

## **Open Service Access (OSA); Parlay X Web Services; Part 9: Terminal Location**



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Reference

DES/TISPAN-01007-09-OSA

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Keywords

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## Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN).

The present document is part 9 of a multi-part deliverable covering 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".

The present document has been defined jointly between ETSI, The Parlay Group (<http://www.parlay.org>) and the 3GPP.

**The present document is equivalent to 3GPP TS 29.199-09 V6.0.0 (Release 6).**

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# 1 Scope

The present document is part 9 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 present document specifies the Terminal Location Web Service. The following are defined here:

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

---

# 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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

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

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

[2] ETSI ES 202 391-1: "Open Service Access (OSA); Parlay X Web Services; Part 1: Common".

[3] ISO 6709: "Standard representation of latitude, longitude and altitude for geographic point locations".

---

# 3 Definitions and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in ES 202 391-1 [2] apply.

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations defined in ES 202 391-1 [2] apply.

---

## 4 Detailed service description

Terminal Location provides access to the location of a terminal through:

- Request for the location of a terminal.
- Request for the location of a group of terminals.
- Notification of a change in the location of a terminal.
- Notification of terminal location on a periodic basis.
- Location is expressed through a latitude, longitude, altitude and accuracy.

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.

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## 5 Namespaces

The Terminal Location interface uses the namespace:

`www.csapi.org/wsd/parlayx/terminal_location/v2_0`

The TerminalLocationNotificationManager interface uses the namespace:

`www.csapi.org/wsd/parlayx/terminal_location/notification_manager/v2_0`

The TerminalLocationNotification interface uses the namespace:

`www.csapi.org/wsd/parlayx/terminal_location/notification/v2_0`

The data types are defined in the namespace:

`www.csapi.org/schema/parlayx/terminal_location/v2_0`

The 'xsd' namespace is used in the present document to refer to the XML Schema data types defined in XML Schema [1]. The use of the name 'xsd' is not semantically significant.

## 6 Sequence diagrams

### 6.1 Terminal location query

Pattern: Request / Response.

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

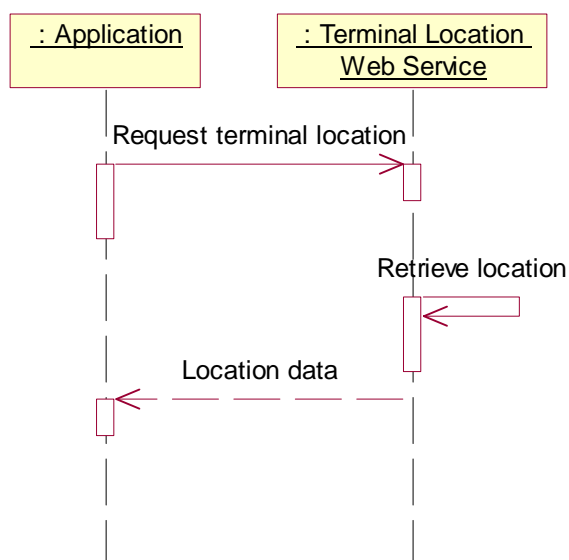


Figure 1



## 6.2 Terminal location group query

Pattern: Request / Response.

When an application requires the locations of a set of terminal devices, it may provide an array of terminal device addresses, including network managed group addresses, and receive the location data for the set of devices requested.

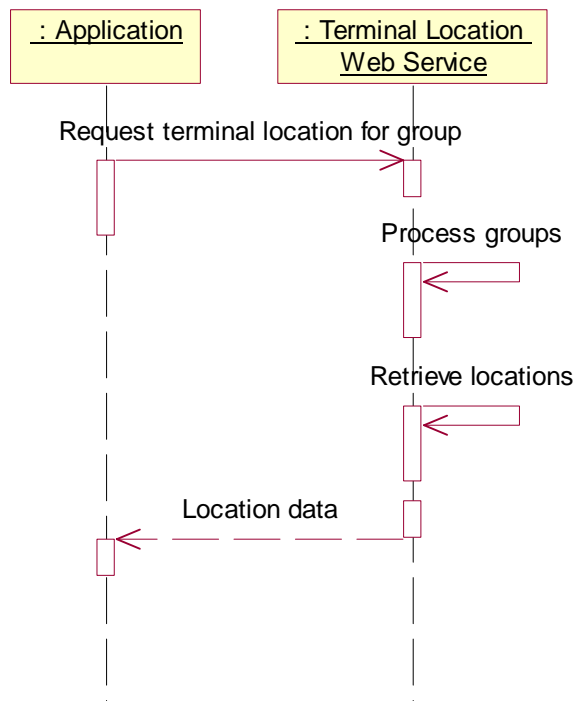


Figure 2

## 6.3 Terminal location notification

Pattern: Application Correlated Multiple Notification.

An application can be notified of a terminal device entering or leaving a geographical area. When a matching event occurs; a notification message will be sent to the application.

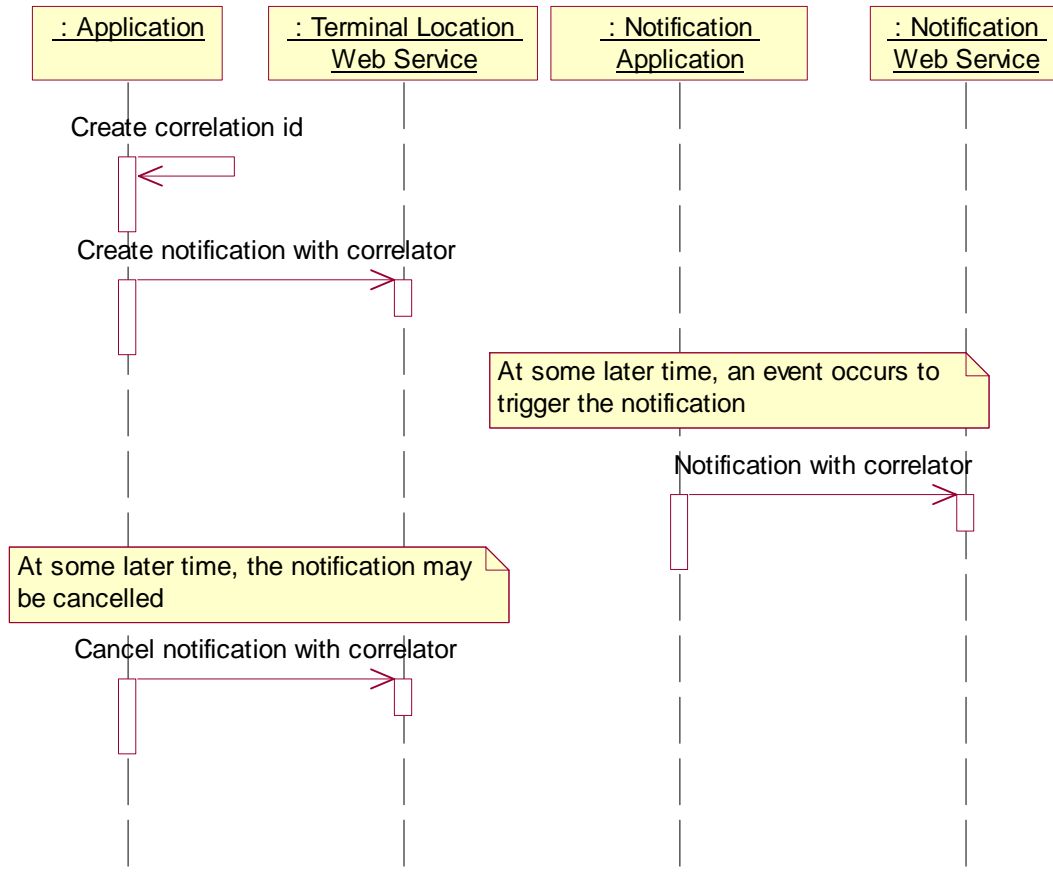


Figure 3

## 6.4 Terminal location notification with check immediate

In some applications, the terminal location notification will be used to watch for a specific location change. An example is a 'call when present' service, where the terminal location is checked and determined to be outside the target area, and a notification is set up to notify the application when the terminal enters the target area. Between the time of the original location determination and the time the notification is set up, the terminal could move into the target area, thus the notification on entry into the target area would not be sent.

Using the check immediate flag, after the notification is established, the terminal location will be determined, and if the terminal is in the target area, then a notification will be sent immediately. The following sequence diagram shows this scenario.

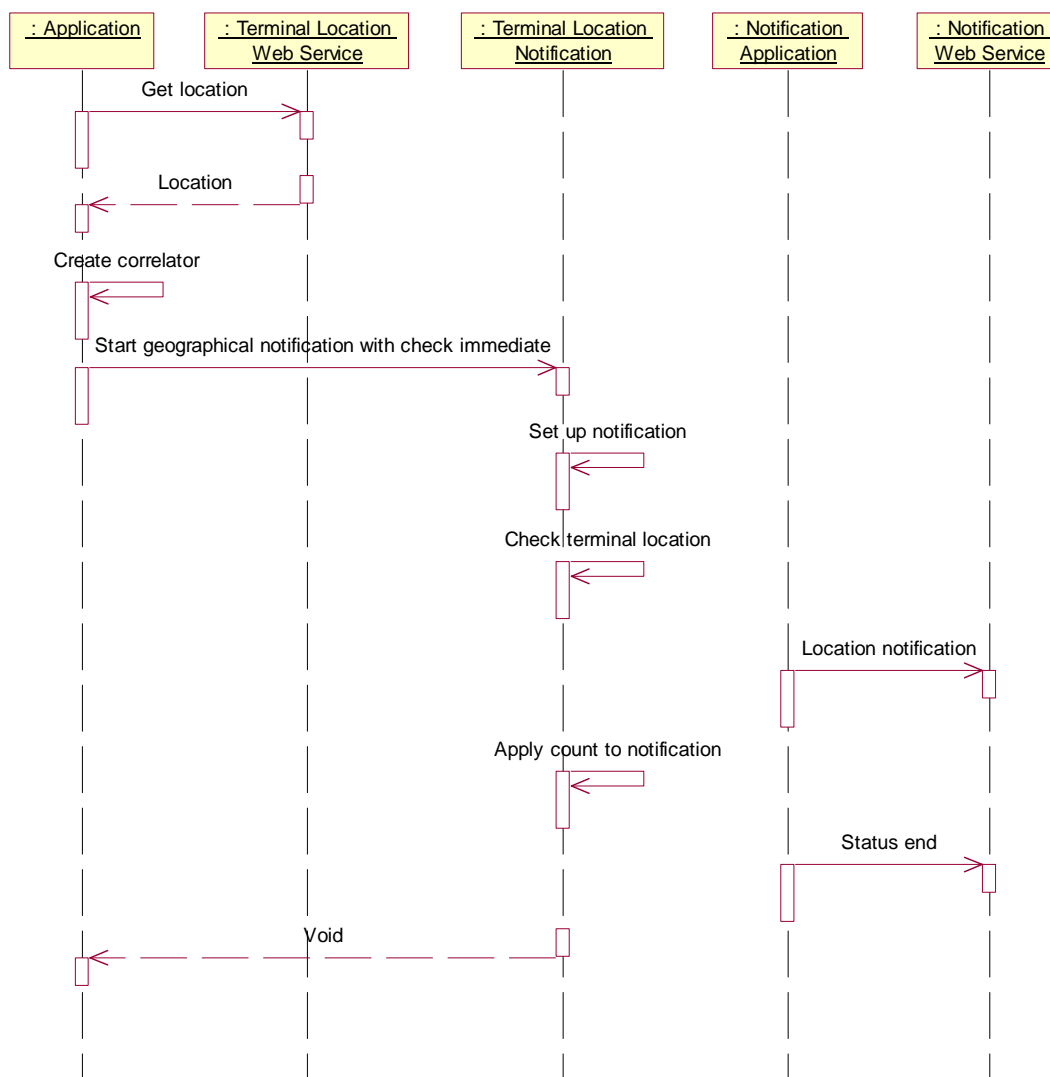


Figure 4

This sequence shows:

- The Enterprise Application checks the location of a terminal, and receives its location (in this scenario determining that the terminal is outside the target area).
- The Enterprise Application generates a correlator, and starts a notification with criteria defined to notify the Enterprise Web Service when the terminal enters the target area and the check immediate flag set to true.
- Sets up the notification to monitor terminal location.
- Check the current location of the terminal, and determine if the terminal lies inside the target area.

- In this case, the terminal is in the target area, 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 startGeographicalNotification 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.

## 6.5 Terminal location periodic notification

Pattern: Application Correlated Multiple Notification.

An application can be notified of a terminal device location on a periodic basis. At each interval, a notification message will be sent to the application.

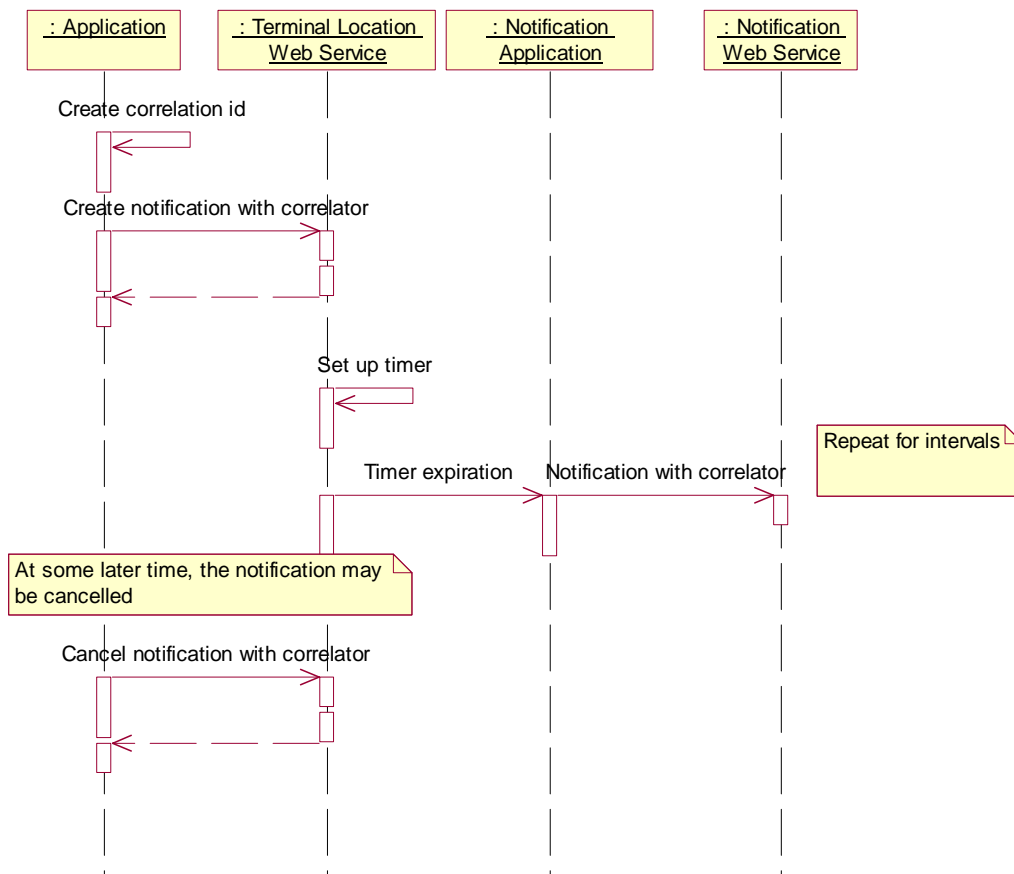


Figure 5

## 7 XML Schema data type definition

### 7.1 Latitude and Longitude values

Latitude and longitude values used in the present document follow the conventions of the ISO 6709 [3] specification, as it applies to latitudes and longitudes specified using decimal degrees.

Latitude values are expressed as floating point numbers in the range -90,0000 to +90,0000, using decimal degrees (as opposed to minutes and seconds). Positive values indicate locations north of and on the equator. Negative values indicate locations south of the equator.

Longitude values are expressed as floating point numbers in the range -180,0000 to +180,0000, using decimal degrees (as opposed to minutes and seconds). Positive values indicate locations east of and on the prime meridian (Greenwich). Negative values indicate locations west of the prime meridian up to the 180<sup>th</sup> meridian.

### 7.2 Accuracy values

Two accuracy values are used in some of the operations. These values express the desire of the application for the location information to be provided by the Web Service. The choice of values may influence the price that the Service Provider charges.

The 'requested accuracy' expresses the range in which the application wishes to receive location information. This may influence the choice of location technology to use (for instance, cell sector location may be suitable for requests specifying 1 000 meters, but GPS technology may be required for requests below 100 meters).

The 'acceptable accuracy' expresses the range that the application considers useful, if the location cannot be determined within this range, then the application would prefer not to receive the information. For instance, a taxi tracking service to determine the closest taxi to a person may not be useful if the accuracy cannot be provided within 1 000 meters to provide prompt service. This will also reduce customer satisfaction issues, since results that are not useful can be handled appropriately for billing (e.g. Service Provider may choose not to bill for these).

### 7.3 EnteringLeavingCriteria enumeration

Indicator for whether the notification is related to entering an area or leaving an area.

Enumeration	Description
Entering	Terminal is entering an area
Leaving	Terminal is leaving an area

### 7.4 LocationInfo structure

Location information represented as a coordinate.

Name	Type	Description
Address	xsd:anyURI	Address of the terminal device to which the location information applies
Latitude	xsd:float	Location latitude
Longitude	xsd:float	Location longitude
Altitude	xsd:float	Location altitude (optional)
Accuracy	xsd:int	Accuracy of location provided in meters
Timestamp	xsd:dateTime	Date and time that location was collected

## 7.5 RetrievalStatus enumeration

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

Enumeration	Description
Retrieved	Location retrieved, with result in CurrentLocation element
NotRetrieved	Location not retrieved, CurrentLocation is not provided (does not indicate an error, no attempt may have been made)
Error	Error retrieving location

## 7.6 LocationData structure

Data structure containing device address, retrieval status and location information. 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	Description
ReportStatus	RetrievalStatus	Status of retrieval for this terminal device address
CurrentLocation	LocationInfo	Location of terminal
ErrorInformation	common:ServiceError	If report status is error, this is the reason for the error. Error due to privacy verification will be expressed as POL0002 in the ServiceError

---

## 8 Web Service interface definition

### 8.1 Interface: TerminalLocation

Request the location for a terminal.

#### 8.1.1 Operation: GetLocation

This operation is intended to retrieve the location for a single terminal. The accuracy requested is the desired accuracy for the response. The acceptable accuracy is the limit acceptable to the requester. If the accuracy requested cannot be supported, a PolicyException (POL0230) will be returned to the application. If the accuracy of the location is not within the acceptable accuracy limit, then the location will not be returned, instead a ServiceException (SVC0200) will be returned. 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: GetLocationRequest

Part name	Part type	Description
Address	xsd:anyURI	Address of the terminal device for which the location information is requested
RequestedAccuracy	xsd:int	Accuracy of location information requested
AcceptableAccuracy	xsd:int	Accuracy that is acceptable for a response

##### 8.1.1.2 Output message: GetLocationResponse

Part name	Part type	Description
Result	LocationInfo	Location of the terminal for which location information was requested

### 8.1.1.3 Referenced faults

ServiceException from ES 202 391-1 [2]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0200: Accuracy out of limit.

PolicyException from ES 202 391-1 [2]:

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

## 8.1.2 Operation: GetTerminalDistance

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

### 8.1.2.1 Input message: GetTerminalDistanceRequest

Part name	Part type	Description
Address	xsd:anyURI	Address of terminal to check
Latitude	xsd:float	Latitude of the location to measure from
Longitude	xsd:float	Longitude of the location to measure from

### 8.1.2.2 Output message: GetTerminalDistanceResponse

Part name	Part type	Description
Result	xsd:int	Distance from terminal to the location specified in meters

### 8.1.2.3 Referenced faults

ServiceException from ES 202 391-1 [2]:

- SVC0001: Service error.
- SVC0002: Invalid input value.

PolicyException from ES 202 391-1 [2]:

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

## 8.1.3 Operation: GetLocationForGroup

The getLocationForGroup operation initiates a retrieval activity, where one or more terminals, or groups of terminals, may have their locations determined. The accuracy requested is the desired accuracy for the response. If the accuracy requested is not supported, a PolicyException (POL0230) will be returned to the application. If the location retrieved is not within the acceptable accuracy limit, then the location data will contain a ServiceError (SVC0200).

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 for which a location retrieved was not attempted.

### 8.1.3.1 Input message: GetLocationForGroupRequest

Part name	Part type	Description
Addresses	xsd:anyURI [0..unbounded]	List of URIs to get location for, including group URIs
RequestedAccuracy	xsd:int	Accuracy of location requested in meters
AcceptableAccuracy	xsd:int	Accuracy that is acceptable for a response in meters

### 8.1.3.2 Output message: GetLocationForGroupResponse

Part name	Part type	Description
Result	LocationData [0..unbounded]	Set of results for the request

### 8.1.3.3 Referenced faults

ServiceException from ES 202 391-1 [2]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0004: No valid addresses.
- SVC0006: Invalid group.

PolicyException from ES 202 391-1 [2]:

- POL0001: Policy error.
- POL0003: Too many addresses.
- POL0006: Groups not allowed.
- POL0007: Nested groups not allowed.
- POL0230: Requested accuracy not supported.

## 8.2 Interface: TerminalLocationNotificationManager

Set up notifications for terminal location events using geographical based definitions.

### 8.2.1 Operation: StartGeographicalNotification

Notifications of location 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 location will be checked. If the terminal location is within the radius provided and the criteria is Entering or is outside the radius and the criteria is Leaving, a notification will be sent to the application. This notification will count against the count requested. This addresses the case where the location 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 (specifying a count of zero). If the count value provided is not in policy, a PolicyException (POL0004 or POL0005 as appropriate) will be returned.

### 8.2.1.1 Input message: StartGeographicalNotificationRequest

Part name	Part type	Description
Reference	common:SimpleReference	Notification endpoint definition
Addresses	xsd:anyURI [0..unbounded]	Addresses of terminals to monitor
Latitude	xsd:float	Latitude of centre point
Longitude	xsd:float	Longitude of centre point
Radius	xsd:float	Radius of circle around centre point in meters
Criteria	EnteringLeavingCriteria	Indicates whether the notification should occur when the terminal enters or leaves the target area
CheckImmediate	xsd:boolean	Check location immediately after establishing notification
Frequency	common:TimeMetric	Maximum frequency of notifications (can also be considered minimum time between notifications)
Duration	common:TimeMetric	Length of time notifications occur for, null to use default notification time defined by service policy
Count	xsd:int	Maximum number of notifications, zero if no maximum

### 8.2.1.2 Output message: StartGeographicalNotificationResponse

Part name	Part type	Description
None		

### 8.2.1.3 Referenced faults

ServiceException from ES 202 391-1 [2]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0004: No valid addresses.
- SVC0005: Duplicate correlator.
- SVC0006: Invalid group.

PolicyException from ES 202 391-1 [2]:

- 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.
- POL0231: Geographic notification not available.

## 8.2.2 Operation: StartPeriodicNotification

Periodic notifications provide location information for a set of terminals at an application defined interval. The accuracy requested is the desired accuracy for the response. If the accuracy requested is not supported, a PolicyException (POL0230) will be returned to the application.

### 8.2.2.1 Input message: StartPeriodicNotificationRequest

Part name	Part type	Description
Reference	common:SimpleReference	Notification endpoint definition
Addresses	xsd:anyURI [0..unbounded]	Addresses of terminals to monitor
RequestedAccuracy	xsd:int	Accuracy of location requested in meters
Frequency	common:TimeMetric	Maximum frequency of notifications (can also be considered minimum time between notifications)
Duration	common:TimeMetric	Length of time notifications occur for, null to use default notification time defined by service policy

### 8.2.2.2 Output message: StartPeriodicNotificationResponse

Part name	Part type	Description
None		

### 8.2.2.3 Referenced faults

ServiceException from ES 202 391-1 [2]:

- SVC0001: Service error.
- SVC0002: Invalid input value.
- SVC0004: No valid addresses.
- SVC0005: Duplicate correlator.
- SVC0006: Invalid group.

PolicyException from ES 202 391-1 [2]:

- POL0001: Policy error.
- POL0003: Too many addresses.
- POL0006: Groups not allowed.
- POL0007: Nested groups not allowed.
- POL0009: Invalid frequency requested.
- POL0230: Requested accuracy not available.
- POL0232: Periodic notification not available.

## 8.2.3 Operation: EndNotification

The application may end a notification (either type) using this operation.

Until this operation returns, notifications may continue to be received by the application.

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

### 8.2.3.1 Input message: EndNotificationRequest

Part name	Part type	Description
Correlator	xsd:string	Correlator of request to end

### 8.2.3.2 Output message: EndNotificationResponse

Part name	Part type	Description
None		

### 8.2.3.3 Referenced faults

ServiceException from ES 202 391-1 [2]:

- SVC0001: Service error.
- SVC0002: Invalid input value.

PolicyException from ES 202 391-1 [2]:

- POL0001: Policy error.

## 8.3 Interface: TerminalLocationNotification

Notification interface to which notifications are delivered.

### 8.3.1 Operation: LocationNotification

When the location of a monitored device changes a notification is delivered to the application with the new location information. If a group identifier was used, the terminal device URI is provided, not the group URI.

#### 8.3.1.1 Input message: LocationNotificationRequest

Part name	Part type	Description
Correlator	xsd:string	Correlator provided in request to set up this notification
Data	LocationInfo [0 .. unbounded]	Location information for terminal
Criteria	EnteringLeavingCriteria	Indicates whether the notification was caused by the terminal entering or leaving the target area (provided for geographical notifications, not for periodic notifications)

#### 8.3.1.2 Output message: LocationNotificationResponse

Part name	Part type	Description
None		

### 8.3.1.3 Referenced faults

None.

## 8.3.2 Operation: LocationError

The location error message is sent to the application to indicate that the notification for a terminal, or for the whole notification, is being cancelled by the Web Service.

### 8.3.2.1 Input message: LocationErrorRequest

Part name	Part type	Description
Correlator	xsd:string	Correlator provided in request to set up this notification
Address	xsd:anyURI	Address of terminal if the error applies to an individual terminal, or nil if it applies to the whole notification
Reason	common:ServiceError	Reason notification is being discontinued

### 8.3.2.2 Output message: LocationErrorResponse

Part name	Part type	Description
None		

### 8.3.2.3 Referenced faults

None.

## 8.3.3 Operation: LocationEnd

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: LocationEndRequest

Part name	Part type	Description
Correlator	xsd:string	Correlator provided in request to set up this notification

### 8.3.3.2 Output message: LocationEndResponse

Part name	Part type	Description
None		

### 8.3.3.3 Referenced faults

None.

## 9 Fault definitions

### 9.1 ServiceException

#### 9.1.1 SVC0200: Accuracy out of limit

Name	Description
Message Id	SVC0200
Text	Accuracy of location is not within acceptable limit
Variables	

### 9.2 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 POL0231: Geographic notification not available

Name	Description
Message Id	POL0231
Text	Geographic notification is not available
Variables	None

#### 9.2.3 POL0232: Periodic notification not available

Name	Description
Message Id	POL0232
Text	Periodic notification is not available
Variables	None

## 10 Service policies

Service policies for this service.

Name	Type	Description
MinimumAccuracy	xsd:int	Minimum value for requested accuracy
MinimumAcceptableAccuracy	xsd:int	Minimum value for acceptable accuracy
GeographicalNotificationAvailable	xsd:boolean	Can notifications be set on a geography
PeriodicNotificationAvailable	xsd:boolean	Can a periodic notification be set up
AltitudeAlwaysAvailable	xsd:boolean	Is altitude available for all location responses
AltitudeSometimesAvailable	xsd:boolean	Is altitude available for some or all location responses (if AltitudeAlwaysAvailable is true, this is also true)
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)
MaximumNotificationDuration	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. specify zero in notification count requested)
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 Terminal Location

The document/literal WSDL representation of this interface specification is compliant to ES 202 391-1 [2] and is contained in text files (contained in archive es\_20239109v010101p0.zip) which accompany the present document.

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## Annex B (informative): Bibliography

ETSI TR 121 905: "Universal Mobile Telecommunications System (UMTS); Vocabulary for 3GPP Specifications (3GPP TR 21.905)".



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## History

<b>Document history</b>		
V1.1.1	January 2005	Membership Approval Procedure    MV 20050318: 2005-01-18 to 2005-03-18
V1.1.1	March 2005	Publication