IHE on FHIR
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Tutorial Objectives

• You should:
  • Understand the role of IHE in interoperability
  • Understand the use of FHIR in IHE profiles

• These slides presented at
  • HL7® Workgroup Meeting May 2018 [https://www.hl7.org](https://www.hl7.org)
  • HL7® FHIR® DEV DAYS June 2018 [https://www.fhirdevdays.com/](https://www.fhirdevdays.com/)
Common Vision

A world in which everyone can securely access and use the right health data when and where they need it.

Enable seamless and secure access to health information that is usable whenever and wherever needed.
Common Mission

To provide standards that empower global health data interoperability.

IHE improves healthcare by providing specifications, tools and services for interoperability. IHE engages clinicians, health authorities, industry, and users to develop, test, and implement standards-based solutions to vital health information needs.
• Domains and Technical/Planning Committees
• Conformity Assessment processes and tools
• 3 Annual Connectathons (USA, Europe, Asia)
• Coordinates use of standards such as HL7 and DICOM for specific needs
• IHE national deployment committees in 17 countries

Both conduct “testing, education, outreach, collaboration with local health agencies”

• Work groups and Steering Committees
• Conformance statements for HL7 Standards
• 3 Annual FHIR Connectathons (preceding HL7 Working Group Meetings)
• Develops standards that are often used in IHE profiles (with DICOM, X.12 . . .)
• HL7 Affiliates in 55 countries
IHE Profile Development:  
A Proven 1-year Quality Management Cycle

IHE Profiles Drafted & Published
- Profile Selection by Committees
- IHE Call for Proposals months 1-3
- IHE Technical Framework Development
- Published For Public Comment
- Trial Implementation Posted
- months 4-14

IHE International Development

Testing and Certification
- IHE Connectathon
- Results published in Product Registry
- months 15-18
- Demonstrate at a HIMSS Interoperability Showcase
- IHE USA Deployment
- Install interoperable solutions worldwide

IHE provides a trusted, open process: proven since 1998!
**HL7 ANSI-Accredited Standards Process**

- HL7 work groups meet via conference call and at annual Working Group Meetings (WGMs)
- All meetings are open, run under Robert’s rules, with minutes available
- STUs and Connectathons allow for ongoing testing by implementers
- ANSI rules govern openness, transparency, balance of interests, due process, appeals.
Profiles vs Implementation Guide

- IHE creates and maintains implementation guidelines called IHE Profiles, which are published in a set of documents called the IHE Technical Frameworks. IHE Profiles provide a common language for purchasers and vendors to discuss the integration needs of healthcare sites and the integration capabilities of healthcare IT products.

- HL7 FHIR Profiles define a group of StructureDefinitions (Constraints or Extensions), Value Sets, and examples associated with a FHIR resource for a specific problem or use case.

- A FHIR Implementation Guide is a set of rules about how FHIR resources are to be used to solve a specific problem.

- HL7 EHR Functional Profiles define functional requirements for use cases such as Behavioral Health, Child Health, Long term care . . .
What is a Connectathon?

- Cross-vendor, live, supervised, structured testing event
- All participating vendors’ products tested together in the same place/time
- Experts from each vendor available for immediate problem resolution... fixes are done in minutes, not months!!
- Each vendor tests with multiple trading partners (actual product to actual product)
- Testing of real-world clinical scenarios
Connectathon – IHE vs FHIR

• HL7 FHIR Connectathons help implementers assess, test and explore new opportunities for applying the FHIR specification.
  • Testing as part of a connectathon is a pre-requisite for progressing resources and implementation guides up the FHIR Maturity Model

• IHE Connectathons provide a detailed implementation and testing process to enable standards-based interoperability.
  • Here systems exchange information in a structured and supervised peer-to-peer testing environment, performing transactions required for the roles that perform in carefully defined interoperability use cases (profiles).
IHE Profiles on FHIR®

IHE PROCESS
IHE: Framework for Interoperability

• A common framework for harmonizing and implementing multiple standards
  • “Meta-standards” – standards for standards
  • Profiling existing standards to address specific use cases in healthcare

• Promotes unbiased selection and coordinated use of established healthcare and IT standards to address specific clinical needs

• Amongst other initiatives, IHE develops profiles that enable seamless health information movement within and between enterprises, regions, nations

• Profiles in IHE are equivalent to a FHIR Implementation Guide
  • E.g., they take a specific use-case, define Actors, define Transactions, and define Options

Source: https://www.ihe.net/FAQ/
IHE Terminology

• Integration Profiles
  • Describe workflow use cases, standards and the overall relationships to achieve transparent interoperability

• Integration Statements
  • Tell customers the IHE Profiles supported by a specific release of a specific product

• Technical Frameworks
  • The documents for each “domain” that specify the Integration Profiles and the associated systems (actors) and transactions

• Connectathons
  • Neutral testing events with multiple vendors in one room, consisting of developers and testers (no marketing or sales / no customers), promoting rapid and robust interoperability testing

Source: https://www.ihe.net/FAQ/
IHE Process

Source: https://www.ihe.net/uploadedImages/Content/About_IHE/IHE_process_flowchart.jpg
IHE Process

- Identify Interoperability issues
- Develop Integration Profiles
  - Actors and Transactions
  - Workflow
  - Gather relevant standards
- Connectathon Testing
- Publish Integration Statements
  - Vendors list tested profiles

Profile Proposal
Public Comment
Trial Implementation
Final Text
Radiology Technical Framework

Comments and implementer feedback on all documents can be submitted at Radiology Public Comments.

Final Text (Approved) Change Proposals

In addition to the Technical Framework Volumes and Trial Implementation Supplements listed below, implementers should also review Final Text CPs in preparation for IHEConnectathon. A repository of Radiology’s Final Text Change Proposals and an “index” spreadsheet are located here.

Current Technical Framework - Revision 16.0

August 4, 2017

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Final Text Version

- Volume 1 (RAD TF-1) Integration Profiles
- Volume 2 (RAD TF-2) Transactions
- Volume 3 (RAD TF-3) Transactions (continued)
- Volume 4 (RAD TF-4) National Extensions

These Technical Framework Volumes provide specification of the following profiles:

- Radiology Scheduled Workflow (SWF)
- Patient Information Reconciliation (PIR)
- Consistent Presentation of Images (CPI)
- Presentation of Grouped Procedures (PGP)
- Access to Radiology Information (ARI)
- Key Image Note (KIN)
- Simple Image and Numeric Report (SINR)
- Charge Posting (CHG)
- Post-processing Workflow (PWF)
- Reporting Workflow (RFW)
- Evidence Documents (ED)
- Portable Data for Imaging (PDI)
- Nuclear Medicine Image
- Cross-enterprise Document Sharing for Imaging (XDS-I) - Deprecated 2012-07-24 and replaced with XDS-I b
- Mammography Image
- Import Reconciliation Workflow (IRWF)
- Teaching File and Clinical Trial Export (TCE)
- Radiation Exposure Monitoring (REM) - Added 2012-07-24
- Cross-Enterprise Document Sharing for Imaging (XDS-I b) - Added 2012-07-24
- Cross-Community Access for Imaging (XCA-I) - Added 2013-09-16
- Imaging Object Change Management (OICM) - Added 2014-07-30
- Digital Breast Tomosynthesis (DBT) - Added 2016-09-09 Rev. 15

Source: https://www.ihe.net/Technical_Frameworks/
Organization of the Technical Framework

Source: https://www.ihe.net/FAQ/#What_is_the_IHE_Technical_Framework?
Connectathons

- Neutral testing events with multiple vendors in one room, consisting of developers and testers (no marketing or sales / no customers), promoting rapid and robust interoperability testing
  - Benefit is that means that if your code fails on day 1 of Connectathon, you can hack it that night, and come back with something that only exists on the developers laptop, and try again on day 2

- Whereas IHE Connectathons are organized testing with predefined test cases against published formal specifications, FHIR Connectathons have been traditionally more ad-hoc "hackathon“ organized around specific tracks

Source: https://www.ihe.net/connectathon.aspx
Publishing Integration Statements

• End users use IHE integration statements as a way to know that a system is compliant, e.g., when evaluating an RFP response

• Vendors publish integration statements that are usually available from their websites
  • IHE also voluntarily maintains a product registry

Source: https://www.ihe.net/FAQ/
IHE Domains

• Cardiology
• Dental
• Eye Care
• IT Infrastructure (ITI)
• Pathology and Laboratory Medicine
• Patient Care Coordination
• Patient Care Devices
• Pharmacy
• Quality, Research and Public Health
• Radiation Oncology
• Radiology

• Mammography
• Nuclear Medicine

* Marked in red are domains using FHIR

Source: https://www.ihe.net/IHE_Domains/
• Most profiles from IHE that leverage FHIR have the word “Mobile” in their title.
• Indicates FHIR was used
• Does NOT restrict the use to non-Mobile use
Who is IHE? Organization Sponsors ...

- American Academy of Ophthalmologists (AAO)
- American College of Cardiology (ACC)
- American College of Clinical Engineering (ACCE)
- American College of Physicians (ACP)
- American Heart Association (AHA)
- American Society for Therapeutic Radiology and Oncology (ASTRO)
- Healthcare Information and Management Systems Society (HIMSS)
- Radiological Society of North America (RSNA)
- Society for Imaging Informatics in Medicine
- European Association of Radiology (EAR)
- European Congress of Radiologists (ECR)
- Coordination Committee of the Radiological and Electromedical Industries (COCIR)
- Deutsche Röntgengesellschaft (DRG)
- EuroPACS Association
- Groupement pour la Modernisation du Système d'Information Hospitalier (GMSIH)
- Société Francaise de Radiologie (SFR)
- Società Italiana di Radiologia Medica (SIRM)
- British Institute of Radiology (BIR)
- College of Radiographers
- Institute of Physics and Engineering in Medicine
- NHS Information Authority
- Royal College of Radiologists (RCR)
- Ministry of Economy, Trade, and Industry (METI)
- Ministry of Health, Labor, and Welfare
- MEDIS-DC
- Japan Industries Association of Radiological Systems (JIRA)
- Japan Association of Healthcare Information Systems Industry (JAHIS)
- Japan Radiological Society (JRS)
- Japan Society of Radiological Technology (JSRT)
- Japan Association of Medical Informatics (JAMI)
- ... and more

In addition to these sponsoring organizations, IHE also has more than 135 member organizations.

Source: https://www.ihe.net/Member_Organizations/
IHE Profiles on FHIR®

ITI PROFILES
• Mobile Access to Health Documents (MHD)
• Audit Trail and Node Authentication (ATNA) - Query
• Mobile Alert Communication Management (mACM)
• mobile Care Services Discovery (mCSD)
• Mobile Cross-Enterprise Document Data Element Extraction (mXDE)
• Non-patient File Sharing (NPFS)
• Patient Identifier Cross-reference for Mobile (PIXm)
• Patient Demographic Query for Mobile (PDQm)
• Internet User Authentication (IUA) – Special Mention
Mobile Access to Health Documents (MHD)

- Defines FHIR interface to an XDS environment, and defines:
  - submit a set of documents and metadata from the mobile device to a document receiver,
  - find the document submission set metadata based on query parameters;
  - find document entries containing metadata based on query parameters, and
  - retrieve a copy of a specific document

Source: [https://wiki.ihe.net/index.php/Mobile_access_to_Health_Documents_(MHD)](https://wiki.ihe.net/index.php/Mobile_access_to_Health_Documents_(MHD))
Audit Trail and Node Authentication (ATNA)

- Establishes security measures which provide patient information confidentiality, data integrity and user accountability
- FHIR was added for RESTful query of audit records

Source: https://wiki.ihe.net/index.php/Audit_Trail_and_Node_Authentication

FHIR® Resources:

- AuditEvent
- Bundle
Mobile Alert Communication Management (mACM)

- Provides ability to send short, unstructured text alerts to human recipients
- Records the outcomes of any human interactions upon receipt of the alert
- Allows for feedback mechanism to determine the status of an alert through the use of alert statuses

Source: [https://wiki.ihe.net/index.php/Mobile_ALERT_Communication_Management(mACM)](https://wiki.ihe.net/index.php/Mobile_ALERT_Communication_Management(mACM))
Mobile Care Services Discovery (mCSD)

• Supports discovery of a number of care service resources
  • Organizations such as Healthcare Information Exchanges (HIEs), Integrated Delivery Networks (IDNs), or family practices
  • Location are physical care delivery sites such as hospitals, clinics, health outposts, physician offices, labs, pharmacies
  • Practitioners are healthcare workers like physicians, nurses, or pharmacists
  • Healthcare Services can include surgical services, antenatal care services or primary care services

Source: https://wiki.ihe.net/index.php/Mobile_Care_Services_Discovery_(mCSD)
Mobile Cross-Enterprise Document Data Element Extraction (mXDE)

• Provides means to access data elements extracted from shared structured documents
• Enables the deployment of health data exchange infrastructures where fine-grained access to health data coexists and complements the sharing of coarse-grained documents and the fine-grained data elements they contain

Source: https://wiki.ihe.net/index.php/Mobile_Cross-Enterprise_Document_Data_Element_Extraction
Non-patient File Sharing (NPFSm)

- Defines how to enable the sharing of non-patient files
- Files can be created, consumed and updated by many different systems involved in a wide variety of data sharing workflows

Source: [https://wiki.ihe.net/index.php/Non-patient_File_Sharing_(NPFSm)](https://wiki.ihe.net/index.php/Non-patient_File_Sharing_(NPFSm))
• Defines interface to patient demographics supplier, to be used in many use cases:
  • A health portal securely exposing demographics data to browser based plugins
  • Medical devices which need to access patient demographic information
  • Mobile devices used by physicians (example bedside eCharts) which need to establish patient context by scanning a bracelet

Source: [https://wiki.ihe.net/index.php/Patient_Demographics_Query_for_Mobile_(PDQm)](https://wiki.ihe.net/index.php/Patient_Demographics_Query_for_Mobile_(PDQm))
Patient Identifier Cross-Reference for Mobile (PIXm)

- Provides ability to query for list of patient identifiers based on the patient identifier in a different domain and retrieve a patient’s cross-domain identifiers information.
- Deals only with patient IDs - covers cases where you don't want to disclose/exchange more of the patient resource.

Source: [https://wiki.ihe.net/index.php/Patient_Identifier_Cross-Reference_for_Mobile_(PIXm)](https://wiki.ihe.net/index.php/Patient_Identifier_Cross-Reference_for_Mobile_(PIXm))
Internet User Authentication (IUA) – Special Mention

• Actors should not communicate any patient information unless proper authentication, authorization, and communications security have been performed
• Profile of the OAuth protocol
• IUA enables external Authorization providers, which can leverage pluggable authentication providers
• Network communication security and user authentication are layered in at the HTTP transport layer and do not modify the interoperability characteristics

Source: https://wiki.ihe.net/index.php/Internet_User_Authorization
Radiology Profiles on FHIR

• Standardized Operational Log of Events (SOLE)

• Special mention as these use compatible DICOM web
  • Web Image Capture (WIC)
  • Web Image Access (WIA) formerly called MHD-I
  • Invoke Image Display (IID) - Special mention
Standardized Operational Log of Events (SOLE)

- Supports business intelligence tools
- Information often resides in several different systems, and there are not standard ways to obtain the information
- SOLE defines a way to exchange information about events that can then be collected and displayed using standard methods

Source: https://wiki.ihe.net/index.php/Standardized_Operational_Log_of_Events_(SOLE)
IHE Profiles on FHIR®

PATIENT CARE COORDINATION PROFILES
Patient Care Coordination Profiles on FHIR

• Clinical Mapping (CMAP)
• Dynamic Care Planning (DCP)
• Dynamic Care Team Management (DCTM)
• Point of Care Medical Device Tracking (PMDT)
• Query for Existing Data for Mobile (mQED)
• Reconciliation of Clinical Content and Care Providers (RECON)
• Remote Patient Monitoring (RPM)
• Routine Interfacility Patient Transport (RIPT)
• Emergency Transport to Facility (ETF)
Clinical Mapping (CMAP)

• Supports the need of systems to translate codes from one terminology to another to support exchange of information between different systems

• Often needed at workflow boundaries where concepts used in one workflow have different names than those in another workflow

Source: https://wiki.ihe.net/index.php/Clinical_Mapping

ConceptMap, Parameters
• Care Plans can be dynamically created from tools used to support evidence-based practice

• Care Plans can be dynamically updated as the patient interacts with the healthcare system

• Provides structures and transactions for care planning

• Promotes sharing Care Plans that meet the needs of many, such as providers, patients and payers

**Dynamic Care Planning (DCP) - Update**

**Care Plan Contributor**

- Search for Plan Def [PCC-Y3]
- Retrieve Plan Def [PCC-Y2]
- Update Plan Def [PCC-Y1]
- Subscribe to Plan Def Updates [PCC-Y4]

**Care Plan Guidance Service**

- Provide Plan Def [PCC-Y5]
- Provide Activity Def [PCC-Y6]

**Care Plan Service**

- Apply Care Plan Operation [PCC – Y7]
- Update Care Plan [PCC-37]
- Search for Care Plan [PCC-41]
- Retrieve Care Plan [PCC-38]
- Subscribe to Care Plan Updates [PCC-39]

**FHIR® Resources:**

- CarePlan, Subscription, PlanDefinition, ActivityDefinition
Dynamic Care Team Management (DCTM)

- Provide a mechanism to facilitate system interactions to support care team membership such as:
  - Discovering Care Teams
  - Creating/updating Care Teams
  - Listing Care Teams

Source: https://wiki.ihe.net/index.php/Dynamic_Care_Team_Management
Point-of-Care Medical Device Tracking (PMDT)

- Closes the loop on data acquisition at the point-of-care in support of reporting data about implantable medical devices (e.g., pacemaker, titanium plates) and medical devices (e.g., vital sign monitors, pulse oximeters, blood glucose monitors) during a procedure.
- Enables information it to be retrieved and reused at a later time.

Source: https://wiki.ihe.net/index.php/Point-of-Care_Medical_Device_Tracking
Query for Existing Data for Mobile (mQED)

- Supports queries for clinical data elements (e.g., observations, allergies, etc.) by making the information widely available to other systems within and across enterprises.
- Aimed at class of systems that are resource- and platform-constrained (e.g., tablets, smartphones, and embedded devices including home-health devices).

Source: [https://wiki.ihe.net/index.php/Query_for_Existing_Data_for_Mobile](https://wiki.ihe.net/index.php/Query_for_Existing_Data_for_Mobile)
Reconciliation of Clinical Content and Care Providers (RECON)

• Provides the structures and transactions needed to communicate the list of reconciled items, when they were reconciled and who did the reconciliation
  • Ability to maintain the support of care provision is essential as data is exchanged
• Used to facilitate identification of duplicated, overlapping, conflicting or superseded items that may be introduced as a result of semantic interoperability.

Source: https://wiki.ihe.net/index.php/Reconciliation_of_Clinical_Content_and_Care_Providers

FHIR® Resources:
Provenance, List
Remote Patient Monitoring (RPM)

- Provides means of reporting measurements taken by Personal Healthcare devices in a remote location
  - E.g. outside of the healthcare provider facilities and is typically the patient’s home, and reporting those measurements to the health care provider


**FHIR® Resources:**

Uses FHIR profiles
Routine Interfacility Patient Transport (RIPT)

- Provides means of updating a Transport team with critical and necessary medical information on a patient to be transported
  - FHIR RESTful query
  - Document Sharing with
    - CDA template for RIPT

FHIR® Resources:
Patient, RelatedPerson, Coverage, Practitioner, Claim, AllergyIntolerance, Procedure, Immunization, MedicationStatement, ClinicalImpression, DiagnosticOrder, DiagnosticReport, ImagingStudy, Observation, Condition, Location

Emergency Transport to Facility (ETF)

• Provides means for Emergency Transport to inform destination Hospital with critical and necessary medical information on a patient to be transported
  • FHIR RESTful query
  • Document Sharing with
    • CDA template for RIPT

FHIR® Resources:
- Patient
- RelatedPerson
- Coverage
- Practitioner
- Claim
- AllergyIntolerance
- Procedure
- Immunization
- MedicationStatement
- ClinicalImpression
- DiagnosticOrder
- DiagnosticReport
- ImagingStudy
- Observation
- Condition
- Location

Source TBA
IHE Profiles on FHIR®

PHARMACY PROFILES
Pharmacy Profiles on FHIR

• Mobile Medication Administration (MMA)
• Uniform Barcode Processing (UBP)
Mobile Medication Administration (MMA)

- Populates the mobile device with a list of scheduled medications from the EHR
- Sends the report of administrations to the EHR or any other system
- Example Use Case
  - Patient app that receives scheduled administrations from the pharmacy system or hospital system, and reminds the patient

Source: https://wiki.ihe.net/index.php/Mobile_Medication_Administration

FHIR® Resources:
Patient, Medication, MedicationRequest, MedicationAdministration
Uniform Barcode Processing (UBP)

- Use of barcodes and other automatic identification and data capture (AIDC) in healthcare is increasing
- Barcodes contain data that is encoded in a certain way. In order to be able to use that data, software systems need to “understand” the barcode
- Defines a FHIR Operation
  - $decode-barcode(string, ...)

QUALITY, RESEARCH AND PUBLIC HEALTH PROFILES
QRPH Profiles on FHIR

• Mobile Retrieve Form for Data Capture (mRFD)
• Vital Records Death Reporting (VRDR)
• Birth and Fetal Death Reporting – Enhanced (BFDE)
• Quality Outcome Reporting for EMS (QORE)
Mobile Retrieve Form for Data Capture (mRFD)

- Provides a method for gathering data within a user’s current application to meet the requirements of an external system.
- Supports retrieval of forms from a form source, display and completion of a form, and return of instance data from the display application to the source application.

Source: https://wiki.ihe.net/index.php/Mobile_Retrieve_Form_for_Data_Capture

FHIR® Resources:
Bundle, ANY resource
* Also uses SMART on FHIR
Vital Records Death Reporting (VRDR)

- Supports pre-population of data from electronic health record systems to electronic vital records systems for death reporting
- Establishes interoperable electronic exchange of VR data between EHR and VR Systems
- Higher quality data for demographic and epidemiologic surveillance and research

Birth and Fetal Death Reporting – Enhanced (BFDE)

- Supports pre-population of data from electronic health record systems to electronic vital records systems for birth and fetal death reporting
- Establishes interoperable electronic exchange of VR data between EHR and VR Systems
- Higher quality data for demographic and epidemiologic surveillance and research

Source: TBA
Quality Outcome Reporting for EMS (QORE)

- Supports transmission of clinical data for use in calculating Emergency Medical Services Quality measures
- Establishes interoperable exchange between EMS and EHR systems

Source: TBA
IHE and DICOMweb on FHIR

• 25 Profiles and growing
  • IT Infrastructure (ITI) - 8
  • Patient Care Coordination - 10
  • Pharmacy - 2
  • Quality, Research and Public Health - 4
  • Radiology - 1
References

• https://wiki.ihe.net/index.php/Category:FHIR
• http://www.ihe.net/uploadedFiles/Documents/ITI/IHE_ITI_Suppl_Appx-Z.pdf
• ftp://ftp.ihe.net/TF_Implementation_Material/fhir/

• Blog – John Moehrke’s Healthcare Exchange Standards
  • https://healthcaresecprivacy.blogspot.com
Get Involved

• Join IHE by visiting: https://www.ihe.net/

Mission: IHE improves healthcare interoperability by providing integration profiles, tools and services. IHE engages clinicians, health authorities, industry, and users to develop, test, and implement standards-based solutions to address vital health information needs.

Be part of selecting the profiles to be implemented, developing the IHE Technical Framework, and become an IHE Connectathon champion!
Questions?

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  • Twitter icon https://cdn.pixabay.com/photo/2014/04/03/11/53/twitter-312464_960_720.png
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  • Computer construction https://cdn.pixabay.com/photo/2013/07/13/13/46/computer-161501_960_720.png
  • Radiology sample image https://upload.wikimedia.org/wikipedia/commons/thumb/1/1b/Radiology_ND_0125_ACJ.jpg
  • Coordination image https://upload.wikimedia.org/wikipedia/commons/5/5a/Beta-sodium-metavanadate-xtal-1984-V-coordination-CM-3D-balls.png
  • Drugs https://pixnio.com/free-images/2017/06/08/2017-06-08-13-26-19-900x600.jpg
  • Community health https://upload.wikimedia.org/wikipedia/commons/thumb/5/52/Noun_project_620.svg/1000px-Noun_project_620.svg.png
• The following pages and attached images were referenced:
  • IHE Logo https://www.ihe.net/images/logo.png
  • Connectathon https://www.ihe.net/uploadedImages/Content/Participate/2.1-ihe_na_connectathon08.jpg?n=6722
  • Sample integration statement http://slideplayer.com/694835/2/images/15/Example+IHE+Integration+Statement+IHE+Integration+Statement.jpg
  • FHIR Logo https://www.hl7.org/fhir/assets/images/fhir-logo-www.png
  • DICOM Logo http://dicom.nema.org/dicomhome/IMAGES/Logo2011-2.jpg
By Light Professional IT Services

(End of Presentation)