Interoperability Infrastructure Services to enable Secure, Cross-Border, Operational eHealth Services in Europe

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Session: Infrastructure and Services for Healthcare Transformation
Introduction – Background Initiatives

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Business setup
PEPPOL
e-ID
Common services
Building Blocks
STORK2.0
eID

Making business easier.eu
Making procurement better.eu
Making justice faster.eu
Making healthcare better.eu
Making access smarter.eu

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Interoperability Infrastructure Services to enable Secure, Cross-Border, Operational eHealth Services in Europe

Public administration, agencies, companies from 22 countries

- **Project start:** 1st April 2013
- **Project Coordinator:** Ministry of Justice NRW, Germany
- **Duration:** 48 months
- **Project budget:** 27 m €
- **EU financing:** 13.5 m €
- **Programme:** Competitiveness and innovation framework programme (CIP), ICT policy support programme
eHealth Use Case: ePrescription/ Patient Summary

Scope: Enhance former epSOS’ uses cases (e-Prescription and Patient Summary cross-border exchange) with cross domain Building Blocks to safeguard the continuing applicability and legitimacy of clinical data processing and support the implementation of Directive 2011/24 on the application of patients’ rights in cross-border healthcare.

- Access to the patient summary and any related medical record information from wherever it is located in the host country by healthcare professionals.
- Secure identification of patients using the electronic identification credentials they have in their host country.
- Possibility to have electronic prescriptions issued by their own doctors in their country of origin filled at the pharmacies of the destination country.
Non repudiation

... registers any attempted access to a patient’s protected health information and provides evidence for disputes resolution.

epSOS issue addressed

- Missing non repudiation information in the infrastructure. Non Repudiation of Origin and Receipt can be manually obtained by (un)signed audit trails

How

**SAT – Non-Repudiation and Traceability**

Introduces a mechanism for enforcing evidence generation and collection in the nodes of the four-corner model, to be used for non-repudiation and traceability purposes.

**ABB – Non-Repudiation**

Enables all the corners of the e-SENS 4-corner model to generate and emit electronic evidence used for non-repudiation purposes, based on each domain respective regulations and technological need. (Evidence Management, PR-REM, SBB-Evidence Emitter)
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Evidences

Non Repudiation aspects

- Used to emit electronic evidence on transactions (i.e. ATNA Audit Trails, ETSI REM)
- Evidence Emitter implementation made in conjunction with OpenNCP, and eCodex (OpenNCP to include the code, eCodex providing ETSI REM)
- Plans to include in the CIPA eDelivery
- A change proposal has been submitted to OpenNCP community
- Community suggests to keep researching (Store message content? How to forward the evidence? Where to store?)

List of Artefacts Produced

http://wiki.ds.unipi.gr/display/ESENSPILOTS/5.2.1++Artefcats+and+Assets++Evidences

Open Issues – Future Work

- Missing Evidence Storage and mechanism for evidence exchange
- Missing formal proof of security properties and a governance model

Conformance testing / Piloting

- IHE-Europe Connectathon 2015 (Luxembourg)
- EXPANDathon (Lisbon, 2015)
- IHE-Europe Connectathon 2016 (Bochum)
- 1st e-SENS Simulated Encounters (Lisbon, 2016)
- 2nd e-SENS Simulated Encounters (Athens, 2016)
- 3rd e-SENS Simulated Encounters (Brussels, 2017)
Service Location and Capability Lookup

... provide trusted, secure and efficient mutual configuration for national contact points for eHealth.

**epSOS issue addressed**

Use of epSOS Central Services

**How**

**SAT – eDelivery**
Denotes the process to take (store) and hand over (route and forward) business data and evidence asynchronously, securely and reliably.

**ABB – Capability Lookup**
Defines protocols and data formats to use for accessing and obtaining service metadata about the communication partner’s interoperability capabilities on all levels defined in the European Interoperability Framework. (Capability Resolution, PR-SMP, SBB-SMP)

**ABB – Service Location**
Defines a standard location for metadata service providers. (Address Resolution, PR-BDXL 1.3.0, SBB-SML)
SMP/ SML

Service for end point detection
- Use Service Metadata Publisher (SMP) as a Record Locator Service
- Automatic configuration of client / servers
- DNS-based, XML and REST interfaces
- DIGIT is managing the change requests from eHealth to OASIS TC
- eHealth DSI Change Proposal – Add SMP/SML capabilities

List of Artefacts Produced

http://wiki.ds.unipi.gr/display/ESENSPILOTS/5.2.1+-+Artefacts+and+Assets+-+SML-SMP

Open Issues – Future Work
- SMP client certificate
- National authority signature of SMP files
- DG-SANTE: Deployment of SMP server
- DG-SANTE + MS: migrate from TSL to SMP
- DG-SANTE: review OpenNCP security architecture under eIDAS (waves 2 and 3)
Electronic Identification

... provides the proper authentication strength for patients when seeking health care in a cooperating EU member state, as well as safeguarding their fundamental access rights.

epSOS issue addressed

epSOS is missing standardized, cross-border electronic authentication scheme for patients

How

SAT – eID

Provides a cross-border framework to make interoperable country-specific authentication infrastructure through electronic identity (eID) to allow a legitimate user to securely access services in a foreign European country and to legitimately disclose data to an HP on behalf of data subject (patient).

ABB – Cross Border Authentication

... (Authentication Exchange Protocol, PR-STORK 2.0 SAML or PR-eIDAS SAML, SBB - STORK GW or SBB - eIDAS GW)

ABB – Cross-Border Attribute Provision

... (Attribute Exchange Protocol, PR-STORK 2.0 SAML, SBB - STORK GW)

ABB – Local Attribute Provision

... (Local Attribute Retrieval and Mapping and Local Authentication, SBB-LARMS)

... (Local Attribute Retrieval and Mapping and Local Authentication, SBB-LAM)
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eHealth eID

Electronic Identification of Patients

Basic Scenario relying on smartcards as eID carrier and Qualified Signature Creation Device (QSCD):

- LARMS: extract openly available identity attributes from carrier and encode in an eID SAML/ JWT
- LAM: authenticate to eID carrier for protected attribute release and sign assertion/token
- LAM+: inject patient-signed epSOS TRC-A into workflow after online signature validation

Extended Scenario in unison with the established eIDAS eID services and the notified eID Schemes:

- DCA: fully compliant eIDAS eID Connector with eHealth extensions and eIDAS eID Node
- mobile eID: provide AuthN and Signature plan to mobile eID

List of Artefacts Produced

http://wiki.ds.unipi.gr/display/SENSPILOTS/5.2.1+-Artefacts+and+Assets++eHealth+eID

Open Issues – Future Work

- eHealth cross-border eID lacks interoperability and usability
  - both, eIDAS eID and the cross-border health application, require an explicit consent for data disclosure
  - integration of mobile patient access devices to avoid interaction with health IT at the point of care

Conformance testing / Piloting

- EXPANDathon (Lisbon, 2015)
- IHE-Europe Connectathon 2016 (Bochum)
- 3rd e-SENS Simulated Encounters (Brussels, 2017)
Wrap up

• Work described enhanced the epSOS ICT infrastructure with Non-repudiation, Capability Lookup, Location Lookup, and eID cross-sectorial Building Blocks (BBs)

• Provided BBs to the OpenNCP reference implementation framework for a National Contact Point for eHealth (NCPeH) used in the CEF Telecom call for the eHealth DSI.

• MS support for Domain use case is high
  • CEF funding has been approved for the deployment of Generic Cross Border Services in Malta, France, Portugal, Finland, Cyprus, Italy, Luxembourg, Greece, Ireland, Estonia, Croatia, Sweden, Germany, Czech Republic, Austria and Hungary.
  • 1st wave planned to go live in Q1/2018
Challenges ...

• supporting dynamic discovery without human intervention
• replacing epSOS configuration server
• eID attribute matching
• setting up future Digital Services Infrastructures under CEF
• incorporating BBs into end-user applications
• expanding to other cross-border services requiring more complex solutions like e.g. patient access service, medication reimbursement, etc
Ευχαριστώ! Thank You!

For more info:
- https://www.esens.eu/
- http://wiki.ds.unipi.gr/display/ESENSPILOTS/D5.6-2+-eHealth
- https://ec.europa.eu/cefdigital/wiki/display/EHOPERATIONS/eHealth+DSI+Operations+Home

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