LoL@ - A Prototype of a Network Independent Wireless Internet Service

Harald Kunczier, ftw.
kunczier@ftw.at

ISART 2003, Boulder
Multimedia Services

- Which?
  - Mobility of users
  - M-commerce
  - M-office
  - M-entertainment

- But How?
  - Different devices, displays
  - Different operating systems
  - Different underlying networks
  - Frequent disconnections
  - Expected reliability
  - Etc.

Lots of challenges...

---

Source: European Commission
Outline

- Introduction to LoL@ (Local Location @ssistant)
- Challenges and some solutions
  - Telecommunication and Internet
  - Aspects related to location based services
  - Mobile devices
- Conclusions
A Mobile Service

- Privacy
- Transactions
- User ID

- Security
- Data rate
- Quality of Service

- Input
- Display
- Multi-Modal
- Speech Control

- User Interface
- Mobile Application Features

- External Links
- Multimedia
- Data management

- Localization
- Navigation
- Position
- Accuracy
- Speed
- Direction

- Local Gateway
- Image
- Synchronization
- Messaging
- Real-time
- Audio

- Synchronization
- Distribution
- Content
- User Profile
- Visualization

© ftw. 2002
LoL@ - A Mobile Service

- Touch screen, cursor keys
- 320x120 pixels, 256 colors
- Hierarchical menu, icons, voice shortcuts
- Speaker independent commands

Input
Display
Multi-Modal
Speech Control

Links
Multimedia
Management

Privacy
Transactions
User IC

Symmetry
Burst
Delay
Litter

Local Gateway

Image Synchronization
Messaging
Real-time
Audio

Synchronization
Distribution
Content
User Profile
Visualization
LoL@ - A Mobile Tourist Guide

- Assist users during sightseeing:
  - Navigate through the city (positioning, routing)
  - Online tour diary, including personal entries

- Assist users while preparing the tour:
  - Multimedia information for tour planning in the hotel room

- Retrieve tour diary after finishing the tour:
  - PC version of diary for download
2G Telco Architecture

Vertical application structure, various proprietary APIs

BSS: Base Station Subsystem
S/GGSN: Serving/Gateway GPRS Support Node
MSC: Mobile Services Switching Center
VLR: Visitor Location Register

HLR: Home Location Register
SMSC: Short Message Service Center
LBS: Location Based Service
WAP GW: Wireless Application Protocol Gateway

© ftw. 2002
LoL@ Architecture

Vertical application structure, various proprietary APIs

Mobile Internet Applications

App2

User Mgmt

OSA AS API

Process Mgmt

Security

Persistency

OSA Client

Value Added Service Interface

OSA API

Core Network

S/GGSN

MSC

VLR/HLR

SMSC

LBS

WAP GW

BSS: Base Station Subsystem
S/GGSN: Serving/Gateway GPRS Support Node
MSC: Mobile Services Switching Center
VLR: Visitor Location Register

HLR: Home Location Register
SMSC: Short Message Service Center
LBS: Location Based Service
WAP GW: Wireless Application Protocoll Gateway

© ftw. 2002
Location based services

Service related Aspects

- Single User Log In
- LoL@ push sub-system

Navigation: Maps, Tracking
Position: Automatic Updates
Accuracy: < 150 meters
Speed: < 5 km/h
Single User Log In

- No repetition of username-password log-ins
- Access to all subscribed services

⇒ LoL@ can access Location Sub-System

HLR: Home Location Register
OSA MS API: OSA Mobility Service API
SIP: Session Initiation Protocol
GMLC: Gateway Mobility Location Center
LoL@ Push Sub-System

- More efficient bandwidth use
- Particularly suitable for asynchronous events

⇒ Location data pushed to the application
Content Preparation

- **Split of Business and Presentation Logic**
  - Suitable for different devices
  - Suitable for different sources

- **Business Logic also implemented at the mobile**
  - Reduces data traffic
  - Improves response time

- **Suspend/Resume functionality based on SIP**
Results of Usability Study

- Target Area: City of Vienna
- Running prototype system via GPRS

Good response to the application but

- Response time extremely important: 1sec / 3sec
  Mobile service has to be reliable

- Users don’t distinguish between application & content ->
  correct content important.

- LCS Data has to be available everywhere. Uncertainty
  area has not been accepted.
Conclusions

- It's not only about bandwidth
- Network functionality must be easily accessible for programmers
- Device and connectivity limitations require split of business logic between Client and Server
- Usability extremely important
  ⇒ Reliable
  ⇒ Fast
  ⇒ Individually adapted for all devices

Further information: www.ftw.at

Thank you!