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*Technical Specification*

**Digital cellular telecommunications system (Phase 2+);  
Universal Mobile Telecommunications System (UMTS);  
LTE;  
Open Service Access (OSA);  
Parlay X web services;  
Part 16: Geocoding  
(3GPP TS 29.199-16 version 9.0.0 Release 9)**

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## Foreword

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The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under <http://webapp.etsi.org/key/queryform.asp>.

# Contents

Intellectual Property Rights .....	2
Foreword.....	2
Foreword.....	5
Introduction .....	5
1 Scope .....	6
2 References .....	6
3 Definitions and abbreviations.....	7
3.1 Definitions .....	7
3.2 Abbreviations .....	7
4 Detailed service description .....	7
5 Namespaces.....	9
6 Sequence diagrams .....	10
6.1 Get address of terminal.....	10
6.2 Get address of terminal for group.....	11
6.3 Get terminal distance from address .....	11
7 XML Schema data type definition .....	12
7.1 Accuracy values .....	12
7.2 AddressInfo structure .....	12
7.3 AddressData structure .....	12
7.4 DelayTolerance enumeration.....	12
8 Web service interface definition.....	13
8.1 Interface: TerminalAddress .....	13
8.1.1 Operation: getAddressOfTerminal.....	13
8.1.1.1 Input message: getAddressOfTerminalRequest .....	13
8.1.1.2 Output message: getAddressOfTerminalResponse .....	13
8.1.1.3 Referenced Faults.....	13
8.1.2 Operation: getAddressOfTerminalForGroup .....	15
8.1.2.1 Input message: getAddressOfTerminalForGroupRequest.....	15
8.1.2.2 Output message: getAddressOfTerminalForGroupResponse .....	15
8.1.2.3 Referenced faults.....	15
8.1.3 Operation: GetTerminalDistanceFromAddress .....	16
8.1.3.1 Input message: GetTerminalDistanceFromAddressRequest .....	16
8.1.3.2 Output message: GetTerminalDistanceFromAddressResponse .....	16
8.1.3.3 Referenced faults.....	16
9 Fault definitions.....	17
9.1 Fault: ServiceException .....	17
9.1.1 SVC0200: Accuracy out of limit .....	17
9.1.2 SVC0370: No valid terminal number(s) .....	17
9.2 Fault: PolicyException .....	17
9.2.1 POL0230: Requested accuracy not supported .....	17
9.2.2 POL0350: Too many terminal numbers.....	17
10 Service policies .....	17
<b>Annex A (normative): WSDL for Geocoding .....</b>	<b>18</b>
<b>Annex B (informative): Bibliography.....</b>	<b>19</b>

<b>Annex C (informative):</b>	<b>Description of Parlay X Web Services Part 16: Geocoding for 3GPP2 cdma2000 networks .....</b>	<b>20</b>
C.1	General Exceptions.....	20
C.2	Specific Exceptions .....	20
C.2.1	Clause 1: Scope .....	20
C.2.2	Clause 2: References .....	20
C.2.3	Clause 3: Definitions and abbreviations .....	20
C.2.4	Clause 4: Detailed service description.....	20
C.2.5	Clause 5: Namespaces .....	20
C.2.6	Clause 6: Sequence diagrams .....	21
C.2.7	Clause 7: XML Schema data type definition.....	21
C.2.8	Clause 8: Web Service interface definition .....	21
C.2.9	Clause 9: Fault definitions.....	21
C.2.10	Clause 10: Service policies.....	21
C.2.11	Annex A (normative):WSDL for Geocoding .....	21
<b>Annex D (informative):</b>	<b>Change history .....</b>	<b>22</b>
History .....		23

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## Foreword

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

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where:

- x the first digit:
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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

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## Introduction

The present document is part 16 of a multi-part deliverable covering the 3<sup>rd</sup> 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"
<b>Part 16:</b>	<b>"Geocoding"</b>
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"

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# 1 Scope

The present document is Part 16 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 Geocoding Web Service aspects of the interface. All aspects of the Geocoding 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.

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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 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] 3GPP TS 29.199-1: "Open Service Access (OSA); Parlay X web services; Part 1: Common".
- [6] 3GPP TS 29.199-9: "Open Service Access (OSA); Parlay X web services; Part 9: Terminal location".

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## 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 [5] and the following apply.

**address:** set of strings that represent an address information for a geographical place  
It consists of the country, state, district, city, street, house number and zip/postal code. In this specification, the address means a location address except where otherwise noted.

**coordinates:** latitude, longitude pair that identifies a point on the Earth's surface

**geocoding:** transformation a description of a address, such as a place name, street address or postal code, into a normalized description of the location with a geographical coordinates

**location:** specific set of coordinates

**reverse geocoding:** transformation a given location into a normalized description of address

**terminal number:** string of decimal digits that terminal is uniquely indicated and located

NOTE: Address is a name that is used in both Geocoding SCF and Terminal Location SCF. The former uses address in the customary sense of a location address, while the latter uses it in the sense of a terminal identifier represented as a URI string. So terminal number is a better name for what Parlay X Terminal Location calls address, and address as Geocoding SCF typically define it.

### 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TS 29.199-1 [5], 3GPP TS 29.199-9 [6] and the following apply:

GMLC	Gateway Mobile Location Center
MLP	Mobile Location Protocol
MMS	Multimedia Message
MPC	Mobile Positioning Center
OMA	Open Mobile Alliance
OpenLS	Open Location Services
URI	Uniform Resource Identifier
XML	Extensible Markup Language

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## 4 Detailed service description

Where the Parlay X Terminal Location Web Service provides access to the geographical coordinates at which a terminal is located, the Geocoding Web Service provides access to an additional level of refinement, allowing the service developer to work with actual location addresses and the like:

- Request the location address of a terminal number.
- Request the location address of a group of terminals.
- Request the distance of a terminal from a specific location address.

When a request is made on behalf of a group of terminals, the response may be 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 requestor to initiate additional requests for those terminals for which information was not provided.



Figure 4.1 shows the Geocoding Web Service architecture composed of Parlay X Application, Parlay X Gateway, Parlay Gateway, GMLC/MPC, Addressing server. OMA/MLP is used between Parlay X Gateway and GMLC/MPC and OpenLS/XML is used between Parlay X Gateway and Addressing server.

In the getAddressOfTerminal and getAddressOfTerminalForGroup operations, if subscriber asks someone's address or group addresses, Parlay X Application calls the Geocoding Web Service. Parlay X gateway gets the geographical coordinates of terminal number from GMLC/MPC and then feeds the retrieved geographical coordinates to addressing server. Finally it gets the location address.

In the getTerminalDistanceFromAddress operation, the subscriber asks for the distance of a terminal from a specific address; the Parlay X Application calls the Geocoding Web Service. The Parlay X gateway gets the geographical coordinates of the address from an addressing server. The Parlay X gateway gets the geographical coordinates of the terminal from GMLC/MPC. Finally it computes the distance between the two sets of geographical coordinates.

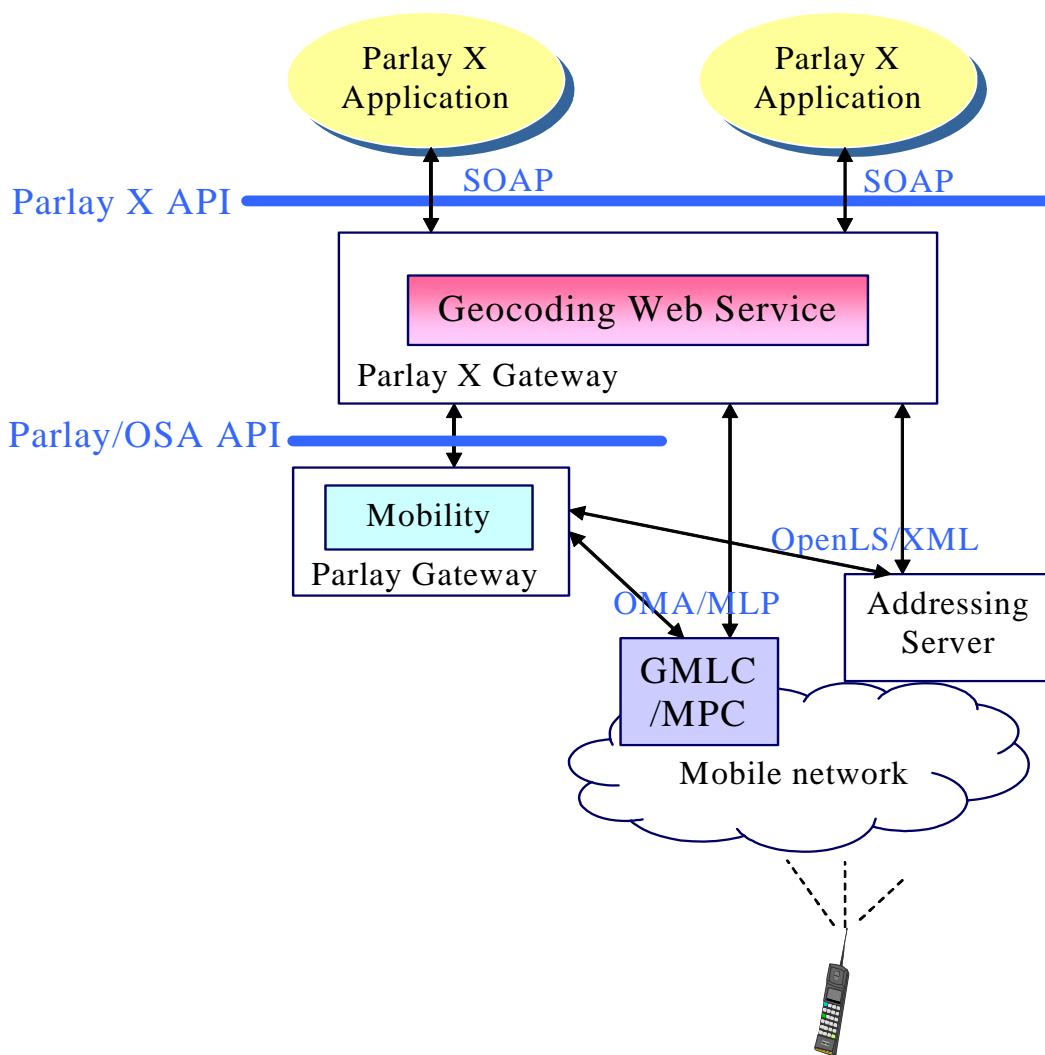


Figure 4.1: Geocoding Web Service architecture

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## 5 Namespaces

The Geocoding interface uses the namespace:

`http://www.csapi.org/wsd/parlayx/geocoding/terminal_address/v4_0`

The data types are defined in the namespace:

`http://www.csapi.org/schema/parlayx/geocoding/v4_0`

The 'xsd' namespace is used in the present document to refer to the XML Schema data types defined in XML Schema (3GPP TS 29.199-1 [5]). The use of the name 'xsd' is not semantically significant.

## 6 Sequence diagrams

### 6.1 Get address of terminal

Pattern: Request / Response.

For an application to determine the address of terminal device, it provides a terminal number and desired accuracy, and receives the location address for the device requested.

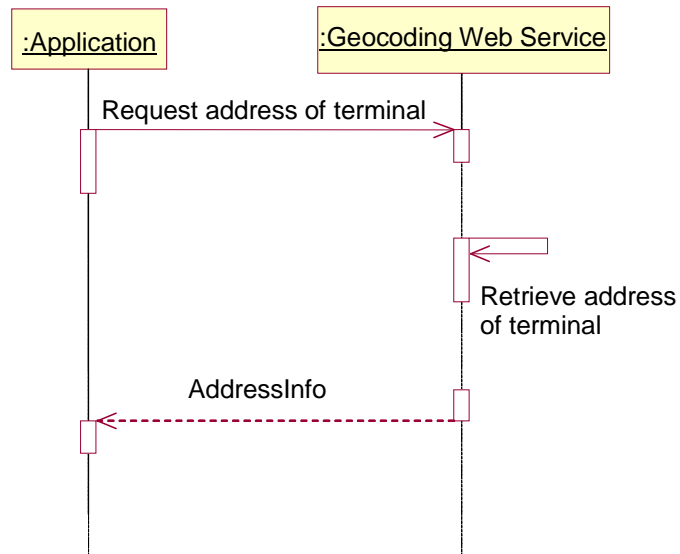


Figure 6.1: Get address of terminal operation

## 6.2 Get address of terminal for group

Pattern: Request / Response.

For an application to determine the address of a set of terminal devices, it provides an array of terminal numbers, and receives the location addresses for the set of devices requested.

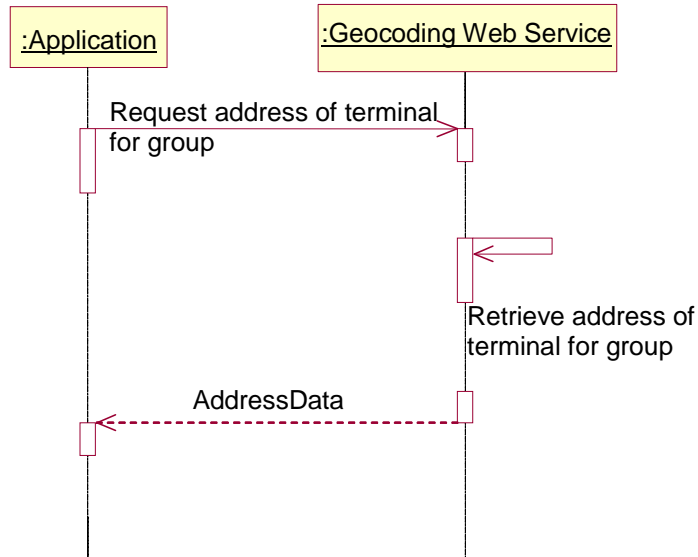


Figure 6.2: Get address of terminal for group operation

## 6.3 Get terminal distance from address

Pattern: Request / Response.

For an application to determine the distance from terminal to address, it provides a terminal number and address, and receives the distance between location of terminal and address.

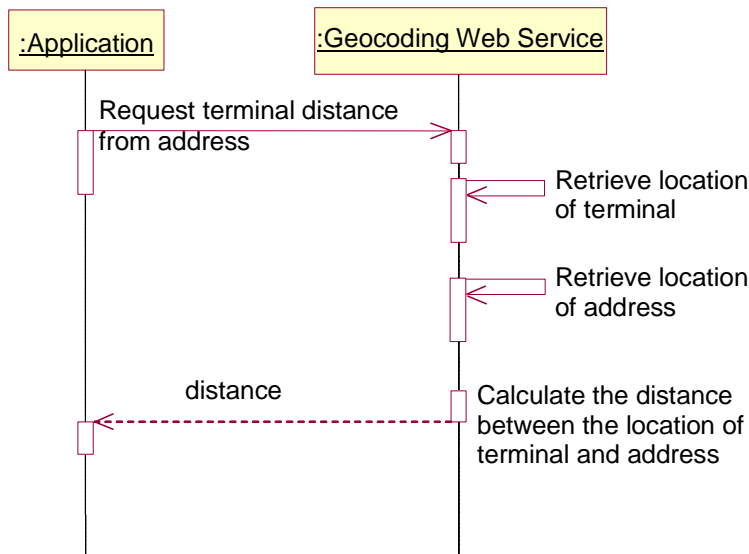


Figure 6.3: Get terminal distance from address operation

## 7 XML Schema data type definition

### 7.1 Accuracy values

Two accuracy values used in three operations are referred to the 3GPP TS 29.199-9 [6]. The "requested accuracy" is the desired accuracy for the terminal location that will be used to generate the address and the 'acceptable accuracy' sets a lower bound on accuracy.

### 7.2 AddressInfo structure

Data structure of location address composed of country, state, district, city, street, house number, additional information, and zip/postal code.

Name	Type	Optional	Description
country	xsd:string	Yes	The country is identified by the ISO 3166 code
state	xsd:string	Yes	National subdivision name (e.g. state, province)
district	xsd:string	Yes	District name
city	xsd:string	Yes	City or township name
street	xsd:string	Yes	Street name
houseNumber	xsd:string	Yes	House number
additionalInfo	xsd:string	Yes	Additional location information
code	xsd:string	Yes	Zip/Postal code

### 7.3 AddressData structure

Data structure containing terminal number and address information for a geographic place.

Name	Type	Optional	Description
terminalNumber	xsd:anyURI	No	URI of the terminal for which address information is being requested.
currentAddress	AddressInfo	No	Address of terminal, composed of country, state, city, street, house number, additional information, and zip/postal code.

### 7.4 DelayTolerance enumeration

Enumeration of the delay tolerance items that forms part of the address or terminal number request.

Enumeration	Description
NoDelay	The server should immediately return any result estimate that it currently has. If no estimate is available, the server shall return the failure indication and may optionally initiate procedures to obtain a result estimate (e.g. to be available for a later request).
LowDelay	Fulfilment of the response time requirement takes precedence over fulfilment of the accuracy requirement. The server shall return any current result estimate with minimum delay. The server shall attempt to fulfill any accuracy requirement, but in doing so shall not add any additional delay (i.e. a quick response with lower accuracy is more desirable than waiting for a more accurate response).
DelayTolerant	Fulfilment of the accuracy requirement takes precedence over fulfilment of the response time requirement. If necessary, the server should delay providing a response until the accuracy requirement of the requesting application is met. The server shall obtain a current result with regard to fulfilling the accuracy requirement.

## 8 Web service interface definition

### 8.1 Interface: TerminalAddress

Request the address of a terminal, addresses of a group of terminals, and the distance from a terminal to a specific address.

#### 8.1.1 Operation: getAddressOfTerminal

This operation retrieves address information for a single terminal. RequestedAccuracy is the desired accuracy for the terminal location that will be used to generate the address. AcceptableAccuracy sets a lower bound on accuracy. If RequestedAccuracy is not possible, a PolicyException POL0230 is returned. If the accuracy is not within the limit set by AcceptableAccuracy, no address information is returned. Instead, a ServiceException(SVC0200) is returned. The URI provided is for a single terminal, not a group URI. If a group URI is provided, a PolicyException POL0006 is returned.

If tolerance is indicated this affects the priority of accuracy, response time and maximum estimate age.

##### 8.1.1.1 Input message: getAddressOfTerminalRequest

Part name	Part type	Optional	Description
requester	xsd:anyURI	Yes	It identifies the entity that is requesting the information. The application invokes this operation on behalf of this entity. However, it should NOT be assumed that the application has authenticated the requester. If this part is not present, the requesting entity is the application itself.
terminalNumber	xsd :anyURI	No	URI of the terminal for which address information is being requested.
requestedAccuracy	xsd:int	No	Accuracy of terminal location on which returned address will be based.
acceptableAccuracy	xsd:int	No	Accuracy of terminal location that is acceptable for determining the returned address.
maximumAge	common:TimeMetric	Yes	Maximum acceptable age, in seconds, of the address information that is returned.
responseTime	common:TimeMetric	Yes	Indicates the maximum time that the application can accept to wait for a response.
tolerance	DelayTolerance	No	Indicates the priority of response time versus accuracy.

##### 8.1.1.2 Output message: getAddressOfTerminalResponse

Part name	Part type	Optional	Description
result	AddressInfo	No	Address of the terminal for which address information was requested.

##### 8.1.1.3 Referenced Faults

ServiceException from 3GPP TS 29.199-1 [5]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0200: Accuracy out of limit.
- SVC0370: No valid terminal number(s).

PolicyException from 3GPP TS 29.199-1 [5]:

- POL0001: Policy error.
- POL0002: Privacy error.
- POL0006: Groups not allowed.
- POL0230: Requested accuracy not supported.

## 8.1.2 Operation: getAddressOfTerminalForGroup

This operation retrieves address information for one or more terminals or groups of terminals. RequestedAccuracy is the accuracy of terminal location used to generate addresses. AcceptableAccuracy sets a lower bound on that accuracy. If RequestedAccuracy is not possible, a PolicyException POL0230 is returned. If the accuracy is not within the limit set by AcceptableAccuracy, then the address data will contain a ServiceError (SVC0200).

If tolerance is indicated this affects the priority of accuracy, response time and maximum estimate age.

### 8.1.2.1 Input message: getAddressOfTerminalForGroupRequest

Part name	Part type	Optional	Description
requester	xsd:anyURI	Yes	It identifies the entity that is requesting the information. The application invokes this operation on behalf of this entity. However, it should NOT be assumed that the application has authenticated the requester. If this part is not present, the requesting entity is the application itself.
terminalNumbers	xsd:anyURI [1...unbounded]	No	List of URIs, including group URIs, of the terminal for which address information is being requested.
requestedAccuracy	xsd:int	No	Accuracy of terminal location on which returned address will be based.
acceptableAccuracy	xsd:int	No	Accuracy of terminal location that is acceptable for determining the returned address.
maximumAge	common:TimeMetric	Yes	Maximum acceptable age, in seconds, of the address information that is returned.
responseTime	common:TimeMetric	Yes	Indicates the maximum time that the application can accept to wait for a response.
tolerance	DelayTolerance	No	Indicates the priority of response time versus accuracy.

### 8.1.2.2 Output message: getAddressOfTerminalForGroupResponse

Part name	Part type	Optional	Description
result	AddressData [1...unbounded]	No	Addresses of the terminals for which address information was requested.

### 8.1.2.3 Referenced faults

ServiceException from 3GPP TS 29.199-1 [5]:

- SVC0001 - Service error.
- SVC0002 - Invalid input value.
- SVC0006 - Invalid group.
- SVC0200 - Accuracy out of limit.
- SVC0370 – No valid terminal number(s).

PolicyException from 3GPP TS 29.199-1 [5]:

- POL0001 - Policy error.
- POL0002 - Privacy error.
- POL0006 - Groups not allowed.
- POL0007 - Nested groups not allowed.
- POL0230 - Requested accuracy not supported.
- POL0350 - Too many terminal numbers.



### 8.1.3 Operation: GetTerminalDistanceFromAddress

This operation is intended to determine the distance of a terminal from an address. 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.

#### 8.1.3.1 Input message: GetTerminalDistanceFromAddressRequest

Part name	Part type	Optional	Description
requester	xsd:anyURI	Yes	It identifies the entity that is requesting the information. The application invokes this operation on behalf of this entity. However, it should NOT be assumed that the application has authenticated the requester. If this part is not present, the requesting entity is the application itself.
terminalNumber	xsd:anyURI	No	URI of the terminal for which distance information is being requested.
address	AddressInfo	No	Address of the location from which to measure

#### 8.1.3.2 Output message: GetTerminalDistanceFromAddressResponse

Part name	Part type	Optional	Description
result	xsd:int	No	Distance in meters from the terminal to the location address

#### 8.1.3.3 Referenced faults

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

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0370: No valid terminal number(s).

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

- POL0001: Policy error.
- POL0002: Privacy error.
- POL0006: Groups not allowed.

## 9 Fault definitions

### 9.1 Fault: ServiceException

#### 9.1.1 SVC0200: Accuracy out of limit.

Name	Description
Message Id	SVC0200
Text	Accuracy of location is not within acceptable limit.
Variables	None

#### 9.1.2 SVC0370: No valid terminal number(s)

Name	Description
MessageId	SVC0370
Text	No valid terminal number(s) provided in message part %1
Variables	%1 - message part

### 9.2 Fault: PolicyException

#### 9.2.1 POL0230: Requested accuracy not supported

Name	Description
Message Id	POL0230
Text	Requested accuracy is not supported.
Variables	None

#### 9.2.2 POL0350: Too many terminal numbers

Name	Description
MessageId	POL0350
Text	Too many terminal numbers specified in message part %1
Variables	%1 - message part

## 10 Service policies

Service policies for this service.

Name	Type	Description
MinimumAcceptableAccuracy	xsd:int	Minimum value for acceptable accuracy
GroupSupport	xsd:boolean	Groups URIs may be used
NestedGroupSupport	xsd:boolean	Are nested groups supported in group definitions

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## Annex A (normative): WSDL for Geocoding

The document/literal WSDL representation of this interface specification is compliant to 3GPP TS 29.199-1 [5] and is contained in text files;

- parlayx\_geocoding\_terminal\_address\_interface\_4\_0.wsdl
  - parlayx\_geocoding\_terminal\_address\_service\_4\_0.wsdl
  - parlayx\_geocoding\_types\_4\_0.xsd
- which accompany the present document.

The WSDL files have been verified using the following files:

- 16\_wsdl2Java\_axis-1\_4.bat
- 16\_wsdl2Java\_axis2-1\_4\_1.bat

which accompany the present document.

---

## Annex B (informative): Bibliography

- W3C Recommendation (2 May 2001): "XML Schema Part 2: Datatypes".  
<http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/>.
- OMA TS MLP: "Mobile Location Protocol".
- OGC: "OpenGIS Location Services (OpenLS): Core Services".  
<http://www.opengeospatial.org/standards/olscore>
- IETF RFC 4119: "A Presence-based GEOPRIV Location Object Format".  
<http://www.ietf.org/rfc/rfc4119.txt?number=4119>.

---

## Annex C (informative): Description of Parlay X Web Services Part 16: Geocoding 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.

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### C.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.

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### C.2 Specific Exceptions

#### C.2.1 Clause 1: Scope

There are no additions or exclusions.

#### C.2.2 Clause 2: References

There are no additions or exclusions.

#### C.2.3 Clause 3: Definitions and abbreviations

There are no additions or exclusions.

#### C.2.4 Clause 4: Detailed service description

There are no additions or exclusions.

#### C.2.5 Clause 5: Namespaces

There are no additions or exclusions.

## C.2.6 Clause 6: Sequence diagrams

There are no additions or exclusions.

## C.2.7 Clause 7: XML Schema data type definition

There are no additions or exclusions.

## C.2.8 Clause 8: Web Service interface definition

There are no additions or exclusions.

## C.2.9 Clause 9: Fault definitions

There are no additions or exclusions.

## C.2.10 Clause 10: Service policies

There are no additions or exclusions.

## C.2.11 Annex A (normative): WSDL for Geocoding

There are no additions or exclusions.

## Annex D (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Cat	Old	New
Jun 2006	CT_32	CP-060214	--	--	Submitted to TSG CT#32 for Information.	--	1.0.0	
Nov 2006	CT_34	CP-060611	--	--	Submitted to TSG CT#34 for Approval.	--	2.0.0	7.0.0
Mar 2007	CT_35	CP-070048	0001	--	Add OSA Parlay Web Services support for 3GPP2 networks	F	7.0.0	7.1.0
Mar 2007	CT_35	CP-070048	0002	--	Correct number assigned to Geocoding-specific PolicyException	F	7.0.0	7.1.0
Mar 2007	CT_35	CP-070048	0003	--	Correct number & title assigned to Geocoding-specific ServiceException	C	7.0.0	7.1.0
Mar 2007	--	--	--	--	Editorial: Aligned 5 Namespaces	--	7.1.0	7.1.1
Jun 2007	--	--	--	--	Renamed in Introduction Part 18: "Device management" to "Device Capabilities and Configuration"	--	7.1.1	7.1.2
Dec 2008	CT_42	--	--	--	Upgraded unchanged from Rel-7	--	7.1.2	8.0.0
Sep 2009	CT_45	CP-090604	0004	--	Completion of Parlay X Part 16: Geocoding for Release 8		8.0.0	8.1.0
2009-12	-	-	-	-	Update to Rel-9 version (MCC)		8.1.0	9.0.0

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# History

<b>Document history</b>		
V9.0.0	January 2010	Publication