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Konfido: Secure and Trusted Paradigm for Interoperable eHealth Services

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CEF Regulation

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Connecting Europe Facility (CEF) is a regulation that defines how the Commission can finance support for the establishment of **trans-European** networks to reinforce an interconnected Europe

CEF Transport: 24,05 BN €

CEF Energy: 5,53 BN €

CEF Telecom: 1,04 BN €

Digital Service Infrastructure

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A DSI describes solutions that support the implementation of EU-wide projects, providing trans-european interoperable services. It is founded by CEF

Building Block DSI: basic digital service infrastructures (key enabler, like eDelivery)

Sector Specific DSI: DSI for specific domains (eHealth, Cybersecurity, e-Justice, ...)

Exchange of eHealth data in Europe

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- OpenNCP is a Sector Specific DSI service that allows for the exchange of eHealth Data in Europe (Patient Summary and ePrescription)

Konfido

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- Horizon 2020 project to advance state-of-the-art eHealth technology and specifically OpenNCP along these dimensions:
  - Digital security
  - Data preservation
  - Data access and modification
  - Data exchange
  - Interoperability
  - Compliance
- Holistic approach:
  - **User centric**
  - Targeting all the levels of an IT infrastructure
  - Taking into account legal, organizational and operational contexts

User-centric approach

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- eHealth users have strong, legitimate views on how they want to do their difficult job
- You have to gain their trust, otherwise they simply don’t use the system
- In Konfido users participate from the design phase
- There are three pilots to test the system and raise awareness on OpenNCP

Konfido Partners and Countries

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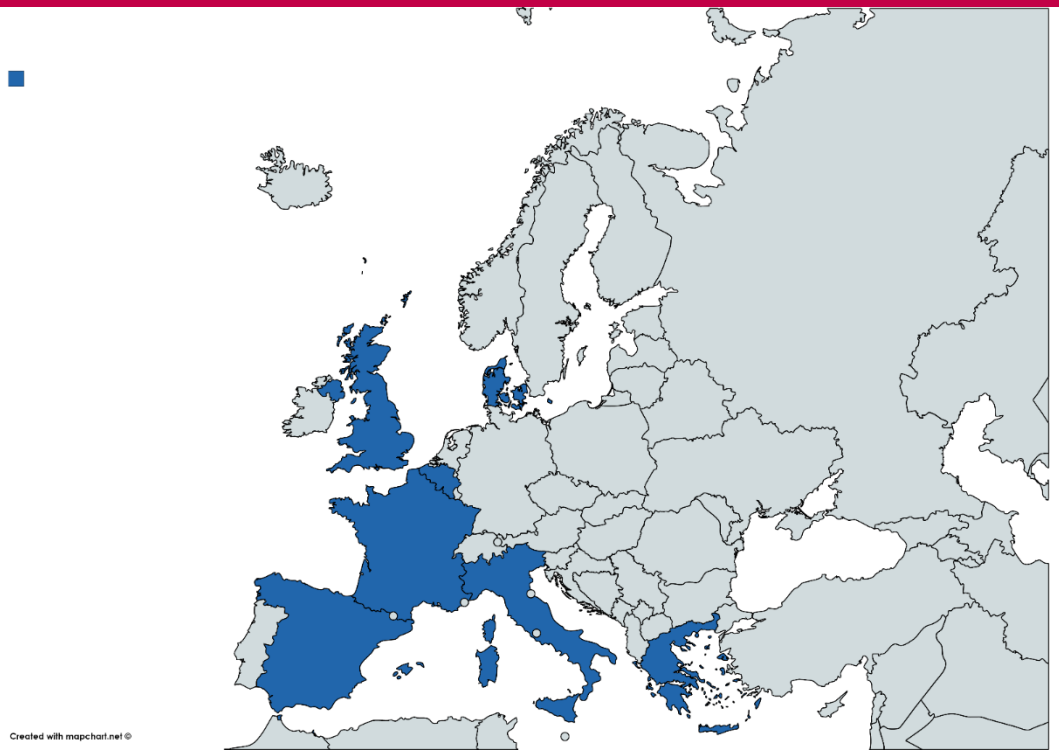

bit4id

cini consorzio interuniversitario nazionale per l'informatica

Telbios

sundhed.dk

medcom

EXUS INNOVATION

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eurecat
Centre Tecnològic de Catalunya

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CENTRE FOR RESEARCH & TECHNOLOGY-HELLAS

Imperial College London

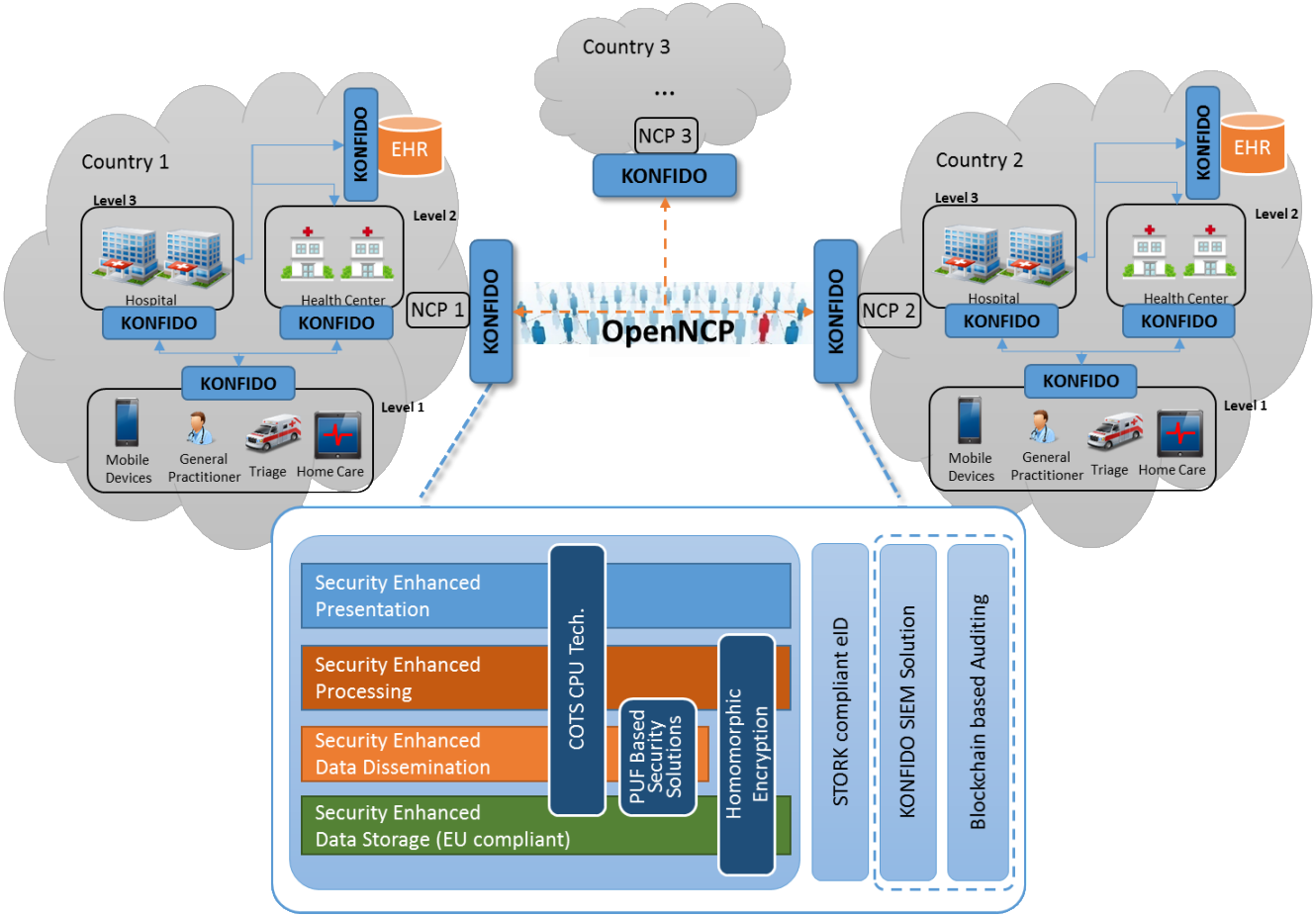
Agència de Qualitat i Avaluació Sanitàries de Catalunya
AGENCY FOR HEALTH QUALITY AND ASSESSMENT OF CATALONIA

Santobono Pausilipon
fondazione

IDIBAPS
Institut D'investigacions Biomèdiques August Pi I Sunyer

time.lex

Konfido deployment view



Italy Denmark Spain

OpenNCP: users identification

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- Users (physicians, nurses, pharmacists) identification
  - Each OpenNCP instance authenticates its users within its national system (no need to use the eID DSI)
  - How we check that a physician is a physician?
    - (National) Attribute Authority?
    - Each OpenNCP instance should trust other instances that the authentication and authorization phases have been performed properly

OpenNCP: patient identification

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- Patient identification
  - When it is needed? What if the patient cannot/could not cooperate in the identification phase?
  - The eIDAS unique identifier is used as patient ID number?
    - Yes for some countries (LU, FI, SE, IT?)
    - Not in others (PT, AT) (translation service/attribute authority is needed)

Konfido technologies: eIDAS eID

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Using an eIDAS eID for eHealth brings in a clear legal framework for interoperability and security (assurance)

We are not considering the general solution for the problem, only what is needed to support eIDAS eIDs in the three participating countries

eIDAS means of authentication: Italy

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Italy:

- Carta Nazionale dei Servizi (smart card)
- Carta d'Identità Elettronica (smart card)
- SPID (server based, but it does not yet provide an high level of assurance)

eIDAS means of authentication: Spain

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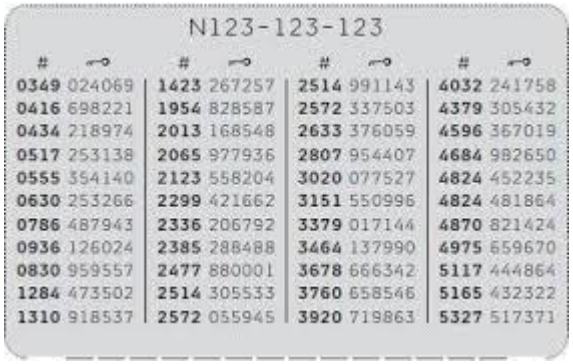
Spain:

- Documento Nacional de Identidad (smart card)
- OCM España: Consejo General de Colegios Oficiales de Médicos de España (smart card)

The first is *issued* to all the citizens, the second is *used* by (almost) all the physicians in Spain working in hospitals

eIDAS means of authentication: Denmark

Denmark uses a combination of user name, password and OTPs arranged on a matrix card



Konfido technologies: blockchain based logging

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- Country A requires eHealth data for a patient cared for in Country B
- How this two countries could agree now and in the future that an exchange has actually been requested and then performed?
- A blockchain based logging (a distributed ledger) could track all of these business transactions
- Each country could digitally sign its view of the business transaction
- All of these signed transactions are stored inside the ledger

Konfido technologies: Omomorphic Encryption

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- Health Data of patient are stored inside a country's eHealth system
- These data will travel outside of the country when a physician request them
- How could the patient be assured that his/her data will be read only by the caring physician, without losing the ability to perform some aggregate statistics?

Konfido technologies: Photonic Physically Unclonable Functions

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- A PUF is a way to seed a random number generator using physical defects, intrinsically not reproducible, found in an off the shelf chip
- A physician uses a smartphone to access Konfido system, so she has a lot of possible chips for PUF
- A PUF could be used as an on-the-field provisioning of some kind of digital identity

Konfido technologies: System Information and Event Monitoring

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- OpenNCP lacks a SIEM that, analyzing the different logs produced by the system, could create an ongoing view of the system, to understand what's happening and if some kind of attack is taking place

Konfido technologies: Software Guard Extension

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- The security of the key is the security of the system
- Using a smart card as a key store for an online service brings in some operational problems (e.g. Who will enter the PIN?)
- Intel is developing Software Guard Extensions
  - Enclaves (regions of memory) that are protected from accessing from OS and hypervisor, could be used to store and compute with a private key

Konfido: some useful links

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- Web site: www.konfido-project.eu
- @konfidoproject

- Why don’t you join the Project Advisory Board? eID experts are more than welcome!

- For more info: pca@bit4id.com