Smart Spaces and Internet of Things

Working group meeting at FRUCT11
St.-Petersburg, Russia
Agenda

1. Activity on Smart Spaces and IoT in EIT: status and collaboration
2. Smart-M3 platform development
3. Applications and methods
Smart-M3 platform development

- Sergey Balandin, Kirill Krinkin, Dmitry Korzun: Smart-M3 status and plans
- Kirill Krinkin: Smart-M3 code repository and mainstream
- Kirill Krinkin: Smart-M3 network access and SSAP, SIB runtime stability
- Kirill Yudenok: Smart-M3 security
- Dmitry Korzun (thanks to Alfredo D’Elia from UniBo): Smart-M3 SIB and knowledge base, piglet SIB vs. redland SIB
- Dmitry Korzun: Smart-M3 SDK
Smart-M3 status and plans

- Repository: [http://sourceforge.net/projects/smart-m3/](http://sourceforge.net/projects/smart-m3/)
- SOFIA project: [http://www.sofia-project.eu/](http://www.sofia-project.eu/)
- Smart Objects Community: [http://www.sofia-community.org/](http://www.sofia-community.org/)
- Unibo Smart-M3 Lab
  - [http://mml.arces.unibo.it/sofia.chiron.shared.material/](http://mml.arces.unibo.it/sofia.chiron.shared.material/)
- SPbETU Smart-M3 Activity
- PetrSU Smart-M3 activity [http://oss.fruct.org/wiki/SmartSlog](http://oss.fruct.org/wiki/SmartSlog)
Smart-M3 status and plans

- Jukka Honkola: Code repository and mainstream (v.0.9.5)
- SPbETU: SSAP (SIB side)
- UniBo: SIB and knowledge base
- SPbETU: security
- UniBo: low-level SDK
- PetrSU: high-level SDK
Smart-M3 SIB and knowledge base

- piglet SIB vs. redland SIB
- Redland SIB:
  - SSAP compatibility
  - Faster (insert & delete) and more stable (subscription, no SQL lite with garbage collection)
  - Potentially, RDF-XML syntax in triples specification
  - SPARQL support instead of WilburQL
    - Lack of supporting KPI (some progress for Java, C#, Python)
    - Bug: if incorrect SPARQL query sent
- Public SIBs
  - PetrSU: 194.85.173.9, Smart-m3 (piglet) v.0.9.5
  - UniBo: 137.204.143.19, redland SIB
Smart-M3 SDK

- **Low-level (RDF triples)**
  - Python, Qt/C++, ANSI C, Java, C#

- **High-level (OWL: classes, objects & properties)**
  - Python, ANSI C, C#

- **Specification and code generation**
  - Ontological models for knowledge representation and reasoning
  - Rule-based approach of logic programming
Applications and methods

- Dmitry Korzun, Sergey Balandin, Alexey Kashevnik: Foundations of smart space computing
- Alexey Kashevnik, Dmitry Korzun, Yury Korolev: Integration of Smart Conference and SmartScribo
- Alexey Kashevnik, Kirill Krinkin: SmartLogistics and Geo2Tag
- Andrew Vasilev, Alexey Kashevnik: Integration of SmartConference and HiveMind
- Yury Korolev, Dmitry Korzun: Integration of smart space applications
- Andrew Vasilev, Dmitry Korzun: Cross-platform development for Smart-M3
- Sergey Balandin: Discussion on cooperation between smart spaces and mHealth activities
Foundations of smart space computing

- Space-based computing, pub/sub, Semantic Web
  - Base principles and the paradigm
- Ontological knowledge representation models
  - space sharing, knowledge inference, space compositions
- Design and functional patterns for agent
  - KP side: architecture and logic, space sessions and access primitives, multi-space, code specification
- Infrastructure
  - SIB side: knowledge deduction and maintenance, SIB networks, identification, search, security
Foundations of smart space computing

External world
- Internet services and clouds
- Sensors in pervasive environments
- Semantic Web
...

smart space A

smart space B

smart space C
Smart Conference + SmartScribo

- Blog service
- Scribo mediator
- Blog clients
- Conference blog service
- Conference blog processor
- User KP
- Conference client
- Scribo client
- Whiteboard
- Projector
- External services

SIB
- Blogosphere
- Smart space
- Overlay
- Conference smart space
Integration of smart space applications

There some papers recently

- (intra-space) The 34th Int’l Conf. on Information Technology Interfaces (ITI2012), accepted
  Dmitry Korzun, Ivan Galov, Sergey Balandin: Proactive Personalized Mobile Mutli-Blogging Service on Smart-M3

- (intra-space) The 5th Conf. on Internet of Things and Smart Spaces (ruSMART2012), submitted
  Yury Korolev, Dmitry Korzun, Ivan Galov: Smart Space Applications Integration: A Mediation Formalism and Design for Smart-M3

- We need more use cases
Cross-platform development for Smart-M3

- Maemo 5
- Meego / Harmattan
- Symbian
- Android
- Windows Phone