Realtime Security for Enterprise Networks based upon the Correlation of Metadata

Josef von Helden
(University of Applied Sciences and Arts, Hanover)

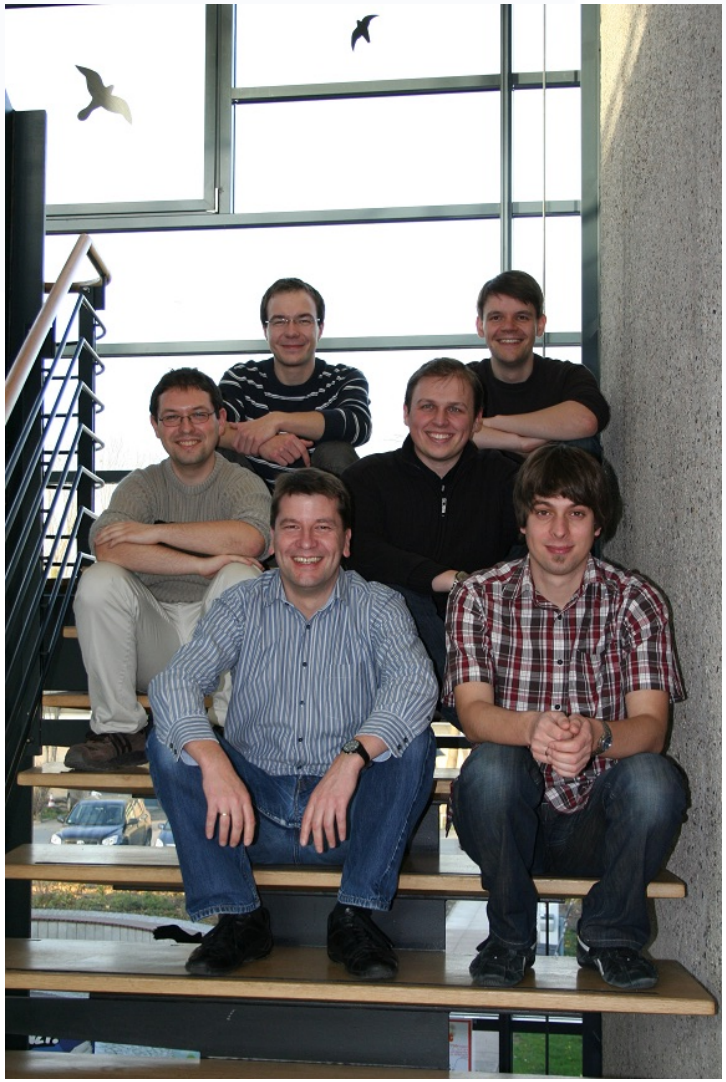
15.06.2011, München

ESUKOM

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



ESUKOM overview

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

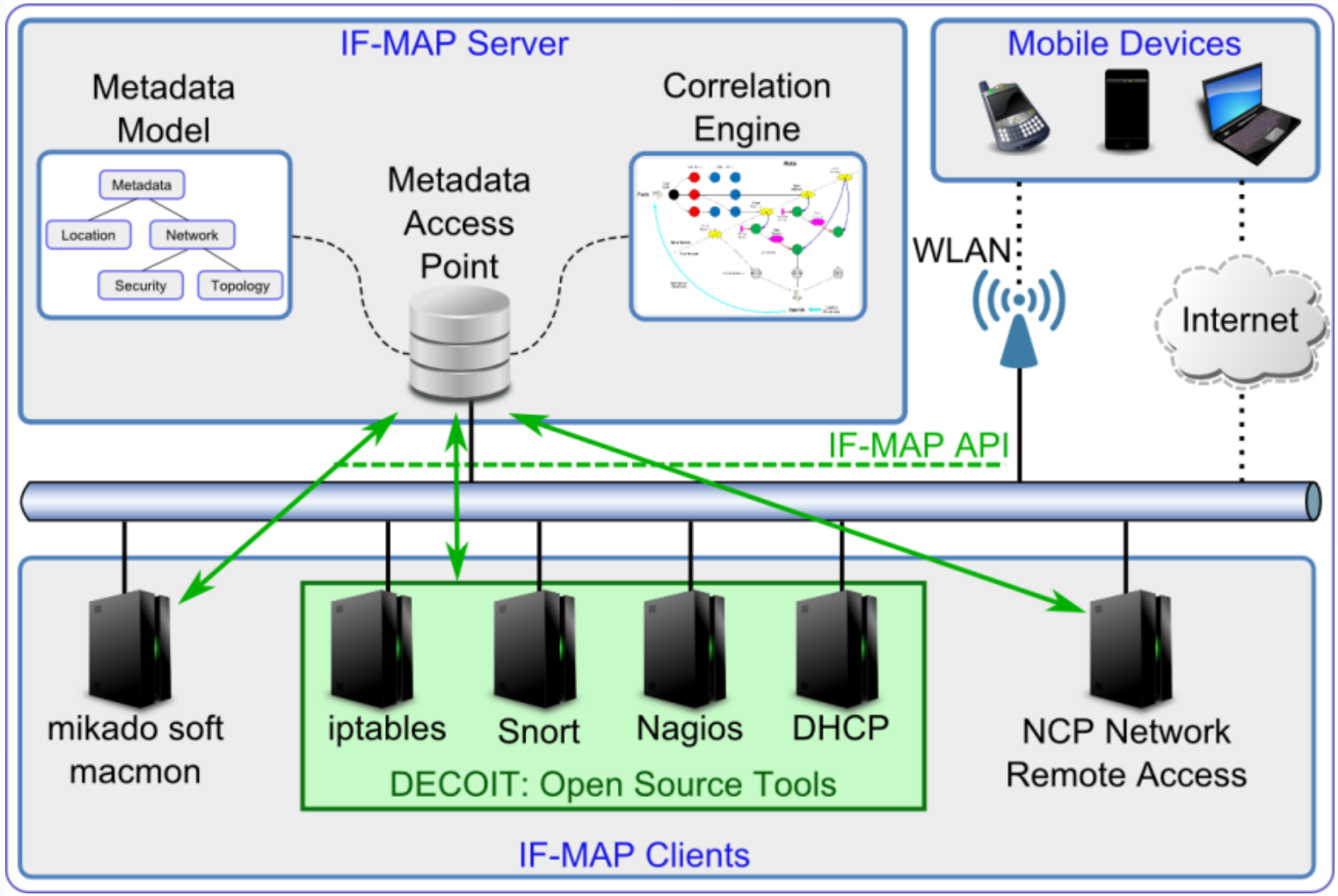
SPONSORED BY THE
Federal Ministry of Education and Research

Project Consortium

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

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

ESUKOM High Level Architecture

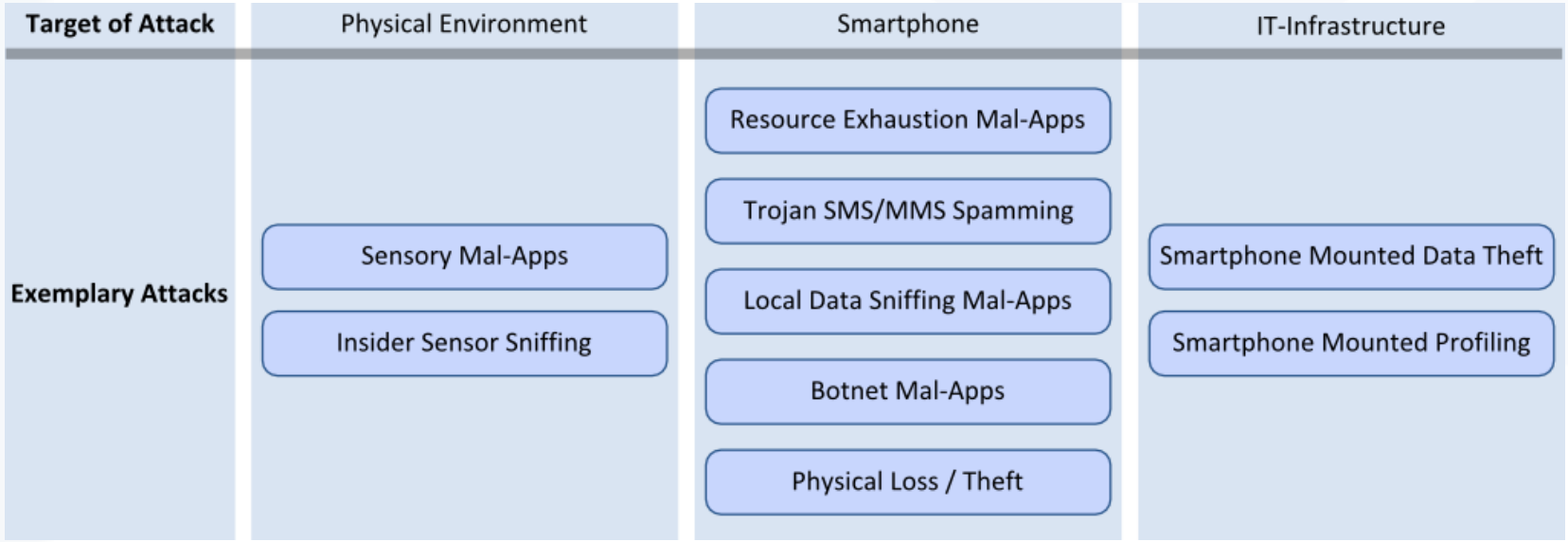


Mobile Phone Security

Smartphone Threat Analysis for ESUKOM

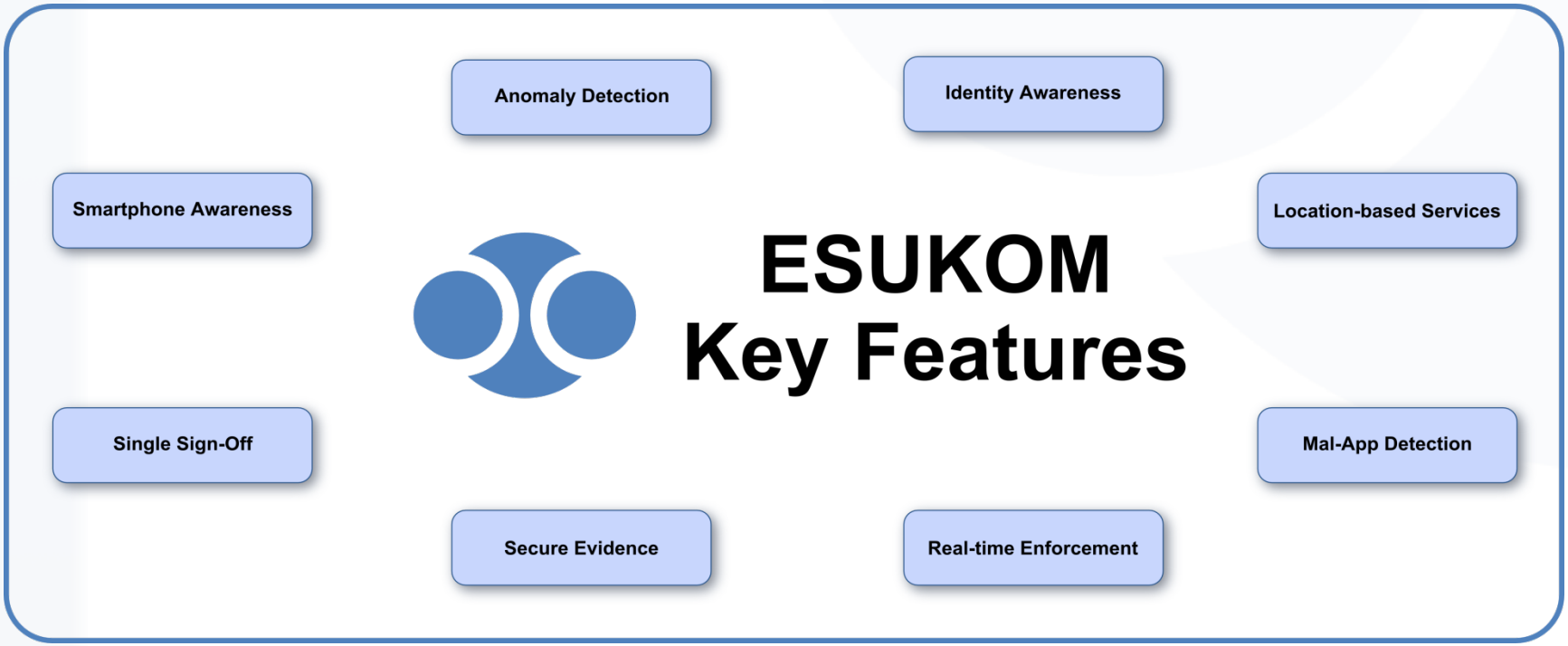
- Goal
  - Threat model for smartphones used in corporate environments
  - Smartphones == mobile consumer electronic devices
- Smartphone Characteristics
  - Built-in Sensors
  - Connectivity
  - Internet-support
  - Resource Paradox
  - App-based Architectures
  - Platform Diversity

Smartphone Threat Analysis for ESUKOM



ESUKOM Key Features

ESUKOM Key Features



ESUKOM Development

ESUKOM Development: Overall Planning

	Anomaly Detection	Smartphone Awareness	Identity Awareness	Location-based Services	Mal-App Detection	Real-time Enforcement	Secure Evidence	Single Sign-Off	Responsibility
macmon	P/S	P	P	P/S	S	S	P		MIC
NCP VPN	P/S	P	P	P	S	S			NCP
(Free) RADIUS	P		P				P	P/S	DEC
Snort	P				P/S	P			DEC
Detection Engine	P/S	S		P/S	P/S	P/S			FHH
Nagios	P								DEC
iptables			P/S	P/S		S			DEC
Smartphone	P/S	P	P	P	P/S		P/S		FHH
DHCP			P				P		FHH
IRONGUI	S	S	S	S	S	S	S	S	FHH
Timing Authority							P		SIT
TNC Server							P/S		SIT
Privacy CA							P		SIT
Evidence DB							S		SIT
Open VPN (Redundancy to NCP VPN)	P/S							P/S	DEC

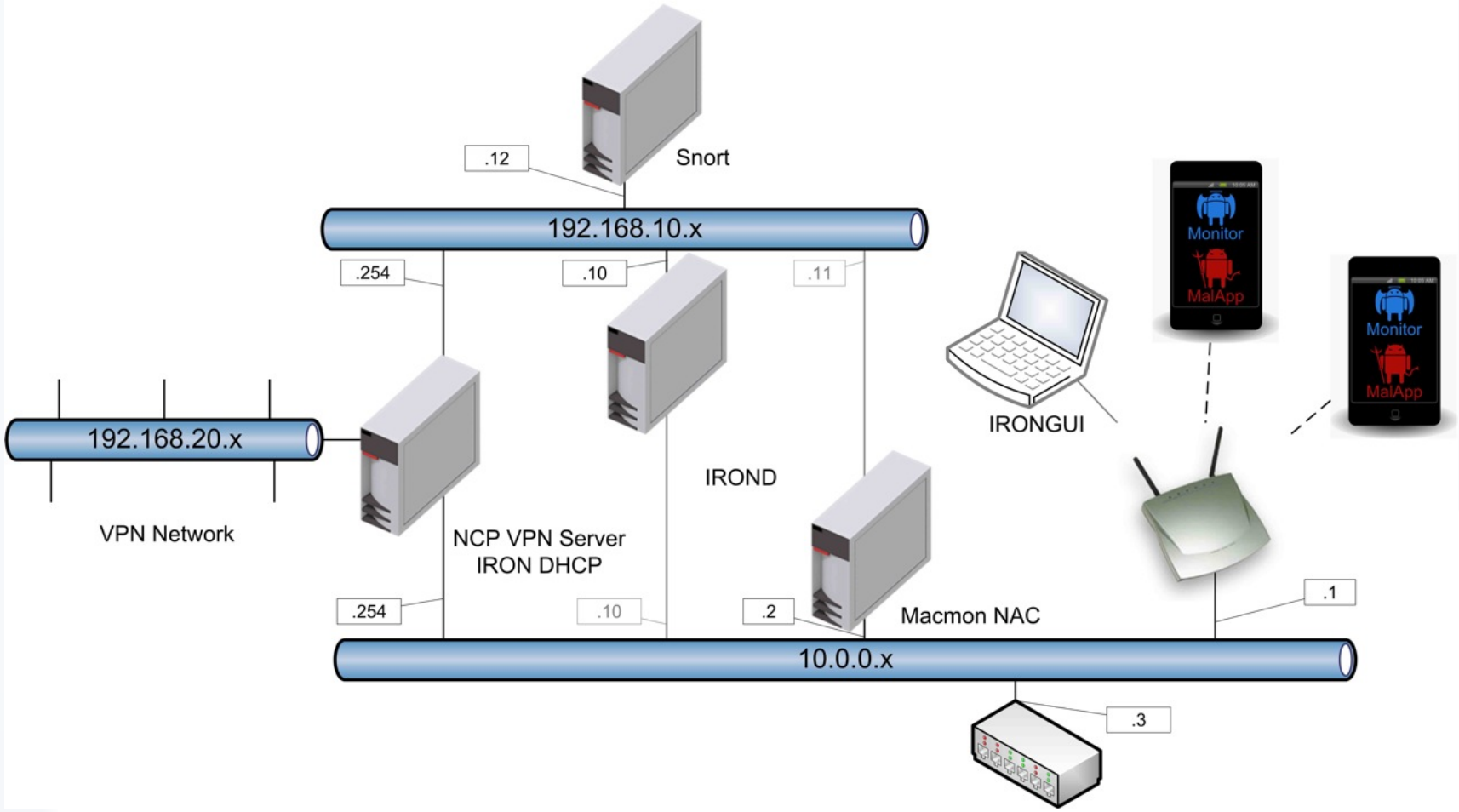
P = Publish	S = Subscribe	P/S = Publish + Subscribe

ESUKOM Development

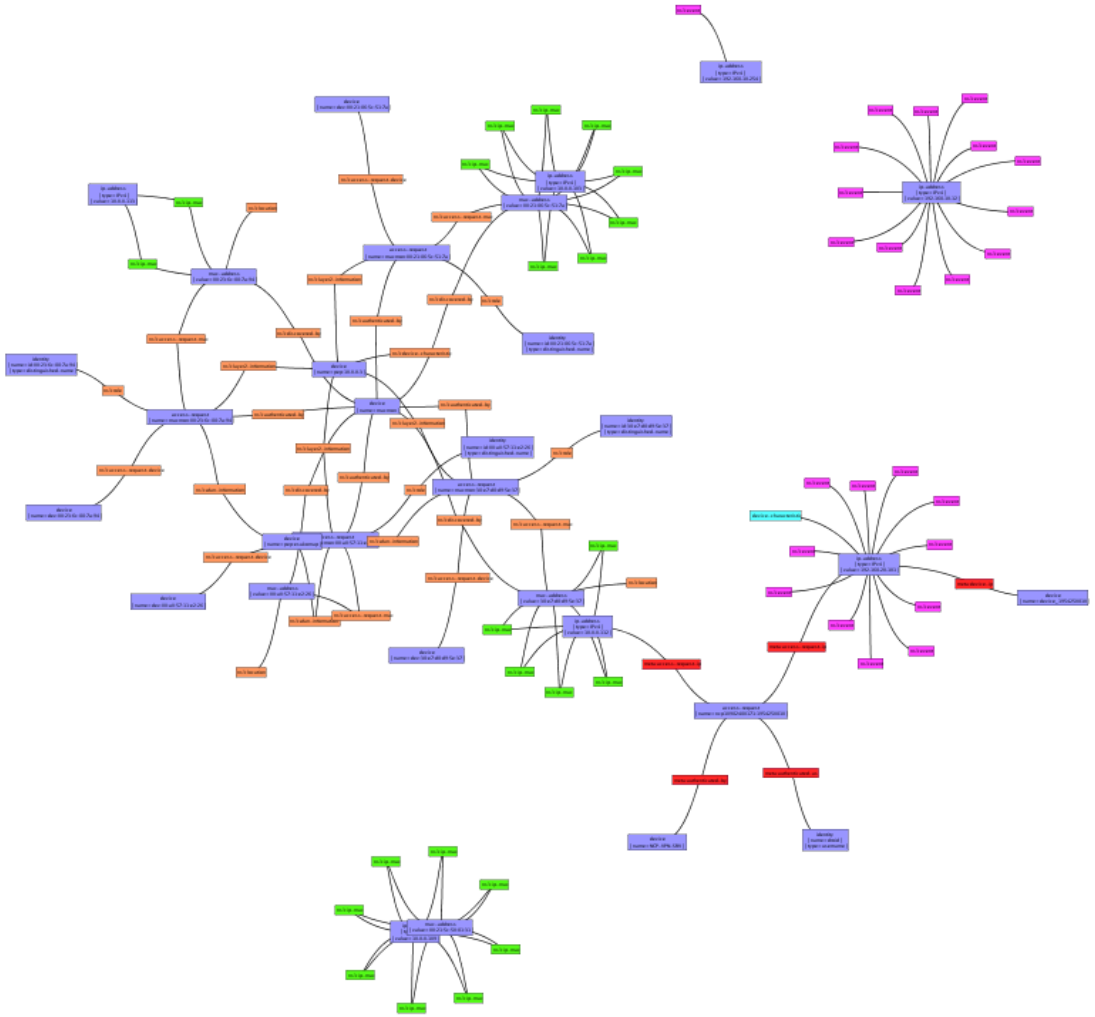
- Status by 15/06/2011
  - Publish functionality of standard metadata by MAP Clients
    - NCP VPN Gateway
    - mikado soft macmon
    - Snort
    - Android Smartphone
    - DHCP
  - MAP Server
    - irond
  - Visualization
    - irongui
  - subscribe / search functionalities: under development

Live Demo

ESUKOM Demo Setup



ESUKOM Demo: Screenshot irongui



Open (Research) Questions

Open (Research) Questions

- Effective correlation of large metadata graphs
  - What are suitable correlation approaches?
  - What part of metadata graph is relevant for what purpose?
- Trustworthiness of metadata graph

=> Detection Engine

Further Open (Research) Questions

- Smartphone specific metadata vocabularies
  - Status of sensors
  - Platform configuration (installed apps, used permissions)
- Interdomain MAP
  - MAP-Server to MAP-Server Communication
- Threats introduced by IF-MAP?
  - Impact of rogue MAPCs

Thank You

Questions ?

ESUKOM

ESUKOM

Copyright 2011

Das dem Projekt zugrunde liegende Vorhaben wurde mit Mitteln des Bundesministeriums für Bildung und Forschung unter dem Förderkennzeichen „01BY1050“ gefördert. Die Verantwortung für den Inhalt liegt bei den Autoren.