D01.6 Periodic Reports (M25-M42)

Plan for using and disseminating the knowledge

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Abstract	This document describes the currently available results of the OpenTC project as well as the exploitation taken place or planned in the near future by the partners.
KeywordsKnowledge, dissemination	Knowledge, dissemination

Dissemination level	Public
Revision	1.1 Final

Instrument	IP	**Start date of the project**	1st November 2005
Thematic Priority	IST	**Duration**	42 months

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1 Section 1 – Exploitable knowledge and its use

1.1 Introduction

Throughout the last 18 month of the OpenTC project, partners have again carried out numerous dissemination activities. Each partner is keeping track of its knowledge use and exploitation plans and activities.

1.2 Overview of exploitable knowledge

During the years of the OpenTC project, the project partners achieved a respectable amount of exploitable knowledge. The details of the products including their patents or other IPR issues are listed below.

Exploitable Knowledge	Exploitable products or measures	Sector(s) of application	Date of commer-cial use	Patents or other IPR protection	Owner/ partners involved
Basic and enhanced Trusted Computing enablement in product	Code, Concepts, Architectures, Use Case in prototype. Functionality integrated into product codebase	Enterprise customer	2009	None	IBM, HP, SUSE
Certificate service provider management application	MEITC CA component	Certificate management	2008	N/A	TUB
Command line and library utilities to interact with the system's TPM and a privacy CA, with imple-mentation of DAA – FINAL RELEASE	POL/OpenTC Trusted Platform Agent (TPA)	Software development	2009	None, open source	POL
DAA prototype implementation	IAIK DAA	Software development	2009	None, open source	IAIK
Expertise in trusted computing technology	Introduction of a new ‘security-focused’ undergraduate degree in computer science. As part of this undergraduate degree program a course in trusted computing will be offered in 2009/10, again	Higher education	09/2009	N/A	RHUL

	building directly on the dissemination materials developed within the OpenTC project.				
Deep understanding of trusted computing and its applications	11-week MSc level course on Trusted Computing	Higher education	Yearly (since 2007)	None, open source	RHUL (support by HP and CUCL)
Deep understanding of trusted computing and its applications	11-week BSc final-year level course on Trusted Computing	Higher education	January 2010	None, open source	RHUL
DRM system and compartment integration	DRM core & DRM enabled video player	Digital media management	Not planned	MPEG-21	LDV, VLC deve-lopers
Encrypted File Service and related tools	Encrypted file service, key escrow tool, backup and recovery Tool	Defence, Medical, Financial	2010/11	GNU GPL	PORT
Enhancement of TLS- with DAA client authentication - FINAL RELEASE	POL/OpenTC Enhancement of OpenSSL (DAA engine)	Software development	2009	None, open source	POL
Framework for security management	Technology developed under OpenTC is expected to influence IBM's system management products	Data Centre management, Corporate computing at home	Post 2009	Protected	IBM (owner)
Graphical user interface of a TC-secured hypervisor	Hypervisor software	Virtualisation enhanced hardware	N/A	Patent protection being considered	ITAS
GUI for Trusted Virtual Client	Concept / Code	Business client platforms	2009/10	None	HP
Implementation of a TLS-based Trusted Channel FINAL RELEASE	POL/OpenTC Enhancement of OpenSSL (DAA engine)	Software development	2009	None, open source	POL, RUB
Implementation of JSR 321	IAIK jTSS-321	Software development	2009	None, open source	IAIK
Libraries for Trusted Virtual Platform (TVP) components to	HIM TPM layer	Software development	2008	None, open source	TUD

allow TPM access					
Libraries to allow access to input devices in Xen MiniOS	Xen input drivers for SUI component	Software development	2008	None, open source	TUD, HP
Libraries and services to make secure standard application (protection of keys and configuration files) – FINAL RELEASE	POL/OpenTC Key Management Adaptation service (KMA)	Software development	2009	None, open source	POL
MPEG-A – Open Access Application Format	Publication and exchange system	Publication and academic sector	Not planned	Patents on MPEG standards	LDV
MPEG-21 License parsing	DRM Core Compartment	Digital Rights Management	N/A	N/A	LDV
Native Java Implementation of the TCG Soft-ware Stack (TSS)	IAIK jTSS	Software development	2008	None, open source	IAIK
Network security management	Xen hypervisors	System management	Approx. 2008	None	IBM, HP
New super-conductive Nb-Ti alloy	MRI equipment	Medical, industrial inspection	2007, 2008	Patent planned for 2006	TUB
Object oriented Java API for interaction with the TCG Software Stack (TSS) for Java applications, UPDATE	IAIK/OpenTC Java TSS Wrapper	Software development	2008	None, open source	IAIK
On-the-fly video decryption for MPEG-4/21 files	DRM Player Compartment	Digital Rights Management	N/A	N/A	LDV
Password management system	Hypervisor software	Virtualisation enhanced hardware	N/A	Patent protection considered	ITAS
Java Privacy CA implementation running in XEN-compartment	PrivacyCA in a box	Software development	2009	None, open source	IAIK
IAIK/Java VM for TCP Implementations	TCPVM	Software development	2008	None, open source	IAIK
Patch to the OpenJDK providing basic services to extend the	IAIK TCPVM	Software development	2008	None, open source	IAIK

chain-of-trust to the managed Java environment					
PCA service running in a mini-malistic (Java) compartment	PrivacyCA v2 in a Box	Software development	2009	Software development	IAIK
PrivacyCA implementation	IAIK privacyCA	Software development	2008	None, open source	IAIK
Static C code analyser	CAVEAT	Safety-critical sectors (aeronautics, space,railways, nuclear power plants, medical devices)	Currently undefined (point-wise agreements)	Deposit of a CAVEAT version at an usher	CEA
Secure Initialization Prototype (DRTM)	Secure intitalization of an AMD based PC platform using hardware support on the platform, integration with OS software	Computers, Security, Trusted Computing	2006 - ongoing	N/A	AMD
Secure initialisation prototype	Software proto-type and archi-tecture specifi-cation as basis for the standard	IT Security	2010	None	N/A
Security Methodology	Testing security, audits, frameworks	Any	2009	None, open source	ISE
Security metrics	Auditing Services, Procurement Services, Product Labelling	I.T., Banking, Consultancy, Finance/ Auditing	2008	None, open source	ISE
Set of command line utilities to interact with the system's TPM, UPDATE	IAIK/OpenTC Java TPM Tools (jTPM-Tools)	Software development	2008	None, open source	IAIK
Set of applications enhanced with KMA – FINAL RELEASE	OpenSSH, Ipsec setkey utility, Racoon (IKE), OpenSSL engine, PKCS#11 interface	Software development	2009	None, open source	POL
Source Code Metrics	Measuring security complexity in	N/A	2009	None, open source	ISE

	source code				
Static C code analyser	FRAMA-C	Safety-critical sectors (aeronautics, space,railways, nuclear power plants, medical devices)	Undefined	Patent "PROCEDE ET SYSTEME DE VERIFICATION DE PROP-RIETES D'UN PROGRAMME INFORMATIQUE" BD1710 filed in France (no. 0700557)	CEA
Storage security management	Xen Hypervisor	System management	2008	None	IBM
TC-supported virtualization	Architecture, concept-bound image building. Embedded hypervisor in client- and server platforms supported by Linux in dom0.	Enterprise customer, interested consumer	2009	None	SUSE
Teaching of TC and its associated technologies, including the OpenTC demon-strator prototype	Tutorial documents (papers, book chapters, presentations), and HOW-TOs	Higher education, professional training	N/A	N/A	RHUL
Testing experience in automated TSS security testing	TCG Software Stack (TSS) Security and Robustness Test Suite	IT (Trusted Computing)	2008	None yet	BME (coop. with SEARCH-LAB Ltd.)
Testing experience in the automated security testing of XEN Hypervisor	XEN Hypervisor Security and Robustness Test Suite	IT (Trusted Computing)	2008	None yet	BME (coop. with SEARCH-LAB Ltd.)
Testing experience in the security testing of Trousers	Trousers Security and Robustness Test Suite	IT (Trusted Computing)	2008	None yet	BME (coop. with SEARCH-LAB Ltd.)
Testing experience in the security testing of L4 microkernel	L4 Security and Robustness Test Suite	IT (Trusted Computing)	2009	None yet	BME (coop. with SEARCH-LAB Ltd.)
Tool to create special types of certificates and	IAIK/OpenTC TCcert	Software development	2008	None, free for research,	IAIK

certificate extensions as specified by the Trusted Computing Group UPDATE				education and evaluation	
TPM secure firmware update, Linux	Secure firmware update program	TC developers, system integrators, IT departments	Since 2008	License contract	IFX
TPM test software Tool4TPM, Linux	Low level test program for platform verification	TC developers, system integrators, developers	Since 2008	License contract	IFX
TPM Software stack (TSS) Linux	TSS as licensable code	TC system integrators	Since 2008	License contract	IFX
Trust Metrics	Computerized Trust decision making	Sales, Auctions, Financing, Loans	2010	None, open source	ISE
Trusted Computing trust domain concepts (TvD)	Code, Concepts, Architectures, Applied Use Case in prototype. Vswitch, trusted GUI	Enterprise customer	2009	None	SUSE
Trusted email framework	MEITC	Software development	2009	None	TUB
Trusted mail management software	MEITC web management	Software development	2009	None	TUB
LibVirt Security Architecture	Management standardization	IT	2009	None	IBM
User interface for TC-supported virtualisation	N/A	IT	N/A	N/A	ITAS; to be used by all partners
XIDC management extension for generic XEN IPC based, network like communication in XEN	Prototype library	Universal (OS Virt)	2008	None, intended release as OSS	HP
Security service: virtual switch for XEN inter-domain communication	Prototype implementation	Universal (OS virt)	2008	None, intended release as OSS	HP, RUB
Security service: GUI for XEN (client platforms,	Prototype implementation	Universal (OS virt)	2009	None, intended release as	HP, RUB, CUCL

management consoles)				OSS	
Management infrastructure for trusted virtualized clients	Platform components for management	Managed corp. PCs	2011	n.a. (software)	HP
Trusted virtualized client architecture	PCs and Notebooks with embedded hypervisors	Universal	2011	trade-marked	HP
Virtual TPM for L4.Fiasco/L4Env platform	VTPM for L4.Fiasco/L4Env and future platforms	Software development	2008	None, open source	TUD
XKMS PKI protocol implementation, release and UPDATE	IAIK XKMS	Software development	2008	None, free for research, education and evaluation	IAIK

Table 1: Exploitable knowledge achieved

1.3 Description of results

The main outcomes in exploitable knowledge are described below:

1.3.1. OpenTC Java TPM Tools (jTPM-Tools)

The jTPM Tools provide a set of command line utilities to interact with the system's TPM. The tools are based on the IAIK/OpenTC jTSS Wrapper and the IAIK/OpenTC TCcert library (developed in WP05). The most important features, distinguishing the jTPM Tools from other TPM utilities, are the ability to create Attestation Identity Keys (AIKs) and AIK certificates as well as the ability to extract the Endorsement Key (EK) certificates from Infineon 1.1b and 1.2 TPMs. In year two several new versions of the jTPM-tools have been published, adding PKI-functionality and integrating support for new versions of software stacks used.

1.3.2. OpenTC Java TSS Wrapper

Trusted Computing, as specified by the Trusted Computing Group (TCG) (http://www.trustedcomputinggroup.org/), comprises multiple layers of hard- and software. While the hardware consists of the Trusted Platform Module (TPM) and related trusted building blocks, the main software components include the TPM hardware driver and a Trusted Software Stack (TSS). This TSS is typically developed in pure C and can therefore not directly be used from other languages such as Java. For that reason, the IAIK/OpenTC jTSS Wrapper provides language bindings for Java via the Java Native Interface (JNI). The goal is to make the Trusted Service Provider Interface (TSPI) of the TSS stack available to Java developers in an object oriented fashion. Much of the required functionality was already developed during year one. Later on, most of the changes were bug fixes, API-adaptations and workarounds necessary to access the Infineon-stack. This is necessary since the TSS-specification is written with sufficient flexibility allowing implementers to come up with different variations still claiming to be con formant to the standard. Currently different updates on the jTSS Wrapper were made. One important update is to allow jTss Wrapper
to be build with current TrouSerS 0.3.1cvs.

1.3.3. OpenTC Tccert

IAIK/OpenTC TCcert is a software tool which enables one to create special types of certificates, as specified by the Trusted Computing Group. TCcert implements the "TCG Infrastructure Credential Profiles" document and supports the TPM Endorsement Key (EK), Platform Endorsement (PE) and Attestation Identity Key (AIK) credentials. TCcert also allows to build the Subject Key Attestation Evidence (SKAE) extension for certificates, both in plain and encrypted format.

1.3.4. XKMS

IAIK has developed an implementation of the XML Key Management Specification (XKMS) (http://www.w3.org/TR/xkms2/). As suggested by the TCG in their "Reference Architecture for Interoperability" document: "XKMS provides the most attractive solution for credential management for existing CAs in the PKI industry." Thus, XKMS is a prime candidate as a foundation of a Trusted Computing enabled public key infrastructure. This release so far does not contain the Trusted Computing specific classes. It is a generic build, intended to stimulate public interoperability testing with other XKMS implementations. Several bugfix updates were also made.

IAIK XKMS is available for download at the Trusted Java Sourceforge website at:

http://trustedjava.sourceforge.net

1.3.5. *jTSS*

To provide pure Java access to TPMs for applications, we have developed on a pure Java version of jTSS.

The IAIK jTSS stack is an implementation of the TCG Software Stack for the Java™ programming language. In contrast to approaches like the IAIK/OpenTC jTSS Wrapper, the IAIK jTSS does not wrap a C stack like TrouSerS but implements all the TSS layers in Java™. For this stack we followed the TSS-specifications of the TCG but will also investigate other ways to provide TSS functions to applications. The first version has been published by the end of April 2007 and an update has been made available in September 2007. Implementation of SOAP-support has also been finished. Until December 2008 several new features have been incorporate in jTSS 0.4. The changes include support for NV access, key migration, CMK, a new event log, an alternative SQL-Database for Persistent Storage, support for monotonic counters, more tests, a TrouSerS key import tool and a new Windows installer that eases deployment of trustedJava applications. The updated version of the JTSS is now available for download.

This implementation supports the Infineon 1.2 TPM and is also compatible with most of the following common TPMs: Infineon 1.1b, Broadcom 1.2, ST Microelectronics 1.2, Atmel 1.1 and the software TPM emulator. The stack also demonstrates the platform independence of Java as it is usable under Linux as well as Windows Vista.

1.3.6. *PRIVACYCA*

The Trusted Computing team of IAIK releases a basic PrivacyCA 0.1 implementation, utilizing EK and AIK certificates, plus minimal PKI operations (e.g. Issue, locate, validate, revoke). Note that the emphasis is on basic. This is a proof-of-concept implementation of the mechanics, to gain experience of the issues involved. A future advanced TC PKI design is expected to improve on the current design.

Now another Trusted Computing PKI (APKI) package to run a PrivacyCA is released. This is a redesigned version of the functionality provided in the 0.1 release. It was optimised to be as small as possible, thus doing away with the XKMS and XML overheard and using a much simpler protocol. This release allows to run the PrivacyCA Java server in a 17Mb Xen compartment (build instructions included). Further, commandline demonstration clients for jTSS (Java) and TrouSerS (C) are provided.

All required software packages are available from http://trustedjava.sourceforge.net/.

For your testing curiosity, a basic set-up is running at http://opentc.iaik.tugraz.at/.

1.3.7. *Java Tools Update*

IFX 1.2 TPM patch for TrouSerS 0.2.9: Just days after TrouSers 0.2.9 was released the IFX 1.2 DUAL patch is ready.

jTSS Wrapper 0.2.5 + jTpm Tools 0.2: Also, the Java Wrapper plus demonstration tools were updated and should work just as fine as they did with TrouSerS 0.2.8.

IAIK XKMS 0.2: On the PKI side the XKMS protocol implementation received a major overhaul.

Documentation and source code are available at the Sourceforge website at:

http://trustedjava.sourceforge.net

IAIK XKMS 0.1 is developed and maintained at the Institute for Applied Information Processing and Communication (IAIK) (http://www.iaik.at) at Graz University of Technology.

1.3.8. *New set of Java Software Packages*

IAIK Trusted Computing labs release a new set of software packages to support Trusted Computing with the Java(tm) programming language.

JTSS 0.1: The IAIK jTSS stack is an implementation of the TCG Software Stack for the Java(tm) programming language. In contrast to the approach of the jTSS Wrapper, jTSS does not wrap a C stack like TrouSerS but implements all the TSS layers in 100% Java(tm). This is the first public release of IAIK jTSS and it is still in early stages of development. It is currently regarded as experimental software targeted at research and educational environments.

jTss Wrapper 0.3: Beginning with version 0.3, IAIK/OpenTC jTSS Wrapper is no longer a standalone package, but is an add-on to the IAIK jTSS.

IAIK/OpenTC jTSS Wrapper provides Java(tm) bindings for the TrouSerS TSS. To make switching between the wrapper and the full jTSS stack as simple as possible, both packages employ the same API.

JTpmTools 0.3: The IAIK/OpenTC jTpmTools are a set of command line tools demonstrating basic interaction with the Trusted Platform Module (TPM) and the Trusted Software Stack (TSS). This includes tools for taking/clearing ownership and reading/extending PCRs. Also, commands for managing keys and binding/sealing of data blocks are available. Further, commands for creating Attestation Identity Keys (AIKs) and interaction with a remote PrivacyCA service (to obtain accompanying certificates) using the XKMS protocol are included.

1.3.9. TCcert 0.2.2: This release synchronizes TCcert with the new releases of jTpmTools and jTss.

Documentation and source code are available at the Sourceforge website at:

http://trustedjava.sourceforge.net

Graphical user interface of a TC-secured hypervisor

Problem: As hypervisors and PCs with TPMs will increasingly be used, both normal users and administrators will have a need to handle these conveniently and securely. Based on findings from an expert survey, ITAS developed characteristics of the user interface of a hypervisor such as the OpenTC prototype. The requirements are that the user interface should be easy to handle (similar to today's user interfaces), graphical (for ease of use), the graphics should be on the usual screen (as special screens etc. would be overlooked), the user interface should help the user in managing his security and the security of business partners and employers.

Solution: A GUI which has similarities with existing GUIs of operating systems, but also differences, in particular concerning the security aspects, so that users can tell between the new interface parts and ones from the legacy OS. Switching between operating systems should therefore be similar to switching between applications, but in new type of separate task bar. Security is ascertained by a sealed image in the same separate task bar, which is only shown if the hypervisor is in a proper state. Control of the hypervisor (and the TCB) is similar to the control of a normal operating system, with e.g. providing a desktop or context menu, in new forms, though. The innovative desktop of the hypervisor provides easy control over the installed or running operating systems, system resources, security status, etc. Some compartments could even be secured or displayed as securely isolated by the hypervisor/TCB, even if their contents not in certified. In this case, users can e.g. define that they are displayed with a green light, or users could define that they are secure for their purposed when booted (for subsequent deletion). Traffic-light symbols or other visualisation could be used.

The innovative user interface could be used throughout the IT industry, from server systems to mobile phones.

1.3.10. Password Management System

Problem: Users may increasingly use different instances of operating systems on the same machine. This increases the problem for the user of securely handling all these passwords. The problem is aggravated by the need to securely handle other passwords, e.g. to VPN-access.

Solution: A password management system has to authenticate the user and help the user in managing IDs and passwords. The system should allow to manage the service, e.g. to configure it (e.g. which password links to which operation) and to delete, change, view history, export, backup, restore data, etc. Passwords for other operations (e.g. mobile phone) could be managed by the same service. Some processes might be given access to part of the service if they can authenticate themselves. The password management system should be able to handle different users on the same machine and store their information in separate encrypted files. The password management system may need to run in its own encrypted compartment.

The system could be used with any computer, but in particular with any hypervisor-based system. The system itself doesn’t need on-line access. If on-line access is available, the integrated backup-system could send the encrypted backup-files automatically to a backup-server.

2 Section 2 – Dissemination of knowledge

2.1 Introduction

The overview below contains a summary of all dissemination activities that were carried out and reported during month 25 and month 42.

Later in the document the activities are detailed in a more comprehensive manner and the major activities are detailed further.

In brief, the amount of different dissemination activities summarised in the following table:

Activity Type	International	National
Conferences	29	0
Workshops	10	6
Presentations	13	4
Discussions	11	1
Courses	14	9
Other	2	0

Table 2: Amount of different dissemination activities

It can be seen from this table that the majority of the dissemination activities have taken place in international contexts. As the activity types are self-explanatory, they will not be described here in further detail. In addition to their international nature, consortium partners have carried out the dissemination activities in cooperation. The OpenTC project has been communicated in paper and electronic media in different ways as well as in various conferences, summits, workshops and seminars by active participation in the organisation of these events or through invited speakers or conference paper contributors.

2.2 Overview of conferences, public discussions and talks

The dissemination activities of the OpenTC consortium are collected below and listed in a chronological order.

Planned/ actual dates	Type	Type of audience	Countries addressed	Size of audience	Partner (s)
11/2007	Trustworthy Global Computing (TGC 07)	Research	Europe	N/A	IAIK
11/2007	The Second ACM Workshop on Scalable Trusted Computing (STC'07)	Research; professionals	Inter-national	N/A	IAIK
11/2007	Summit Talk	Industry, higher education	Inter-national	150	CUCL
02/11/2007	T. Eisenbarth, T. Güneysu, C. Paar, A.-R. Sadeghi, D. Schellekens, M. Wolf:	Higher education, Industry	Inter-national	N/A	RUB

	“Reconfigurable Trusted Computing in Hardware” - Accepted for ACM STC				
15/11/2007	DailyDave security list	Professionals	Inter-national	3000	ISE
15/11/2007	Xen Summit, Santa Clara - Talk: "Improving Xen security through domain-zero disaggregation".	Industry	Inter-national	100	CUCL
28/11-30/11/2007	AXMEDIS Conference 2007. Panel for Issues in security for Digital Rights Management.	Scientific community, research	Inter-national	40	LDV
09/12/2007	Innovation Event	Defense	National, Sweden	80	IBM
17/12/2007	OTC booth at HP colloquium at RHUL	Industry, Higher education	Europe	80	RHUL
12/2007	Two half-day sessions were presented at the University of Macquarie, Sydney, entitled: “Enabling Secure Download using Trusted Computing” & “Trusted Mobile Platforms”.	Research	Inter-national	20	RHUL
2007	Internal presentation	Laboratories, department and company	CEA employees	N/A	CEA
2007	11 week MSc course in Trusted Computing	Higher education	Inter-national	20	RHUL
2007	Y. Gasmi, A.-R. Sadeghi, P. Stewin, M. Unger, N. Asokan, 'Beyond Secure Channels', Accepted for ACM STC (Scalable Trusted Computing)	Higher education, Industry	Inter-national	N/A	RUB
2007	N. Asokan, J.-E. Ekberg, A.-R. Sadeghi, C. Stüble, M. Wolf, 'Enabling Fairer Digital Rights Management with Trusted Computing', to be presented at ISC07, Information Security Conference 2007	Higher education, Industry	Inter-national	N/A	RUB
2007	S. Gajek, A.-R. Sadeghi, J. Schwenk and M. Winandy, 'Trusted User-Aware Web Authentication', Accepted for 3rd Workshop on Trustworthy User Interfaces for Passwords and Personal Information (TIPPI'07), Stanford (USA)	Higher education, Industry	Inter-national	N/A	RUB

2007	D. Birk, S. Gajek, F. Gröbert, and A.-R. Sadeghi, 'Phishing Phishers - Observing and Tracing Organised Cybercrime', Accepted for IEEE Workshop on Cyber-Fraud (Cyberfraud'07), Silicon Valley (USA)	Higher education, Industry	Inter-national	N/A	RUB
2007	S. Gajek, M. Manulis, A.-R. Sadeghi and J. Schwenk', Browser Models for Usable Authentication Protocols', Accepted for IEEE Security and Privacy, Web 2.0 Security and Privacy Workshop (W2SP'07), Oakland (USA)	Higher education, Industry	Inter-national	N/A	RUB
2007	D. Birk, S. Gajek, F. Grobert, and A.-R. Sadeghi, 'Phishing phishers - oberserving and tracing organised cybercrime', In IEEE Cyberfraud, 2007	Higher education, Industry	Inter-national	N/A	RUB
2007	S. Katzenbeisser, A.-R. Sadeghi, B. Skoric, M.Celik, 'Combining Tardos fingerprinting codes and fingercasting', Accepted for Information Hiding Conference (IH'07)	Higher education, Industry	Inter-national	N/A	RUB
2007	A.Adelsbach, U. Huber and A.-R. Sadeghi, 'Fingercasting - Joint Fingerprinting and Decryption of Broadcast Messages', Accepted for LNCS Transactions on Data Hiding and Media Security 2007	Higher education, Industry	Inter-national	N/A	RUB
2007	S. Gajek, A.-R. Sadeghi, C. Stüble and M. Winandy, 'Compartmented Security for Browsers - Or How to Thwart a Phisher with Trusted Computing', Accepted for The Second International Conference on Availability, Reliability and Security ARES 2007	Higher education, Industry	Inter-national	N/A	RUB
01/2008	Research seminar at Trinity Hall	Higher education	National, UK	30	CUCL
18/01/2008	1st COMMUNIA International Workshop (Technology and the Public Domain) http://ws1-2008.communia-project.eu/	Higher education, research, government	Europe	~100	POL

19/01-25/01/2008	SOFSEM 2008 conference	Research	Inter-national	N/A	RUB
07/02/2008	Lecture on Trusted Computing for MSc in Information Security – Software security course	Higher education	Inter-national	40	RHUL
23/02/2008	FOSDEM 2008 Conference , Brussels - Seminar on Trusted Computing	Developers	Europe	120	TUB
26/02-28/02/2008	Trusted Computing Group face to face meeting, Tokyo: Trusted computing standardization	TC specialists researchers, developers	Inter-national	~150	IFX
03/03/2008	Invited talk at the Department of Computer Science, University of British Columbia, Vancouver: "Improving Xen security through disaggregation"	Higher education	Canada	10	CUCL
07/03/2008	ACM VEE 2008, Seattle - Talk: "Improving Xen security through disaggregation"	Higher education	Inter-national	50	CUCL
10/03-13/03/2008	Contributions to Trust 2008, Villach, Austria (tutorials, talks and presentations, papers, booths, organisation, ...)	TC- experts, higher education, industry,	Inter-national	~150	All partners
10/03-14/03/2008	An invited talk was presented at the TRUST2008 educational event titled “Who is the TCG and what are the TCG concepts?”	Higher education	Europe	40	RHUL
10/03-14/03/2008	An paper was presented at TRUST2008 entitled “On a possible privacy flaw in Direct Anonymous Attestation(DAA)”	Research	Europe	30	RHUL
12/03/2008	Talk within the TRUST conference	Technical experts	Inter-national	100	IAIK
13/03/2008	Course for professors of applied technological universities: Trusted computing for embedded microelectronics with Megawirkung– Innovative Solutions for Energy Efficiency, Communication and Security	Higher education	National	~50	IFX
17/03/2008	BrainShare, Salt Lake City	Industry Professionals	Inter-national	38	SUSE
31/03/2008	EuroSec 2008, Glasgow -	Higher	Inter-	15	CUCL

	Talk: "Privilege separation made easy"	education	national		
07/04-11/04/2008	RSA conference 2008 San Francisco, USA; Security and cryptography, Trusted Computing	TC experts, professionals	Inter-national	~8000	IFX
07/04 - 19/07/2008	University lecture “Distributed Operating Systems”, introducing trusted computing paradigms to students	Higher education	Inter-national	20	TUD
18/04/2008	Output'08 - Open day at TUD's department of computer science http://output.inf.tu-dresden.de/	Students	Germany	10	TUD
20/04-26/04/2008	ISPEC 2008 conference	Research	Inter-national	N/A	RUB
05/2008	Professional course (Introduction to Trusted Computing)	Industry	National, Italy	~20	POL
07/05/2008	Technical Discussion	Java Experts	Inter-national	10	IAIK
08/05/2008	Workshop on electronic billing	Business and technical managers	National, Italy	~200	POL
12/05-13/05/2008	Research meeting jointly organised by Microsoft Research and HP Labs: “The Rise and Rise of the Declarative Datacenter“	Higher education	Inter-national	N/A	IBM, HP
19/5/2008	CCGrid 2008 Conference - Tutorial on “Trusted virtualization and grid security”	Developers	National; France	15	TUB, PORT
19/05-22/05/2008	Paper presented at WSES2008 - the 3rd International Work-shop on Workflow Systems in e-Science, Lyon, France, “Securing Grid Workflows with Trusted Computing”	Research	Europe	30	RHUL
28/05/2008	Presentation	Linux Experts	National, Germany	100	IAIK
06/2008	Workshop / Presentation	Technical Experts	Inter-national	20	IAIK
23/06-25/06/2008	Paper presented at ICCS 2008 - the 8th International Conference on Computational Science: Applications of Work-flows in Computational Science Krakow, Poland, “Securing	Research	Europe	30	RHUL

	Grid Workflows with Trusted Computing"				
30/06–02/07/2008	Contributions to the Future of Trusted Computing Conference, Berlin, Germany	Higher education, industry, public	Inter-national	~300	RUB, HP, IFX, IAIK
07/2008	Presentation	TC experts	Inter-national	100	ITAS
08/2008	Demonstration of OpenTC EFS to Turkish Defense Industry	Defense industry	National, Turkey	50	PORT
11/08-15/08/2008	Asia-Pacific TC Summer School Malaysia (keynote, presentation)	Higher education/ industry	Inter-national SE Asia	150	HP
20/08-24/08/2008	First Asia Pacific Trusted Infrastructure Summer School	Higher education, industry	Asian-Pacific Region	200	HP, RUB
23/08/2008	Public event at Linux Birthday Celebration by Chamber of Electrical Engineers	Linux and OSS community	National, Turkey	150	PORT
31/08-05/09/2008	3rd European Trusted Infrastructure Summer School (ETISS) – Oxford, UK	Higher education, industry, TCG member organizations	Europe	~100	POL, RUB,
08/09/2008	OSS developer conference Liberec, CZ	Linux and OSS developers	Inter-national	28	SUSE, IBM
08/09-10/09/2008	Paper presented at IAS 2008 - the 4th International Conference on Information Assurance and Security, Naples, Italy, entitled: "A Device Management Framework for Secure Ubiquitous Services Delivery"	Research	Europe	30	RHUL
15/09-18/09/2008	ISC 2008 conference	researchers	Inter-national	N/A	RUB
31/09–04/10/2008	An invited talk was presented at the 3rd European Trusted Infrastructure Summer School 2008 (ETISS 2008), Oxford, U.K., titled "Mobile Security and the Mobile Trusted Module"	Higher education	Inter-national	100	RHUL
09/2008	Outpost 24 Security Conference	Professionals	Inter-national	100	ISE
8/10/2008	SecTor Security Conference	Security Professionals	Canada, USA	100	ISE

21/10/ - 24/10/2008	Systems 2008: Industry fair - Embedded Trusted Computing for increased security and safety in Munich, Germany	Developers	Inter-national	~200	IFX
10/2008	Keynote at the Asia Pacific Trusted Computing Conference (APTC 2008)	Higher education, industry	Inter-national, SE Asia	250	HP
10/2008	IBM Innovation Center Showcase	IBM Partners in Turkey	National, Turkey	50	PORT
11/2008	Professional course “Introduction to Trusted Computing”	Industry	National, Italy	~20	POL
11/2008	IST Event 2008	Higher education, industry, public	Europe	N/A	POL, TUB, HP, BME
11/2008	Talk	TC Experts	Inter-national	N/A	IAIK
25/11-27/11/2008	ICT 2008 conference http://ec.europa.eu/information_society/events/ict/2008/index_en.htm	Higher education, industry	Europe	~4000	TEC, HP, ITAS, POL, IAIK
28/11/2008	AXMEDIS Conference 2008 Panel for Issues in security for Digital Rights Management	Scientific community, research	Inter-national	40	LDV
05/12-10/12/2008	SOSP 2008 http://www.sosp.org/	Higher education, industry	Inter-national	~500	TUD
08/12-10/12/2008	OSDI 2008, http://www.usenix.org/events/osdi08/	Higher education, industry	Inter-national	~500	TUD
12/2008	Workshop “Betriebssystemsicherheit”	Industry, academia, law enforcement	National, Germany	100	HP
Spring 2008	Elective course on trusted computing in University of Kocaeli	Students	National, Turkey	25	TUB
2008	11 week MSc course in Trusted Computing.	Higher education	Inter-national	20	RHUL
2008	Conference paper on Functional Programming, “Hashconsing in an incre-mentally garbage-collected system:a story of weak pointers andhashconsing in ocaml 3.10.2”, Pascal Cuoq	N/A	Inter-national, Canada	N/A	CEA
2008	Automotive TC workshop:	Automotive	Inter-	~ 200	IFX

	Trusted computing for next generation of reliable automotive electronics	development experts, newcomers for trusted computing	national		
2008	Mobile phone workshops: Trusted computing as integrated part of mobile phones	Mobile phone development experts	Inter-national	~ 200	IFX
2008	Trusted Computing Summer School 2008 and following one week event: Training and discussion for students and interested researchers	Higher education	Inter-national	~40	IFX
2008	Presentation at Airbus Workshop Toulouse	Avionics	Europe	50	CEA
04/2009	Papers and Talks	TC Experts	Inter-national	80	IAIK
24/02/2009	Talk: “Satori: Enlightened page sharing.” Xen Summit, San Francisco, CA	Industry	Inter-national	N/A	CUCL
24/02/2009	Talk: “Flexible and secure hardware 3D rendering on Xen.” Xen Summit, San Francisco, CA	Industry	Inter-national	N/A	CUCL
05/03/2009	Tutorial on the trusted mobile platform at University of Bristol	Higher education	Inter-national	10	RHUL
19/03/2009	Lecture on Trusted Computing for MSc in Information Security – Software security course	Higher education	Inter-national	30	RHUL
31/03/2009	Frama-C training session	Higher education, Industry	Europe	37	CEA
31/03/2009	Talk: “Secure 3D Graphics for Virtual Machines”, EuroSec 2009 workshop, Nuremberg, Germany.	Higher education	Inter-national	40	CUCL
03/2009	Practical Lab for Master Course on TC at Royal Holloway University London	Higher education	Europe	~10	POL, RHUL
04/2009	Elective course on trusted computing in University of Kocaeli	Students	National, Turkey	25	TUB
01/04-03/04/2009	A paper was presented at the 17th International Workshop on Security Protocols, Cambridge, UK entitled “A novel stateless authentication protocol”.	Higher education	Europe	40	RHUL
06/04-08/04/2009	A paper was presented at Trust 2009, Oxford, U.K.,	Research	Europe	N/A	RHUL

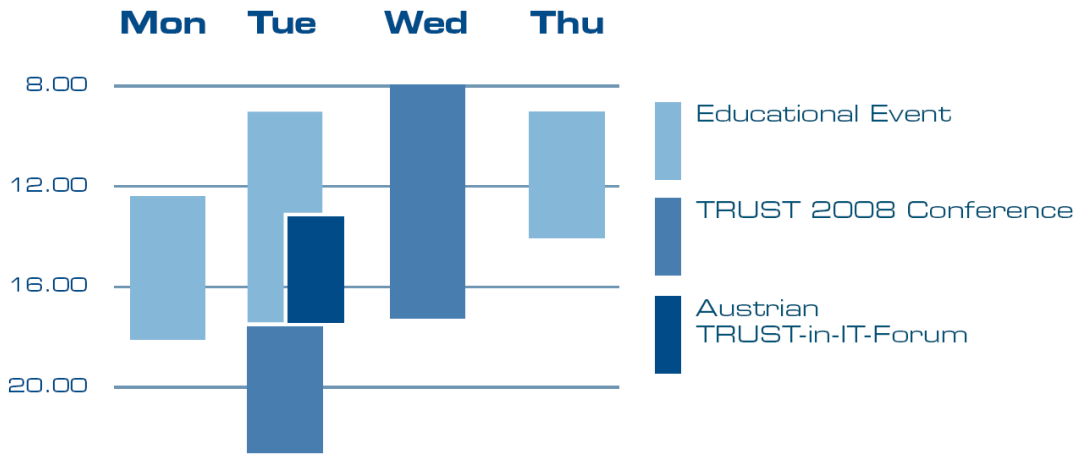
	titled “A Property-dependent Agent Transfer Protocol”				
05/2009	Knowledge Transfer Network IT Security	Higher education, Industry	National, UK	100	HP
06/2009	Professional course “Introduction t”	Industry	National, Italy	~20	POL
06/2009	Summer School at Carnegie Mellow University	Academia	Inter-national USA	~100	POL, HP
09/2009	Conference	ICT	Bulgaria, Greece, Romania	~300	TUS
09/2009	4rd European Summer School on Trusted Infrastructure (ETISS) – Graz, Austria	Higher education, Industry, TCG member	Europe	~100	POL and other OpenTC partners
11/2009	2008 International Symposium on Trusted Computing	Scientific Conference	Inter-national	N/A	IAIK
11/2009	SITIS 2009: 5th international conference on signal-image technology & internet based systems	Higher education	Europe	400	TUB
2009	11 week MSc course in Trusted Computing	Higher education	Inter-national	10	RHUL
regularly	ISECOM Subscriber discussions	Professionals	Inter-national	1.000	ISE
regularly	News List	Professionals	Inter-national	30.000	ISE
regularly	Penetration Testing Mailing List	Professionals	Inter-national	50.000	ISE
regularly	BugTraq Mailing List	Professionals	Inter-national	100.000	ISE
regularly	XEN Summit: AMD is a regular attendee of the XEN summit, which happens 2 to 4 times a year. AMD presents there new developments in virtualization and related security technologies	Higher education, Industry, Government	Inter-national	>100	AMD, HP, IBM
regularly	Distribution of the OpenTC newsletters	Industry, government, higher education, research	Inter-national	~300	TEC

Table 3: Detailed listing of dissemination activities

2.3 Description of major activities

2.3.1. TRUST2008 Conference and Spring School

The most prominent dissemination event held in relation to the OpenTC project was TRUST2008, organised by Technikon. Trust2008 was an international event, which took place in Villach, Austria in March 2008 and brought together scientific stakeholders from all over the world in the field of trusted computing. The conference focused on trusted computing and trust in IT, and saw the presentation of both state of the art technologies and forward looking research papers. The main module, i.e. the scientific conference, served to maximise communication and knowledge exchange between international parties from both the scientific/research community and industry.



Picture 1: Time Planning for the TRUST2008 conference

During Trust2008, several project meetings and workshops took place. In the foreground was the OpenTC meeting, at which almost all partners were represented. The research papers presented during the scientific module at the conference (which are highly relevant to the work being completed within OpenTC) were published by Springer Verlag in LNCS 4968. Feedback indicated that the international audience from both industry and science was pleased by the mix of conference articles, project presentations and discussions. In total 159 participants (made up of people of 18 different nationalities from 4 continents) registered for Trust2008. It was the perfect occasion to present the state-of-the-art and beyond. Visions and possibilities for the future development were given as well as communication between science and industry was provided. Trust2008 fostered the knowledge exchange at the best possible rate.

2.3.2. ICT-Mobile Summit 2008

The ICT Mobile and Wireless Communications Summit took place in Stockholm. This was the seventeenth in a series of Annual Conferences supported by the European Commission, which regularly attract over 600 delegates from industry and research to share experiences and research results, identify future trends, discuss business opportunities and identify opportunities for international research collaboration under the ICT Theme FP7.

2.3.3. Asia Pacific Trusted Infrastructure Summer School (2008)

APTISS (Asia-Pacific Trusted Infrastructure Summer School) is a joint educational, academic and professional forum aimed at a wide variety of state-of-the-art research and development in Trusted Infrastructure. The lectures are presented by international experts that represent a variety of companies, research institutes and universities. The event was held in Shah Alam (Selangor), Malaysia on the 11 to 15 August 2008.

The purpose of this event was to provide a platform for the researchers in this region to acquire information and knowledge on Trusted Infrastructures from renowned experts from all over the world. Also, this event aims to enhance the awareness of the industries in this region on the significance of Trusted Computing.

The event was jointly organised by Faculty of Electrical Engineering, University Teknologi MARA, MIMOS Berhad, Ruhr-University Bochum, University of Oxford, HP Labs Bristol, IEEE Malaysia Section and several others.

The main focus for the summer school is the Trusted Infrastructure, which means building trust into communications infrastructure by embedding Trusted Computing functionalities into its components.

Topics included:

1. Trusted Infrastructure Fundamentals
2. O/S & Virtualization
3. Trusted Network Connect
4. Mobile Trusted Module
5. Trusted Applications

2.3.4. 3rd European Trusted Infrastructure Summer School (ETISS) (2008)

The Third European Trusted Infrastructure Summer School was held in Oxford, 31st August - 5th September 2008. The venue was the Oriel College.

The aim of the summer school was to provide a programme which is attractive to masters' and doctoral students learning about Trusted Infrastructure for the first time, and also for academics and researchers with more experience. The event included introductory and more advanced lectures, practical labs, and research seminars. Many of those who have been instrumental in shaping the emerging Trusted technologies were among the lecturers, like David Grawrock, Graeme Proudler (HP Labs), Paul Congdon (HP ProCurve CTO), Robert Thibadeau (Seagate Chief Technologist), Paul England (Microsoft) and many others.

2.3.5. OpenTC newsletter

This service is designed to inform the interested public about downloadable prototypes, project achievements and other up-to-date information, and it is meant to support discussion about the underlying issues. We aim to publish this newsletter irregularly during the course of the project and beyond.

2.4 Articles in journals and magazines, papers and electronic publications

Planned/ actual dates	Type	Type of audience	Countries addresses	Partner (s)
11/2007	Journal article in 'Hiradastechnika'	IT and Comm. engineers	Hungary	BME
02/11/2007	T. Eisenbarth, T. Güneysu, C. Paar, A.-R. Sadeghi, D. Schellekens, M. Wolf: "Reconfigurable Trusted Computing in Hardware". *In: 2nd ACM Workshop on Scalable Trusted Computing (STC 2007), ACM Press,*	Research	US	RUB, KUL

	pp. 15-20, 2007			
12/2007	Chapter in a Teletrust book: "Trusted Computing Introduction"	TC- experts, students	German-speakers	IFX
2007	Paper on the C code static analysis tool	Industry	Inter-national	CEA
2007	Publication	Researchers, industry	Inter-national	CEA
2007	Publication on CEA intranet	Employees of CEA	CEA	CEA
2007	Publication	Industry	National	CEA
2007	Presentation	Internal: laboratories, department and company meetings	CEA	CEA
Since 2007	General trusted computing news site (trustedforum.org)	Public	Inter-national	TUB
01/2008	*SOFSEM 2008* Invited Talk, LNCS 4910, 2008 "Trusted Computing—State of the Art and Challenges."	Research	Inter-national	RUB
18/01/2008	1st COMMUNIA International Workshop on Technology and the Public Domain, Torino, Italy:A. Lioy, G. Ramunno, D. Vernizzi: "Trusted Computing and Infrastructure Commons"	Higher education, research, government	Europe	POL
03/2008	*TRUST2008* - Conference paper	Research	Austria	CEA
03/2008	B. Jansen, H.G.V. Ramasamy, M. Schunter: "On Integrity Protection and Verification for Virtual Machines" In: Proceedings of the 4th ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments 2008 (VEE '08), Seattle, pgs. 101-110	Higher education, industry	Inter-national	IBM
07/03/2008	ACM VEE 2008 - Scientific paper: "Improving Xen security through disaggregation"	Higher education	Inter-national	CUCL
10/03-14/03/2008	*T*rust 2008, Villach, Austria. – Scientific paper:A. Leung, L. Chen, C.J. Mitchell: "On a possible privacy flaw in Direct Anonymous Attestation (DAA)" (http://www.trust2008.eu/)	Research	Europe	RHUL

10/03-14/03/2008	An invited talk was presented at the TRUST2008 educational event titled "Who is the TCG and What are the TCG Concepts?".	Higher education	Europe	RHUL
10/03 - 13/03/2008	Klaus Kursawe and Dries Schellekens, "Flexible µTPMs through Disembedding," In *Proceedings of the 2009 ACM Symposium on Information, Computer and Communications Security*	Higher education	Inter-national, Australia	KUL
12/03/2008	Dries Schellekens, Pim Tuyls and Bart Preneel, "Embedded Trusted Computing with Authenticated Non-Volatile Memory," In *1st International Conference on Trusted Computing and Trust in Information Technologies (TRUST 2008) and In: K. Koch, P. Lipp, and A. Sadeghi (eds.): TRUST 2008. LNCS 4968, Springer-Verlag, 2008, pgs. 60-74*	Higher education	Inter-national	KUL
12/03/2008	Trust 2008, Villach, Austria. – Scientific paper: C. Weinhold, H. Härtig: "Trusted Computing Serving an Anonymity Service"	Higher education, industry, government	Inter-national	TUD
31/03/2008	E. Cesena, G. Ramunno, D. Vernizzi: "Secure storage using a sealing proxy". *In: Proceedings of the ACM SIGOPS European Workshop on System Security*	Higher education, research,	Europe	POL, CUCL
31/03/2008	EuroSec 2008 - Scientific paper: "Privilege separation made easy"	Higher education	Inter-national	CUCL
31/03-04/05/2008	A. Böttcher, B. Kauer, H.Härtig: "VPFS: Building a Virtual Private File System with a Small Trusted Computing Base". *Proceedings of the EuroSys 2008 Conference*	Higher education, industry	Inter-national	TUD
04/2008	*The 4th Information Security Practice and Experience Conference (ISPEC 2008), Sydney, Australia. - scientific paper:*"Securing Peer-to-peer Distributions for Mobile Devices"	Research	Inter-national	RUB
04/2008	S. Balfe, E. Gallery, C. J. Mitchell, K. G. Paterson: "Crimeware and Trusted Computing". *In: M. Jakobsson, Z. Ramzan (eds.): Crimeware. Understanding New Attacks and Defenses. Addison-Wesley*	Industry, research	Inter-national	RHUL
04/2008	A proposal for a book on Trusted	Industry,	Inter-	RHUL

	computing and its applications has been accepted by Cambridge University Press	higher education, research	national	
05/2008	Cabuk, S.; Dalton, C. I.; Ramasamy, H. V.; Schunter, M. Declarative Security Specification of Virtual Networks. *The Rise and Rise of the Declarative Datacenter*. R2D2 Workshop, Microsoft Research,	Higher education, research	Inter-national	IBM, HP
15/05/2008	S. Cabuk, C.I. Dalton, K. Eriksson, D. Kuhlmann, H. Govind, V. Ramasamy, G. Ramunno, A.R. Sadeghi, M. Schunter, C. Stueble: "Towards Automated Security Policy Enforcement in Multi-Tenant Virtual Data Centers". *Submitted to Journal of Computer Security (JCS) for 6th FP European Projects*	Higher education, research	Europe	HP, IBM, POL, RUB
19/05- 22/05/2008	3rd International Workshop on Workflow Systems in e-Science 2008, Lyon, France: P.W. Yau, A. Tomlinson, S. Balfe and E. Gallery: "Securing Grid Workflows with Trusted Computing (Extended Abstract)"	Research	Europe	RHUL
06/2008	ACM CCS STC'08:Paper about Trusted Channels submitted	Research, professionals	Inter-national	RUB, POL
06/2008	ACM CCS STC'08:Paper about building Trusted Computing applications	Research, professionals	Inter-national	POL
06/2008	ACM CCS STC'08: Cabuk, S.; Grete, P.; Plaquin, D. Towards Virtual Platforms	Research, Scientific	Inter-national	HP
06/2008	*IEEE TrustCom2008:* Paper about Trusted Broadcast Encryption	Research	Europe	POL
06/2008	Paper	Technical Experts	Inter-national	IAIK
21/06/2008	Cabuk, S.; Plaquin, D.; Hong, T.; Murray, D.; John, E. Improving Policy Verification Capabilities of Trusted Platforms, HP Labs technical report HPL-2008-71	Research, Scientific	Inter-national	CUCL, HP
23/06- 25/06/2008	ICCS 2008 - 8th International Conference on Computational Science, Krakow, Poland: P.W. Yau, A. Tomlinson, S. Balfe, E. Gallery: "Securing Grid Workflows with Trusted Computing"	Research	Inter-national	RHUL
08/2008	B. Jansen, H.G.V. Ramasamy, M.	Higher	Inter-	IBM

	Schunter, A. Tanner: "Architecting Dependable and Secure Systems using Visualization" *In: R. d. Lemos, F. Di Giandomenico, C. Gacek, H. Muccini, M. Vieira (eds.): "Architecting Dependable Systems V". Berlin: Springer LNCScience 5135*	education, industry	national	
09/2008	The new new thieves	Professionals	Inter-national	ISE
09/2008	S. Balfe, E. Gallery, K. Paterson and C.J. Mitchell, "Challenges for trusted computing", IEEE Security and Privacy, volume 6, number 6, pgs 60-66, November/December 2008.	Industry, Higher education, Research	Inter-national	RHUL
08/09- 10/09/2008	IAS 2008 - 4th International Conference on Information Assurance and Security, Naples, Italy: A. Leung, C.J. Mitchell: "A Device Management Framework for Secure Ubiquitous Services Delivery"	Research	Inter-national	RHUL
23/10- 24/10/2008	"Trusted-Computing Technologies for the Protection of Critical Information Systems" A. Lioy, G. Ramunno, D. Vernizzi*(CISIS'08 - Int. Workshop on Computational Intelligence in Security for Information Systems)*	Higher education, research, industry	Inter-national	POL
31/10/2008	"An Efficient Implementation of Trusted Channels Based on OpenSSL" F.Armknecht, Y.Gasmi, A.R.Sadeghi; P.Stewin, M.Unger, G.Ramunno, D.Vernizzi *(STC'08: 3rd ACM workshop on Scalable Trusted Computing 2008)*	Higher education, research	Inter-national, US	RUB, POL
31/10/2008	"Boxing clever with IOMMUS" VMSec, Fairfax, VA	N/A	Inter-national	CUCL
11/2008	Talk	TC Experts	Inter-national	IAIK
18/11- 20/11/2008	"*Towards Trusted Broadcast Encryption*" *E.Cesena, G.Ramunno, D.Vernizzi (TrustCom 2008: The 2008 International Symposium on Trusted Computing*)	Higher education, research	Inter-national, China	POL
2008	E. Gallery, C.J. Mitchell: "Trusted Computing: Security and Applications", In: Cryptologia. Taylor & Francis	Research	Inter-national	RHUL
2008	K. Koch, P. Lipp, and A.R. Sadeghi	Research	Inter-	TEC, IAIK,

	(eds.): TRUST 2008. LNCS 4968, Springer-Verlag, 2008,		national	RUB
2008	ASIACCS'08 – scientific paper: "Provably Secure Browser-Based User-Aware Mutual Authentication over TLS	Research	Inter-national	RUB
2008	CHES 2008 – accepted paper: "Efficient Helper Data Key Extractor on FPGAs"	Research	Inter-national	RUB
2008	A.R. Sadeghi, C. Stüble, M. Winandy: "Property-Based TPM Virtualization." *Proceedings of 11th Information Security Conference (ISC 2008)*	Research	Inter-national	RUB
2008	"A Demonstrative Ad-hoc Attestation System." *Proceedings of 11th Information Security Conference (ISC2008)*	Research	Inter-national	RUB
2008	L. Chen, H. Löhr, M. Manulis, A.R. Sadeghi: "Property-Based Attestation without a Trusted Third Party." *Proceedings of 11th Information Security Conferene (ISC 2008)*	Research	Inter-national	RUB
2008	"Resettable and Non Transferable Chip Authen-tication for E-Passports." *RFIDSec 2008*	Research	Inter-national	RUB
2008	"User Privacy in Transport Systems Based on RFID E-Tickets." *Proceedings of the 1st International Workshop on Privacy in Location-Based Applications (PiLBA)*	Research	Inter-national	RUB
2008	"An Efficient Implementation of Trusted Channels based on OpenSSL." *Proceedings of ACM STC'08*	Research	Inter-national	RUB
2008	"Flexible and Secure Enterprise Rights Management based on Trusted Virtual Domains." *Proceedings of ACM STC'08*	Research	Inter-national	RUB
2008	D. Schellekens, P. Tuyls, B. Preneel, "Remote attestation on legacy operating systems with trusted platform modules.". In: F. Massacci, F. Piessens (eds.): Electronic Notes in Theoretical Computer Science. *Proceedings of the First International Workshop on Run Time Enforcement for Mobile and Distributed Systems (REM 2007). Vol 197(1), Elsevier, 2008, pgs. 59-*	Higher education, TC-experts	Inter-national	KUL

	72			
2008	D. Schellekens, B. Wyseur, B. Preneel: "Embedded Trusted Computing with Authenticated Non-Volatile Memory". In: K. Koch, P. Lipp, and A. Sadeghi (eds.): TRUST 2008. LNCS 4968, Springer-Verlag, 2008, pgs. 60-74	N/A	N/A	KUL
2008	Contribution to project newsletter	TC-experts	Inter-national	ITAS, RHUL, TEC, HP
2008	Paper on the C code static analysis tool	Industry	Inter-national	CEA
2008	Product web site http://frama-c.cea.fr	Public	Inter-national	CEA
2008	Trustworthy Global Computing, Revised Selected Papers	Public	Inter-national	IAIK
2008	Proceedings of the 2008 International Symposium on Trusted Computing, TrustCom 2008	Public	Inter-national	IAIK
01/2009	SIGOPS Journal on Operating Systems	Higher education, industry	Inter-national	HP
01/2009	"Towards Automated Security Policy Enforcement in Multi-Tenant Virtual Data Centers" Serdar Cabuk, Chris I. Dalton, Konrad Eriksson, Dirk Kuhlmann, Hari Govind V. Ramasamy,Gianluca Ramunno, Ahmad-Reza Sadeghi, Matthias Schunter and Christian Stueble *(accepted for the special issue of Journal of Computer Security, JCS) for 6th FP European Projects)*	Higher education, research	Europe	HP, IBM, POL, RUB
02/2009	Trusted Computing (book chapter for Springer & Verlag)	Public	Inter-national	POL
03/2009	"Towards Automated Security Policy Enforcement in Multi-Tenant Virtual Data Centers" Serdar Cabuk, Chris I. Dalton, Konrad Eriksson, Dirk Kuhlmann, HariGovind V. Ramasamy, Gianluca Ramunno, Ahmad-Reza Sadeghi, Matthias Schunter and Christian Stueble *(accepted for the special issue of Journal of Computer Security, JCS) for 6th FP European Projects)*	Academia, Research	Europe	HP, IBM, POL, RUB
31/03/2009	Workshop paper: Adam Lackorzynski, Alexander Warg,	Higher education,	Inter-national	TUD

	"Taming Subsystems: Capabilities as Universal Resource Access Control in L4", IIES 2009: *Workshop on Isolation and Integration in Embedded Systems, Nuremberg*	Industry		
31/03/2009	Workshop paper: Michael Peter, Henning Schild, Adam Lackorzynski, Alexander Warg, "Virtual Machines Jailed", *VTDS'09: EuroSys Workshop on Virtualization Technology for Dependable Systems, Nuremberg*	Higher education, Industry	Inter-national	TUD
04/2009	Papers and Talks	TC Experts	Inter-national	IAIK
04/2009	Dirk Weber, Arnd Weber, Stephane Lo Presti: Requirements and Design Guidelines for a Trusted Hypervisor User Interface in: Proceedings of Future of Trust in Computing Conference, Berlin, 2008. 2009	N/A	Inter-national	ITAS, RHUL
04/2009	E. Gallery, A. Nagarajan and V. Varadharajan, "A property dependent agent transfer protocol", in: *Proceedings of Trust 2009, L. Chen, C. J. Mitchell and A Martin (eds.), LNCS 5471, Springer-Verlag, 2009, pp.240-264.*	Research	Inter-national	RHUL
05/2009	Paper about Trusted Migration *(Crisis 2009?)*	N/A	N/A	POL
06/2009	Paper about WYSIWYS *(ACM STC'09?)*	N/A	N/A	POL
06/2009	Paper about DAA-enhanced TLS *(ACM STC'09?)*	N/A	N/A	POL
07/07 - 10/07/2009	International Course on State of the Art and Evolution of Computer Security and Industrial Cryptography 2009	Academia, Industry, Government	Leuven, Belgium	KUL
11/2009	S. Balfe, E. Gallery, K.Paterson and C.J. Mitchell, "Challenges for Trusted Computing," *IEEE Security and Privacy, vol. 6, no. 6, p. 60ff*	Industry, Higher education, Research	Inter-national	RHUL
To appear 2009	A Secure Wallet for a Mobile Trusted Platform; OpenTC newsletter; E. Delfs, D. E. Gallery, D. Jennings, H. Loehr	General public	Inter-national	RHUL, RUB, IFX
To appear 2009	General trusted computing news site (trustedforum.org)	Public	Inter-national	TUB
To appear 2009	A. Leung, P.W. Yau, C.J. Mitchell: "Using Trusted Computing to Secure	Research	Inter-national	RHUL

	Mobile Ubiquitous Environments". In: S. Gritzalis, T. Karygiannis, C. Skianis (eds.): Security and Privacy in Wireless and Mobile Networking. Troubador Publishing			
To appear - 2009	E. Gallery and C.J. Mitchell, "Trusted Computing: Security and Applications", *Cryptologia (a quarterly journal devoted to all aspects of cryptology) published by Taylor & Francis*	Research	Inter-national	RHUL
To appear 2009	"Modeling Trusted Computing Support in a Protection Profile for High Assurance Security Kernels." *Accepted for TRUST 2009*	Research	Inter-national	RHUL
To appear 2009	"Secure VPNs for Trusted Computing Environments." *Accepted for TRUST 2009*	Research	Inter-national	RHUL
To appear 2009	"Trusted Privacy Domains — Challenges for Trusted Com-puting in Privacy-Protecting Information Sharing". *Accepted for Information Se-curity Practice and Experience Conference (ISPEC'09)*	Research	Inter-national	RHUL
To appear 2009	EEE Multimedia Magazine, "The Open Access Application Format"	Research	Inter-national	LDV
In preparation	Paper about building Trusted Computing applications	N/A	N/A	POL
In preparation	Paper about Trusted Virtual Domains (TVDs) Policies	Research	N/A	POL, other OTC partners
Review pending	Journal article	Professionals	Hungary	BME
To appear 2010	Paper about KMA *(ACM Eurosys '10?)*	N/A	N/A	POL

Table 4: Publications

3 Section 3 – Dissemination and Use ("Publishable Results")

To enable maximum community benefit, the project results were integrated into, and distributed as, Open Source software, supporting Linux in particular. A main objective was the development of complete trusted Linux kernels for different use classes, which will be distributed as part of the Novell/SUSE (a project member) Linux distribution package. By making the project results widely available, the OpenTC consortium expects to encourage Europe's IT industry to invest in trust and security development. Especially small and medium-sized enterprises, industry, and research institutions will be enabled to develop and market trusted computing systems and applications independently. The integration of trust and security into next-generation European products will make these more competitive on the world market.

An important result achieved during the second period of the project was the publication of its first prototype for Privacy Enhanced Transactions (PET). It was released as proof-of-concept because it was an intermediate step towards a more comprehensive solution, did not contain all components of the architecture and included components that were not in a finalised form. With a few minor exceptions, the source code was released under the GNU GPL version 2 license and provided as both a Live CD (binaries) and source code. It was tested on HP and IBM laptops equipped with Trusted Platform Modules (TPMs) and distributed with a disclaimer of responsibility.

In 2008 the second proof-of-concept prototype, the CC@HOME (Corporate Computing at Home) was developed. (it could also have been termed "Private Computing on Corporate Platforms".) It reflects the situation where employers tolerate, within reasonable limits, the utilization of corporate equipment (in particular notebooks) for private purposes. However, while conniving in the private use of their equipment, employers still want a safeguard that their machinery remains fit for being used on their corporate network. The prototype was capable of hosting both proprietary and non proprietary operating systems and came with a much improved graphical user interface that allowed simplified switching between compartments and roles. It was produced using SuSE's build environment and and disseminated under GPLv2 through SuSE's repositories that are mirrored worldwide. The prototype raised considerable interest in product divisons of industrial partners. An extended version has been used extensively as hands-on training system for Trusted Computing technology since 2007.

The third proof-of-concept prototype addresses a virtual datacenter scenario and will be released as dedicated OpenSuSE 11.1 distribution under GPLv2 in 2009. The system allows to create and manage mutually isolated "Trusted Virtual Domains", that is, clusters of virtual machines residing on arbitrary nodes of a managed infrastructure. The architecture provides for sophisticated logical isolation of data and management traffic. It includes platform components for network separation, tools for managing physical and virtual components, and a console implementation allowing to map Trusted Virtual domains to dedicated management compartments hosting the administrative frontends. OpenTC results will also be included as improvements in upstream packages and will thereby become part of future distributions of Linux and Xen. Like the second proof-of-concept prototype, the third one will be extended and maintained as training system for academic and industrial use.

In addition to the proof-of-concept prototypes, all of OpenTC's documentation and courseware have been made publicly available under the Creative Commons license. For a comprehensive overview of OpenTC's past and future use, the reader is encouraged to consult chapter of this report. Further details and publishable results can be found in the OpenTC webpage (www.opentc.net) in the Publications and download sections. Furthermore all released Newsletters can be read on the OpenTC

webpage. This service was designed to inform the interested public about downloadable prototypes, project achievements and other up-to-date information, and it is meant to support discussion about the underlying issues.