

Contract Number 235542

## **RACE networkRFID**

FP7 Thematic Network  
ICT-PSP: a European concerted effort on RFID

### **D4.4 – Security, Privacy and Safety issues and requirements report**

Due date of deliverable: 28-02-2011 (M24)  
Actual submission date: 20-04-2011

Start date of project: March 1<sup>st</sup>, 2009

Duration: 36 months  
Version: 1

Organisation name of lead contractor for this deliverable: ETSI  
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<b>Project co-funded by the European Commission within the Seventh Framework Programme (2007-2013)</b>		
<b>Dissemination Level</b>		
<b>PU</b>	Public	<b>PU</b>
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
<b>RE</b>	Restricted to a group specified by the consortium (including the Commission Services)	
<b>CO</b>	Confidential, only for members of the consortium (including the Commission Services)	

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# Introduction

Some RFID applications make a direct and positive contribution to Security, Privacy and Safety. It has to be recognized that in order to promote widespread and growing adoption of RFID applications these applications like so many other technologies need to be designed, implemented and monitored for their impacts with respect to security, privacy and safety.

Security can assist with privacy and broader concerns about potential threats to information and physical security related to RFID deployment. The unanswered questions are which elements of security need universal application, which need targeted and, which may undermine or weaken security and/or RFID adoption? The breadth and speed of RFID adoption is susceptible to impediments to costs and to performance, both of which are commonly related to complexity. Security measures generally equate to complexity. Further universal application of security measures can lead to the premature diminishing of the security measure effectiveness, examples of which make media headlines around the world continually.

Privacy equates to data protection of personal information for a number of stakeholders. For other stakeholders privacy goes beyond data protection to cover the broader aspects which pose potential threats either real or perceived, being related to information or physical objects. While there are issues to be addressed by considering data protection of personal information the widespread adoption of RFID will be impeded in some way or other by not gathering a more comprehensive answer to these wider concerns.

Safety covers a number of areas some of which relate to long term exposure to electromagnetic fields of RFID systems through to areas overlapping with security such as the threats to individuals or their property from illegal activities. While privacy and security by design is a popular expression it is essential to the future success of RFID applications and others using wireless technology that safety and the ‘precautionary principle’ is universally implemented from application design through to the applications end of life.

<b>Deliverable number: D4.4</b>							
<b>Deliverable title:</b> Security, Privacy and Safety issues and requirements report							
Dissemination level (i): P				Nature of the Deliverable (ii): R			
Month of Delivery: M12, 24, 36							
Participant no. contributing to the deliverable	5	2	7	11	14	18	20
Participant short name	ETSI	GS1	IBERLOG	ELTRUN-AUEB	UNIMAN	VTT	RAND EUROPE
Participant no. contributing to the deliverable	21	22	25	12			
Participant short name	SINTEF	RFID NORDIC	INTER NET	RFIDsec			
Deliverable description and objectives to be achieved (iii): The Thematic Network will identify and report the issues and requirements on RFID Applications and Services Security, Privacy and Safety.							

## Progress

In 2010 CEN, CENELEC and ETSI cooperated together in the development of the common answer to the EC RFID Mandate M/436 on RFID Security and Privacy, on RFID Emblem and RFID Privacy Impact Assessment (PIA). RFID M/436 Phase 1 report has been published in 2010 as ETSI TR 187 020:

RFID system and network security and privacy protection

Doc. Nb. TR187 020

Ref. DTR/TISPAN-07044

0.0.6 Stable draft (2010-07-16)

0.0.12 Final draft for approval (2011-01-21)

[http://webapp.etsi.org/WorkProgram/Report\\_WorkItem.asp?WKI\\_ID=31383](http://webapp.etsi.org/WorkProgram/Report_WorkItem.asp?WKI_ID=31383)

IERC is IoT European Research Cluster <http://www.internet-of-things-research.eu/>  
ETSI Patrick GUILLEMIN is Contracted Member of CASAGRAS2 and RACE networkRFID WP4 Leader. He is IERC IoT Standardisation Coordinator

AVANTA Trevor Peirce is

- rapporteur of ETSI TC TISPAN WG7 work item DTR/TISPAN-07044.
- ETSI contracted expert in CASAGRAS2
- is IERC IoT Security and Privacy Coordinator
- ETSI contracted expert in RACE networkRFID (WP4)
- and AVANTA RACE networkRFID WP5 Leader

CEN TC 225 has been involved in RACE in the framework of RFID Mandate M/436 on RFID Security and Privacy, RFID Emblem and RFID PIA. This has in fact involved CENELEC too. CEN TC 225 has been involved in WP4, WP5 and WP1.

ETSI facilitated the cooperation between: ETSI, CEN, CENELEC, The European Commission (DG ENTR, DG INFSO), CASAGRAS2, IERC, RACE networkRFID, EC RFID Recommendation Informal Stakeholder Group, The EC IoT Expert Group drafting next IoT Standardisation Mandate, EU-China IoT/RFID MoC, RFID Mandate M/436 Phase 1 Coordination Group and Experts and all IoT/RFID Projects members of IERC. RACE networkRFID is member of IERC and the worldwide recognized IERC: the IoT/RFID European Research Platform.

Detailed WP4 achievements

A large part of RACE networkRFID WP4's activities have been to gather together information on RFID application security, privacy and safety. This activity was scheduled to coincide with the start of the activities related to Mandate M436, Phase1. Further actions will depend upon the information received from RACE networkRFID members and taking into consideration related activities underway within the European Standards Organizations (ESOs).

There has been support of Mandate M436 Phase 1 through a contribution to ETSI STF396 (STF for Specialist Task Force). While there was great expectations of TISPAN WG7 it became apparent that the measures to improve RFID privacy and security were not matched with those for the NGN (Next Generation Network, term used in ETSI TC TISPAN in Telecommunications core and edge networks including amongst other IMS - IP MultiMedia SubSystems) as originally intended. Compatibility with NGN privacy and security measures

was targeted in order that RFID applications could be afforded equivalent protection when the RFID systems were connected via a NGN and, allowing “safe” RFID into the home, mobile and many other locations. In particular ETSI TC TISPAN WG7 advised for Mandate Phase 1 to be addressed through the creation of a “protection profile”. This exceeded the progress made with NGN security as there is yet to be an ETSI TC TISPAN WG7 protection profile created for the NGN.

There has been some time a lack of consensus between Radio experts, Security Experts and Privacy Experts in ETSI STF396 concerning some relations between RFID and privacy. This exposed perhaps the EC Recommendation on RFID Security and Privacy and the EC RFID Mandate Phase 1 to discussions and conclusions limiting, from the Security and Privacy perspective, the quality of the RFID Mandate Phase 1 report. This underlines the contrasting considerable success of the EC’s RFID Recommendation Work Groups in coming to an agreement on the RFID Recommendation, the RFID PIA Framework and the progress with the common European (RFID) sign.

## Deliverables



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### Work Package 4 - D4.4 (In collaboration with WP1)

## Results Summary 2010 RACE Member Survey Privacy, Security & Health

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## Strategic Approach

- The network strategy is to concentrate on two distinct areas of priority:
  - Enabling adoption by providing adequate **policy tools**, including *enabling policies* and *awareness towards decision makers, industry and governments*
  - A programme of activity to raise general **awareness** of RFID among users, SMEs and the general public
- In effect a “push” and “pull” approach

## Overview

- 10 questions
- 50 visits
- 23 completed surveys (1 anonymous)

Q2 Are you familiar with EC & EU Law related references to privacy & security & health?

Q3 Can suitable privacy measures accelerate European RFID adoption?

Q4 Can security features influence European RFID adoption?

Q5 Wireless technologies including RFID will they create health concerns limiting European RFID adoption?

- +

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## Overview

Q6 Do you feel European SME adoption of RFID will improve due to RFID privacy, security and health related initiatives?

Q7 Do you agree that privacy with respect to RFID refers to:

- i) Control of access to personal data?
- ii) The possibility to identify or track individuals through RFID?
- iii) Protecting individuals from additional risks of crime (object identity)?
- iv) Supports freedom from discrimination, individuals and groups?

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Q8 Why are elements of RFID targeted now by European initiatives focusing on privacy, security and health?

- i) Newly developing RFID apps bringing RFID into a wider public domain?
- ii) Due to item level RFID embedded or attached to objects in public domain?
- iii) Due to hype surrounding projected growth?
- iv) Due to recent influence of popular RFID low security technologies and supporting standards making security threats more likely through opportunities to replicate attacks?

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## Overview

Q9 How strongly do you feel that the following offers a potential positive contribution to RFID application security, privacy and/or health:

- i) Application design - PIA?
- ii) Application design – Good practice guidelines?
- iii) Application design – RFID removal option from objects they are attached to?
- iv) Application design – Air interface data minimization e.g. anonymous identifiers?
- v) Technology – RFID “kill” and/or user configurable switch on/off features responding to the ‘silence of the chips’?
- vi) Technology – Wireless communication range configuration features e.g. allowing user control?
- vii) Technology – RFID device memory “lock” features to minimize interference/tampering?
- viii) Technology – Encryption of data communicated over the RFID air interface?

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## Overview

Q10 Do you feel that RACE should make a greater contribution to advance RFID with respect to privacy, security and health?

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## Comments received:

Q3 & Q4. Health issues less important profitability for success

Suitable protection always needed and in particular at beginning of deployment, but not crucial to adoption

Q4. No one knows the combined effects of complex cumulative radio emissions, need to measure field and engage independent expertise by public bodies

Q5. prevention of abuse of wild marketeers and protection against crime, profiling, behaviour, identity – preventing discrimination through encryption and anonymization & “silence of the chips”

Concerns addressed whether perception or science based. Further research required.

Q7.a. Depends on whether tag holds personal data

b. Technical, organizational and environmental conditions needed might not always allow tracking or profiling

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### Comments received:

- Q7.b. Profiling harder than tracking
- c. Technical & environment needed to be met simultaneously
- d. Profiling and tracking using EPC technology only possible when personal data linked to individual
- Q8. Only political discussion forced by biased customer interest groups, there exist more efficient ways to track people
- Due to public opinion influenced by mediocre journalism. Data protection regulations are OK but fines could be higher. Health risks not proven. More security required
- Q9.g. Commercial confidentiality & integrity of concern rather than privacy
- h. Privacy ridiculous consideration, but concerns for health from too many readers with different frequencies, even if their operating powers are less than for mobile phones. What happens with mobile wireless & RFID in populated areas



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### Q2 EU RFID Comms?

- I am aware Approx. 67%
- I am not familiar Approx. 33%

### Q3 Privacy can accelerate EU RFID adoption?

- Yes and I would support initiatives under RACE Approx. 52%
- No, privacy has no impact on RFID adoption Approx. 22%
- Yes, but I would not support other initiatives with the exception of those started Approx. 17%
- Comments Approx. 14%



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## Q4 Can security features positively influence the rate of wider European RFID adoption?

- Yes and I would support initiatives offering more application information security features Approx. 50%
- Yes and I would support initiatives offering more RFID security features Approx. 41%
- 5 Comments



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## Q5 Wider use of Wireless and RFID tech will they create future health concerns?

- Yes but only concerned for public perceptions Approx. 55%
- No I believe there are adequate references to satisfy public opinion and suitably guide architects and operators of RFID applications Approx. 32%
- 2 Comments



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**Q6 Do you feel that European SME adoption of RFID will improve due to privacy, security and/or health related initiatives?**

- Yes , considerably \_\_\_\_\_ Approx. 31%
- Yes , marginally \_\_\_\_\_ Approx. 31%
- No change \_\_\_\_\_ Approx. 28%
- No, the opposite \_\_\_\_\_ Approx. 8%



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**Q7 Rate the following RFID privacy aspects in relation to European adoption:**

- |   | <u>Important or Moderate Influence</u> |
|---|--|
| • Possibility to track individuals through tagged objects _____   | Approx. 91%                            |
| • Control of access to personal data _____  | Approx. 87%                            |
| • Protecting individuals from additional risks of crimes e.g. property crime _____                        | Approx. 66%                            |
| • Freedom from discrimination either individually or due to association with a group e.g. profiling _____ | Approx. 57%                            |
| • 3 Comments  |  |

**Q8 Why do you feel RFID is targeted now by European initiatives focusing upon privacy, security and health?**

Important or Moderate Influence

- Due to item level RFID embedded or attached to objects in public domain? Approx. 91%
- Newly developing RFID apps bringing RFID into a wider public domain? Approx. 78%
- Due to hype surrounding projected growth? Approx. 59%
- Due to recent influence of popular RFID low security technologies and supporting standards making security threats more likely through opportunities to replicate attacks? Approx. 50%
- 3 Comments



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**Q9 How strongly do you feel that the following offers potential positive contribution to either privacy, security or health through RFID application design or technology?**

Important or Moderate Influence

- Application design – Good practice guidelines? Approx. 88%
- Technology – RFID “kill” and/or user configurable switch on/off features responding to the ‘silence of the chips’? Approx. 77%
- Application design - PIA? Approx. 73%
- Application design – RFID removal option from objects they are attached to? Approx. 72%
- Application design – Air interface data minimization e.g. anonymous identifiers? Approx. 72%
- Technology – Wireless communication range configuration features e.g. allowing user control? Approx. 67%
- Technology – RFID device memory “lock” features to minimize interference/tampering? Approx. 16%
- Technology – Encryption of data communicated over the RFID air interface? Approx. 15%
- 3 Comments



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### Q10 Do you feel RACE should make a greater contribution to advance RFID with respect to privacy, security and health?

- Yes I agree and will actively support additional RACE initiatives Approx. 54%
- No RACE is making an adequate contribution to RFID public policy issues Approx. 36%
- Yes I agree but I will not actively support additional RACE initiatives Approx. 8%



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### Early Proposals

- 1) Mapping of RACE project activities to privacy, security and health questionnaire responses
- 2) Grouping of RACE contributions for communication to European Commission and European Parliament
- 3) RACE communication of RFID security, privacy and health reference documents and updates upon developments possibly supported by:
  - Workshops/Webinars
  - Articles on anticipated influences & guidance
  - Questionnaires

The WP4 survey was extended to the new members of RACE networkRFID following a request received from RACE networkRFID Management Board (MB) members at the Stockholm General Assembly (GA) meeting. Between the conclusion of the preliminary survey and the Stockholm GA the membership of RACE networkRFID increased significantly. The survey was only sent to the new members of RACE networkRFID and the results of the first survey restricted from public circulation in order to avoid influencing the results of the re-released survey. The results of the re-released survey did not dramatically alter the conclusions of the original survey.

Other related activities centred on the Phase 1 of Mandate M436. In outline these were the following:

- March 2010, STF396 (\*) face-to-face meeting at ETSI
- April 2010, ETSI TISPAN WG7 Work Item 07042 report and discussion at TISPAN WG7 meeting, STF396 face-to-face meeting at ETSI, developed draft Technical Report (TR), developed RFID sign coordination agreement with RACE and CEN
- May 2010, ETSI TISPAN WG7 Work Item 07042 was first an agenda item with WG7 meeting, advance TR,
- June 2010 – Visit to NEDAP to discuss Penetration Testing, OPEN MEETING in Brussels,
- July 2010 – Developed STF396 sign requirements specification
- August 2010 – Launched STF396 sign requirements specification review
- September 2010, Updated and presented STF396 sign requirements specification, responded to Open meeting review feedback on sign
- October 2010, Update TR with RFID sign requirements specification, attend STF396 Coordination Group meeting
- November 2010 – February 2011, Input to final draft TR

(\*) [http://portal.etsi.org/Portal\\_STF/Detail.asp?PTCODE=396](http://portal.etsi.org/Portal_STF/Detail.asp?PTCODE=396)

#### STF 396

**Full title :** Response to Phase 1 of EC mandate M/436 (RFID) - SA/ETSI/ENTR/436/2009-02

**Status :** ACTIVE (STF is working)

**Start Date :** 2010-03-01

**End Date :** 2011-03-31 (Planned)

[View STF Contacts](#)

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#### Work Items for STF 396

Reference	Version	Current Status
<a href="#">DTR/TISPAN-07044 (TR 187 020)</a>	0.0.12	Start of pre-processing (2011-01-31)

WP4 also contributed significantly to dissemination or public policy related RACE networkRFID progress. WP4 provided content to WP1 D1.2.2 – Quarterly Public Policy Update #7 on the 17<sup>th</sup> January 2011. WP4 wrote the RFID in Europe (RACE) Newsletter - input from WP4 & WP5 on 24<sup>th</sup> November 2010.

## **Planned Activities to M36**

In close collaboration with WP1, WP5, WP7 and WP9 it is proposed to develop activities in support of the member survey conclusions. Specific actions are anticipated with regards to the RFID PIA Framework and for the common European (RFID) sign throughout the next twelve months.

## Appendix A) Detailed WP4 achievements

- 1<sup>st</sup> March 2010 Management Board Conference call
- 24<sup>th</sup> & 26<sup>th</sup> March 2010 General Assembly, Management Board and Review Meetings, Frankfurt
- 6<sup>th</sup> April 2010 Management Board Conference call
- 12<sup>th</sup> April 2010 Policy WP Leaders Conference call & prepare updated WP4 M24 planning
- 28<sup>th</sup> April 2010 EC RFID Recommendation Informal Working Group meeting, Brussels
- 4<sup>th</sup> May 2010 Management Board Conference call
- 12<sup>th</sup> May 2010 EU China IoT Expert Group Conference call
- 19<sup>th</sup> – 21<sup>st</sup> May 2010 EU China IoT Expert Group meeting, Beijing
- 27<sup>th</sup> & 28<sup>th</sup> May 2010 WP4 common terminology conference call & document update
- 31<sup>st</sup> May 2010 WP4 M24 planning & common terminology conference call & document update
- 6<sup>th</sup> July MB Conference call
- 7<sup>th</sup> July Preliminary draft of WP4 RACE Member survey – privacy, security and health
- 8<sup>th</sup> July Update to draft of WP4 RACE Member survey – privacy, security and health
- 15<sup>th</sup> July Review and discussion with WP1 leaders (GS1 Marisa Jimenez and Emilie Danel) of RACE Member survey – privacy, security and health
- 16<sup>th</sup> July Further coordination of WP1 leaders (Marisa & Emilie) input to WP4's RACE Member survey – privacy, security and health
- 27<sup>th</sup> July Review and modifications to WP4 RACE Member survey – privacy, security and health
- 29<sup>th</sup> July MB Conference call – common European RFID sign
- 3<sup>rd</sup> August Release distribution and follow-up WP4 RACE Member survey – privacy, security and health
- 9<sup>th</sup> August Support to WP4 RACE Member survey – privacy, security and health
- 10<sup>th</sup> August WP4 RACE Member survey – privacy, security and health
- 18<sup>th</sup> August Follow-up upon changes to RACE page on EU Web Portal
- 20<sup>th</sup> August WP4 RACE Member survey – privacy, security and health
- 23<sup>rd</sup> August Discussion over support of WP5 by fulfilling leadership role
- 4<sup>th</sup> October RACE follow-up to EC sign meeting
- 5<sup>th</sup> October MB Conference call
- 7<sup>th</sup> October preparations of WP5 leadership and interim organization
- 8<sup>th</sup> October meeting with Katerina Pramatarari at Brussels Airport to discuss WP5
- 14<sup>th</sup> October analysis WP4 privacy, security and health survey
- 19<sup>th</sup> October presentation preparation for MB and GA
- 20<sup>th</sup> October RACE MB & partner meetings in Stockholm
- 21<sup>st</sup> October RACE GA meeting in Stockholm with presentation of WP4 privacy, security and health survey and, WP4 common terminology (on Web site) and, WP5 RFID sign
- 22<sup>nd</sup> October Follow-up actions from MB and GA meetings
- 3<sup>rd</sup> November follow-up with EU Parliament on privacy
- 9<sup>th</sup> November MB Conference call
- 18<sup>th</sup> & 19<sup>th</sup> November Preparation for WP6 SME Event
- 22<sup>nd</sup> November WP6 SME Event presentation and RFID Medical Demonstration
- 24<sup>th</sup> November WP4 & WP5 articles for RACE Newsletter. Collect and forward SME Event presentations for distribution to members
- 30<sup>th</sup> November article on all policy (WP 1, 4, and, 5) related activities for Ian Smith
- 6<sup>th</sup> December MB Conference call
- 8<sup>th</sup> December follow-up with review and edits to RACE Newsletter
- 14<sup>th</sup> December RACE sustainability proposal drafted and distributed to MB
- 16<sup>th</sup> December follow-up with EC to identify EU Parliament members who would providing supporting public quotations
- 11<sup>th</sup> January 2011, RACE MB Conference call
- 24<sup>th</sup> & 25<sup>th</sup> January 2011, participate in ITU-T JCA NID meeting
- 1<sup>st</sup> February 2011, deliver RFID/IoT presentation to Effects+ cluster meeting in Brussels
- 3<sup>rd</sup> & 4<sup>th</sup> February 2011, Face to face Management Board Meeting in Barcelona/Sitges
- 15<sup>th</sup> February 2011, Conference call with EU members of EU China IoT Expert Group and preparation for next f-2-f meeting in Beijing
- 22<sup>nd</sup> February 2011, EU China IoT Expert Group meeting in Beijing