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Telecooperation

A Provider-Independent, Proactive Service for Location Sensing in Cellular Networks

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Motivation

- Straightforward idea: LBS in cellular networks can use cell information

- Tedious implementation – how to get this data?

- Project Gulliver, 2000: "We are using additional context data such as location"
  - Cellular provider could not give access to cell information
  - → Location inferred from suggested position, manual correction

- Since then: Implementation of ETSI 3GPP TS 03.71 increasing
  - Getting data still complicated and costly

- Austaller, 2004: Getting data by parsing from provider's webpage

Architecture

- **Web services based**
  - LBS get SOAP messages w/ location data
  - Currently different transport than HTTP used, HTTP possible
- **Cost-sensitive**
  - Only uses small UDP packets on handheld
  - Proxy transforms data into SOAP messages
  - ~5-50 KB additional traffic/day
- **2 Message types**
  - Simple: IMEI + cell data
  - Coordinates: Augmented w/ geocoordinates of base station

Architecture

Simple
Message

Message
w/ coordinates

SOAP
Proxy

CellID +
IMEI

Cell
Lookup

SOAP
Proxy

CellID +
IMEI +
Channel Broadcast
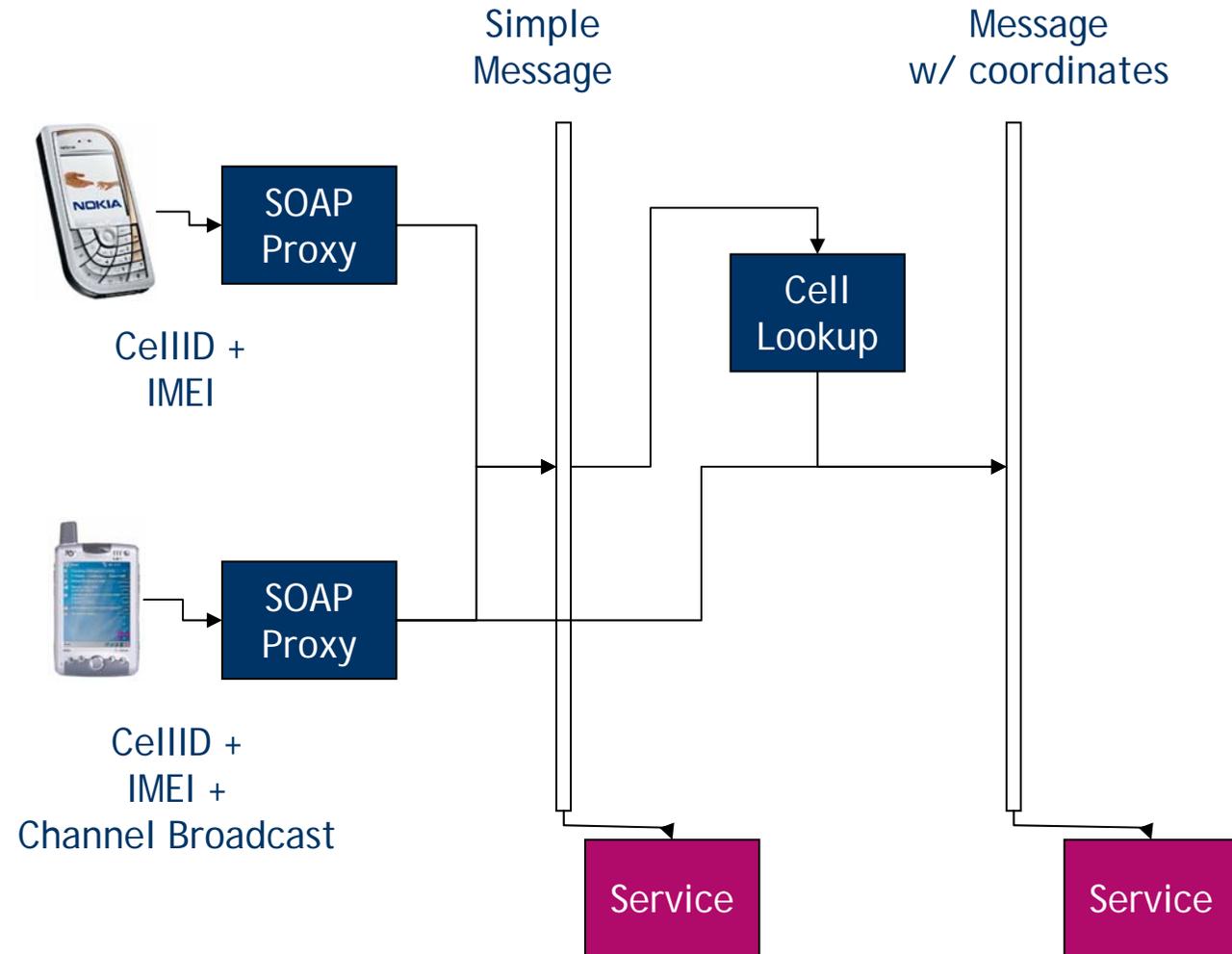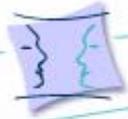
Service

Service

Using LBS

- ## Sample code (Python)

```python
from mundocore import *

class LocationService(PyService):

  def init(self):
    PyService.init(self)
    self.subscribeObject("org.mundo.service.location", self.received)

  def received(self, msg):
    print msg.user
    print msg.potsdam  #print potsdam coordinates
```

- ## Java, C++ Bindings also available, about 50 LOC

Security & Privacy

- Research prototype – neither security, nor privacy yet
- Use IPSec or other key-exchange method for communication phone⇔proxy
  - Keep low footprint for communication w/ cell-phone
- Use XML-Signature for SOAP message

- Privacy to be guaranteed by the middleware