# IES – Integrating the Energy System IES – Integrating the Energy System Interoperability in Smart Grid using IHE Integration Profiles

"The Commission will: Promote the development of interoperability standards and European reference architectures, as well as open cross-sectorial platforms for the digitization of European industry, including experimentation, validation, interoperability testing facilities and trusted labels and certification schemes;"

Source of excerpt: https://ec.europa.eu/digital-single-market/en/news/communication-ict-standardisation-priorities-digital-single-market

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**Objective** The purpose of the project IES is the adaption and implementation of an already existing, vendor-neutral and cooperative method to gain interoperability in smart grids. IES is completely conform with the targets of the European Commission and the content of their latest press release "Commission sets out path to digitize European industry" (Brussels, 19th of April, 2016) concering its strategy to create a Digital Single Market (cross sector, cross border) https://ec.europa.eu/digital-single-market/en/europe-2020-strategy • http://europa.eu/rapid/press-release\_IP-16-1407\_en.htm

### What is IHE?

IHE (Integrating the Healthcare Enterprise) is an initiative by healthcare professionals and industry to improve the way computer systems in healthcare share information.

IHE was established in 1998 by a consortium of radiologists and information technology (IT) experts with the intention to standardize and harmonize the data exchange between healthcare systems.

IHE created and operates a process through which interoperability of healthcare IT systems can be improved. The group gathers case requirements, identifies available standards and develops technical guidelines which manufacturers can implement.

The IHE process is also described in the ISO/TR 28380 technical report created by ISO TC215 in 2013.

Although IHE was developed for the healthcare market it could be easily adopted for other verticals/ domains like "Energy". Also smart grids require more than just connectivity and can only be used efficiently through adequate **interoperability** of the involved systems.

## Just replace healthcare by energy!

### **IHE Structure**

**Integration Profiles:** Integration Profiles are used to organize a set of actors and transactions for a specific need. It describes how to use established standards and specifies Actors and Transactions to get a specific use case done. A group of systems that implement the same integration profile address the need/scenario in a mutually compatible way.

Actors: Actors are information systems or components of information systems that produce, manage, or act on categories of information required by operational activities in the enterprise.

**Transactions**: Transactions are interactions between Actors that transfer the required information through standards-based messages.

#### **Technical Framework**

IHE technical frameworks are detailed documents which specify the Integration Profiles and associated Actors (systems) and Transactions.



**Connectathon – Luxemburg 2015** 

**Connectathon**: A Connectathon is an annual testing event where equipment vendors bring their products. The aim of a Connectathon is to prove the implementation of IHE Integration Profiles and test them with other vendors.

**Integration Statement**: IHE integration statements are prepared and published by a vendor to list the IHE profiles supported by a specific release of a specific product.

Some existing IHE Profiles from the IHE IT Infrastructure Technical Framework are not healthcare

specific and could be equally used for the energy sector. IHE Actors can be "grouped" to allow a specific

system to play all necessary "roles" for its real world usage. These IHE Interoperability Profiles

already got reference to public European procurement through Commission Decision 2015/1302.

### **Smart Grid Technical Framework**

A dedicated "Smart Grid Technical Framework" - following the IHE guidelines - can be defined to describe the needed use cases (Profiles), the involved systems (Actors) and the interaction (Transactions) between them, based on established communication standards extended with all necessary constraints to achieve interoperability.

**Example: Audit Trail and Node Authentication (ATNA)** 

The Audit Trail and Node Authentication (ATNA) Integration Profile establishes security measures which, together with the Security Policy and Procedures, provide patient information confidentiality, data integrity and user accountability.

It contributes to access control by limiting network access between nodes and limiting access to each node to authorized users. Network communications between secure nodes in a secure domain are restricted to only other secure nodes in that domain. Secure nodes limit access to authorized users as specified by the local authentication and access control policy.



#### **Actor Grouping**

In some Profiles (e.g., XDS Cross-Enterprise Document Sharing), there is already an inherited requirement to group with ATNA Secure Node or Secure Application Actor. This grouping forces the network transactions to utilize mutually authenticated and encrypted TLS (Transport Layer Security) or equivalent. Furthermore to the fact that already existing profiles can be reused in other domains like energy IHE provides the tools and processes to define new profiles, which describe use cases in energy in a technical and comprehensible way.

### **Example: Supplier Switching**



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