A framework for instant messaging and presence data exchange with the Mobilkom Austria

Design Draft

IPcom GmbH
Karlsplatz 1/2/9
A-1010 Wien

Document History

2007-07-30	2h	Klaus Darilion	first draft
2007-07-31	3h	Klaus Darilion	bulk vs. dedicated, example, formatting
2007-08-03	1h	Klaus Darilion	phone call with F. Kröpfl
2007-08-03	2h	Klaus Darilion	RFC research
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2007-08-07	6	Klaus Darilion	remove SUSBCRIBE/NOTIFY, clarify GML usage
2007-08-07	2,5h	Klaus Darilion	Examples
2007-08-10	2,5h	A. Mayrhofer	PIDF-LO-Dynamic, more examples, added UAC-vision, MESSAGE changed to username addressing, more notes.

Table of Contents

1 Introduction

Several systems in the network of Mobilkom Austria are able to generate and process location data. Location data can be seen as a subset of presence data, enhancing any presence related application.

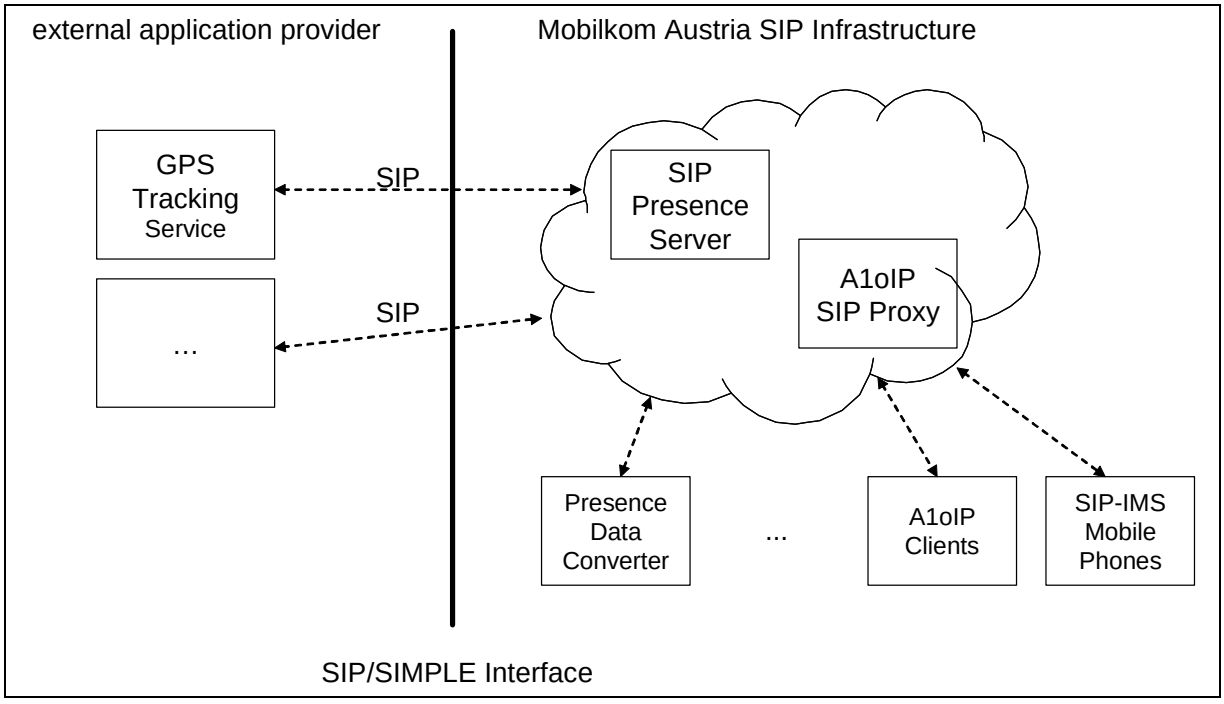
This document defines an interface between the network of Mobilkom Austria and external application providers to exchange location enabled presence data and instant messaging. For this purpose the Session Initiation Protocol (SIP) and its extensions for instant messaging and presence (SIMPLE) will be used.

The following sections describe how external application providers should use the SIP/SIMPLE conform interface to communicate with Mobilkom Austria's SIP/SIMPLE systems.

2 Overview

The "SIMPLE Interface" will use the Session Initiation Protocol (SIP) and its extension for instant messaging (IM) and presence (SIMPLE) for data exchange. External application providers gain access to the Mobilkom Austria (MKA) SIP infrastructure via the SIMPLE interface. This interface is bi-directional. Thus, external application providers can use this interface to deliver presence data and IM to MKA or to receive such data from MKA.

The following figure shows exemplarily an external GPS tracking service which delivers the location of subscribers as SIP presence data to MKA. MKA for example can use this data to extend the presence status of A1overIP subscribers.



3 Definition of the SIMPLE Interface

Although presence and instant messaging usually appear together, they are two different services based on SIP. Thus, these two services will be described each on its own.

3.1 Presence

The IETF describes two methods for exchanging presence data.

- [RFC 3856] [RFC 3859] describes an event package for usage with the SUBSCRIBE/NOTIFY framework [RFC 3265].
- [RFC 3903] defines the PUBLISH method for publication of state events.

Whereas the SUBSCRIBE/NOTIFY framework is well suited for subscription to selected resources, the PUBLISH method is well suited for state publication of arbitrary resources.

This document specifies the use of the PUBLISH method for presence state publication.

Thus, there is no need for the SIP infrastructure to REGISTER or SUBSCRIBE at the service provider's SIP service as the provisioning of the publisher is done outside of the scope of SIP.

Note: As the publication is not done by the presentity (e.g. the GPS receiver) itself but by the service providers service, the publication is often also called "third party publication"

The presence is described in an XML document using the Presence Information Data Format [RFC 3863], following called PIDF document. The PIDF document is transmitted in the body of the PUBLISH request using the content type "application/pidf+xml".

3.1.1 Location

Presence does not only contain online/offline status of the resources/presentities but also more detailed descriptions like the location of the presentity. Adding location to presence is defined in [RFC 4119], shortly called PIDF-LO.

PIDF-LO itself allows the inclusion of location information using two different location types:

- civic location
- geographic coordinates

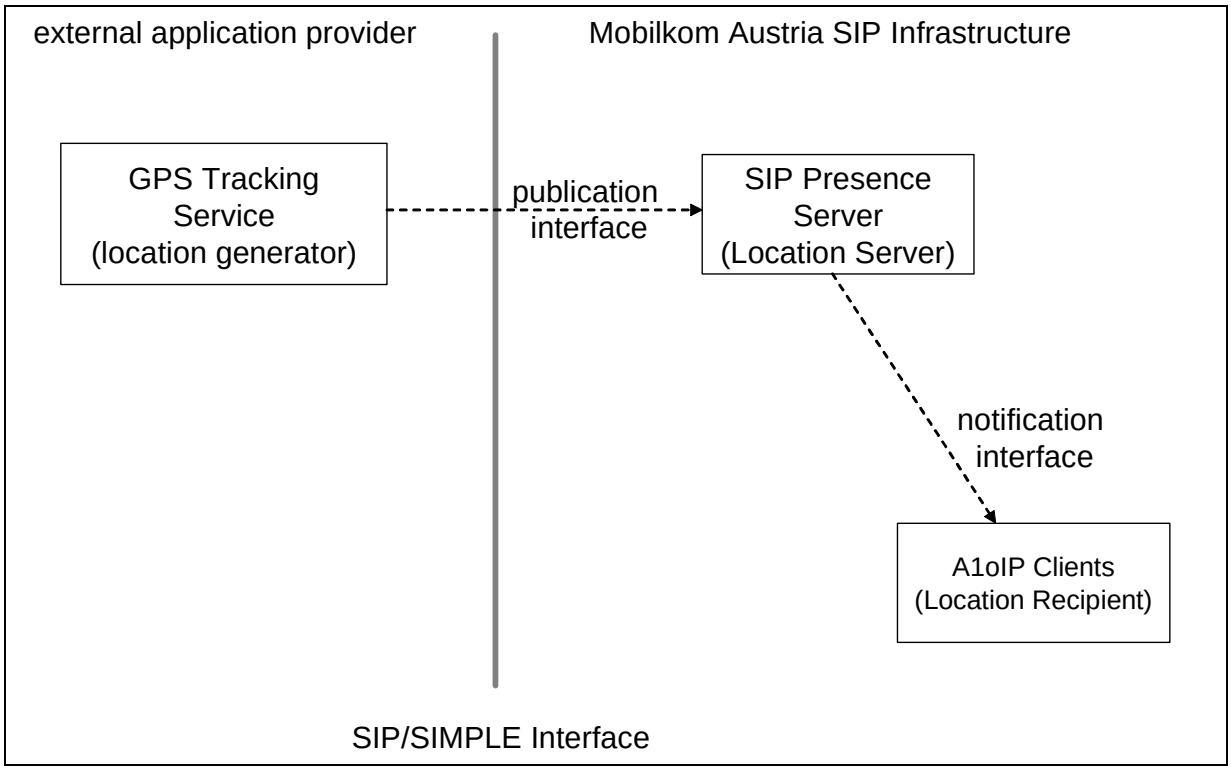
A PIDF-LO extension for carrying temporal (dynamic) spatial information is currently developed in the IETF ([draft-singh-geopriv-pidf-lo-dynamic]), this extension allows conveyance of speed, bearing, acceleration, etc.

For civic locations PIDF-LO defines the civic location format (namespace=urn:ietf:params:xml:ns:pidf:geopriv10:civicLoc).

For geographic coordinates PIDF-LO refers to the Geography Markup Language (GML) 3.0 [GML]. As the GML is very generic and allows various different shapes its usage may be confusing. Thus, the MKA SIMPLE interface uses a reduced subset of the GML, defined in [draft-ietf-geopriv-pdif-lo-profile-08.txt] [GML 3.1.1 PIDF-LO]. The PIDF-LO profile also gives usage rules how the PIDF-LO document should be structured and how multiple location data should be integrated in a single PIDF document.

This document specifies the usage of the PIDF-LO profile for adding location to PIDF documents. Further, the PIDF-LO document should use the “Circle” shape to describe a location and uncertainty. If altitude is known too, the “Sphere” type should be used.

The following figure applies the terminology of [RFC 3693] to this framework:



According to section 5.3 of [RFC 3693], the publication interface is a “trusted data flow”. Thus there is no need to apply the stringent privacy requirements of presence and location data to this interface.

Requirements:
The location generator (the SIP node of the external service provider) should publish the presence/location status of the respective presentities to the SIP Infrastructure of MKA. For this purpose the destination of the PUBLISH request will be told by MKA and must be configured in the location generator.

The location generator must be able to publish the presence data to multiple, independent targets.

The “Expires” header should be set by the location generator to a value corresponding with the used tracking technology. For example if the presentity sends location updates at least

every 5 minutes to the tracking service, the Expires header should be set to a similar, greater value, e.g. 360 seconds.

The location generator should send PIDF documents according to [RFC 3863], [RFC 4119] and [draft-ietf-geopriv-pdif-lo-profile] using the “Circle” as preferred location shape.

Location information must be provided in the WGS 84 reference system. Information in other reference systems must be reprojected into WGS 84 before being used. The EPSG code “4326” must be used for representation of 2-dimensional information (Circle), while the EPSG code “4979” must be used to represent 3-dimensional locations (Sphere).

For additional presence data about the entity which is covered by [draft-singh-geopriv-pidf-lo-dynamic], the location generator should use the respective elements in the document to convey such data. From the elements defined in that draft, the location generator can use the following elements:

- speed (containing the speed of the presentity, the only supported unit is “km/h”)
- bearing (containing the true bearing of the presentity, the only supported variant is the use of a gml:DirectionVector)

Dynamic data must not include elevation – elevation is to be provided by means of the “Sphere” type as describe in the standard PIDF-LO specification.

(Note: the PIDF-LO-Dynamic draft is a **preliminary** specification (“work in progress”), it should be anticipated that there will be changes to this specification, which might affect the definition of the interface described in this document)

For any other information the location generator wishes to convey the use of existing PIDF-LO extensions is preferred. If there is no existing specification to express the additional data, the service provider should define a new namespace and XML schema which will be included in the PIDF document. The new namespace and XML schema has to be agreed with and acknowledged by MKA.

In addition to the information above, mobilkom Austria is also interested in receiving the following location related data:

- true distance of the presentity since the last location publication (eg. Distance driven by a car)
- average speed of the presentitiy since the last location publication (eg. Average speed of a car)

Although this information could in some cases be derived from the information of several subsequent location updates, information directly taken from the client might be more accurate (eg. Because the straight line between two subsequent location updates might not reflect the true distance the presentity has moved)

For this information, extensions to PIDF-LO have to be agreed between mobilkom Austria and location generators. Suggestions for such a format are appreciated.

Implementation note: The location generator has to maintain the state of the SIP-Etag for each presentity and target [RFC 3903].

Examples for PIDF-LO documents with and without dynamic information are contained in section 5.1.

3.2 Instant Messaging

[RFC 3428] defines the MESSAGE method which is used for sending instant messaging. This instant messaging mode is called “page mode” as multiple instant messages are not related to each other (like sending SMS – there is no transaction state kept in following instant messages).

This is contrary to the “session mode” where SIP is used to establish a dedicated IM session using the Message Session Relay Protocol [MSRP].

This document specifies the use of the MESSAGE method (aka “page mode”) for instant messaging.

The message itself is transported in the body of the MESSAGE request. The content type of the body should be “text/plain” [RFC 2046]. The default character set of text/plain is US-ASCII. Thus, if the instant message contains non US-ASCII characters the character set should be UTF-8, e.g.:

```
Content-type: text/plain; charset=UTF-8
```

3.3 SIP Requirements

In general the SIMPLE interface is a SIP interface and has to conform to [RFC 3261]. This RFC defines the basic behavior of SIP UA Clients and SIP UA Servers (if not explicitly addressed in the extension RFC).

Further, for locating SIP proxy servers the rules in [RFC 3263] have to be applied to resolve the destination to a destination socket[1]. Note: The destination address where the requests should be sent to (the ingress point to the MKA SIP infrastructure) may be different from the host part of the request URI (see section 4).

The location generator should obtain a rate limit for sent SIP requests. The rate should be configurable per presentity and for all requests. These rate limits will be defined by MKA, for example an overall maximum of 100 PUBLISH requests per second and per presentity a maximum of 1 PUBLISH request per second.

The location generator should support sending and receiving SIP messages via UDP, TCP. Further, when the SIP traffic passes public Internet the SIP signaling has be encrypted either by using TLS as transport protocol or by using an IP layer encryption protocol like IPsec. When using UDP the location generator has to be “SIP symmetric” which means that SIP messages are sent from and received at the same port. In case of TCP/TLS the location generator should receive SIP traffic on the default listening port and on current established TCP connections. Further, connection reuse should be applied.

[1] A socket is defined by an IP address and a port

4 Addressing

The Addressing is done via SIP URIs. The main identifier is the IMSI of the mobile subscriber, although depending in the scenario other identifiers like the MSISDN or a username can be used too.

A SIP message has at least 3 places where SIP URIs are used:

request URI	The SIP URI in the request line of the SIP request
To URI	The SIP URI in the To: header of a SIP message
From URI	The SIP URI in the From: header of a SIP message

The following sections define how this 3 URIs should be populated with address identifiers.

Note: As specified in RFC3261 routing decisions must be made on the request URI and not on the To URI. Once the routing decision was done, the destination address will be derived from the domain in the request URI or from a pre configured destination address.

4.1 Presence Publication

The presentity whose presence is to be PUBLISHED is addressed in the request URI of the request. The external service provider should use a SIP URI with the IMSI as the username and a domain identifying its service. For example the presentity of the mobile subscriber with the IMSI 284011234567890, tracked by “provider.com” using the “gpstracker” service has the SIP URI:

```
sip:284011234567890@gpstracker.provider.com
```

The PUBLISH request sent by publisher to the MKA SIP infrastructure should use the following URIs:

request URI	the presentity’s SIP URI using the IMSI as username, e.g: `sip:284011234567890@gpstracker.provider.com`
To URI	identical to the request URI
From URI	a generic SIP URI identifying the publisher, e.g. `sip:server15@gpstracker.provider.com`

Note: According to the SIMPLE specifications, the “request URI” and the “To URI” contain the URI of the presentity on behalf of which presence is published, not the “destination” of the request itself.

Note: As the request URI’s domain is the service provider’s domain, this domain can not be used to derive the destination of the PUBLISH request. The destination will be announced by MKA for each interconnection and may be an IP address and port or a domain name. If MKA provides a domain name, the resolution mechanisms defined in RFC 3263 should be used. Further, if MKA provides multiple destination IP addresses (either directly or indirectly via SRV records), and sending of the publication fails, the publication should be sent to the next IP address instead (failover).

Location generators should publish a PIDF document without location information when a user comes online, but has not provided (yet) usable location information.

4.2 Instant Messaging

In the service providers network the subscriber should be identified with its IMSI (refer to section 4.1).

If not otherwise defined, addressing a subscriber within the MKA SIP network is based on the A1.net username of the subscriber, using the respective MKA domain, e.g. a1.net.
For example:

```
sip:example_user@A1.net
```

The MESSAGE request sent by the service providers SIP proxy to the MKA SIP infrastructure should use the following URIs:

request URI	The SIP URI of the subscriber in the MKA SIP network, e.g.: `sip:example_user@A1.net`
To URI	identical to the request URI
From URI	the presentity's SIP URI using the IMSI as username, e.g.: `sip:240011234567890@gpstracker.provider.com`

The MESSAGE request sent by the MKA SIP proxy to the service providers SIP proxy will use the following URIs (unless otherwise specified):

request URI	The targets SIP URI using the IMSI as username, e.g.: `sip:240011234567890@gpstracker.provider.com`
To URI	identical to the request URI
From URI	the SIP URI of the subscriber in the MKA SIP network, e.g.: `sip:example_user@A1.net`

Note: The defined addressing schema uses different identifiers: the service provider's subscribers are identified using the IMSI whereas the MKA subscribers are identified using the user_id. This is necessary as the service provider does not know the user_id of a MKA subscriber, but the user (the human person) only knows the user_id of other subscribers. For example user "John Public" uses the gpstracker service of provider.com, which also allows sending instant messages. John Public sends an instant message to its friend with the username example_user. The service provider does not know the mappings between IMSI and username – thus it has to use the IMSI as identifier of the sender and it has to use the username as identifier of the receiver.

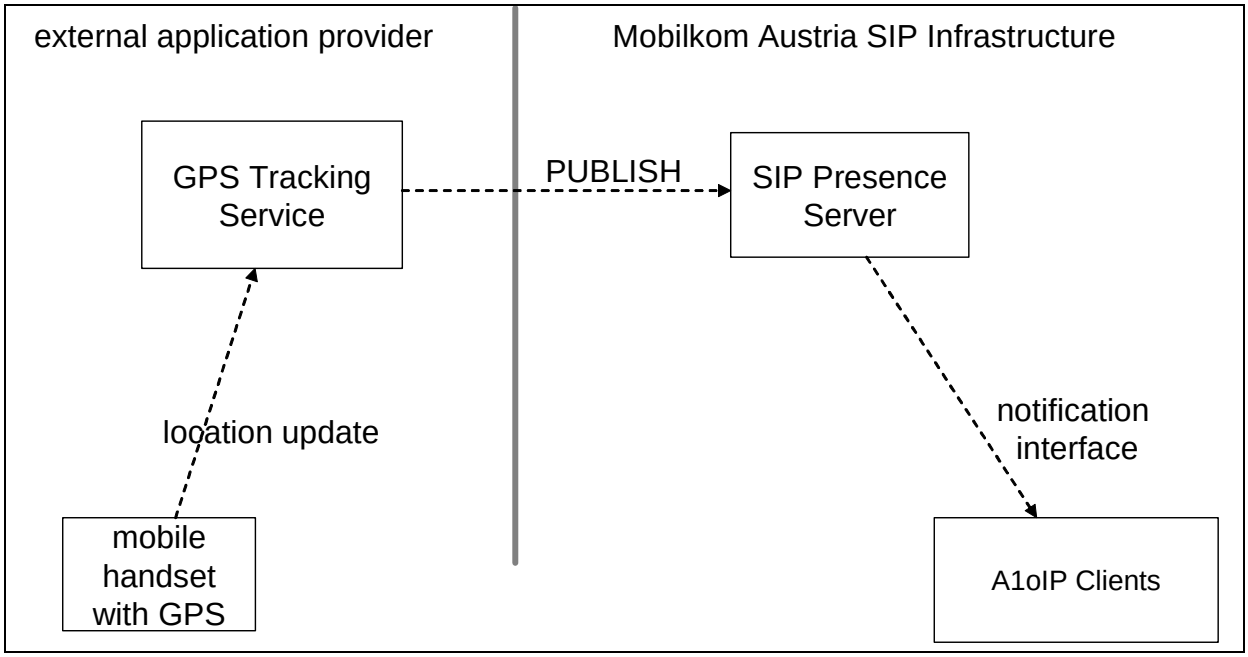
Note: In this case the service provider could use the request URI's domain to route the request to route the request to MKA. But usually MKA will explicitly provide target IP addresses or a domain name (the ingress point to the MKAs SIP network) where the service provider should deliver the instant message.

Future variations of this addressing scheme could also use the full E.164 numbers (MSISDN, eg. "+43664123456") of the subscriber to deliver instant messages. However, current setup of the A1.net system would forward such requests as SMS instead of instant messages. The future variant would use the E.164 number in the user part instead of the username listed above.

5 Examples

5.1 PUBLISH

A mobile subscriber uses an external GPS tracking service. Each location update sent by the subscriber's handset to the tracking service generates a SIP PUBLISH request, transmitting the location of the subscriber as presence (PIDF-LO) to the MKA SIP network.



Assumption: MKA defined for this service the ingress point sipin.a1.net. The specified transport protocol is TCP. IMSI of the mobile subscriber: 284011234567890

Example PUBLISH request containing location information without elevation:

```
PUBLISH sip:284011234567890@gpstracker.provider.com SIP/2.0
Via: SIP/2.0/TCP 5.6.7.8:5060;branch=z9hG4bK652hsge
To: <sip:284011234567890@gpstracker.provider.com>
From: <sip:sip15@provider.com>;tag=1234wxyz
Call-ID: 8181dgdg43535ghdbhdfht3z
CSeq: 1 PUBLISH
Max-Forwards: 70
Expires: 360
Event: presence
Content-Type: application/pidf+xml
Content-Length: 1242

<?xml version="1.0" encoding="UTF-8"?>
   <presence xmlns="urn:ietf:params:xml:ns:pidf"
    xmlns:dm="urn:ietf:params:xml:ns:pidf:data-model"
    xmlns:rp="urn:ietf:params:xml:ns:pidf:rpid"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:gp="urn:ietf:params:xml:ns:pidf:geopriv10"
    xmlns:cl="urn:ietf:params:xml:ns:pidf:geopriv10:civicLoc"
    xmlns:gml="http://www.opengis.net/gml"
    xmlns:gs="http://www.opengis.net/pidflo/1.0"
    entity="sip:284011234567890@gpstracker.provider.com">

    <tuple id="sg89ae">
```

```
        <status>
           <basic>open</basic>

      <gp:geopriv>

        <gp:location-info>
          <gs:Circle srsName="urn:ogc:def:crs:EPSG::4326">
           <gml:pos>
              42.5463 -73.2512
           </gml:pos>
           <gml:radius uom="urn:ogc:def:uom:EPSG::9001">
              850.24
           </gml:radius>
          </gs:Circle>
        </gp:location-info>

        <gp:usage-rules>
          <gp:retransmission-allowed>yes</gp:retransmission-allowed>
          <gp:retention-expiry>2007-08-15T16:57:29Z
          </gp:retention-expiry>
        </gp:usage-rules>
        <gp:method>gps</gp:method>
      </gp:geopriv>

        </status>
        <contact>sip:284011234567890@gpstracker.provider.com</contact>
      </tuple>
    </presence>
```

Note: urn:ogc:def:crs:EPSG::4326 references to WGS84 and urn:ogc:def:uom:EPSG::9001 means “meters”[2].

Note: In the <contact> element a SIP URI should be used if the addressed contact supports multiple SIP services (voice, video, presence, instant messaging …). If the contact only supports presence, a “pres” URI should be used. In this case, the SRV DNS records according to [RFC 3861] should be provisioned.

The message will be sent to the IP address/port announced in the SRV records of _sip._tcp.sipin.a1.net. If there are multiple SRV records, the publisher should use them in the specified order and support SRV failover.

Example PUBLISH request for a location including elevation data:

(Note: differences in the PIDF-LO-Information versus the document above are shown in bold)

```
PUBLISH sip:284011234567890@gpstracker.provider.com SIP/2.0
Via: SIP/2.0/TCP 5.6.7.8:5060;branch=z9hG4bK652hsge
To: <sip:284011234567890@gpstracker.provider.com>
From: <sip:sip15@provider.com>;tag=1234wxyz
Call-ID: 8181dgdg43535ghdbhdfhafaf
CSeq: 1 PUBLISH
Max-Forwards: 70
Expires: 360
Event: presence
Content-Type: application/pidf+xml
```

[2] These references are defnied by EPSG and can be downloaded from http://www.epsg.org/databases/epsg-v6_13.zip

```
Content-Length: 1245

<?xml version="1.0" encoding="UTF-8"?>
   <presence xmlns="urn:ietf:params:xml:ns:pidf"
    xmlns:dm="urn:ietf:params:xml:ns:pidf:data-model"
    xmlns:rp="urn:ietf:params:xml:ns:pidf:rpid"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:gp="urn:ietf:params:xml:ns:pidf:geopriv10"
    xmlns:cl="urn:ietf:params:xml:ns:pidf:geopriv10:civicLoc"
    xmlns:gml="http://www.opengis.net/gml"
    xmlns:gs="http://www.opengis.net/pidflo/1.0"
    entity="sip:284011234567890@gpstracker.provider.com">

    <tuple id="sg89ae">
       <status>
          <basic>open</basic>

    <gp:geopriv>

      <gp:location-info>
        <gs:Sphere srsName="urn:ogc:def:crs:EPSG::4979">
         <gml:pos>
            42.5463 -73.2512 224
         </gml:pos>
         <gml:radius uom="urn:ogc:def:uom:EPSG::9001">
            850.24
         </gml:radius>
        </gs:Sphere>
      </gp:location-info>

      <gp:usage-rules>
        <gp:retransmission-allowed>yes</gp:retransmission-allowed>
        <gp:retention-expiry>2007-08-15T16:57:29Z
        </gp:retention-expiry>
      </gp:usage-rules>
      <gp:method>gps</gp:method>
    </gp:geopriv>

       </status>
       <contact>sip:284011234567890@gpstracker.provider.com</contact>
    </tuple>
   </presence>
```

Example PUBLISH request for a location including elevation data and dynamic information (speed, bearing):

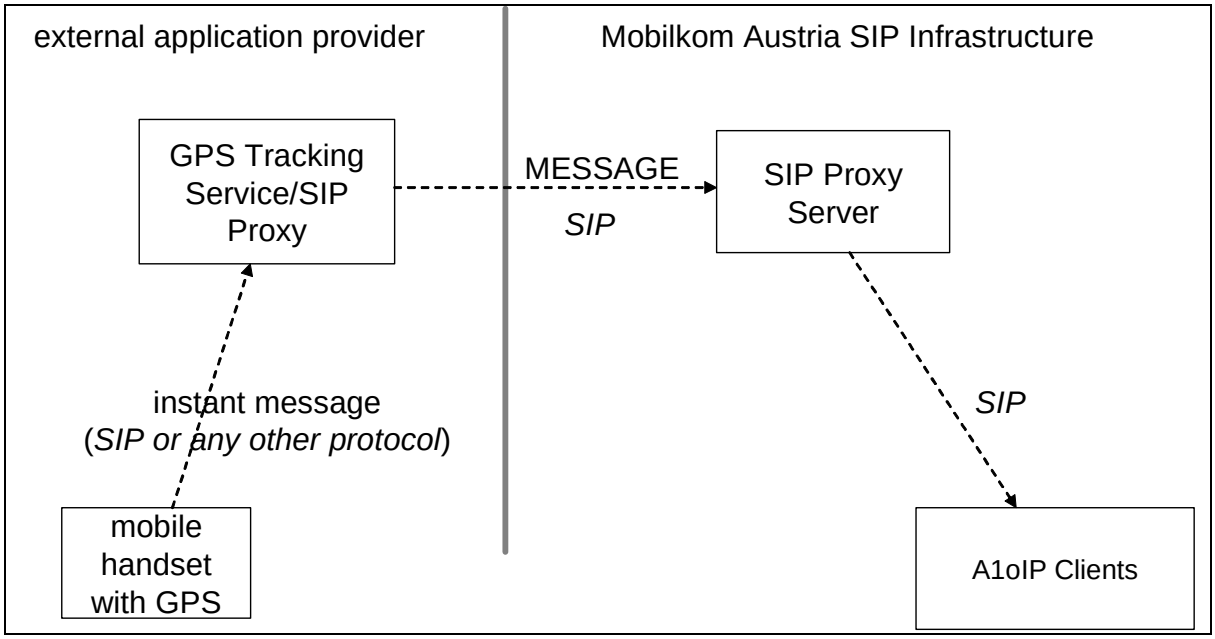
(Note: differences in the PIDF-LO-Information versus the first PIDF-LO example above are shown in bold)

```
PUBLISH sip:284011234567890@gpstracker.provider.com SIP/2.0
Via: SIP/2.0/TCP 5.6.7.8:5060;branch=z9hG4bK652hsge
To: <sip:284011234567890@gpstracker.provider.com>
From: <sip:sip15@provider.com>;tag=1234wxyz
Call-ID: 8181dgdg43535ghdbhdfhafaf
CSeq: 1 PUBLISH
Max-Forwards: 70
Expires: 360
Event: presence
Content-Type: application/pidf+xml
Content-Length: 1245
```

```
<?xml version="1.0" encoding="UTF-8"?>
   <presence xmlns="urn:ietf:params:xml:ns:pidf"
    xmlns:dm="urn:ietf:params:xml:ns:pidf:data-model"
    xmlns:rp="urn:ietf:params:xml:ns:pidf:rpid"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:gp="urn:ietf:params:xml:ns:pidf:geopriv10"
    xmlns:cl="urn:ietf:params:xml:ns:pidf:geopriv10:civicLoc"
    xmlns:gml="http://www.opengis.net/gml"
    xmlns:gs="http://www.opengis.net/pidflo/1.0"
    entity="sip:284011234567890@gpstracker.provider.com">

    <tuple id="sg89ae">
       <status>
          <basic>open</basic>

    <gp:geopriv>

      <gp:location-info>
        <gs:Sphere srsName="urn:ogc:def:crs:EPSG::4979">
         <gml:pos>
            42.5463 -73.2512 224
         </gml:pos>
         <gml:radius uom="urn:ogc:def:uom:EPSG::9001">
            850.24
         </gml:radius>
        </gs:Sphere>
        <gml:speed uom=”#kph”>112</gml:speed>
        <gml:bearing>
          <gml:DirectionVector>
            <gml:vector SRS=”#rightHandRuleVec”>176 -2</gml:vector>
          </gml:DirectionVector>
        </gml:bearing>
      </gp:location-info>

      <gp:usage-rules>
        <gp:retransmission-allowed>yes</gp:retransmission-allowed>
        <gp:retention-expiry>2007-08-15T16:57:29Z
        </gp:retention-expiry>
      </gp:usage-rules>
      <gp:method>gps</gp:method>
    </gp:geopriv>

       </status>
       <contact>sip:284011234567890@gpstracker.provider.com</contact>
    </tuple>
   </presence>
```

5.2 MESSAGE

A mobile subscriber uses an external GPS tracking service which supports also the sending and receiving of instant messages. The protocol between the mobile handset and the service provider can be SIP or any other protocol. The service provider forwards (and if necessary translates into SIP) the messages between the mobile handset and the MKA SIP network.



Assumption: MKA defined for this service the ingress point 1.2.3.4 port 5070. The specified transport protocol is TCP. IMSI of the mobile subscriber: 284011234567890. The IM is sent to "example_user". The E.164 number of the respective user is "+43 664 123456".

Example MESSAGE request addressed by username:

```
MESSAGE sip:example_user@a1.net SIP/2.0
Via: SIP/2.0/TCP 5.6.7.8:5060;branch=z9hG4bK652hsge
To: <sip:example_user@a1.net>
From: <sip:284011234567890@gpstracker.provider.com>;tag=1234wxyz
Call-ID: ASRTRGFSGSDDASF352343ASDFSAF
CSeq: 45 MESSAGE
Max-Forwards: 70
Content-Type: text/plain; charset=UTF-8
Content-Length: 55

Ich habe die Abfahrt übersehen. Komme etwas später.
```

Example MESSAGE request addressed by E.164 number (MSISDN):

(Note: differences to the example above are outlined in bold)

```
MESSAGE sip:+43664123456@a1.net SIP/2.0
Via: SIP/2.0/TCP 5.6.7.8:5060;branch=z9hG4bK652hsge
To: <sip:+43664123456@a1.net>
From: <sip:284011234567890@gpstracker.provider.com>;tag=1234wxyz
Call-ID: ASRTRGFSGSDDASF352343ASDFSAF
CSeq: 45 MESSAGE
Max-Forwards: 70
Content-Type: text/plain; charset=UTF-8
Content-Length: 55

Ich habe die Abfahrt übersehen. Komme etwas später.
```

Note: Each of the Umlaut ä and ü will need 2 bytes due to UTF-8 encoding.

The message will be sent to IP address 1.2.3.4 port 5070 using the TCP protocol.

6 Location generators / Endpoints acting as UAC

Future extensions could allow location generators to act as a UAC on behalf of an individual subscriber. In that case, the addressing scheme of MESSAGE and PUBLISH requests might need to be adopted.

There might also be situations in which endpoints itself publish their location instead of using location aggregators. Such a scenario has various implications on trust relations, security and privacy related to the publication of such information. In contrary to the situation above, where the location information is produced by a trusted platform, individual users could publish false location information. Therefore, additional mechanisms to ensure credibility of PIDF-LO information provided directly by the user need to be established. Such mechanisms could include signing location information with a key to which the user does not have access to.

The actual specification of such methods needs to be investigated in a broader scope, and is not in scope of this document.

7 References

7.1 SIP

[RFC2046] RFC 2046 - Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types

[RFC 3261] SIP: Session Initiation Protocol

[RFC 3263] Session Initiation Protocol (SIP): Locating SIP Servers

[RFC 3428] Session Initiation Protocol (SIP) Extension for Instant Messaging

[RFC 3903] Session Initiation Protocol (SIP) Extension for Event State Publication

7.2 Geo-Presence Format

[RFC 3693] Geopriv Requirements

[RFC 3861] Address Resolution for Instant Messaging and Presence

[RFC 3863] Presence Information Data Format (PIDF)

[RFC 4119] A Presence-based GEOPRIV Location Object Format

[GML] OpenGIS, "Open Geography Markup Language (GML) ImplementatioSpecification", OGC 02-023r4, January 2003, <http://www.opengeospatial.org/specs/?page=specs>.

[draft-ietf-geopriv-pdif-lo-profile-08.txt] GEOPRIV PIDF-LO Usage Clarification, Considerations and Recommendations

[GML 3.1.1 PIDF-LO] GML 3.1.1 PIDF-LO Shape Application Schema for use by the Internet Engineering Task Force (IETF)

[draft-singh-geopriv-pidf-lo-dynamic-01.txt] Dynamic Feature Extensions to the Presence Information Data Format Location Object (PIDF-LO)

7.3 Presence using the SUBSCRIBE/NOTIFY framework

[RFC 3265] Session Initiation Protocol (SIP)-Specific Event Notification

[RFC 3856] A Presence Event Package for the Session Initiation Protocol (SIP)

[RFC 3859] Common Profile for Presence (CPP)

7.4 Informative

[MSRP] draft-ietf-simple-msrp-relays-10.txt, The Message Session Relay Protocol

7.5 Further Readings

The following documents are recommended for further reading:

RFC 2778 - A Model for Presence and Instant Messaging

RFC 4079 - GEOPRIV Presence Arch

RFC 4589 - Location Types Registry

draft-ietf-geopriv-revised-civic-lo-05.txt - Revised Civic Location Format for PIDF-LO

RFC 4480 - RPID: Rich Presence Extensions to the Presence Information Data Format (PIDF)

RFC 4479 - A Data Model for Presence

RFC 4481 - Timed Presence Extensions to the Presence Information Data Format (PIDF) to Indicate Status Information for Past and Future Time Intervals

RFC 4482 - CIPID: Contact Information for the Presence Information Data Format

RFC 4660 - Functional Description of Event Notification Filtering

RFC 4661 - An Extensible Markup Language (XML)-Based Format for Event Notification Filtering

draft-ietf-simple-simple-00 - SIMPLE made Simple: An Overview of the IETF Specifications for Instant Messaging and Presence using the Session Initiation Protocol (SIP)

All the RFCs and draft from the IETF GEOPRIV and SIMPLE working group:
http://www.ietf.org/html.charters/simple-charter.html
http://www.ietf.org/html.charters/geopriv-charter.html