

# 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/>
- SOFIA project: <http://www.sofia-project.eu/>
- Smart Objects Community:  
<http://www.sofia-community.org/>
- EIT ICT Labs: <http://eit.ictlabs.eu/action-lines/smart-spaces/>
- Unibo Smart-M3 Lab
  - <http://www.moodle.unibo.it/mod/wiki/view.php?id=10624>
  - <http://mml.arces.unibo.it/sofia.chiron.shared.material/>
- SPbETU Smart-M3 Activity
- PetrSU Smart-M3 activity  
<http://oss.fruct.org/wiki/SmartSlog>

# Smart-M3 status and plans

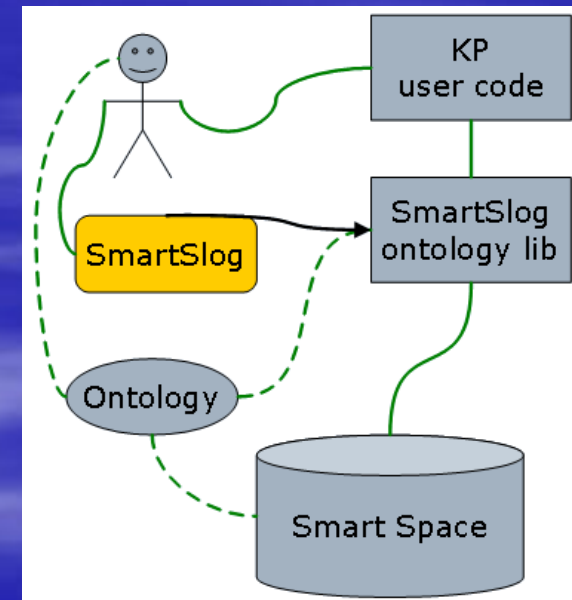
- Jukka Honkola: Code repository and mainstream (v.0.9.5)
- SPbETU: SSAP (SIB side)
- UniBo: SIB and knowledge base
- SPbETU: security
- UniBo: low-level SDK
- PetrSU: high-level SDK

# 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

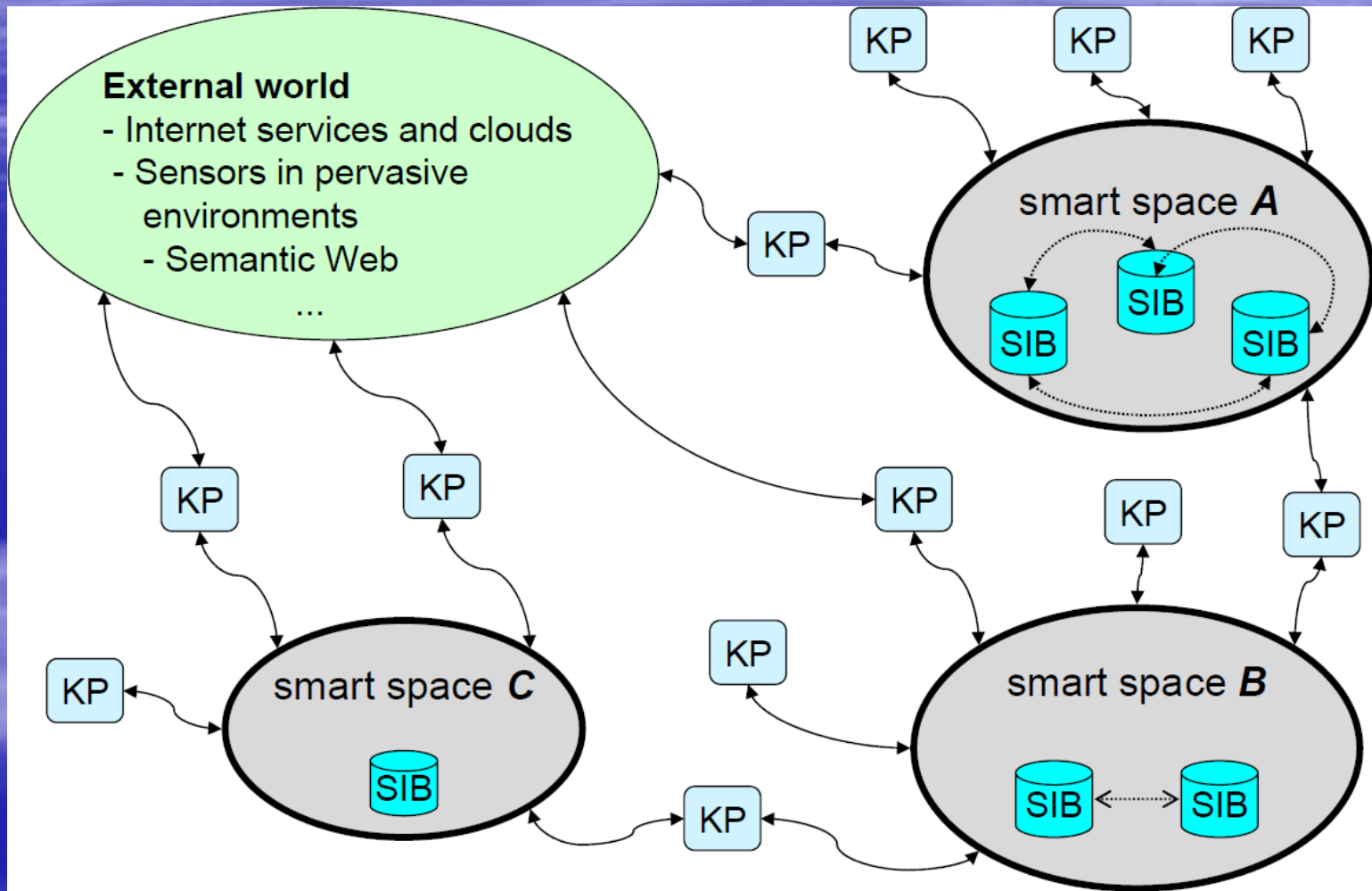
- Dmitry Korzun, Sergey Balandin, Alexey Kashevnik:  
**Foundations of smart space computing**
- Alexey Kashevnik, Dmitry Korzun, Yury Korolev:  
**Integration of Smart Conference and SmartScribo**
- Alexey Kashevnik, Kirill Krinkin:  
**SmartLogistics and Geo2Tag**
- Andrew Vasilev, Alexey Kashevnik:  
**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**



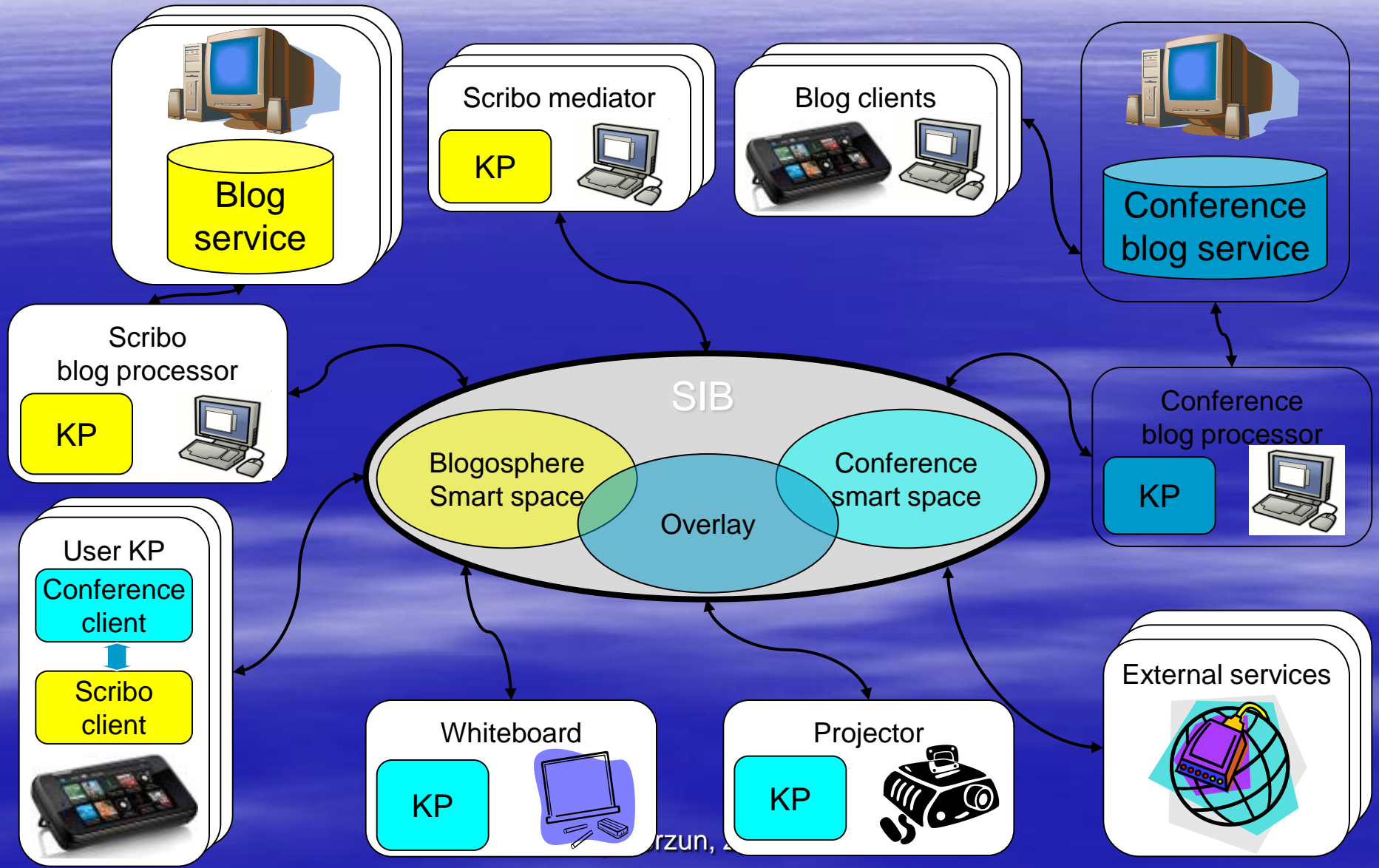
# Foundations of smart space computing

- 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



# Smart Conference + SmartScribo



# Integration of smart space applications

There some papers recently

- (intra-space) The 34<sup>th</sup> 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