Radiology Image Sharing

Seminar with private hospitals / radiology facilities

Health Level Seven

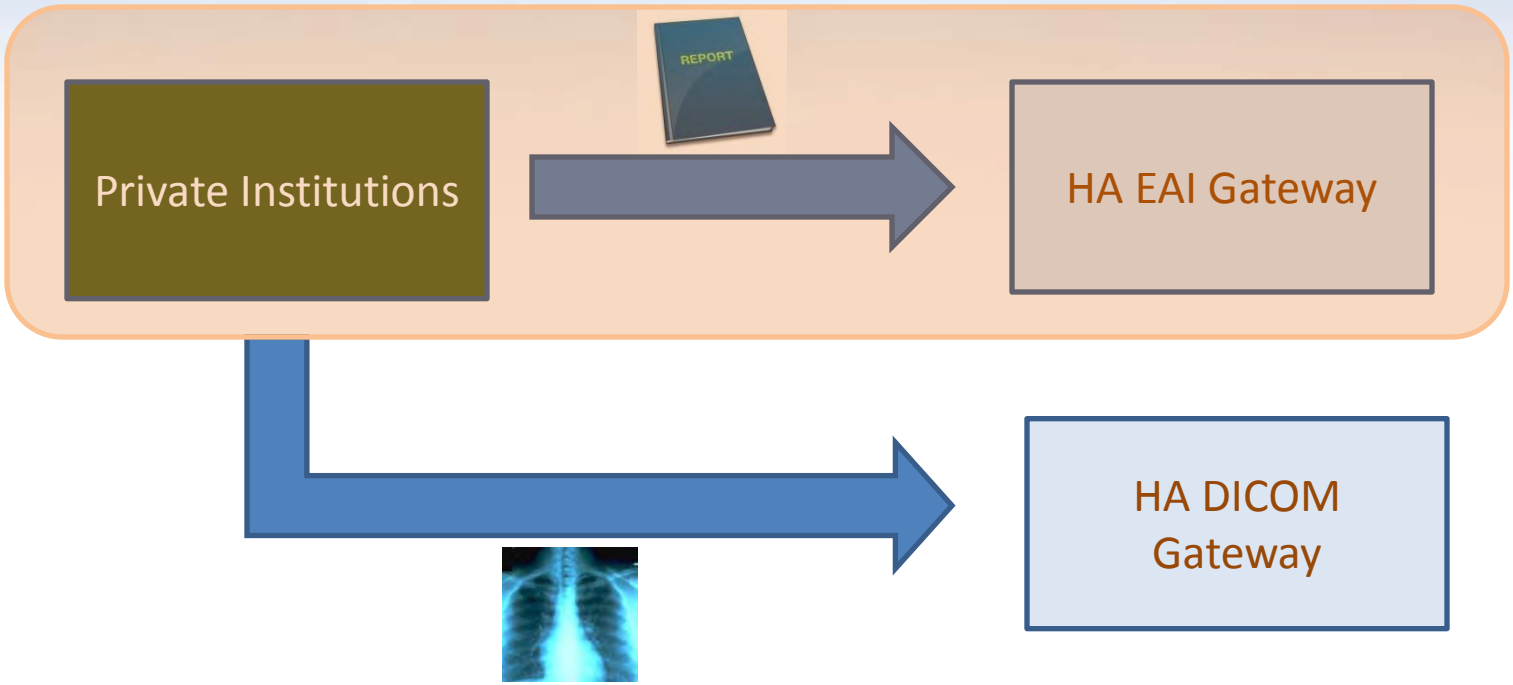
1st September, 2010

Agenda

- Health Level Seven (HL7)
- Web Services Communication Protocol
- Integration Workflow

High Level Workflow Diagram

- High Level Diagram



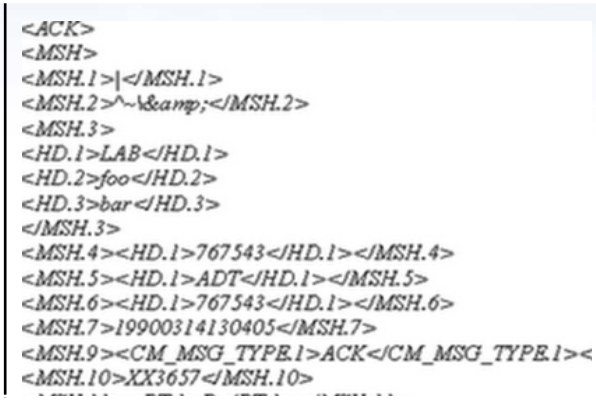
Health Level Seven (HL7) - Basic

- Founded in 1987

- Message standard for Healthcare for improving
  - Optimize clinical workflow
  - Reduce ambiguity
  - Enhance knowledge transfer

Health Level Seven (HL7) – Basic (Con't)

- Version: v2.1~v2.6, v3.0 and ……
- Format: Native (v2.1~v2.6) and XML (>v2.3.1)

Native	XML
	

- This project is using HL7 v2.5 XML Format

General Message Structure

- Each message has a **message type** that defines its purpose
  - For example, the ADT Message type is used to transmit portions of a patient's Patient Administration (ADT) data from one system to another
  - This project is using ORU message for transmission of radiology result from private institution to HA
- All HL7 messages are made up of segments, composites and primitive data types

Segments

- Each Segment has its own semantic purpose or function
- There are over 120 types of Segments that can be used
- Each Segment provides a specific type of data to be sent

Types of Segments

- **MSH - Message Header.** This contains information about the Sender and Receiver of the message, the type of message, time stamps, etc.

- **PID – Patient Identification.** This contains patient identifying and demographic information such as name, hkid, date of birth, sex, etc

Types of Segments

- **OBR – Observation Report.** This contains information about the observation order request

- **OBX – Observation/Result.** This contains information of single, indivisible unit of observation or report. And it is repeatable

- There are some other segments such as PV1, NK1, and etc which serve for other purposes and some can be repeated

Composites

- Composites are the specific fields of a segment
- The fields can be either a primitive data type such as a string number, alpha or alphanumeric or it can be made up of other composites (components)

Essential Fields for Radiology Image Sharing

- In Patient Identity Segment (PID):
  - **HKID** (PID.3), **Name** (PID.5), **DOB** (PID.7) and **Sex** (PID.8) for patient verification
- In Observation Request Segment (OBR):
  - **Accession Number** (OBR.3) for Image and Report linking
- In Observation/Result Segment (OBX):
  - **Embedded Based64 PDF** (OBX.5) – Actual Report

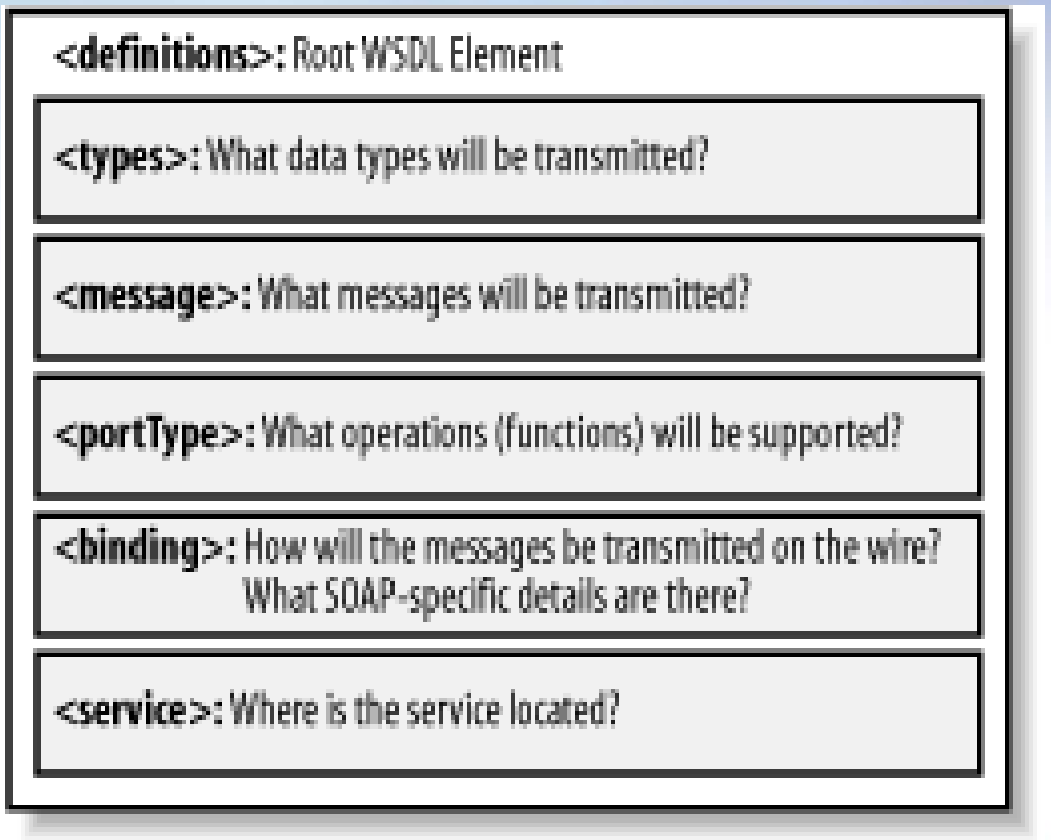
Web Services Communication Protocol

- What are Web Services?
  - Web services are application components
  - Web services are self-contained and self-describing
  - Web services communicate using open protocols
  - XML is the basis for Web services

Web Services Description Language (WSDL)

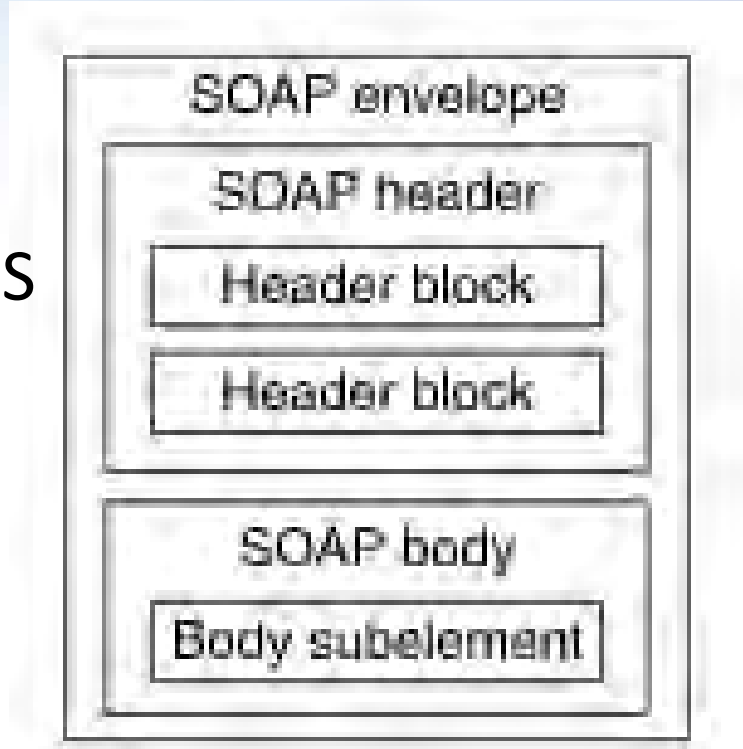
- Web Services is self-described by WSDL
  - XML-based
  - Describe and

  Locate web services

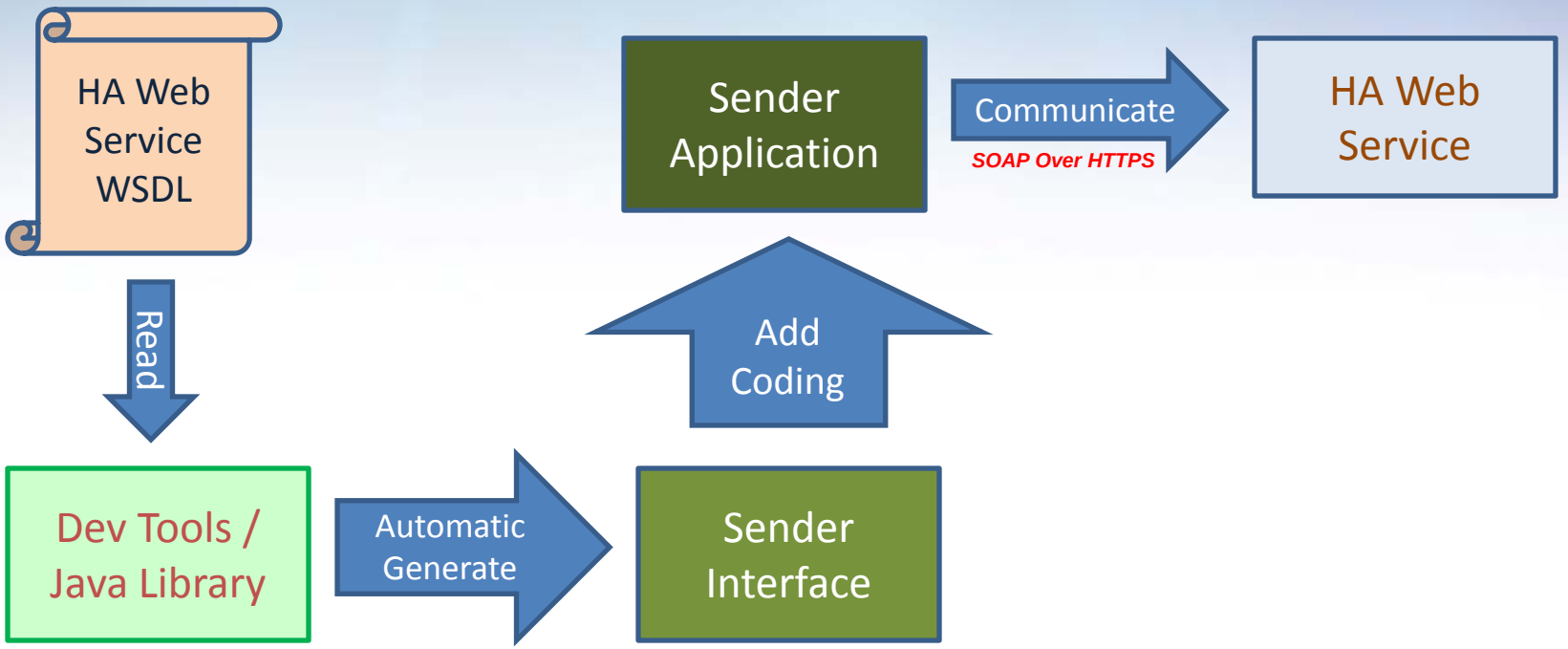


Simple Object Access Protocol (SOAP)

- Web Services is using SOAP as communication protocol
  - Open standard
  - XML-based
  - Transport over HTTP/HTTPS

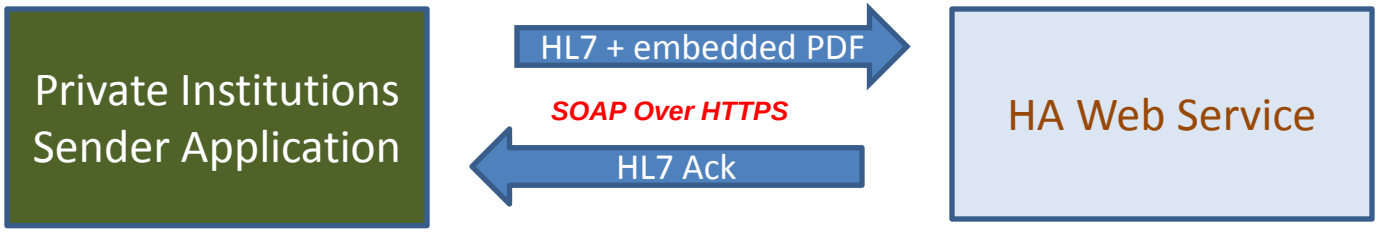


How it works


HA Web Service WSDL
Read
Dev Tools / Java Library
Automatic Generate
Sender Interface
Add Coding
Sender Application
Communicate
SOAP Over HTTPS
HA Web Service

RIS Integration Workflow

- Private Institution invoke HA WS by providing HL7 message with embedded based-64 PDF report in string format
- HA will response HL7 ACK message in string format



References

- www.w3.org
- www.hl7.org
- http://healthcareinformatics3000feet.blogspot.com/2007/02/20-minute-hl7v2x-primer.html
- www.w3schools.com

Thanks