IHE® | Integrating the Healthcare Enterprise

EUROPE

Whitepaper on Connectathon®

IHE® 20 Years

Vienna 2014
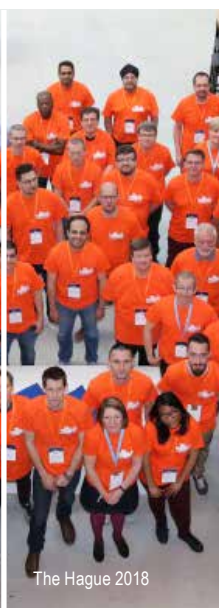
Luxembourg 2015

Bochum 2016

Venice 2017

The Hague 2018

Rennes 2019

The IHE Connectathon.
What is it?
How is it done?

Whitepaper on
Connectathon®

Vienna 2014   Luxembourg 2015   Bochum 2016   Venice 2017   The Hague 2018   Rennes 2019

Index

What is IHE?

IHE is a world-wide initiative that enables healthcare IT system users and suppliers to work together to enable interoperability of IT systems. It does this through:

- Careful definition of specific healthcare tasks (use cases).
- Identification of the information and processes required to support those tasks.
- Specification of the necessary information exchange using existing standards and the processing to be performed.
- Annual testing of supplier systems for conformance to the specifications in the **Connectathon** to show evidence-based interoperability.

Beginning in the **Radiology Domain** back in 1999 **IHE** has expanded into multiple domains and today thirteen domains are covered, thereby ensuring system interoperability between suppliers and their systems on a very big scale and on an even larger world stage.

Why the Connectathon?

The **Connectathon** gives vendors an opportunity to test the interoperability of their products in a structured and rigorous environment with peer vendors. It also enables the **IHE** Technical Framework itself to be tested in the form of trial implementation/deployment settings.

Participating companies test their implementation of **IHE Integration Profile** specifications against those of other vendors using real-world clinical scenarios.

"Connectivity of imaging information in the era of digital radiology is mandatory and crucial. Interoperability of modalities and IT systems from different vendors is not self-evident. The most favourable approach to have positive experiences is using solutions which have been tested during an IHE Connectathon. Besides the more general eHealth solutions - covered by the IHE-XDS Profiles family - there is a lot ongoing for Radiology, e.g. the new version of the IHE Profile "Scheduled Workflow", Report Templates or Radiation Exposure Monitoring (REM). The European Society of Radiology (ESR), supporting IHE as a sponsor, is following different strategic IT-related projects, e.g. Decision Support, Structured Reporting and especially dose optimisation (EMAN-Project). As part of EMAN, the IHE REM approach is very relevant, but representation of products supporting REM is still limited. Therefore, more interest by vendors supporting these Profiles would be very helpful to radiologists. This would facilitate discussion at an IHE demonstration at radiology congresses in future."

Dr. Peter Mildenberger
IHE-Europe Deputy User Co-Chair, Associate Professor of Radiology, University Medical Center Mainz, Germany

What is the Connectathon?

The **Connectathon's** objective is to test systems' conformity to **IHE Profiles** by using validators and the interoperability between systems or simulators. Clinical workflow is guidance for testing. **IHE** allows test validation in a controlled and neutral environment.
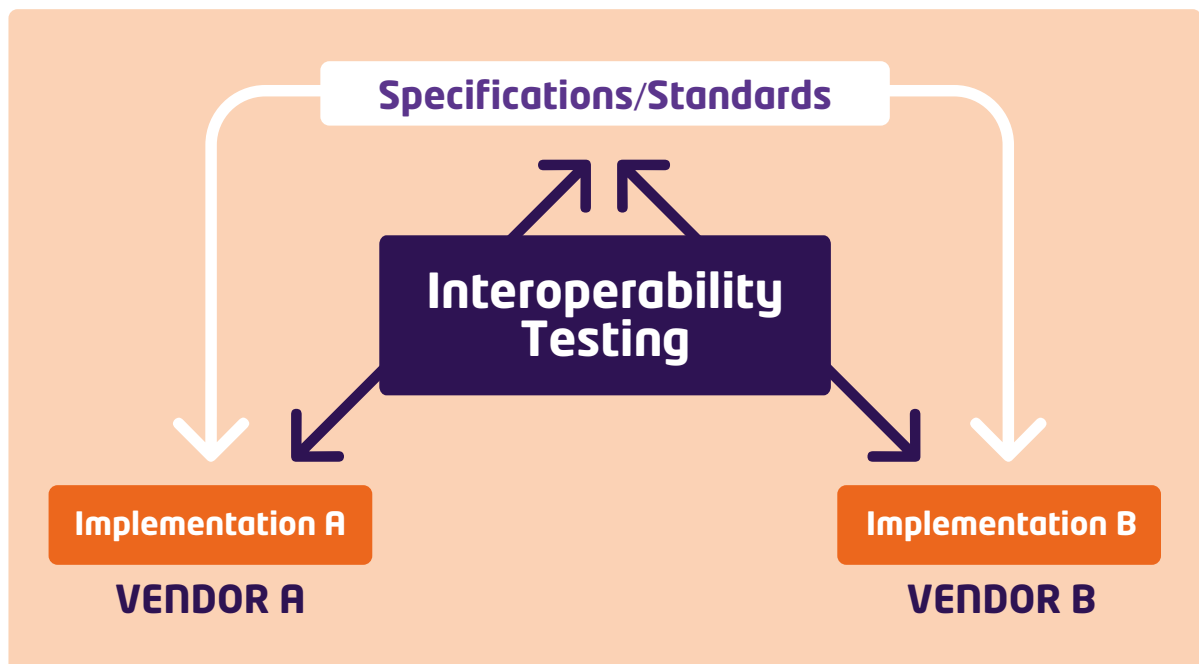
The Connectathon is a Connectivity Test Marathon

- It allows week-long, face-to-face testing of the participating products' interoperability.
- Participants prepare and test with open source test tools and plans provided in advance.
- It encourages vendors, large and small, to work closely together to solve issues.
- Participants are allowed to correct non-conformities during the event.
- Hundreds of transactions are verified using both test tools and peer tests.
- Tests are recorded and outcomes validated by neutral Monitors.
- At the end of the event, successful vendors are registered in the **Connectathon** Results Matrix.
- There are sanity checks to see whether the **IHE Profiles** are clear enough and can be implemented consistently.

Benefits for the Users of Healthcare IT Systems

- Reduces potential interoperability issues on site.
- Qualifies vendors who have invested in proving their products support **IHE Profiles**.
- Facilitates decision-making for tender responses from competing vendors.
- Saves money and inconvenience through qualified vendor stipulation.
- Gives confidence to the procurement process and subsequent deployment.
- Flags vendors who have been through **Connectathons** and peer group reviews.

Benefits for the Company's Product Development of Implementing and Testing IHE Profiles

Specific Benefits

- Reduced development cost and time-to-market by implementation of one connectivity method.
- Accelerated testing through the **Connectathon**'s structured and supervised testing environment. Minutes of testing can save months of in-company effort on the question: **Have we correctly implemented these IHE Profiles?**
- Independent product testing by qualified test specialists and proven test tools ensures product quality and drives down implementation cost.
- Ensures your products continue to meet the expanding base of **IHE Profiles**.
- Facilitates comprehensive interoperability tests with many peers in the industry. This allows for better preparation and avoids system integration at customer sites.

General Benefits

- **IHE Profiles** enable seamless and secure exchange of health information for both providers and patients across the globe and provide access to a world-wide eHealth market.
- Successful vendors are registered in the Connectathon Results Matrix ➜.
- You can demonstrate market leadership in the industry on interoperability feature adoption.
- Networking opportunities with industry leading professionals during the week-long event.

"As for Arsenàl.IT the collaboration with IHE is chiefly important in the development of the Fascicolo Sanitario Elettronico regionale (regional Electronic Health Record) project. We can apply international standards and know-how such that they easily drop in to designing and planning solutions, reducing the time gap of implementation by applying solutions recognised at an international level.

In this context, the Connectathon represents a chance for Arsenàl.IT to enhance our know-how as regards test and labelling mainly for our associated members, all the 23 public local Health Authorities and Hospital Trusts of the Veneto Region. Indeed, having the chance to discuss and collaborate with suppliers with a wide experience in implementing standards at an international level guarantees to set up our working method in a better way, providing the best solutions in a shorter time".

Claudio Saccavini
Technical Director of Arsenàl.IT, Veneto's Research Centre for eHealth Innovation

- The ability to gain deep insights from world leading experts on **IHE Profile** requirements.
- Enhance credibility about **IHE Profile** implementation competency towards customers when you register your products in the **IHE** Product Registry →.
- Country, region and hospital tender procedures increasingly demand independent demonstration of **IHE Profile** implementation competency.

Overall Industry Benefits

- VIP tours of the **Connectathon** floor together with industry leaders.
- Event that is recognised among the international healthcare community.
- Shared experiences with over 350 of the industry's top professionals on site.
- Demonstrates industry uptake of interoperability features.
- Being part of the emerging healthcare consensus in standards and interoperability.
- The greater the number of vendors participating, the better the standards of interoperability in the market place between vendors, leading to enhanced benefits for patients and healthcare staff.

Which IHE Profiles will be Tested?

- Those **Profiles** for which the vendors have registered.
- Sometimes sponsoring organisations and vendors work together to specify **Profiles** that should be tested.
- Vendors may select the **Profiles** they want to test.
- Every year **IHE's** international team of experts develops new **Profiles** which are available for testing.
- The **Domains** offered for testing include IT Infrastructure, Radiology, Eyecare, Laboratory, Pharmacy, Patient Care Coordination, Patient Care Devices and Cardiology. What is actually tested on the Connectathon floor will depend on what vendors have registered to test. Testing for a **Domain** will only take place if there are enough vendors requesting it.
- Relevant **IHE Profiles** which are used in "user and buyer" communities and reflect the challenges in eHealth will also be available for testing.

"Hosting the European IHE Connectathon 2016 was a great challenge and made us very proud. For over 13 years IHE-Germany has concentrated on the deployment of IHE Profiles and concepts in a number of Healthcare IT environments. The Connectathon in Bochum (April 11-15, 2016) gave all vendors and providers in Europe a centralised place to test their products and solutions as well as the opportunity to come together and connect within the largest European community in healthcare interoperability. It was a great event that pushed the healthcare IT markets in Germany and across Europe."

Alexander Ihls
Former Vendor Co-Chair IHE-Germany

How are the Tests Performed?

The **Connectathon** test platform using test management software system is called **Gazelle →**. Essentially, there are a variety of tools, e.g. validation tools, to verify that messages/documents are in conformity with specifications as well as simulator tools to test the interoperability of an application, not as a reference implementation but as a controlled test case.

During the **Connectathon**, testing is performed using the **Gazelle** Test Bed. The **Gazelle** suite of tools provides **Connectathon** participants, Monitors and the management with the tooling to run the event. Participants share configurations, samples and identify test partners through the **Gazelle** test management tool. The tool provides them with a list of tests to be performed and enables them to log evidences of the tests performed. Participants are free to run the test at their own pace.

Monitors, who are subject-matter experts, verify each test. As for the participants, they have the ability to check the conformance of the exhanged messages that are most critical, using validation services. The Management Team is provided with indicators that allow them to monitor the testing progress and grade the participants.

Interoperability + Conformance Testing
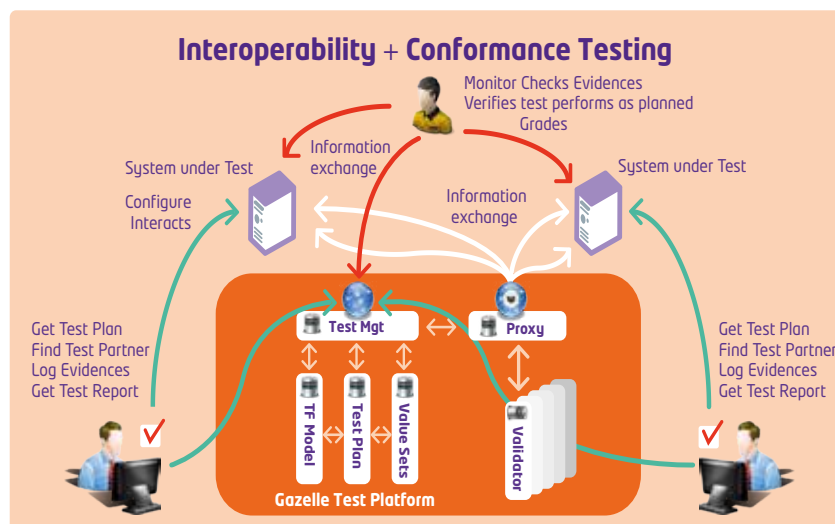
Please check our videos of some past **Connectathons** in Barcelona, Bern, Istanbul. More details can be found on the Connectathon website.

"Interoperability testing done by IHE Connectathons is invaluable when it comes to implementing the enterprise-wide healthcare Informatics solutions in the NHS. Standalone Imaging Solutions or department-wide Healthcare Imaging Informatics Solutions are fairly standard, simple to deploy and implement - especially with the maturity of networking technologies. However, trust-wide HII Solutions, that can even go beyond the enterprise and reach out to other NHS Trusts, are both challenging and demanding when it comes to 'end-to-end' workflow, integration and interoperability.

At GOSH, these challenges and demands in the current VNA and EPR implementation are greatly assisted with the knowledge that the majority of the components and their suppliers of such solutions adhere to IHE Profiles. Whilst it is not exactly 'plug and play' we have come a long way from the problematic, complicated and time-consuming installs before IHE Connectathons."

Dewinder Bhachu

Great Ormond Street Hospital for Children NHS Trust. Former Head of PACSnet, NHS funded, DOH Evaluation Centre for Healthcare Imaging Informatics.

The IHE Connectathon Test Process

108 Systems tested

3000+ Transaction tests completed

350+ Connectathon contributors

63 Monitors

The **Connectathon** is a forum where vendors and their technical specialists can exchange implementation experiences and where participants effectively share samples – for example radiology images and HL7 CDA documents. These will be checked for conformance to **IHE Profiles** using the validation software. It is common for engineers to discuss their own technical issues and to work on the fly with engineers, often from competing organisations, but without commercial pressure.
Even though all of them are committed **IHE** members, none of them are commercially aligned.
They have many years of experience, often in a commercial environment.

The desire to succeed is the spirit that is present amongst all participating vendors.
The Monitors are not looking to fail anyone, and the "help-each-other-mentality and stay-until-it-works-mentality" are paramount amongst those present. After all, problems one vendor may experience today may invariably arise for another vendor tomorrow.

There is also the opportunity to meet other experts involved in European projects, e.g. epSOS, eHGI, Trillium Bridge, Antilope, EURO-CAS.

It is important to recognise that the work is done on a domain-specific basis and in domain-specific sessions, where Monitors with domain experience are using their skills, experience from previous **Connectathons** and expertise in their own field to bring success to all.

"IHE Belgium, established only 3 years ago so still very young, is proud and delighted to host the 2020 IHE Europe Connectathon for the very first time in Belgium. eHealth interoperability between IT systems is key for the EPD/HER projects in Belgium and the access to his health data for the patient. We want to highlight the benefits of using international standards and IHE profiles as well as connectivity testing, as it happens during the connectathon and the plugathon. On top we want to give all Belgian eHealth stakeholders the opportunity to come together and connect during the Connectathon Week in Brussels in March 2020 - and of course, have them experience the testing vibes on the Connectathon floor."

Karlien Erauw
Vendor Co-Chair IHE Belgium & ICT Standardisation Expert Agoria

There are approximately 60 Monitors trained in dedicated sessions each year. Whilst the Monitors are there to help, they are also totally independent and objective in their decisions. Ultimately, they have to carry out testing checks that are a pass or a fail.

Monitors are assigned to tests based on their own competencies and skill set. Vendors have to convince them that the work they are effectively grading is soundly based; successful vendors will always have their logs ready to run, replay and replay again if necessary.

**2019 Connectathon Monitors with Eric Poiseau, IHE-Europe Technical Manager.**

"ELGA GmbH is responsible for the introduction and implementation of the electronic health record (ELGA) in Austria and has relied on IHE standards since 2007. Due to the federal organisation of the healthcare system in Austria, ELGA is designed as a distributed system with central components for patient and healthcare provider identification and authorisation management. The core building blocks are composed of numerous IHE XDS Affinity Domains containing the health records and some central components like the master patient index, the healthcare provider index, the access control system and the citizen portal. Communication between the core components strictly follows the rules of IHE Profiles, whereas the communication between the Affinity Domains and the systems at the point of care (hospital information systems etc.) today is still proprietary. The Connectathon 2014 in Vienna provided the perfect testing ground to prove interoperability according to IHE Profiles. Companies which had successfully participated in a Connectathon had a competitive advantage as IHE compliance is increasingly regarded as a success factor in calls for tenders."

Hubert Eisl
Managing Director ELGA GmbH, Austria

European Connectathons

2001: Charenton-le-pont Paris, France
2002: Villejuif in Paris, France
2003: Aachen, Germany
2004: Padova, Italy
2005: Noordwijkerhout, The Netherlands
2006: Barcelona, Spain
2007: Berlin, Germany
2008: Oxford, UK
2009: Vienna, Austria
2010: Bordeaux, France
2011: Pisa, Italy
2012: Bern, Switzerland
2013: Istanbul, Turkey
2014: Vienna, Austria
2015: Luxembourg
2016: Bochum, Germany
2017: Venice, Italy
2018: The Hague, The Netherlands
2019: Rennes, France
2020: Brussels, Belgium
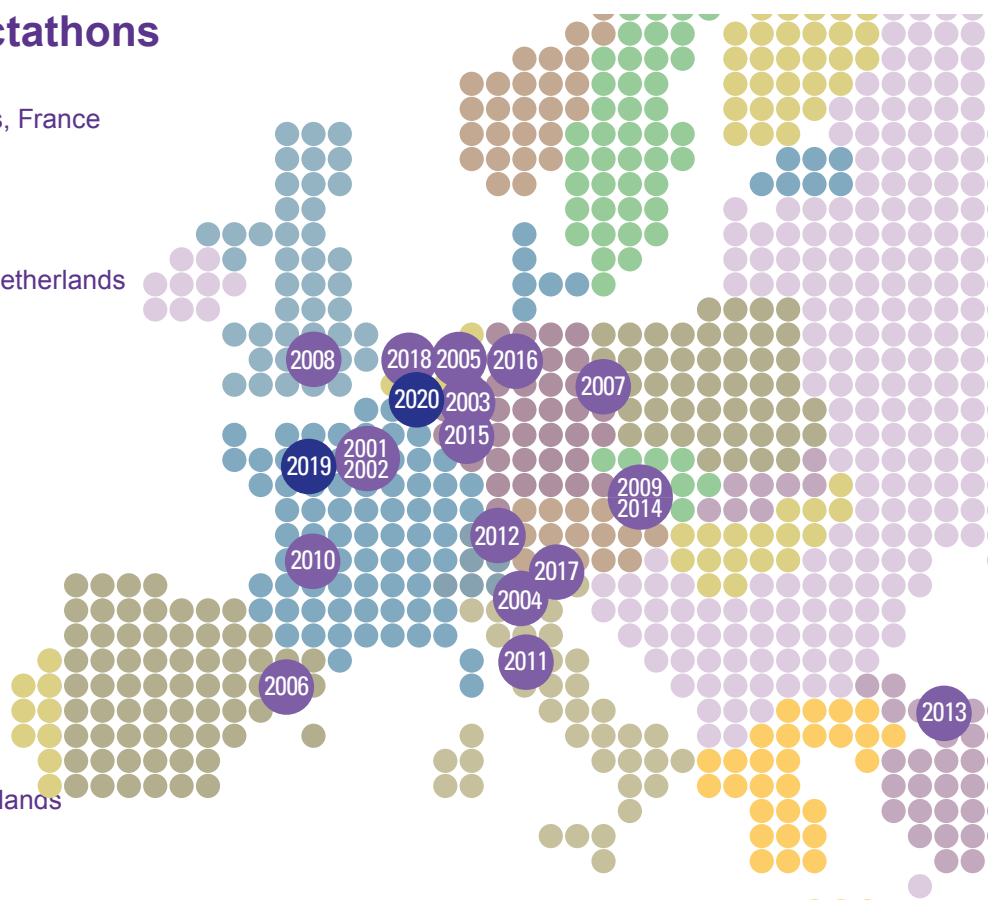
Results Registration in the Results Matrix

IHE communicates the vendors' participation in **Connectathon** at the company level.
IHE will register and disclose the **IHE Profiles**, actors and options that have been successfully tested by the participating company at the **Connectathon** in the **Connectathon Results Matrix →**.
Vendors who tried and learned during the **Connectathon** week that more thorough implementation work is needed to succeed are encouraged to participate again next time and to undertake more dedicated trialing beforehand. **IHE** will not disclose any failures to comply.

"IHE Connectathons have been useful for us in three different ways. First, as a national healthcare IT player, it is crucial for us to closely follow the development of the latest standards and application guides. IHE Connectathon results help us estimate the maturity levels of different IHE Profiles, their current momentum and future potential. Second, while evaluating software acquisitions for our needs, it is important for us to study the Connectathon history of different software vendors. And finally, we can participate in Connectathons ourselves as a national implementer of healthcare IT services - we did just that twice while developing the Finnish epSOS NCP (national contact point). It's been an amazing experience, both as a good start for testing our implementation against NCPs of other countries, and as a socially important event, with side activities and meetings with other projects and communities, often present close to the Connectathon venue."

Konstantin Hyppönen, PhD
IHE Finland Co-Chair, Senior IT Specialist Kela, Kanta Services Finland

IHE Integration Statements and the IHE Product Registry

Vendors publish "**IHE** Integration Statements" to declare the conformity of their products to specific **IHE Profiles**. Participation in the **Connectathon** will, of course, greatly increase the vendor's credibility when these **IHE** Integration Statements are created for their products.
The format of an **IHE** Integration Statement is available at: https://ihe.net/uploadedFiles/Documents/Templates/IHE_TF_GenIntro_AppF_IHEIntegrationStatements_Rev1.0_2014-07-01.pdf
The **IHE** Integration Statements are intended to be made public on the corporate website of the vendor. Potential customers of products with implemented **IHE Profiles** can easily search for vendors and products in the IHE Product Registry ➔. Vendors are encouraged to enter their available, released products in this registry with an **IHE** Integration Statement. It can be linked to the **Connectathon** where the vendor's capability has been tested.

IHE Domains with their Solution Profile Specifications

IHE is organised by clinical and operational **Domains**. In each **Domain**, users with clinical and operational experience identify integration and information sharing priorities, whereas vendors of relevant information systems develop consensus and standards-based solutions to address them.
Each **IHE Domain** includes a Technical Committee, whose primary task is developing and documenting the solutions (known as **Integration Profiles**), and a Planning Committee, whose primary tasks are long-term planning and organising deployment activities (such as testing events and educational programmes). Each **Domain** develops and maintains its own set of Technical Framework documents. Coordination among the **Domains** is the responsibility of the Domain Coordination Committee, comprising representatives from each of the Domain Planning and Technical Committees.

The official and complete IHE Technical Framework documents are available at:
http://www.ihe.net/Technical_Frameworks.
A few IHE profiles are highlighted below. The applicant should consider an overview of all IHE profiles available to test at:
https://wiki.ihe.net/index.php/Profiles#IHE_IT_Infrastructure_Profiles

Participation in IHE and to IHE Connectathons are both key elements in Dedalus' international interoperability strategy. Dedalus strongly supports international standards and the value of the Connectathon is tangible in the product design, development and testing as well as in proving our interoperability capability to our clients. Dedalus is operating in a variety of settings and markets worldwide and IHE and the Connecathon is a valuable tool to help communicate with users and decision-makers on the value of interoperability. Connectathons are seen by our partners, clients and users as a way to effectively deploy interoperability products that work and thus greatly reducing deployment risks.

Lapo Bertini
IHE-Europe Deputy Vendor Co-Chair, Business Manager of Dedalus Healthcare Systems Group, Italy

IHE Profiles Leveraging HL7® FHIR®

Fast Healthcare Interoperability Resources – FHIR –is an HL7 standard that describes data formats and elements and an API for exchanging electronic health records. As such, it provides an additional way to exchange health care data which supplements document-centric approaches by directly exposing discrete data elements like services.

IHE Domain Committees have started to incorporate FHIR elements (STU3 or R4) into new **IHE Profiles** and there are now 29 **IHE Profiles** using FHIR, including:

- Well-established **IHE Profiles** such as PIXm, PDQm for patient identification and MHD as a front-end API to a document sharing infrastructure such as those based on IHE XDS, that will continue to be offered for testing at the **Connectathon**. An extended version of the test tools and test plans will be made available.
- Query for Existing Data for mobile (QEDm) handling queries for clinical data elements
- Mobile Cross-Enterprise Document Data Element Extraction (mXDE), which combines the **IHE** XDS, **IHE** MHD and QEDm Profiles. These FHIR-based **IHE Profiles** allow clinicians to establish an accurate and relevant clinical context in which recorded data elements were formally evidenced. This clearly has wide-reaching implications beyond mHealth.
- Mobile Care Services Discovery (mCSD) that supports querying for: Organisation - Location - Practitioner, and Healthcare Services.
- Restful ATNA Query Option allows performing queries on security events from an Audit Trail Repository.
- Mobile Alert Communication Management (mACM) provides the infrastructure components needed to send and track the status of short, unstructured text alerts to human recipients and subsequent recording outcomes of any human interactions on receipt of the alert.
- Point-of-Care Medical Device Tracking (PMDT) that records medical device information acquired at a point-of-care.
- Dynamic Care Planning (DCP) which shares and updates patient care plans.

 If you require further information please E-mail: secretariat@ihe-europe.net

Asynchronous AS4 Webservices Option for Cross-Community

This new option has been introduced by the **IHE** IT Infrastructure Committees in the XCA, XCPD, XDR, and XCDR **IHE Profiles** (http://bit.ly/2DQz56b). Based on the OASIS Applicability Statement 4 (AS4), it provides a more robust Asynchronous Webservices Exchange stack which is attractive for upcoming cross-border eHealth information exchange, such as the European eHealth Digital Service Infrastructure.

IHE Connectathons are a unique human and technological experience. Engineers are no longer from a big company of from a start-up, they are all professional techs with the same objective of using IT to help solve problems for clinicians and patients, not to create additional problems. Intensive, automated and formalised tests, driven by a unique team of Monitors with coloured shirts, make the difference: we move from interoperability that should work to interoperability that works!"

Emmanuel Cordonnier
Director, e-Health, b<>com Institute of Technology, Rennes, France.

Cybersecurity for Health Data Exchange

Cybersecurity is now considered a key priority for all entities creating and managing health data. **IHE** takes this challenge very seriously and offers support for an important next step.

The concern to remove cyber vulnerabilities applies both within the health delivery organisations as it does in platforms for health information exchange serving regional, national and cross-borders.

For over 10 years **IHE** has been offering the opportunity to address, in standard-based ways, security risks for health data exchange. A major step was approved in 2018 to ensure a coordinated response across a wide range of health IT systems and devices/products. In 2020 the digital health technology community needs to deliver a much stronger Cybersecurity protection, than previously available.

The **IHE-Europe Connectathon** - March 2020 - is a primary opportunity for vendors to demonstrate effective support by testing products and allow users to evaluate their technology partners' readiness.

An extended version of the test tools and test plans will be made available.

There are three new Options in the I**HE Audit Trail and Node Authentication Profile** (ATNA) for Cybersecurity. All three should be supported and tested by products to ensure maximum deployment flexibility:

> **1. STX: TLS 1.0 Floor using BCP195 Option -** offers the highest level of protection by adopting the IETF Best Current Practice (BCP195); it includes backward compatibility to maintain interoperability with systems that do not support BCP195.

> **2. STX: TLS 1.2 Floor using BCP195 Option -** adds additional requirements to (a) reject any TLS protocol lower than TLS 1.2 and (b) make mandatory some newer cypher suites that are only recommended in BCP195.

Both Options are compatible with similar options present in DICOM®, ensuring that DICOM transactions tested in **IHE Profiles** meet the requirements of DICOM Supplement 204 – TLS Security Profiles. These two ATNA Options are also being included in the **IHE** International Conformity Assessment program for release in January 2019.

> **3. FQDN Validation of Server Certificate -** enables the verification that digital certificates have been issued by a trusted authority to the servers to which the request is addressed. This prevents traffic interception by malicious attackers, significantly more dangerous over the public Internet.

IHE is committed to ensuring that Cybersecurity protection is maintained at the highest level possible and encourages continuous testing of devices/products, systems and solutions to minimise cyber vulnerability at all times.

If you require further information please E-mail: secretariat@ihe-europe.net

Connectathon Registration Process

→

Further event information can be found **connectathon.ihe-europe.net**

Here you find a short summary of the registration process:

Identify the list of actors and Profiles that you wish to test

→ Create an account on **Gazelle**→ (only if do not already have one)

→ Update organisation information

→ Register system information

→ Copy and start with systems from previous sessions

→ Print and send the contract

→ Your registration is complete when the payment has been confirmed and the IHE Europe has received the contract

→ Webinar for participants – watch for details

→ Limit for log return – watch for details

→ **Connectathon in Brussels 23-27 March, 2020**

Do not wait **until the last day** to register your system and your participants

Registration opens on **29 November, 2019**	End of registration on **13 January, 2020**	Payment deadline on **28 February, 2020**

Monday 23	Tuesday 24	Wednesday 25	Thursday 26	Friday 27
IHE CONNECTATHON				
PROJECTATHONS				
	IHE World Summit / IHE SYMPOSIUM			
			Belgian eHealth Interoperability Day	
	PLUGATHON			

Links

Connectathon Results →

Documentation →

IHE Integration Statement Template →

IHE Technical Frameworks →

IHE Success Stories →

Link to Product Registry →

Support →

What's after the Connectathon?
## IHE International Conformity Assessment Programme

Any vendor looking for a formal test report that is accepted world-wide, should sign up for the **IHE** Conformity Assessment that provides increased testing rigor based on an ISO/IEC 17025 Quality System in accordance with the **IHE International Conformity Assessment Programme**.
For details, see http://ihe.net/Conformity-Assessment.

The IHE International Conformity Assessment Programme

- is open to all products available on the market at time of application or expected to be released within six months
- is open to any vendor who already passed the **IHE Connectathon** tests for the selected profiles
- provides a striking range of integration profiles to choose from, perfectly complementing **Connecthathon** testing
- testing will be performed by a ISO/IEC 17025 Accredited Testing Laboratory which will publish a Conformity Assessment Report on the IHE International website.

ISO/IEC 17025
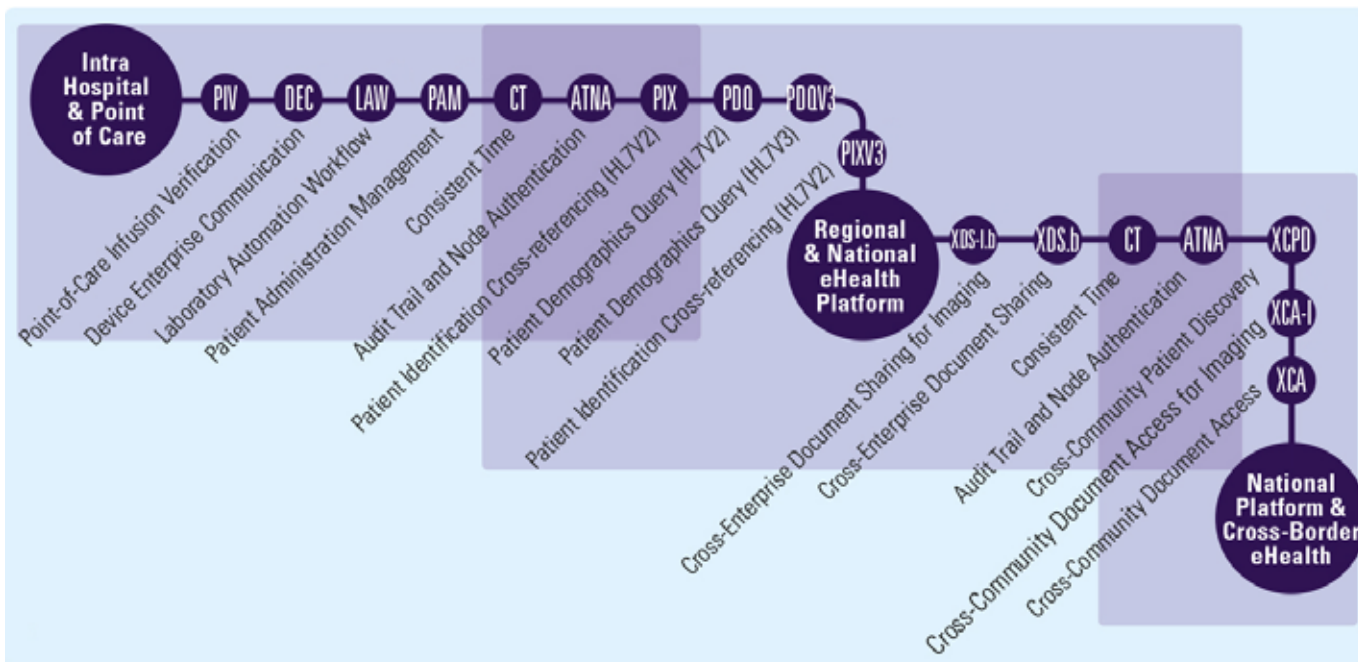
To apply now for Conformity Assessment testing, please contact:
Alexander Berler, IHE-Services Sales & Partners Director
E-mail: secretariat@ihe-europe.net