

**I-Centric 2008, 26.7.-1.8.2008, Malta**

# **Semantic Policies for Service Access in Mobile supported Sensor Networks**

Sarfraz Alam<sup>1</sup>, Josef Noll<sup>1</sup>, and Dumitru Roman<sup>2</sup>

<sup>1</sup> ConnectedLife  
University Graduate Center, Kjeller/  
University of Oslo, UiO  
sarfraz@unik.no, josef@unik.no

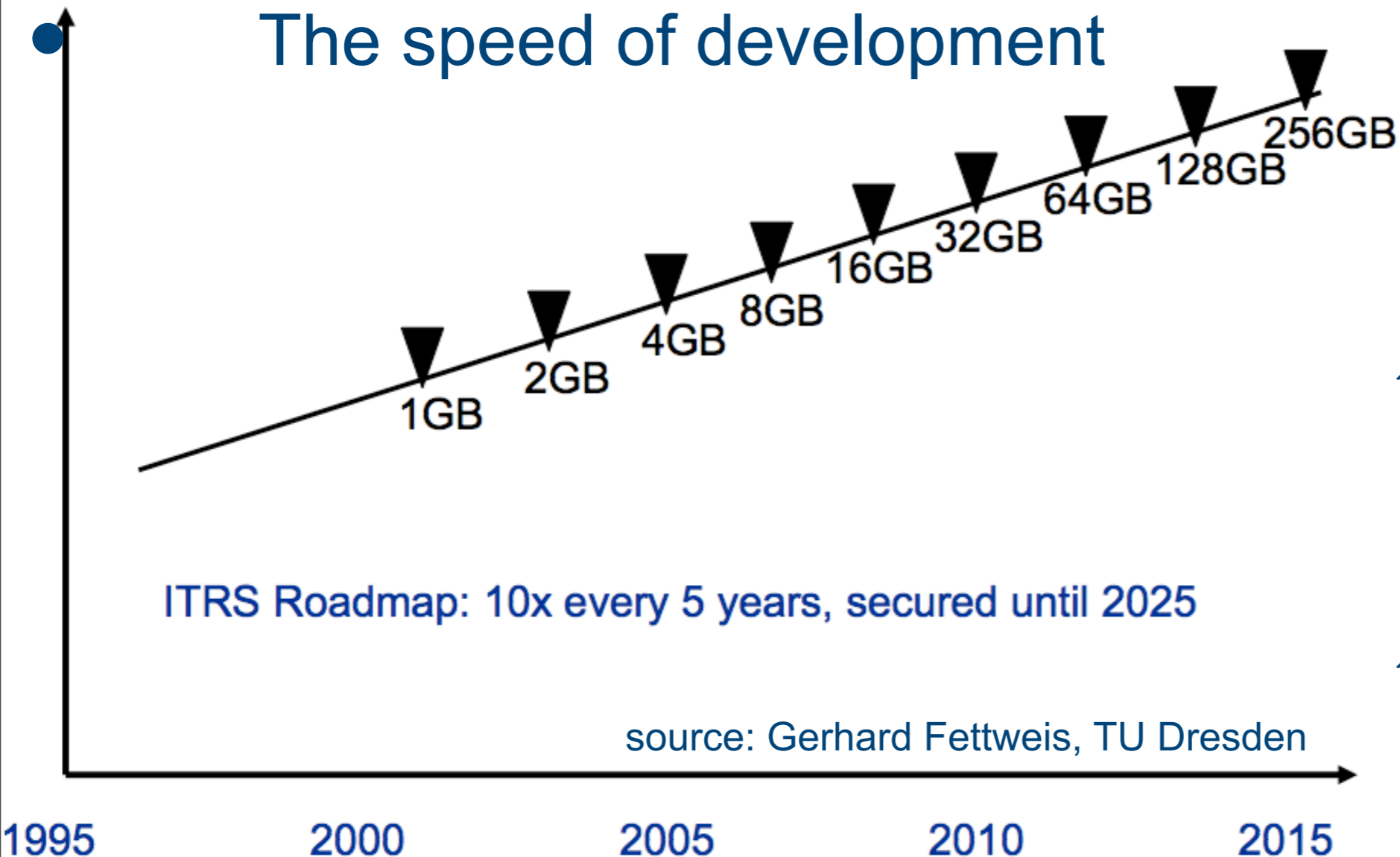
<sup>2</sup>STI institute,  
Innsbruck, Austria  
[dumitru.roman@sti2.at](mailto:dumitru.roman@sti2.at)

# Outline

- Expectations: Technology developments
- Multimedia is everything
- Semantics for integration and more....
  
- The proximity, mobile and user dimensions
- Case study: Integrated TV and service world
- Policy-enforced access management

# The complexity of technology

## The speed of development



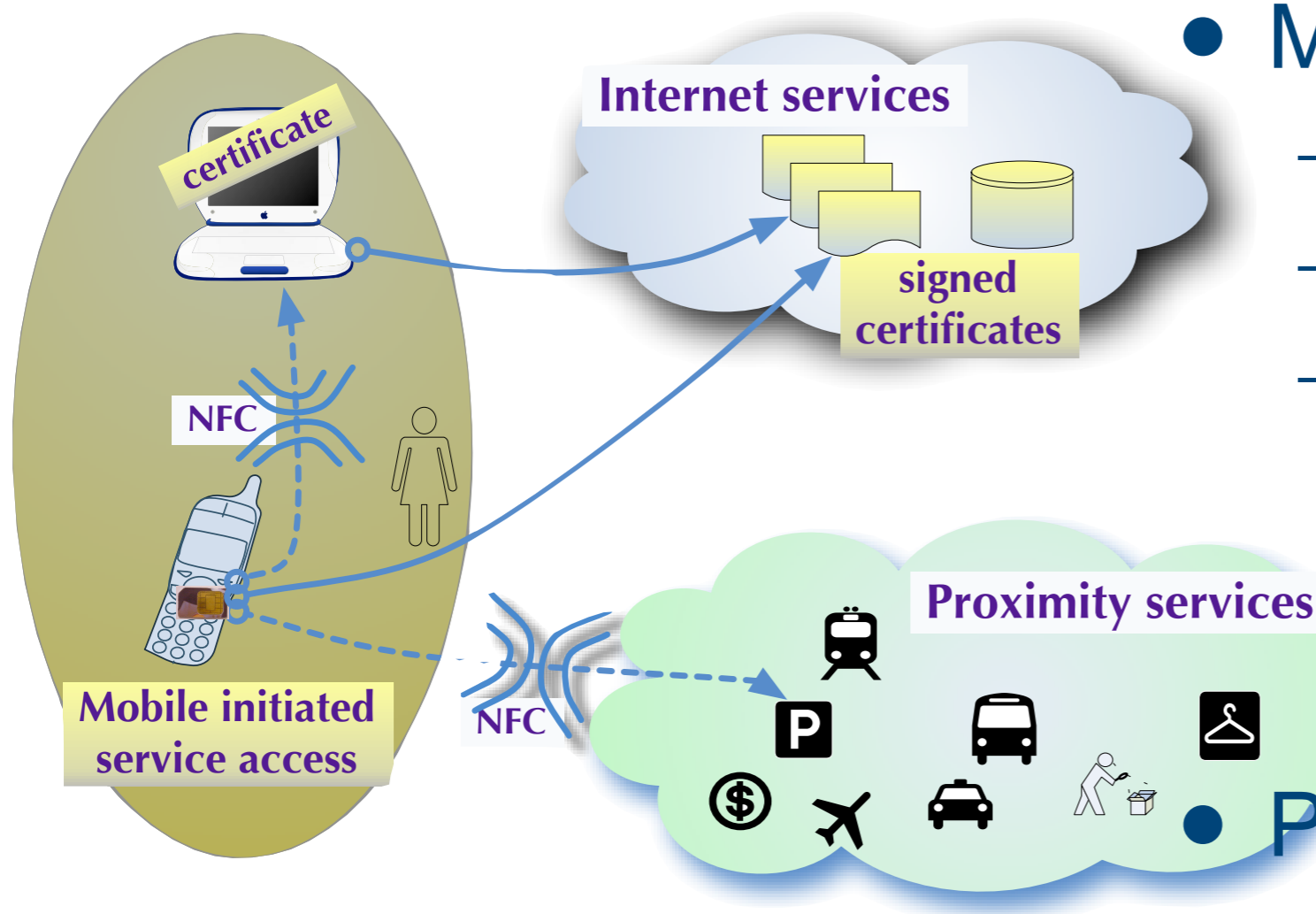
“Much faster than I ever thought!”

“Too complex for me to handle!”

- Do you remember: “*There might be a need for 5 computers*” (1943 Watson(?), 1951 Hartree)
- Mobile: NMT, GSM, GPRS, EDGE, UMTS, 3G, HSDPA, SMS, EMS, MMS,... DVB-H,...

# The Service Challenge

## Mobile and Proximity Services



- Mobile services
  - services in the mobile
  - mobile network services
  - Internet services

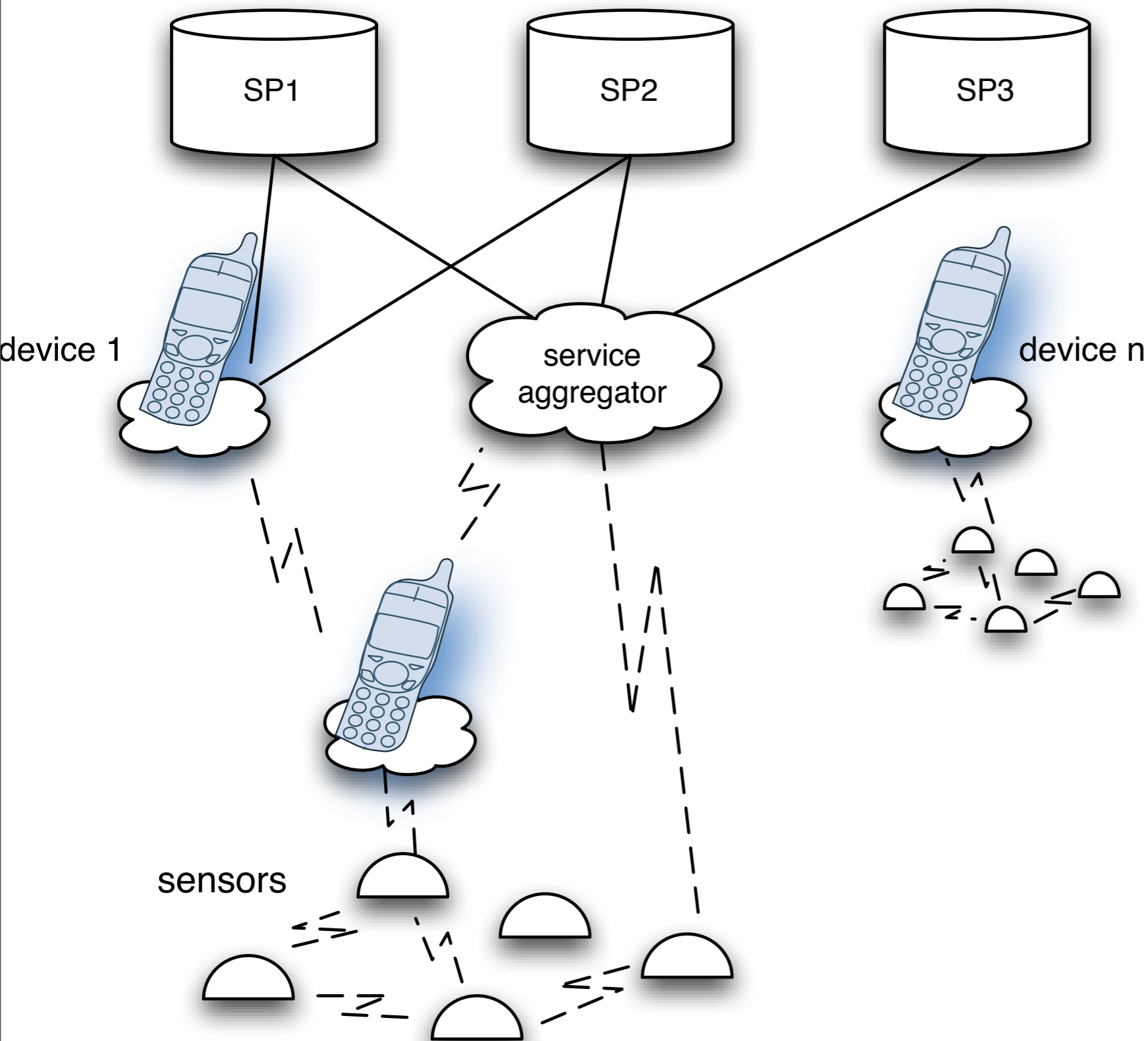
- Proximity services
  - Payment
  - Access, Admittance

# Have you heard these ones?

**"Last year (2007) the world produced more transistors than rice corns"**  
– Hans Christian Haugli, CEO, Telenor R&I

**"In three to five years we will interact with to 30-50 devices in our vicinity"**  
– Marie Austenstaa, Connected Objects, Telenor R&I

# Mobile controlled sensor networks



## Application scenario

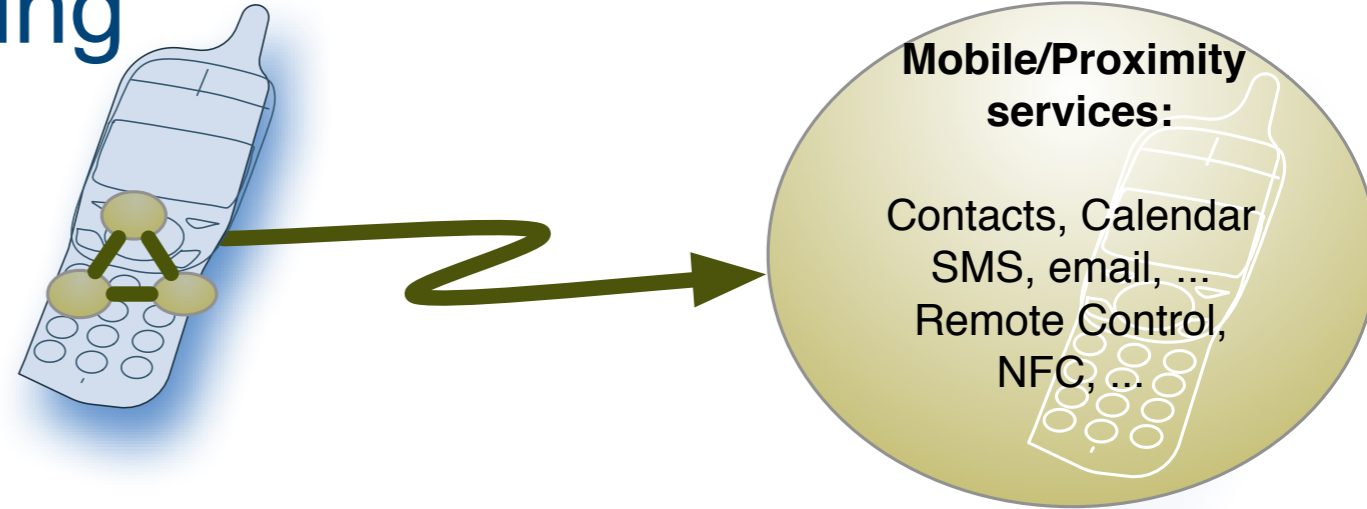
- Body networks
- Home networks

## Functionality of mobile phone

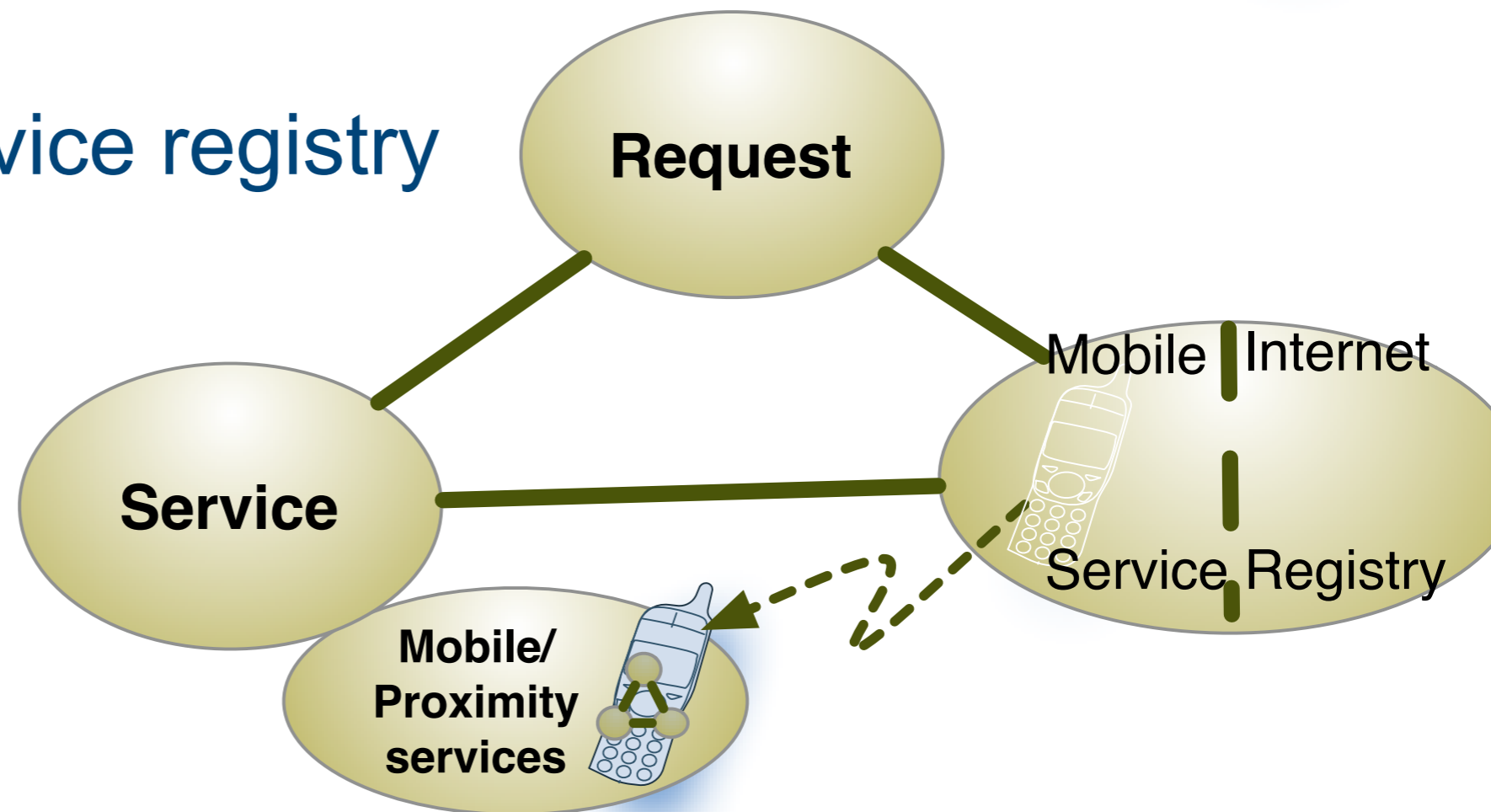
- Service aggregator
- Access controller
- Policy provider

# Integrating the Mobile into a Semantic Web Services delivery

- A virtual mobile, representing the mobile and proximity services in the Internet service world



- An integrated service registry



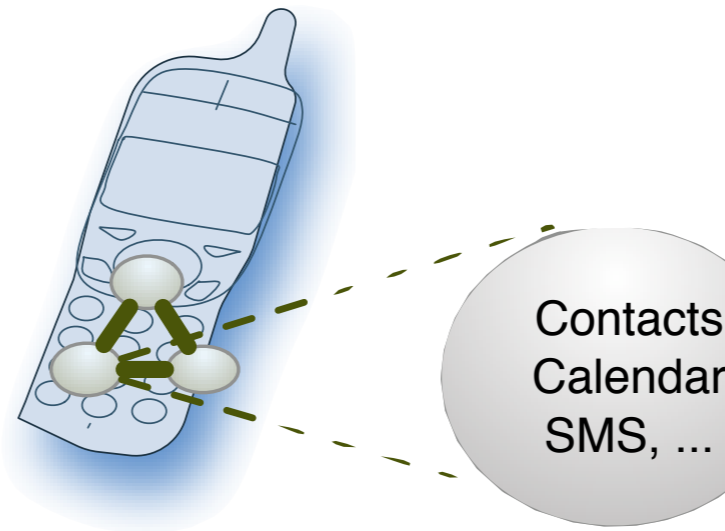
# Mobile and Web Service Architecture

## Key functionalities

- The mobile phone as service aggregator,
- Semantic service profiles for devices,
- User profile ontology,
- Radio and application access (key distribution),
- Policy engine for advanced reasoning



# Mobile Service Oriented Architecture

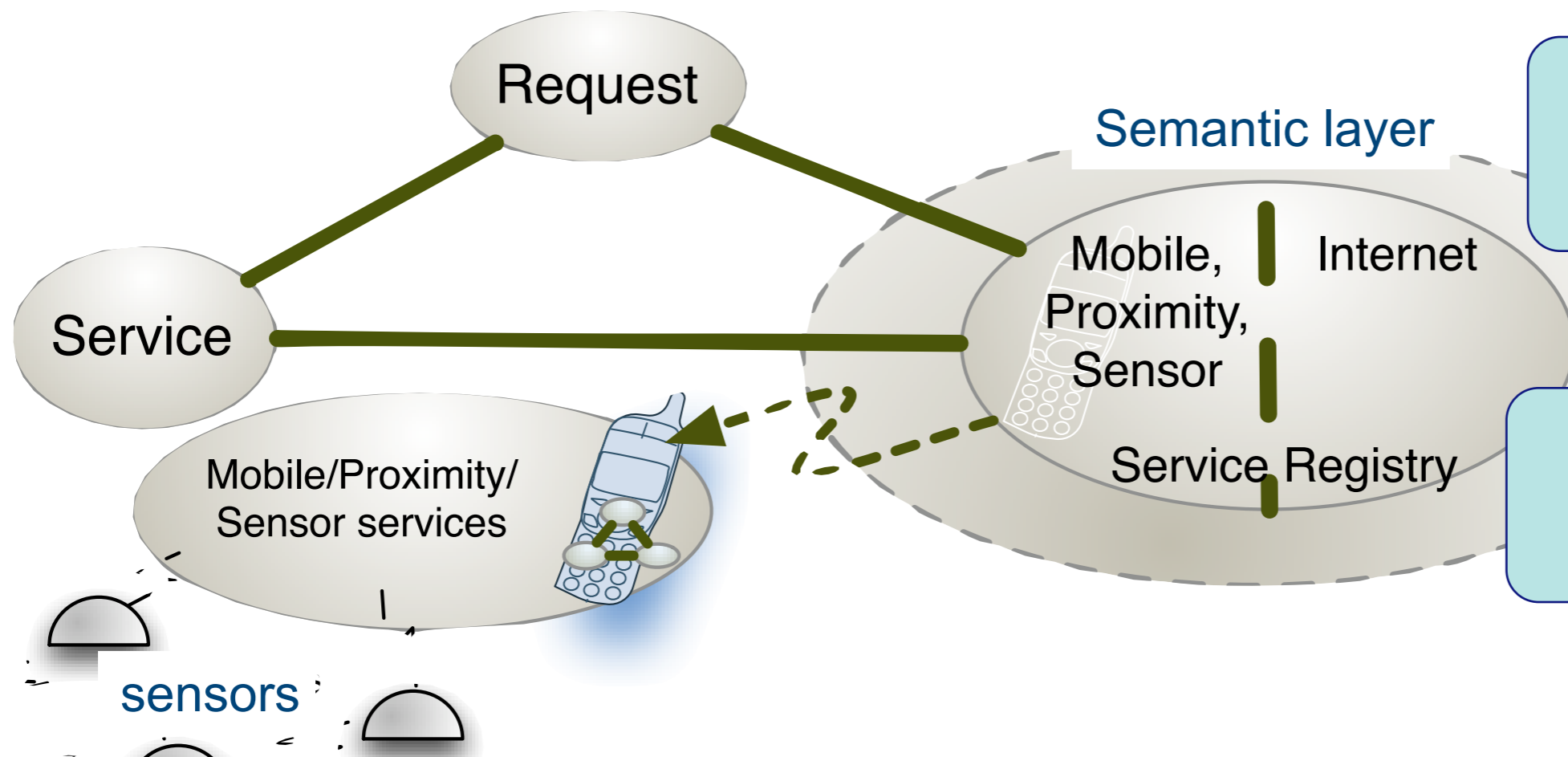


**Mobile services:**  
gSOAP, kSOA,  
JSR-172

**Context:**  
GUP, sensors

**Device profiles:**  
CC/PP, UAProf,  
WURFL

**OWL + SWRL:**  
rule execution



# ITEA-WellCom.org

## From Current TV to interactive services



source: Sony

And some of the partners working on tomorrow's TV experience:

Alcatel-Lucent 

 telenor

 UNIVERSITÉ D'EVRY  
VAL D'ESSONNE





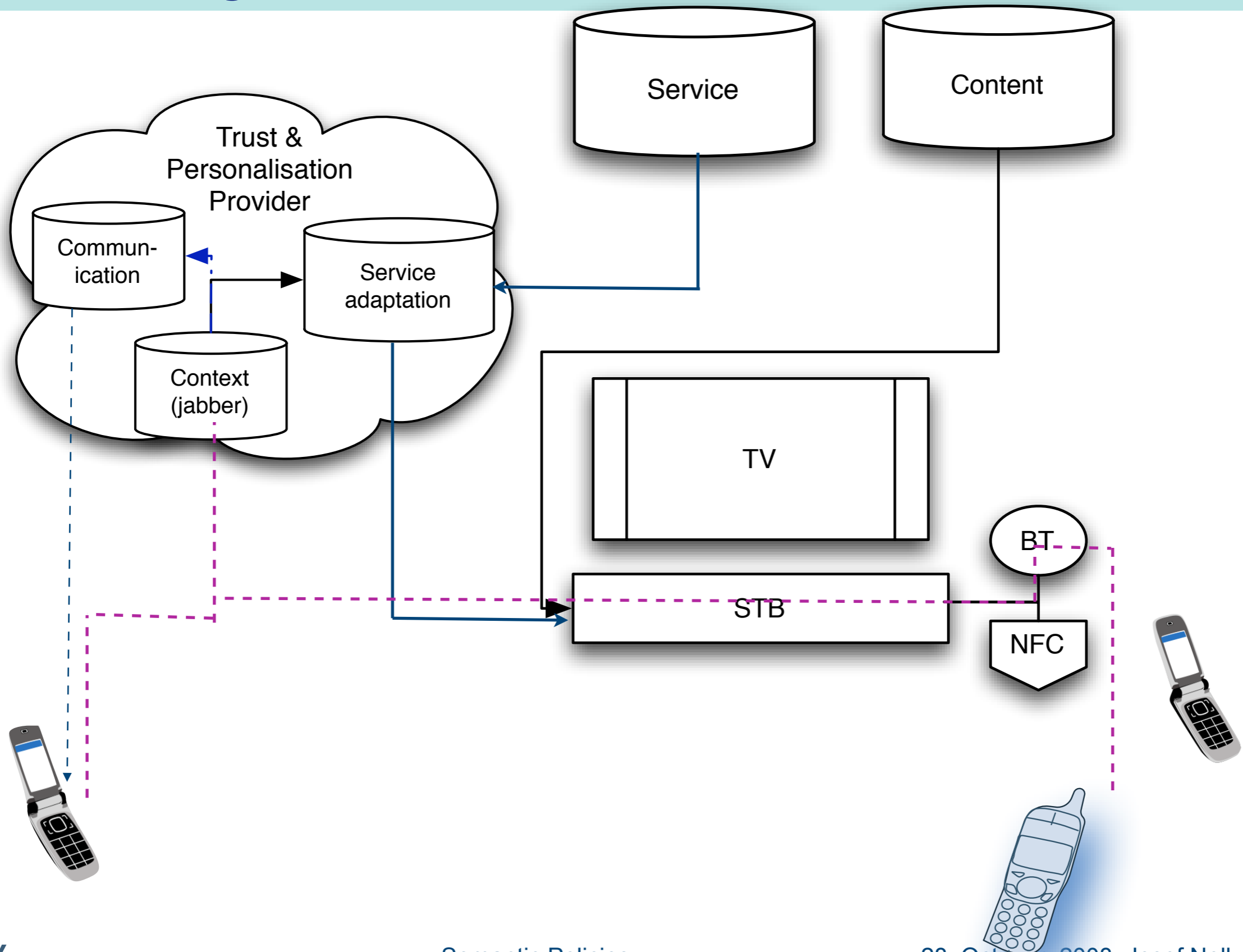
 SES ASTRA  
An SES GLOBAL Company

 NXP  
wired by NXP



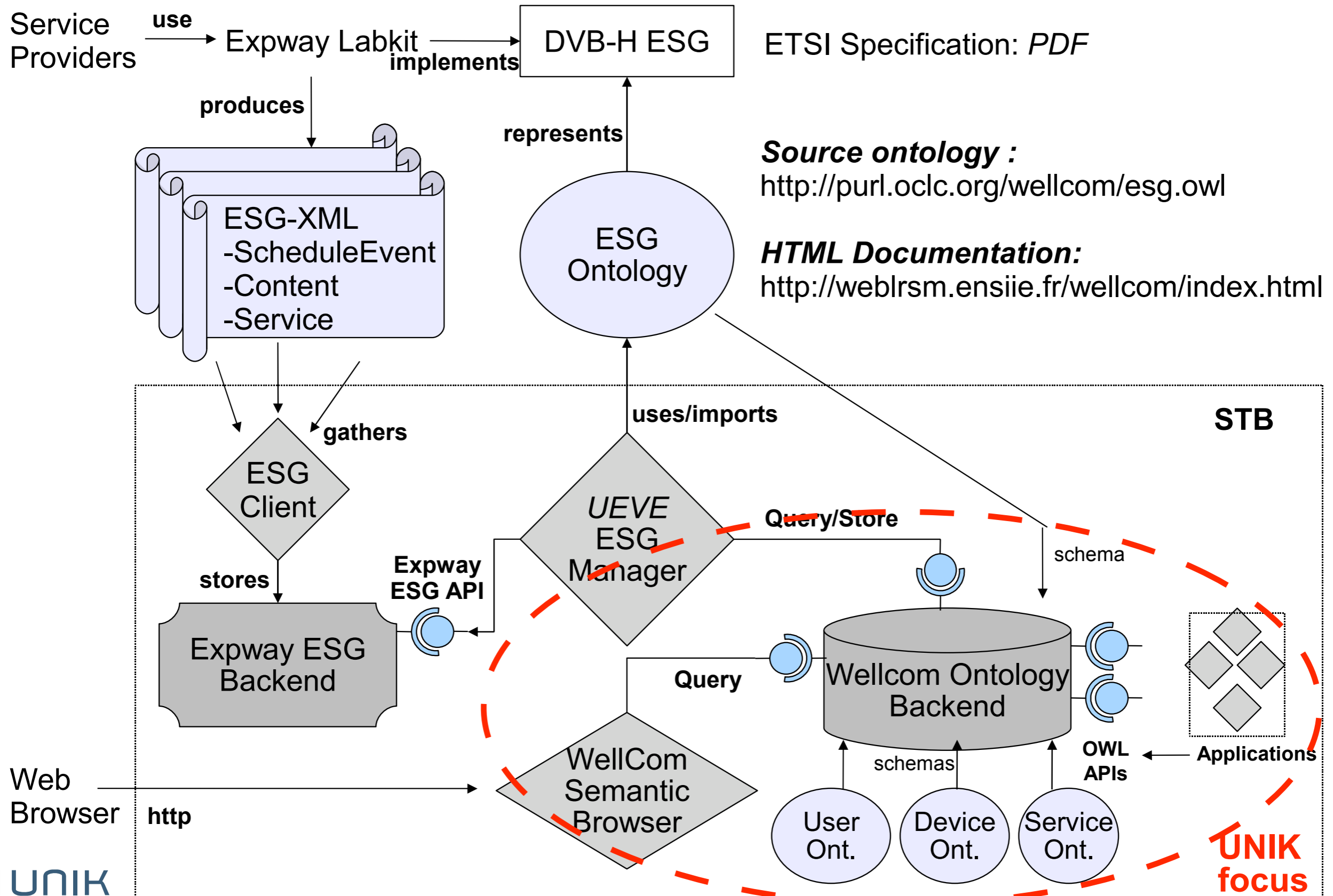


# TV today and tomorrow



# ITEA WellCom: Implementation examples

## Current development

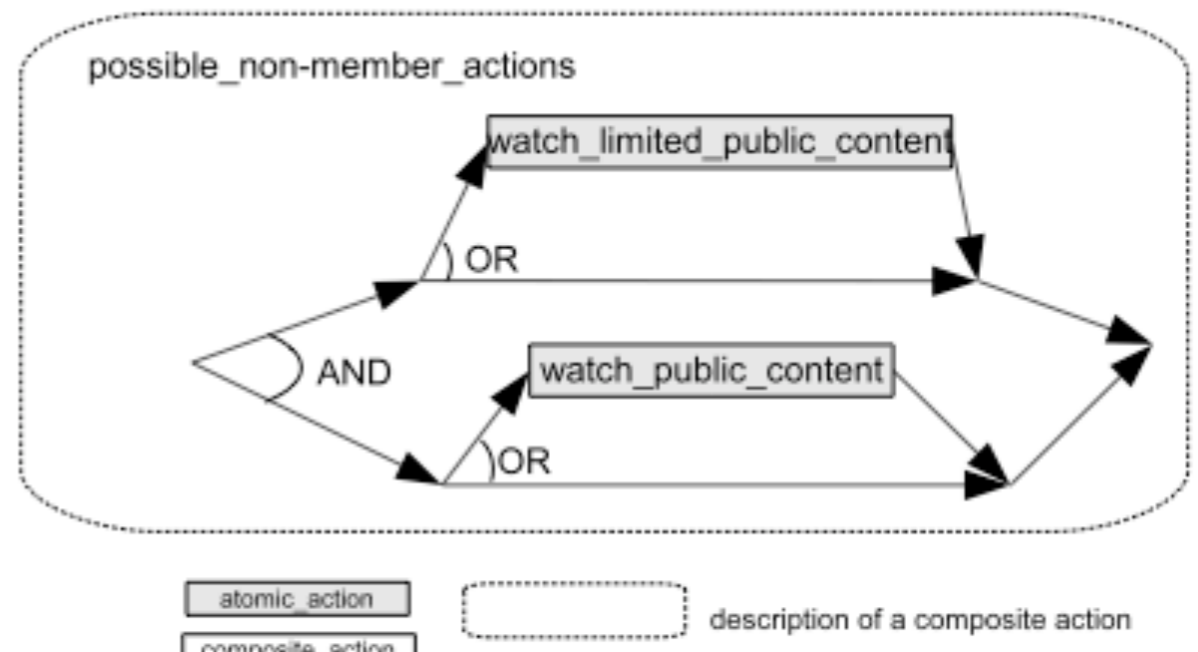
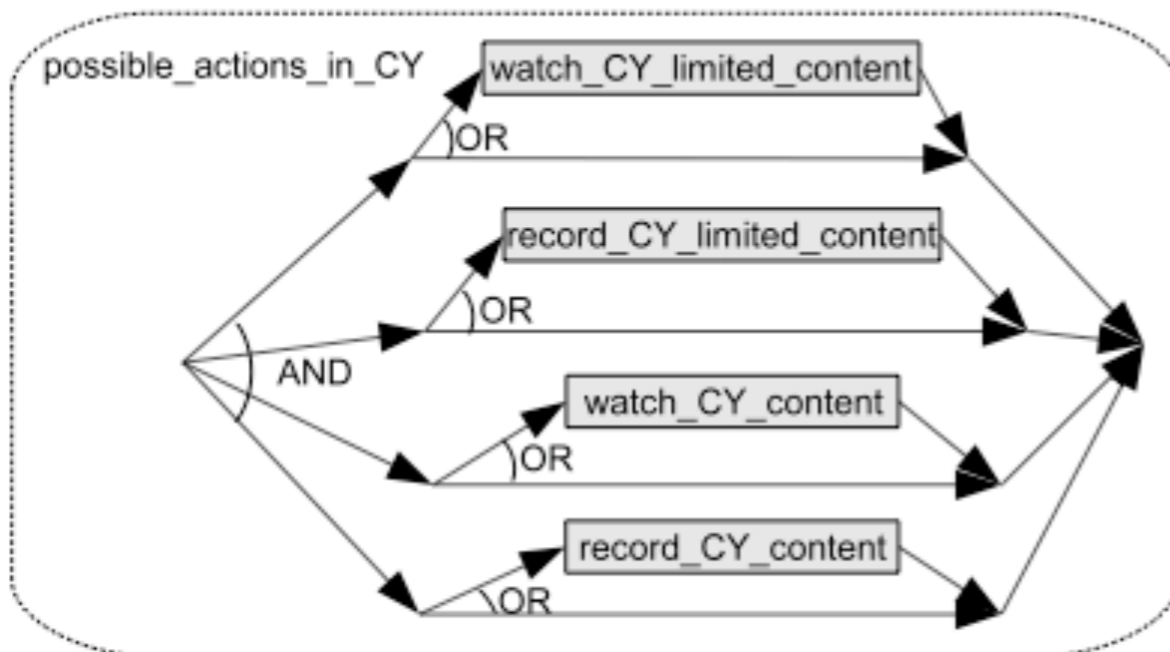
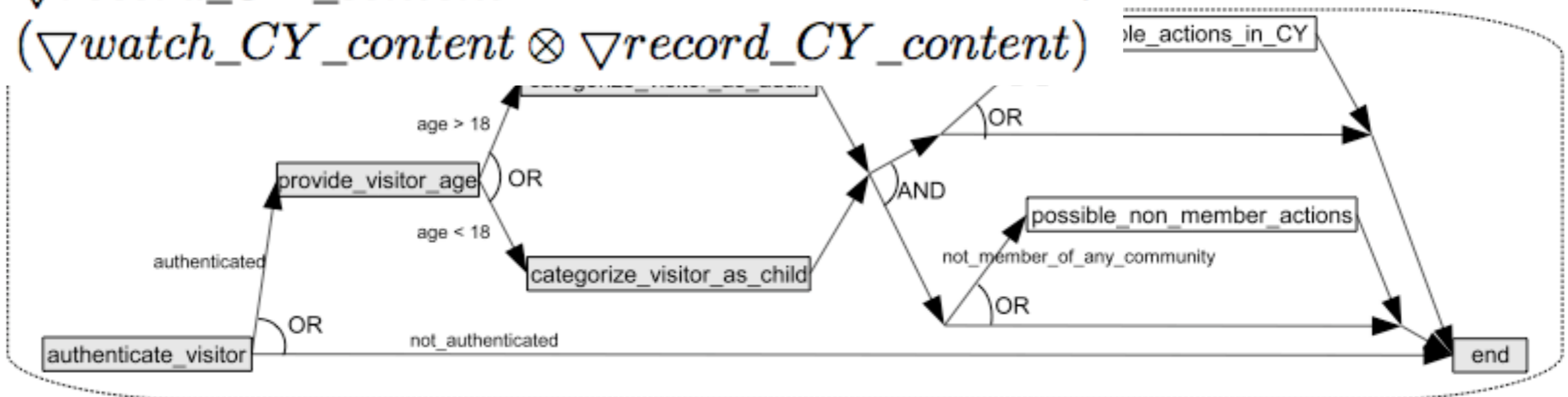


# Policy-enforced access

Pol 1:  $\nabla provide\_visitor\_age$

Pol 2:  $\nabla categorize\_visitor\_as\_child$   $\Rightarrow \neg \nabla watch\_CY\_content$

Pol 3:  $\nabla record\_CY\_content$   $\Rightarrow (\nabla watch\_CY\_content \otimes \nabla record\_CY\_content)$



atomic\_action     description of a composite action  
composite\_action

# Conclusions

- “The last time we were connected by a wire was at birth!” [Motorola]
- The service world is wireless
  - Q: “what is if you loose your phone?”
  - A: “A real crisis in life!”
- Easy access to devices and services, dependent on the context of the user
- Challenges
  - get control of complexity
  - get people understanding what they are doing and us understanding people

