



CENTRIC 2010

22.-26.08.2010, Nice

“WWRF – Security, Privacy, and Trust Agenda”

Mario Hoffmann

Chair WWRF Working Group 7 “Security & Trust”

Fraunhofer Institute for Security Information Technology

Head of Department “Secure Services & Quality Testing”

Darmstadt/Munich, Germany



- **Global platform** to initiate global cooperation towards future wireless world
- Vision from **user perspective** → requirements for the enabling technologies
- Unique way of **active cooperation** within and between industry and academia
- **Reduce risk** for investment in research
- Ease future standardisation by globally **harmonising views**
- Proven history of creating large scale **research cooperation** and
- **facilitating funding**
- **Open** to all actors

WG7 – Privacy, Security & Trust

Table of Content



Source: EU4 ST Project, 2001

Vision
Challenges
Approach
R&D Questions
Join WG7

WG7 – Privacy, Security & Trust

Vision (1/2)



An ambient life style where ... seven trillion wireless devices serve seven billion people in 2020, and

- privacy, security and trust is considered as an enabler and integrated part of use cases,
- dark scenarios are identified and tackled or just - like the movie *Minority Report* - remain science fiction, and
- omni presence (always on) does not lead to omni persistence (always there)

WG7 – Privacy, Security & Trust

Vision (2/2)



WIRELESS WORLD
RESEARCH FORUM



An ambient life style where ... secure, intuitive and wireless interaction becomes the key enabler of smart environments, where ...

- **Identity Lifecycle:** All entities – both real and virtual – involved in wireless interaction (i.e. end-users, devices, services) can choose whether they like to identify themselves (by real name or pseudonyms) or remain anonymous at all levels and
- **Information Lifecycle:** Usage of any kind of data can be limited, bound to a specific purpose or specifically authorised under the entities' control, i.e. information can be revealed, restricted **and** revoked.

WG7 – Privacy, Security & Trust

Major Challenges (1/6)



Integration of **Privacy, Security and Trust** into ...

Integration Layers

Protection Goals

Application Layer

Availability

Platforms/Middleware

Confidentiality

Mobile Devices

Integrity

Infrastructure

Accountability

Authenticity

WG7 – Privacy, Security & Trust

Major Challenges (2/6)



WIRELESS WORLD
RESEARCH FORUM



Application Layer

- **Open Applications:** Privacy, security and trust in future ambient environments, contexts and open applications (see scenarios of WG1)
- **Context security:** User moves with his mobile and body network (monitoring vital functions) from intelligent home into automotive scenario into public places into office etc. (Who has access to what, why and when?)
- **Interoperability:** Seamless interoperability of security policies, e.g. technical solution for: my mobile allows incoming calls from family but office policy does not
- **Identity:** Protection of authenticity and identity of users, services, and devices

WG7 – Privacy, Security & Trust

Major Challenges (3/6)



WIRELESS WORLD
RESEARCH FORUM



Platform/Middleware

- **IoT&S:** Privacy, security and trust in the Internet of Things & Services, e.g. authenticity, confidentiality, accountability
- **Holistic security:** Vertical and horizontal (the whole is more than the sum of its parts)
- **Trust models:** Open service creation (see WG2)
- **Secure HW tokens:** Smart cards, national ID cards
- **Secure communication:** Machine to machine, machine to infrastructure, e.g. safety, reliability, robustness, transparency

WG7 – Privacy, Security & Trust

Major Challenges (4/6)



Mobile Devices

- **Usable security:** User experience, complexity, transparency
- **Surveillance:** Malicious software, misuse, spying out, tracking & tracing
- **Missing interoperability:** Different PST levels and implementations for operating systems
- **Open interfaces:** Wireless and mobile interfaces need protected/stealth modes to support confidentiality and privacy of users

WG7 – Privacy, Security & Trust

Major Challenges (5/6)



WIRELESS WORLD
RESEARCH FORUM



Infrastructure

- PST in the Future Internet, e.g. availability and integrity
- Increasing variety and number of wireless and mobile access technologies and devices (e.g. sensors)
- Trustworthy (at least trusted) devices

WG7 – Privacy, Security & Trust

Major Challenges (6/6)



WIRELESS WORLD
RESEARCH FORUM



Inter-/Cross-Layer Issues

- Pace of technology and encryption algorithms
- Data traces
 - left willingly
 - but also unwillingly and without consensus
 - virtually everywhere at anytime
- ➔ Omni-presence without omni-persistence
- Implementation ... of countermeasures
 - Data minimisation, purpose binding
 - User empowerment
 - Education, Awareness
 - Transparency of existing data sets
- ➔ Informational self-determination

WG7 – Privacy, Security & Trust

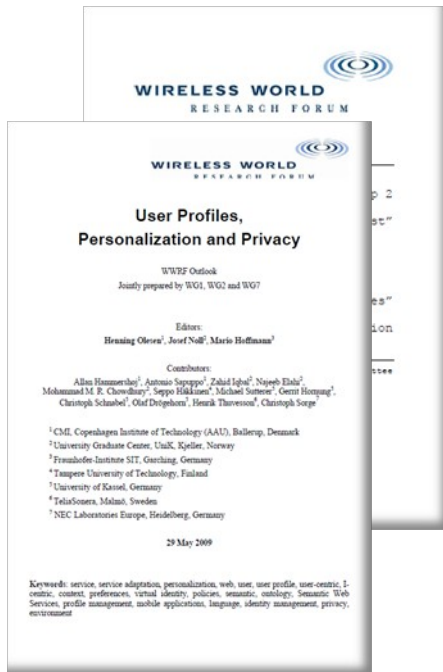
Approach

Privacy, Security & Trust by Design

- Taking PST into account in the design phase of ambient environments minimizes misuse, attacks and additional costs at runtime.

Multilateral Security Approach for Security and Risk Analyses

- Take all parties of a transaction into account considering security requirements and privacy concerns.
- For a comprehensive security analysis consider each communication partner as a possible attacker.
- Try to find a reasonable balance between different interests.



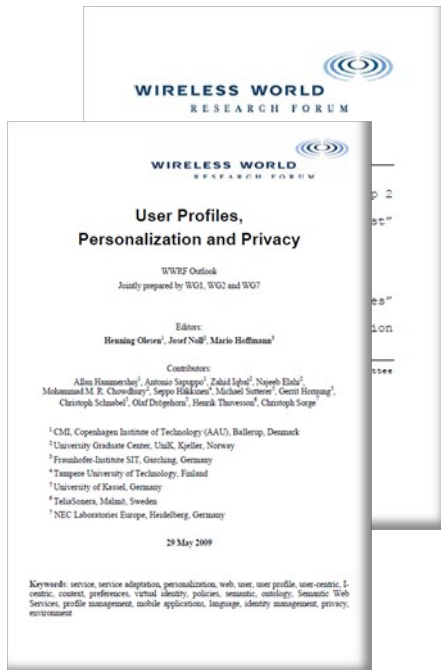
Source: WWRP

WG7 – Privacy, Security & Trust

R&D Questions

How to ...

- specify, negotiate, enforce and monitor a certain Privacy, Security & Trust (PST) context or level between cooperation and communication partners in ambient environments?
- Implementation and integration of security enablers
- Risk and security analysis
- Spy out, deny, tamper, misuse, misinform
- User empowerment, user awareness, enforcing security policies, establishing context security
- Transparency, usable security



Source: WWRP

WG7 – Privacy, Security & Trust

Contact

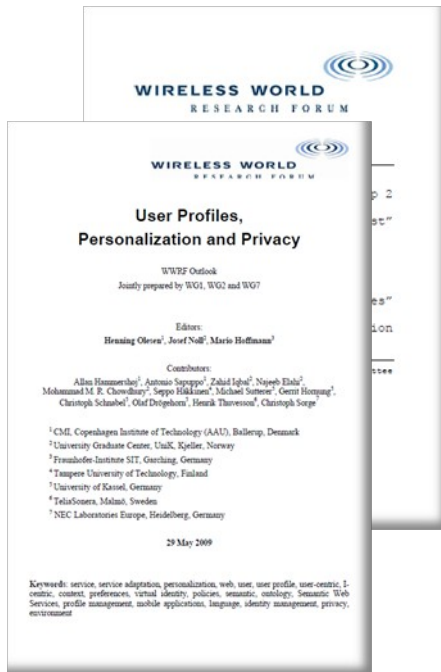


Join WWRF and WG7

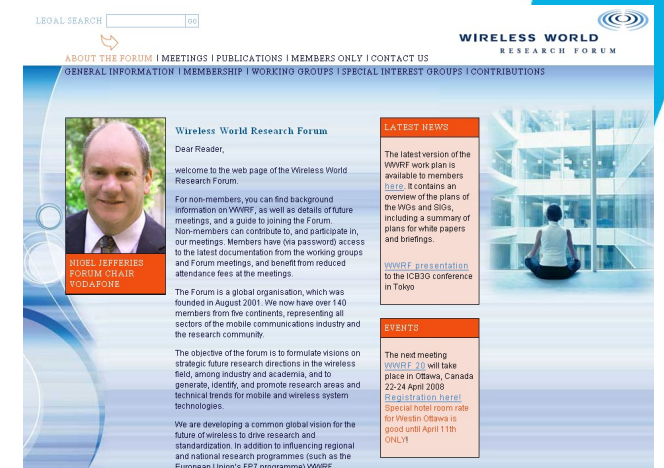
Website: www.wireless-world-research.org/

Subscribe to our mailing list!

Contact: Mario Hoffmann (Chair)
mario.hoffmann@sit.fraunhofer.de
Marcus Wong (Vice Chair)
wong@huawei.com



Source: WWRF



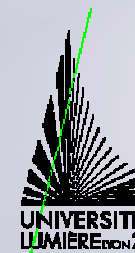
User Centric Systems: Assistance

Elöd EGYED-ZSIGMOND
elod.egyed-zsigmond@liris.cnrs.fr

Laboratoire d'InfoRmatique en Image et Systèmes d'information
<http://liris.cnrs.fr>

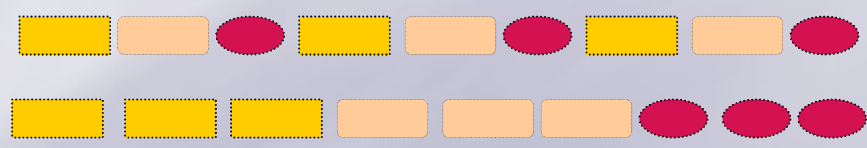
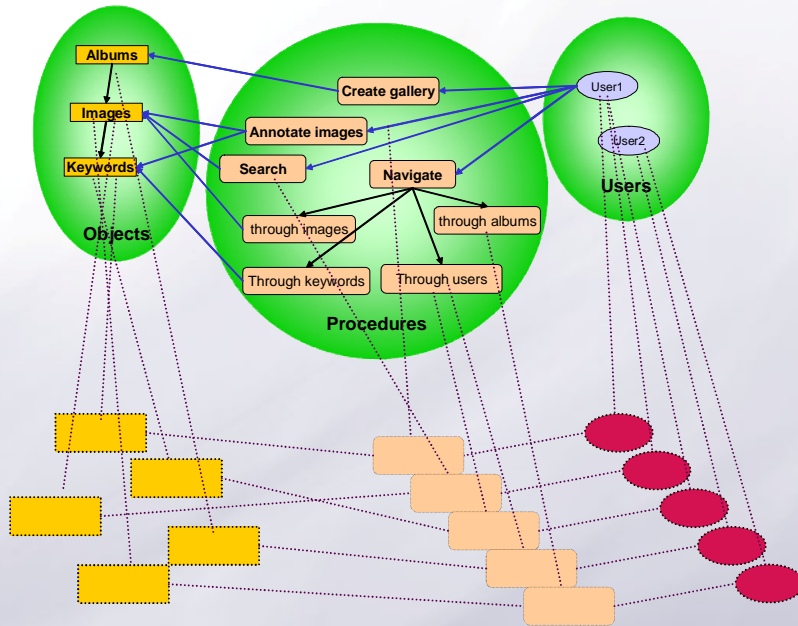


Université Claude Bernard  Lyon 1



Issues

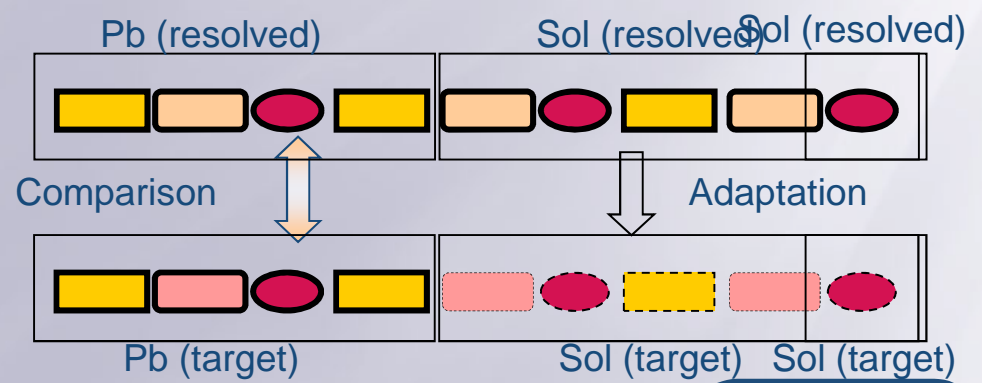
- User centric / For the user
- Help the user
- Proactivity
- Let him/her control
- User profile
- Context
- Capitalize and reuse personal and collective experience
- Privacy

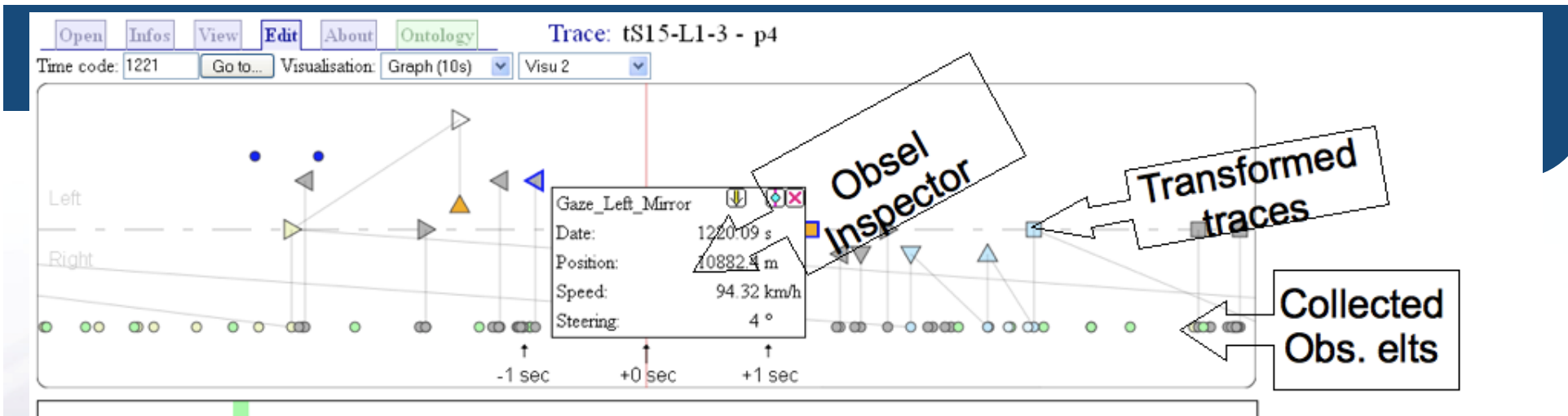


View1

View2

The assistance concerns:
 « **What to do?** »
 rather than
 « How to do? »
 type problems





Rule editor:

Comments:

Lane_Change_Accelerate

Import
Generate ->

Construct: View Edit

- Select an action - (reset)

```
?x1 kb:inferred _:a .
?x2 kb:inferred _:a .
_:a a kb:Lane_Change_Accelerate
_:a kb:date ?d2
```

Where: View Edit

- Select an action - (reset)

```
#Obs. 2 is the first resource of type2 following Obs. 1 of type1
?x1 a kb:Speed_Increase ;
kb:date ?d1 ;
kb:then ?x2 .
?x2 kb:date ?d2 ;
```

Rule name: Lane_Change_Accelerate Save rule Save and process

```
1 # Lane_Change_Accelerate
2
3 PREFIX myfn: <java:com.l4odds.sparql.>
4 PREFIX kb: <http://protege.stanford.edu/kb#>
5 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
6 PREFIX xs: <http://www.w3.org/2001/XMLSchema#>
7 PREFIX fn: <http://www.w3.org/2001/xpath-functions#>
8
9
10 CONSTRUCT (
11 ?x1 kb:inferred _:a .
12 ?x2 kb:inferred _:a .
13 _:a a kb:Lane_Change_Accelerate
14 _:a kb:date ?d2
15 )
16 WHERE (
17
18 #Obs. 2 is the first resource of type2 following Obs. 1 of type1
19 ?x1 a kb:Speed_Increase ;
20 kb:date ?d1 ;
21 kb:then ?x2 .
22 ?x2 kb:date ?d2 ;
23 a kb:Indicator_Left ;
24 kb:duration ?dur .
25 FILTER ( xs:double(?dur) < 5 ) .
26 FILTER ( myfn:MaxDelay(?d1,?d2,4)
27
28 )
29
30
```

A request to build a new obsel by pattern matching

Selected element: id=http://protege.stanford.edu/kb#Collect_Tag-43c45864:111b6adf6de-7fd2



USERNAME ELOD

[Search] (group)

[Stop] [Delete Last Step] [Search] (group) (biennale) [UID:] () [GID:] () [IID:] ([img_6727](#)) [Enlarge] (485851) (défilé) (biennale) (dance) (lyon) (rouge) (orange) (group)

[Search](#) >

- Home
- Upload
- Manage
- Search
- SearchTrace
- Keywords
- Profile
- Logout

SEARCH

group

advanced

search

RELATED KEYWORDS

rouge¹⁷ lyon¹⁷ défilé¹⁷ dance¹⁷
biennale¹⁷ large⁵ orange³ white²

SUGGESTED KEYS

night 1.67
lyon 1.33
[biennale](#) 1.00



NUMBER OF IMAGES: 17 _17 1/2 IMAGES NEXT

USERNAME ELOD
[Keywords]
[Your Galleries]
[Gallery: Défilé]



SUGGESTED IMAGES





Identity suggestion according to your profile

Julie, **motherOf** my **closeFriend** Anne



Alice, **cousinOf** my **closeFriend** Anne



(a)



Identity suggestion according to your profile

Julie, my **mother**











Alice, my **cousin**



(b)

Issues

-  **User centric / For the user**
-  **Help the user**
-  **Proactivity**
-  **Let him/her control**
-  **User profile**
-  **Context**
-  **Capitalize and reuse personal and collective experience**
-  **Privacy**

PRIVACY IN TELEMEDICINE

DR. HMP SINGH, MD, PhD, MASLMS(USA)
ASSOC. PROF, INTERNAL MEDICINE,
PROJECT LEADER TELECARDIOLOGY,
FACULTY OF MEDICINE,
UNIVERSITI MALAYSIA SABAH,
hmpsingh@ums.edu.my

INTRODUCTION

ISSUES INVOLVED

- Conventional medicine
- Doctor patient relationship
- Bond of trust
- Privacy is the basic right of patient
- Sensitive information
- Emotional trauma

HISTORICAL BACKGROUND

- Clinical medicine dates back to early 19th century
- Hippocrates “father of medicine”
- Doctors were self styled leaders of society of considered to be faithful to the society at large and their patients in particulars
- HEALERS of MISERY
- NEXT to GOD ALMIGHTY
- FAITHFUL MESSENGERS

TECHNOLOGICAL DEVELOPMENT

1. In the last 50 years
2. Technological developments have changed the diagnostic scenerio
3. Clinical medicine is no more an ART of practice
4. DOCTORS are more of HIGH TECH TECHNOCRATS
5. Computers, CT, MRI, USG, ICT has changed the scenerio

DOCTORS ARE NO MORE HEALERS ?

- Conventionally doctors had more time for patients
- Now they are sitting behind computers, echo & USG machines
- Diagnostic Dilemmas are more challenging
- Newer Diagnostic & therapeutics are ever changing
- Lasers, endoscopies, distant learning & diagnostics have left doctors with no time for patients

PRIVACY AT THE COST OF LIFE

- Is it essential to maintain the privacy
- Will it be more beneficial really to patients to expose to the paramedics
- What about the bond of relationship
- TRUST is LOST or DILUTED

COUNSELLARS/ ASSISTANT MEDICAL PHYSICIANS

- New concept is of Counsellars/Facilitators
- Assistant Medical Physicians
- Data storage agencies
- Early Diagnosis is KEY to SUCCESS



VIRTUAL SPECIALISTS



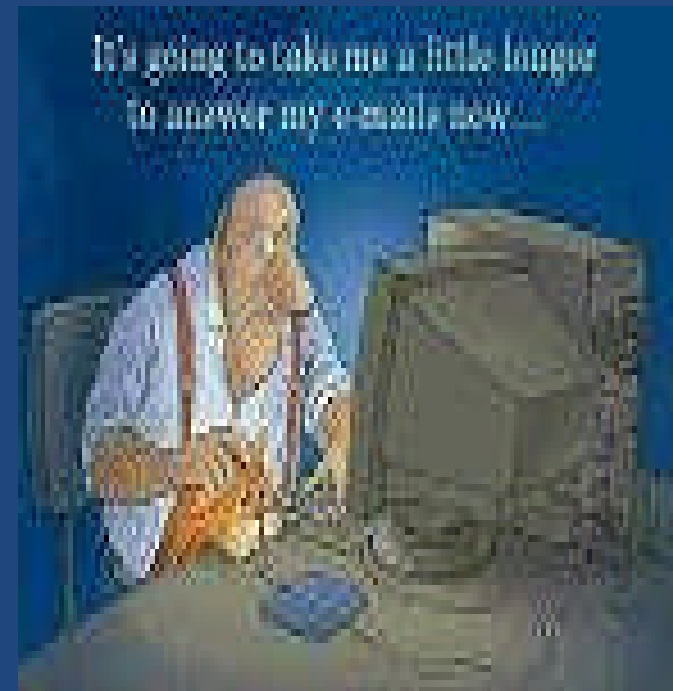


Old is Gold: Virtual Specialists

YES



NO



JUDICIAL USE

- NO BODY DENIES to Newer technical devices
- Cost of treatment is making patients more aware
- Insurance companies are WATCH FUL DOGS
- MONEY is the KEY FACTOR
- DEMARCATION LINE IS THIN
- KEEP THE ETHICAL ISSUES in MIND
- USE THE TECHNOLOGY JUDICIALLY



Thank You!