



Universitat Oberta
de Catalunya

Security and Privacy Technologies for Smart Cities

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SmartGlacis Project (2015-2019)

KISON Group
Helena Rifà-Pous



Smartness is likely to result in ubiquitous control and profiling of citizens

SmartGlacis: Security and Privacy Technologies for smart cities

The general objective of SmartGlacis is designing solutions to help making the life of citizens in a smart city **efficient, secure and privacy-preserving** in three broad areas:

- A. smart green mobility**
- B. e-commerce**
- C. citizen participation**





B. e-Commerce:

- Credit card payments that can be tracked
- Loyalty programs

Research in **electronic tickets** that are secure (cannot be counterfeited) and privacy-aware. Reconcile group discounts and loyalty programs with buyer anonymity

C. Citizen participation

- E-democracy
- User generated content
- City alerts, emergencies

Solutions to encourage citizen participation in the **governance and function of the city** in an anonymous way, but at the same time identifying and penalizing malicious users

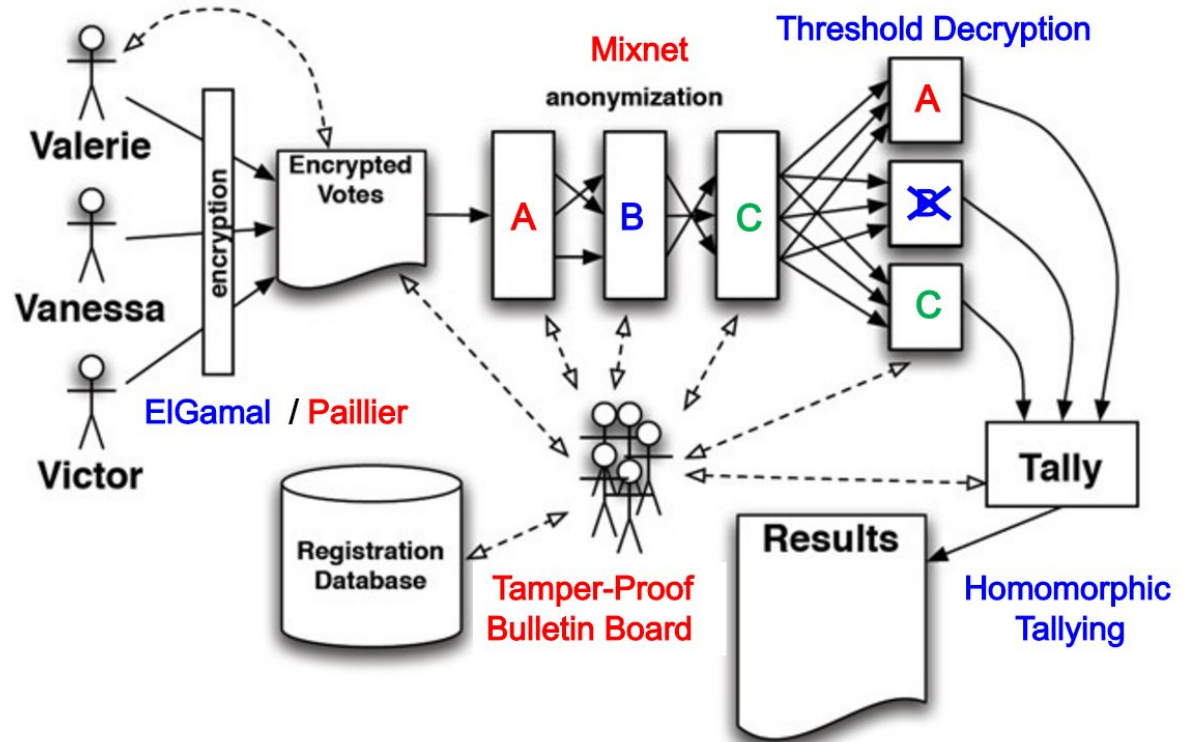


E-democracy

1. Electronic voting and polling systems

Systems to allow groups of people to allow/reject measures or express opinions according to the majority.
Design and implementation of an e-voting system for unsupervised environments and adapted for use in lightweight devices.

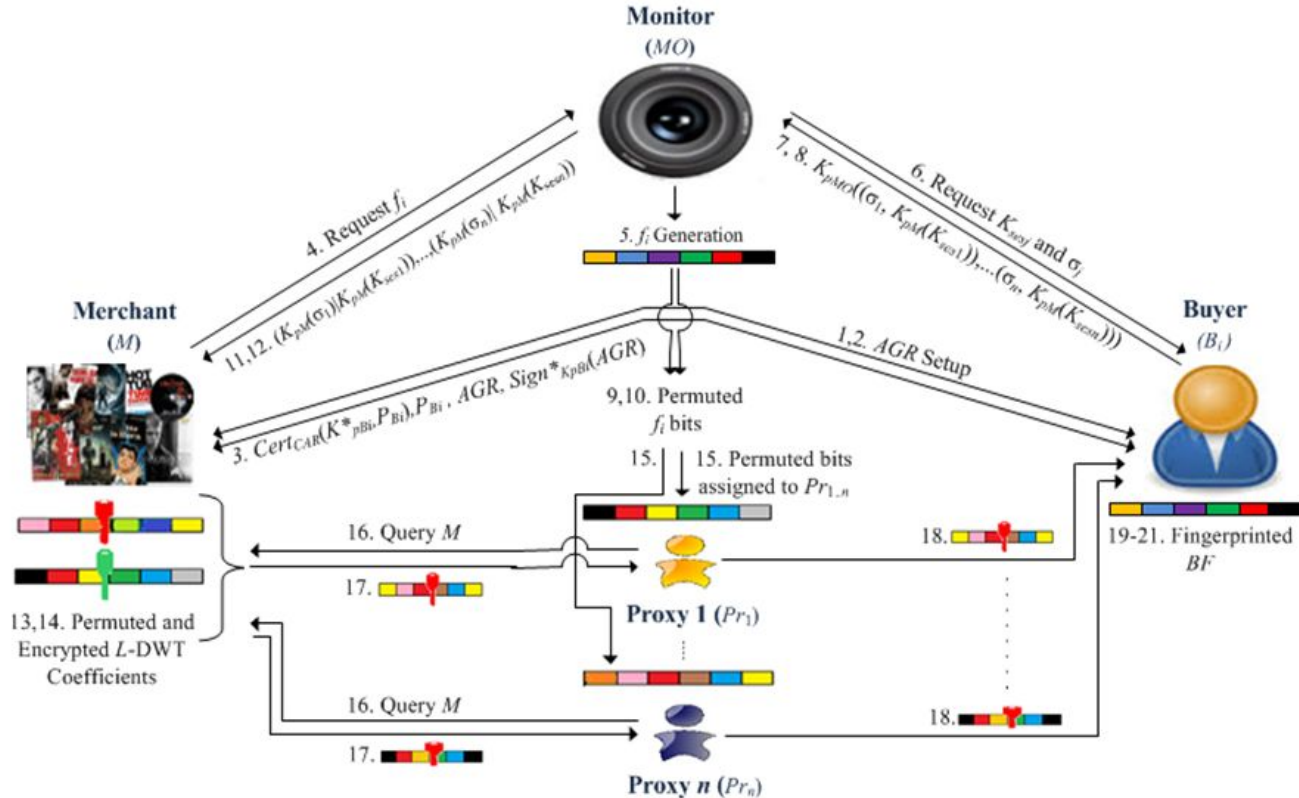
Cryptographic voting systems



User-generated content distribution

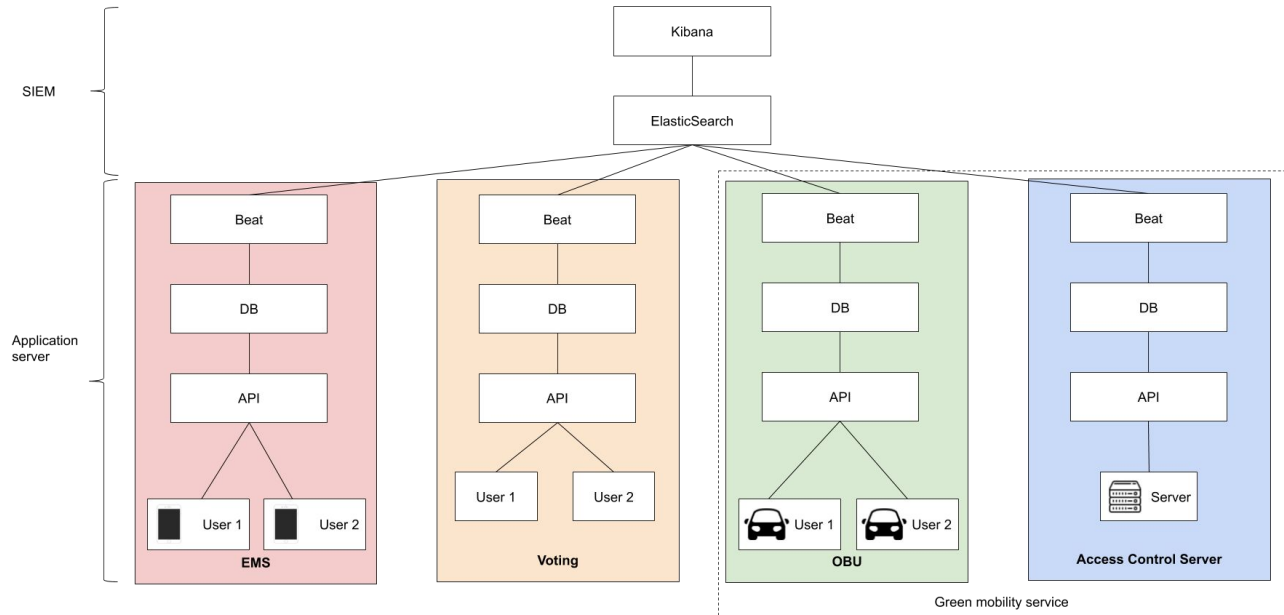
Framework for Privacy-aware Content Distribution in P2P Networks with copyright protection

We propose protocols to share user-generated content through online social networks that avoids **copyright infringements** and **privacy breaches**.



Analysis of alerts and anomalies in the smart city

A SIEM (Security Information and Event Management) based-solution gathers and analyses the records and data generated in the smart city.



kibana

Discover Visualize Dashboard Timelion Canvas Maps Machine Learning Infrastructure Logs APM Uptime Dev Tools Monitoring Management

68 hits New Save Open Share Inspect 5 seconds Last 5m Refresh

> Search... (e.g. status:200 AND extension:PHP) Options

emsbeat-* Auto

Selected fields

? _source

Available fields

- @timestamp
- t_id
- t_index
- #_score
- t_type
- t_agent.ephemeral...
- t_agent.hostname
- t_agent.id
- t_agent.type
- t_agent.version
- t_ecs.version
- t_ems.latitude
- t_ems.longitude
- t_ems.pk1
- t_ems.pk2
- t_ems.pk3
- t_ems.pk4
- t_ems.pk5
- t_ems.r_timestamp

@timestamp per 5 seconds

Time	_source
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May 13th 2019, 10:29:06.834	<pre>@timestamp: May 13th 2019, 10:29:06.834 ems.pk5: MIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQcMDIKaE9wWZy583KPTCxsrEpzFPyUeVk2QjEMNpnq9PLWwezC518xtec9wnkhf+SXFVdhCNHZJLQ+Y1U6zQBaXojrC8jtmTJYt/hpG66BL8tcRjUaPxANE5hN8yE2rmusM6w2mHnrPIPXmJeAy7FILLsncoLmS7w44+BxcNBZFZLwIDAQAB ems.r_timestamp: 2017-04-0723:47:40.282 ems.longitude: 5.09972428 ems.r_type: T ems.latitude: 1.25040885</pre>
May 13th 2019, 10:29:04.834	<pre>@timestamp: May 13th 2019, 10:29:04.834 host.os.name: Ubuntu host.os.kernel: 4.18.0-18-generic host.os.codename: bionic host.os.platform: ubuntu host.os.version: 18.04.2 LTS (Bionic Beaver) host.os.family: debian host.containerized: true host.name: 260941def750 host.hostname: 260941def750 host.architecture: x86_64 agent.id: 7029c286-26c9-4453-83eb-d6364e22853f</pre>
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Data received from the EMS application

Summary

The presented system collects data from all services in a smart city and allows **global analysis of anomalies or attacks**, which would not be possible without the integration of data in a centralized platform.



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