Research on IF-MAP

Ingo Bente (Trust@FHH)

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Introduction

Trust@FHH Research Group

- Team
  - Chair: Prof Dr. Josef von Helden
  - 3 research associates
  - 4 student assistants
- Research Fields
  - Trusted Computing
  - Network & Mobile Security
- Selected Projects
  - TNC@FHH
  - IRON
  - ESUKOM
- More Information
  - trust.inform.fh-hannover.de

The ESUKOM Project in a Nutshell

- Motivation
  - Smartphones are used in business environments
  - Impact of Smartphones in terms of IT-Security is unclear
  - Idea: Address ***Smartphone Challenge*** by leveraging IF-MAP
- Project Goals
  - Investigation of Smartphone platforms in terms of security
  - Development of IF-MAP prototype infrastructure
- Duration
  - 10/2010 – 09/2012 (2 years)
- Funding
  - Funded by german BMBF
- Website
  - www.esukom.de

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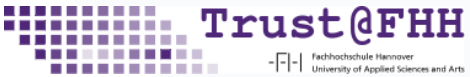
Project Consortium

- 3 SMEs & 2 Academic Institutions
  - DECOIT GmbH
  - mikado soft GmbH
  - NCP Secure Communications
  - Fraunhofer SIT
  - Trust@FHH, FH Hannover



- Further Cooperations
  - Infoblox, Juniper, Enterasys, Infineon
  - PhD Programme with
    Universität der Bundeswehr München

Why using IF-MAP anyway?

ESUKOM Problem Statement

- How to secure smartphones in business environments?

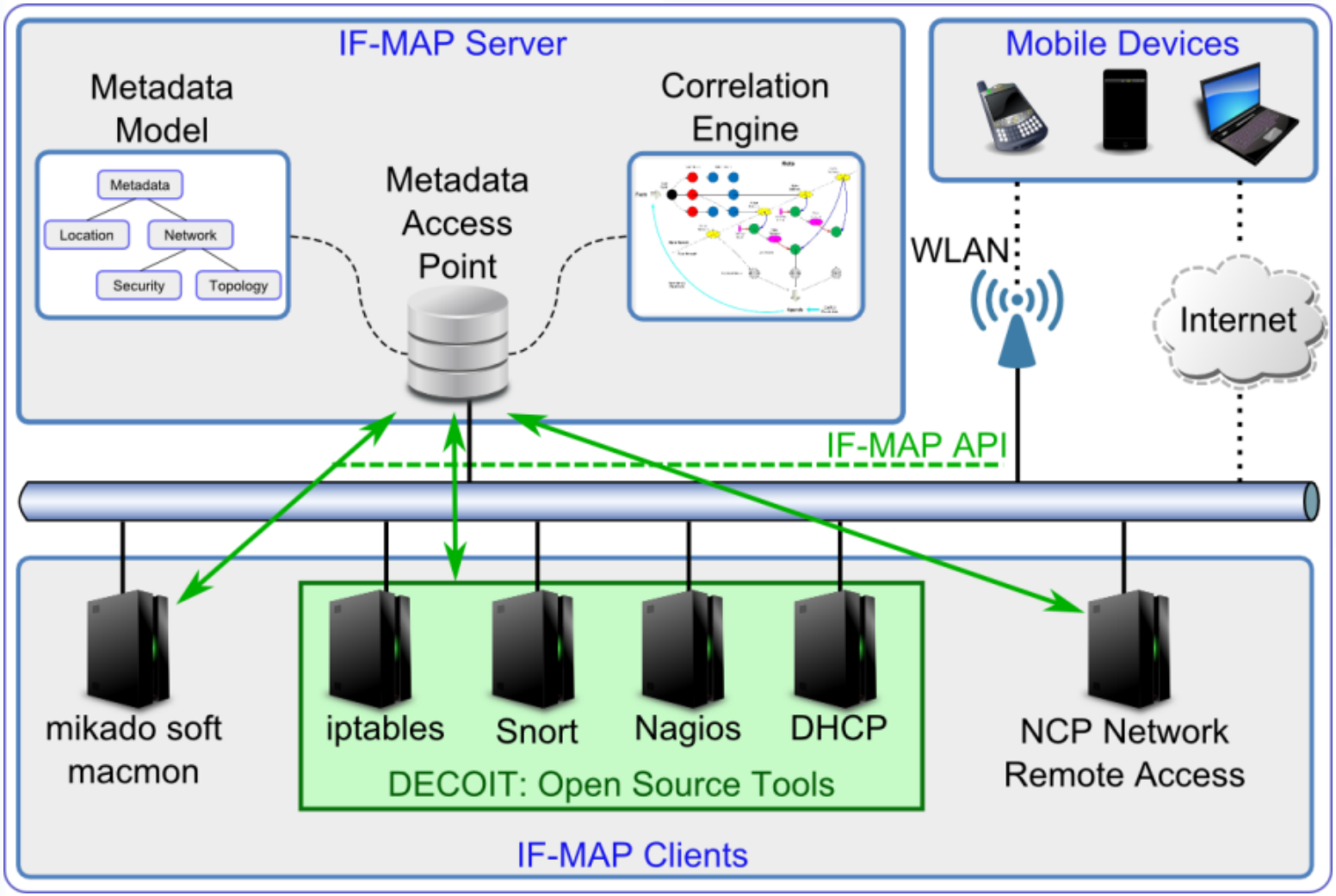
- What we knew in advance
  - (Some) characteristics of smartphones
  - Smartphones are not properly addressed today …
  - … but existing security tools are deployed
  - Our technological background (TC, TNC, IF-MAP)

- What we did ***not*** know
  - How do smartphones change attack surface?
  - What aspects of smartphones are important in terms of security?
  - What (existing/new) means are appropriate to secure smartphones?

ESUKOM Idea

- Idea
  - Leverage existing tools to secure smartphone usage
  - Follow network oriented approach
  - Correlate (smartphone) metadata from arbitrary sources
  - No system security
- Why IF-MAP?
  - General purpose, content based pub/sub protocol
  - Integration of existing security solutions
  - Good experiences from adoption (IRON project)
  - Exciting new technology

ESUKOM High Level Architecture



The Field of Mobile Phone Security

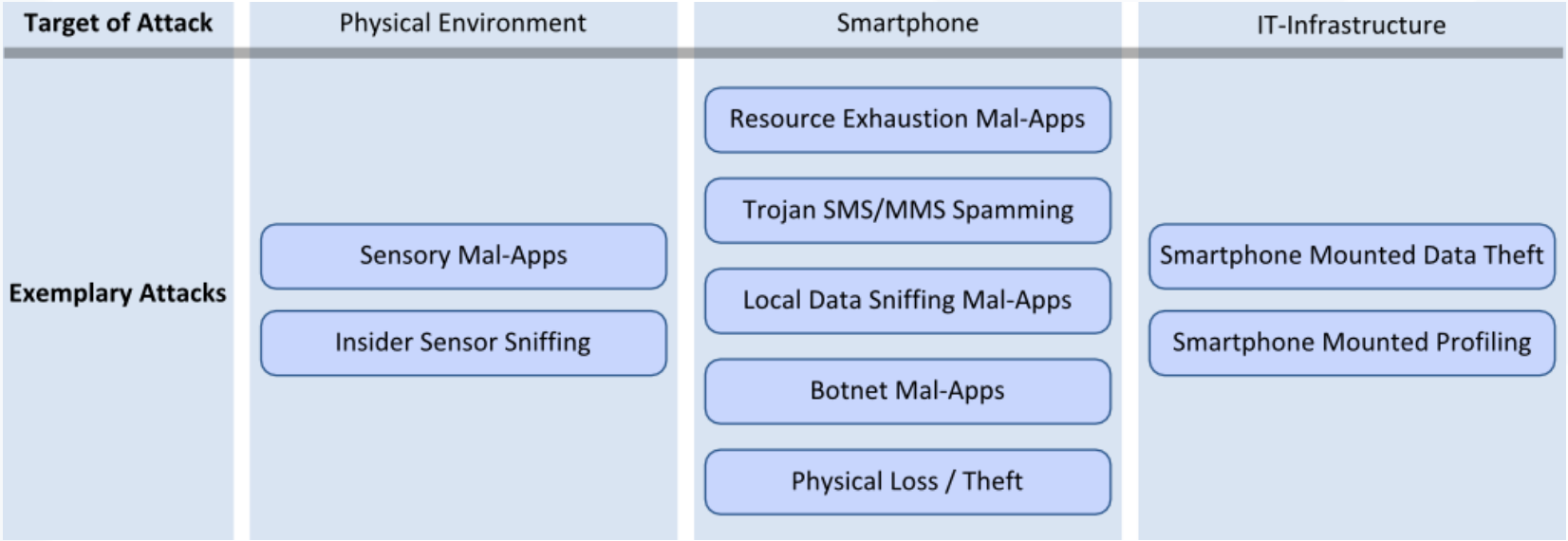
Mobile Phone Security Research

- Research questions
  - Threats introduced by smartphones?
  - Limitations and flaws of current platforms?
- Research field is gaining momentum
  - Focus on Android and iOS
  - Mostly exploits & system security approaches
  - For example Taintdroid, Kirin & Saint (Enck et al. 2009 & 2010, PSU)

Smartphone Threat Analysis for ESUKOM

- Goal
  - Threat model for smartphones used in corporate environments
  - Smartphones == mobile consumer electronic devices
- Smartphone Characteristics
  - Built-in Sensors
  - Connectivity
  - Internet-support
  - Resource Paradox
  - App-based Architectures
  - Platform Diversity

Smartphone Threat Analysis for ESUKOM



ESUKOM Key Features

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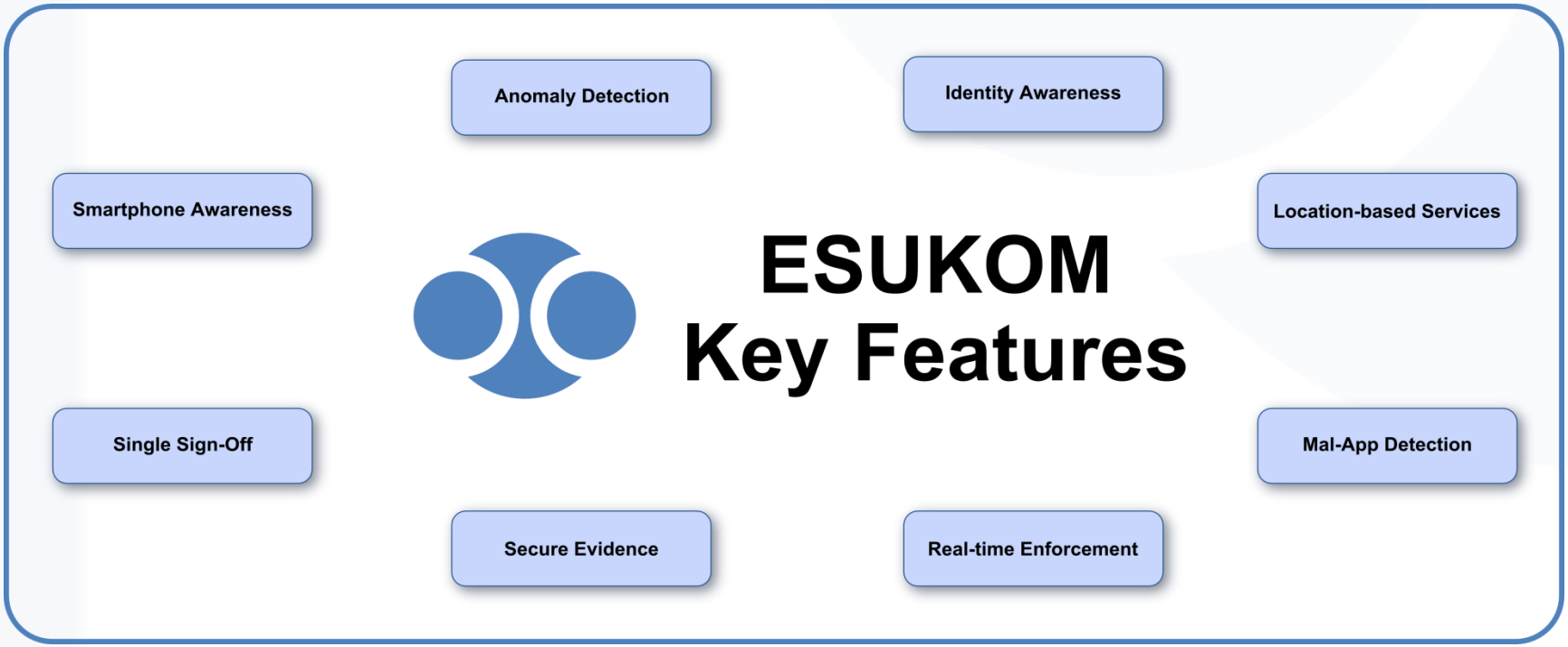

Open (Research) Questions

- Effective correlation of large metadata graphs
  - What are suitable correlation approaches?
  - What part of metadata graph is relevant for what purpose?
- Smartphone specific metadata vocabularies
  - Status of sensors
  - Location
  - Platform Details (installed apps, used permissions)
- Interdomain MAP
  - MAP-Server to MAP-Server Communication
- Threats introduced by IF-MAP?
  - Impact of rouge MAPCs
  - Trustworthiness of metadata graph

Thank You

Questions ?

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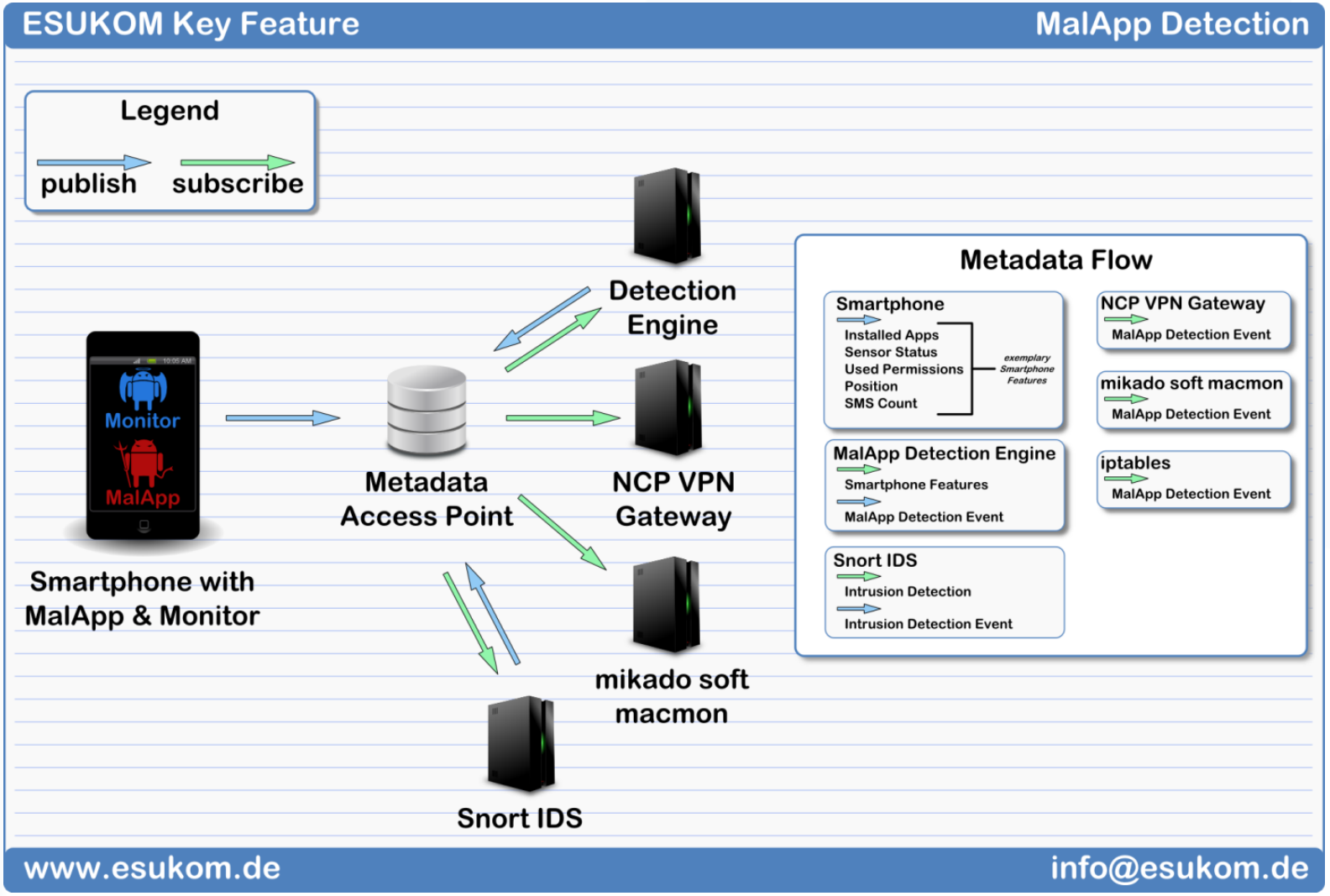
Backup Slides

ESUKOM Key Feature MalApp Detection



Live Demo

IF-MAP Demo

- MAP Server
  - irond 0.2.1
- MAP Clients
  - soapUI (triggers IF-MAP operations)
  - irongui 0.1.0 (visualization)
- Software available at
  - http://trust.inform.fh-hannover.de
  - www.soapui.org
  - Licenses: Apache License 2 & LGPL 2.1

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