Interoperability Specifications and Conformance Testing Services Made Available on the Tukan Platform

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Challenges of Polish health IT community

- National eHealth agenda
  - pilot of central ePrescription and eDispensation system,
  - development of central eReferral system,
  - official recommendation of IHE profiles use
    - cross-enterprise document exchange based on IHE XDS.b profile,
  - continuous development of the Polish National Implementation Guide for HL7 CDA.
  - planned releases of other national localizations of HL7 standards and IHE profiles
    - draft specification of IHE XDS.b metadata
    - draft HL7 v3 templates for IHE PIXV3 and IHE PDQV3
    - draft HL7 FHIR Profiles for eScheduling

- Regional projects concerning cross-enterprise document exchange.
- Existing mature implementations of HL7 CDA standard.
- Growing interest in HL7 FHIR® standard.
Objectives

• Establish a community around HL7 interoperability standards and IHE integration profiles with health IT vendors, medical providers and public authorities for the purpose of boosting standards adoption and implementation.

• Provide tooling for specification publication and implementation validation
  – open and easily accessible for HL7 Poland members,
  – available for the rest of interested parties in some extent.

• Collaborative effort to build a trusted environment for regional, nation-wide and international interoperability testing.

• Use of globally approved tooling, configured to local requirements.

• Support especially those vendors, who are not able to participate in official events like connectathons organized by IHE or HL7.
Online platform dedicated to Polish healthcare IT community, where national specifications for interoperability are published together with a set of testing tools supporting their implementation.

Realized by members of HL7 Poland, with no direct external funding.

Covers selection of HL7 standards and IHE profiles, that are most interesting from Polish perspective.

The platform is ready to be used as an environment supporting peer-to-peer testing in connectathon-like events.
• The Tukan platform is based on software components originating from various sources:
  – open source release of IHE Gazelle components,
  – development tooling of Polish National Implementation Guide of HL7 CDA,
  – ART-DECOR platform software components,
  – HAPI FHIR reference implementation for FHIR STU3 standard,
  – Central Authentication Server (CAS) software components.
• All Tukan platform services are deployed as isolated, Docker-based containers in the Linux environment.
• The platform itself is the main repository of the container images.
• Any service can be easily replicated to many computing nodes if needed, and effortlessly deployed to other infrastructure, including various cloud service providers.
• **PL CDA validation tool**
  – tooling created during development process of Polish National Implementation Guide of HL7 CDA,
  – based on validation artifacts generated from ART-DECOR environment,
  – deployed on the same eXist XML database engine as DECOR services,
  – support for different versions of the Polish specification.

• **IHE XDS.b conformant endpoints simulator**
  – created using NIST XdsTools 4 tooling (also used in IHE Connecathons),
  – TLS and non-TLS endpoints published for all major IHE XDS.b transactions.

• **FHIR server**
  – STU3-conformant reference server instance built using HAPI FHIR implementation,
  – R4-conformant instance developed during FHIR Connecathon in Cologne,
  – **Terminology Services**
    • terminology resources for base v2 code tables, v3 vocabulary domains and FHIR value sets imported,
    • several coding systems and value sets from Polish National Implementation Guide of HL7 CDA represented as FHIR resources,
    • LOINC and SNOMED-CT will be published soon (work in progress).
Several Tukan services are based on IHE Gazelle platform (tooling used extensively during connectathon events organized by IHE Europe).

**IHE Gazelle Security Suite**
- component that enables secure communication as described in IHE ATNA profile,
- public key infrastructure (PKI) management,
- SSL certificates generation,
- TLS endpoint simulator,
- audit record messages (DICOM 15.3 conformant) validator.

**IHE Gazelle Proxy**
- peer-to-peer testing support tooling,
- exchanged messages recording and validation invocation.

**IHE Gazelle Test Management**

**IHE Gazelle External Validation Services Frontend (EVSClient)**
• ART-DECOR environment
  – continuously updated version of ART frontend application and DECOR backend services,
  – placeholder for current release version and minor draft versions of Polish National Implementation Guide of HL7 CDA (as well as on global ART-DECOR instance),
  – sandboxes for vendors created on demand.

• FHIR server
  – base resource structure definitions imported,
  – placeholder for Polish realm specific FHIR profiles developed on national, regional and local levels.
• The project started in June 2017 and the first Tukan services have been made available online in September 2017.

• Pilot phase (6 weeks):
  – 28 organizations
    • mostly software vendors, but also some medical providers, universities and local authorities,
  – HL7 CDA validator attracted most teams,
  – several hundreds of test CDA documents were validated.

• Now 45 organizations use Tukan platform
• National government eHealth agency (CSIOZ) recommends Tukan platform as an independent validation tool for conformance verification
• Two regional projects in Poland have declared to use Tukan.
First Polish connectathon

- HL7 Poland is organizing the first Polish connectathon-like event, that will take place in Warsaw, November 2018.
- The Tukan platform as the trusted testing environment.
- Cooperation with national and regional projects
  - event will be coupled with Polish central ePrescription, eDispensation and eReferral pilot system services projectathon.
- Focus on peer-to-peer testing of conformance to Polish localizations of HL7 standards and IHE profiles.
- Focus on demonstration and trial, not on assessments.
- Our competence:
  - two major Polish vendors (and HL7 Poland members) have participated in IHE Connectathon 2018,
  - two members of our team worked as monitors at that Connectathon
  - Tukan FHIR server took part in FHIR Connectathon in Cologne.
Conclusion

• The pilot phase of Tukan platform has shown that there is a significant interest in testing services
  – especially when there are official specifications of interoperability standards published.
• Providing trusted testing environment is the best way to improve the quality of implementations and to increase maturity of the specifications.
• We have established Polish community interested in interoperability standards and integration profiles.

• The Tukan platform will expand to provide increasing number of validation services, with collaborative effort of HL7 Poland members.