GPP and UMTS are not applicable for the cdma2000 family of standards. Nevertheless these terms are used (3GPP TR 21.905) mostly in the broader sense of "3G Wireless System". If not stated otherwise there are no additions or exclusions required.

CAMEL mappings are not applicable for cdma2000 systems.

B.2   Specific Exceptions

B.2.1   Clause 1: Scope

There are no additions or exclusions.

B.2.2   Clause 2: References

There are no additions or exclusions.

B.2.3   Clause 3: Definitions and abbreviations

There are no additions or exclusions.

B.2.4   Clause 4: Detailed service description

There are no additions or exclusions.

B.2.5   Clause 5: Namespaces

There are no additions or exclusions.

B.2.6 Clause 6: Sequence diagrams

There are no additions or exclusions.

B.2.7 Clause 7: XML Schema data type definition

There are no additions or exclusions.

B.2.8 Clause 8: Web Service interface definition

There are no additions or exclusions.

B.2.9 Clause 9: Fault definitions

There are no additions or exclusions.

B.2.10 Clause 10: Service policies

There are no additions or exclusions.

B.2.11 Annex A (normative): WSDL for Terminal Status

There are no additions or exclusions.

Annex C (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Cat	Old	New
Mar 2007	CT_35	CP-070045	0005	--	Add OSA Parlay Web Services support for 3GPP2 networks	F	6.3.0	6.4.0
Mar 2007	CT_35	CP-070048	0006	--	Applying SVC0004 for a single address in Terminal Status Web Service	C	6.4.0	7.0.0
Mar 2007	--	--	--	--	Editorial: Aligned 5 Namespaces	--	7.0.0	7.0.1
Jun 2007	--	--	--	--	Renamed in Introduction Part 18:"Device management" to "Device Capabilities and Configuration"	--	7.0.1	7.0.2
Dec 2008	CT_42	--	--	--	Upgraded unchanged from Rel-7	--	7.0.2	8.0.0
Sep 2009	CT_45	CP-090596	0008		Completion of Parlay X Terminal Status for Release 8		8.0.0	8.1.0
2009-12	-	-	-	-	Update to Rel-9 version (MCC)		8.1.0	9.0.0