Antilope

Advancing eHealth Interoperability

# Antilope – Testing tools

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ETSI World Class Standards

cip competitiveness and innovation framework programme 2007-2013

SEVENTH FRAMEWORK PROGRAMME

# Antilope Core and Experts Partners

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# Antilope Validation Partners

| | |
|---|---|
| MEDIQ | Denmark, Norway, Sweden Finland, Iceland, Estonia, Lithuania, Latvia |
| NÁRODNÉ CENTRUM ZDRAVOTNÍCKYCH INFORMÁCIÍ | Poland, Czech Republic, Slovakia, Hungary |
| IHE UK Integrating the Healthcare Enterprise | Ireland, United Kingdom |
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| TicSalut Technology, innovation and health | Portugal, Spain |
| HL7 HELLAS | Romania, Bulgaria, Greece, Cyprus, Turkey |

# Main ANTILOPE objectives for testing tools

- Identify existing & new testing tools required to cover the selection of Use Cases described in the eHealth European Interoperability Framework (eEIF) and their refinement
- Promote the use of existing testing tools
- Promote the development of required new or improved testing tools

# Do we need testing and tools?

- Interoperability of future systems is first addressed when specifications for a system are set.
- Basing the solution on **internationally accepted standard** is the first step.
- The next step is setting **the profiles** that would restrict the level of freedom in standards to the level that would make them interoperable.
- eHealth solutions are built to respect all the requirements set in the standards and profiles.
- However, standard and profile specifications are, as a rule, not tight enough and **differing interpretations and erroneous implementations** lead to interoperability problem.
- It has been proven many times that the only solution to that problem is the appropriate level of **testing**.
- In order for the testing to be precise, efficient and less dependent on human intervention **testing tools** are required.

# Key messages on testing tools

| | |
|---|---|
| Testing tools are key to achieving interoperability | Testing and certification of eEIF Use Cases is relying on recognized profiles and will require robust and high quality testing tools |
| Use good testing tools that exist | ANTILOPE is contributing by consolidating and disseminating the knowledge about the testing tools that already available. |
| New or improved test tools need to be developed | ANTILOPE is identifying the gaps<br>and will stimulate the development of required additional capabilities of testing tools |

# Testing tools gap analysis process

eEIF Use Cases

ANTILOPE refined Use Cases

Selection of Profiles and underlying standards adapted to the Use Cases

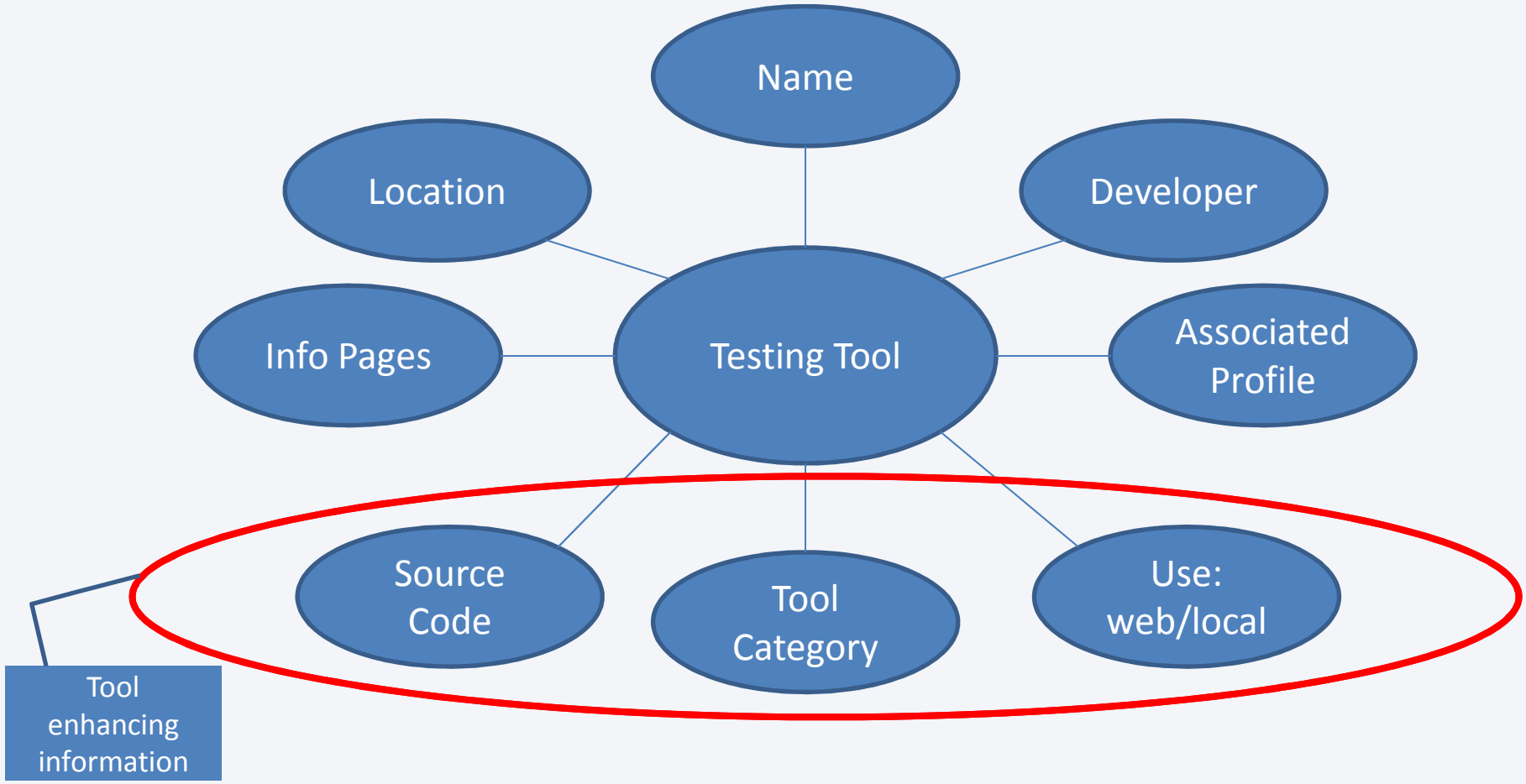
Existing Testing Tools for Selected Profiles and standards

Gaps in existing testing tools

# Relevant profiles

- Profiles extracted from eEIF Use Cases (refined in this project)
- Required IHE profiles:
  - ATNA, BPPC, CT, DEC/RTM, PDQ, PIX, XBeR-WD, XCA, XCPD, XDM, XDR, XDS, XDS-MS, XPHR, XTB-WD, XUA
- Required Continua profiles:
  - HRN, LAN or PAN, WAN
- It is for these profiles that the status of testing tools was analyzed

# Existing Testing Tools Information Diagram



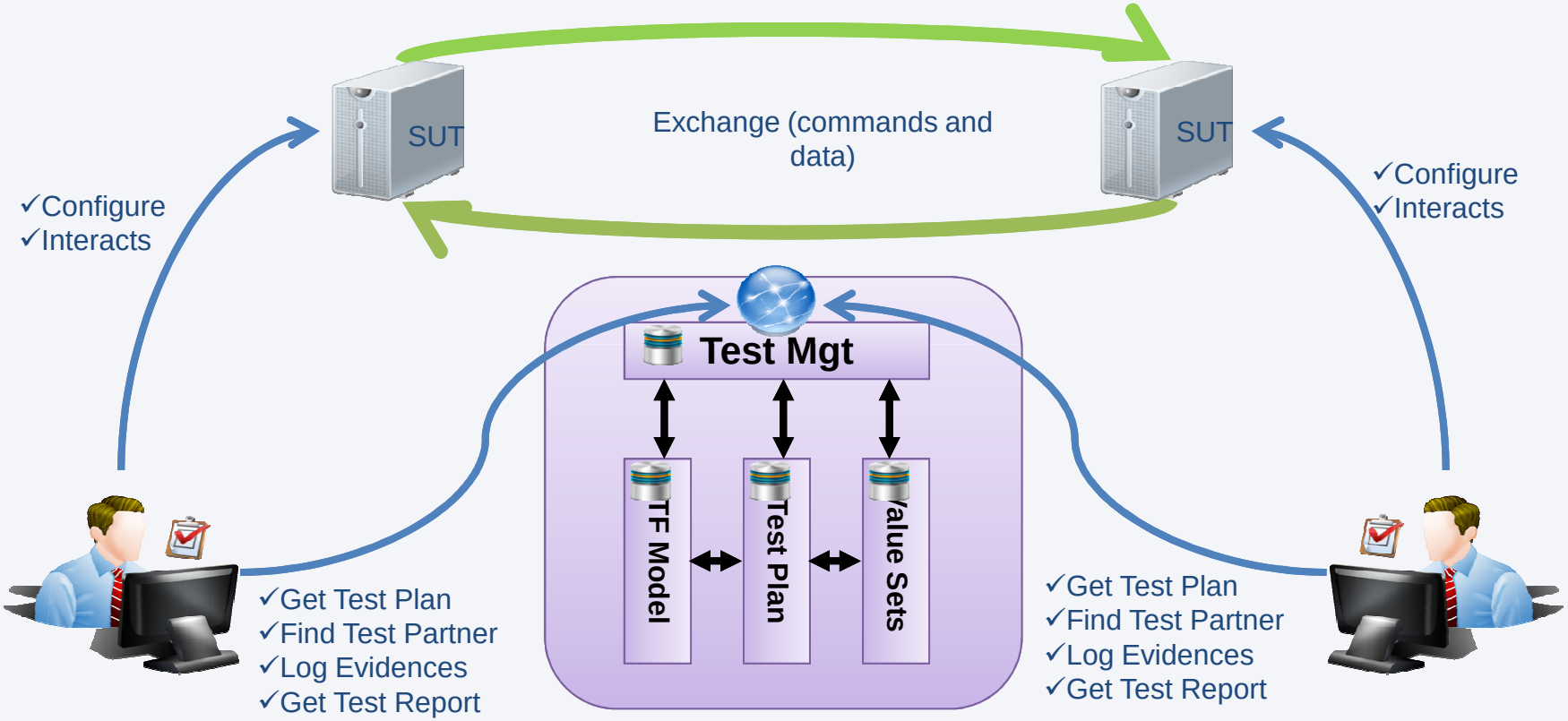
# Testing tool source code

| Source code | Explanation |
|---|---|
| Open source | The source code of a testing tool is **freely available**. This is a preferred solution. |
| Not open | The source code is **not freely available**. |
| Partly open | The source of the testing software is freely available but requires run time support that is may not be free. |

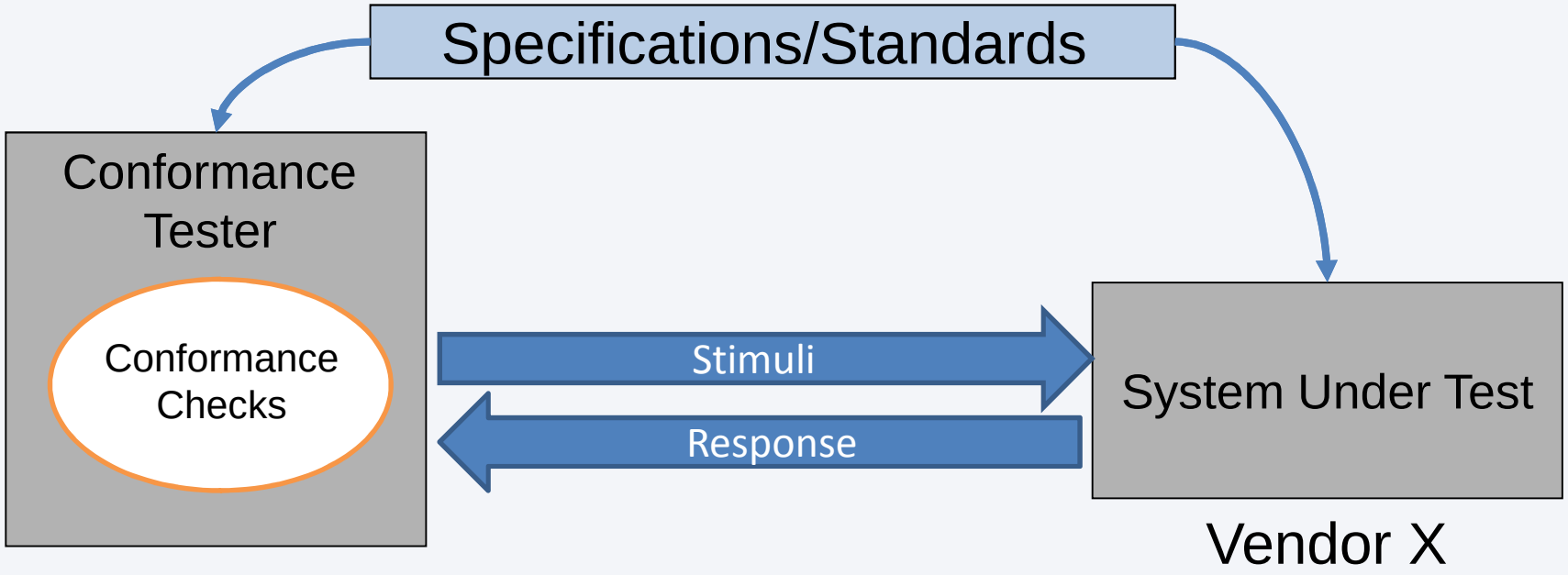
# Testing tools access rights

| Testing tool access | Description |
|---|---|
| Free | Free use of a testing tool, either over the network or free download and installation. This is a preferred solution. |
| Commercial | A testing tool can be accessed under commercial conditions set by the entity that developed or owns the tool. |
| Member restricted access | The testing tool can be accessed under condition of membership in an organization that owns/controls the tool. |
| Combined | Testing software free to use but requires run time environment that is proprietary with possible conditions. |

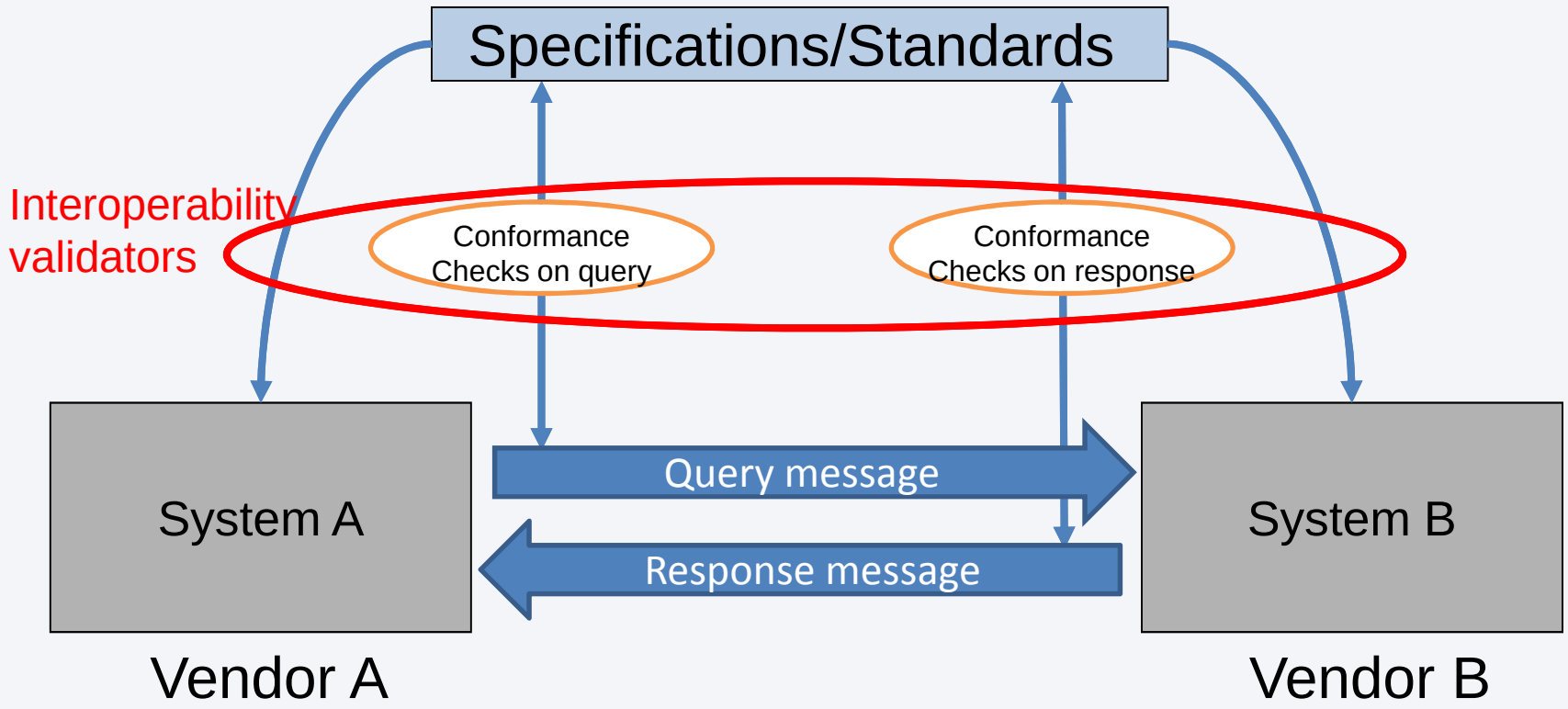
# Testing tool categories: Test management tools



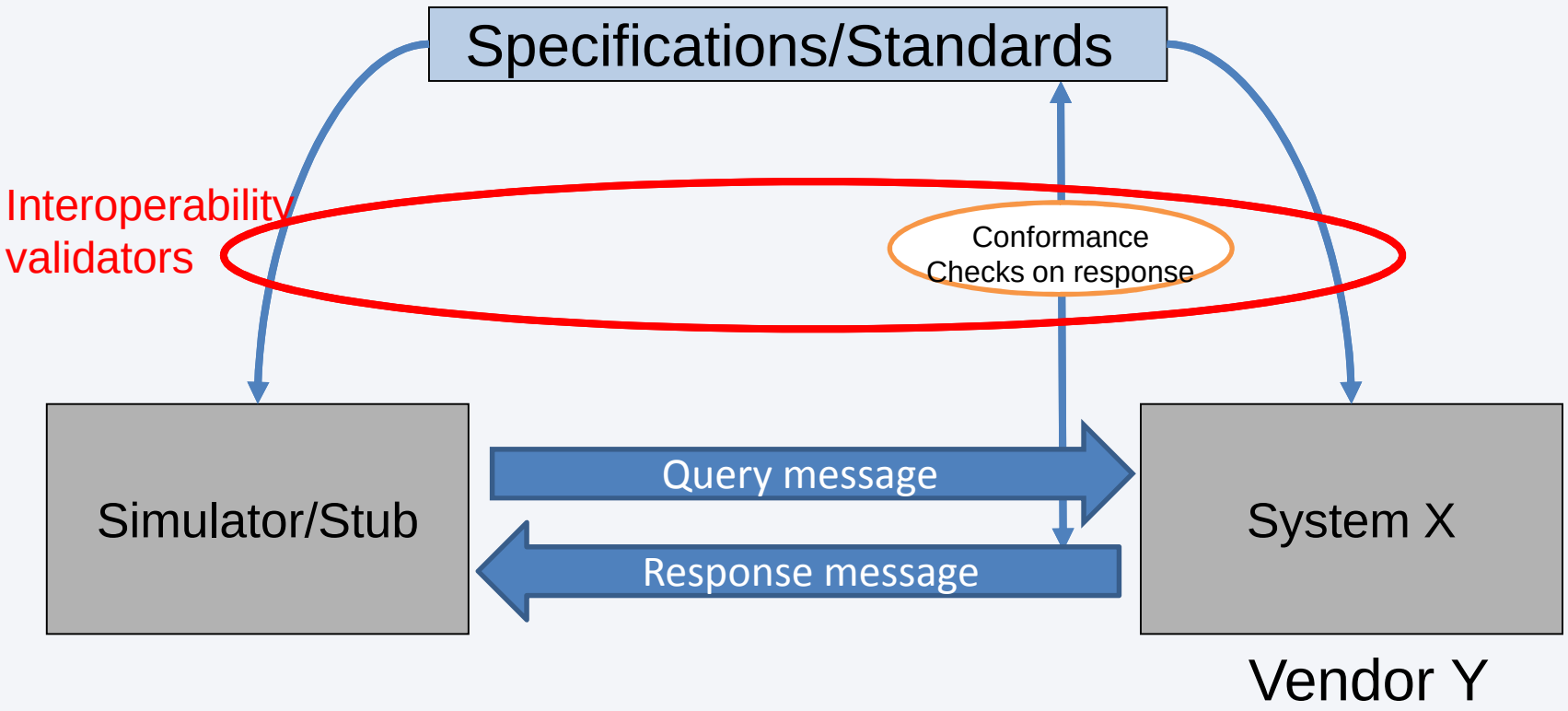
# Testing tool categories: Conformance tester



# Testing tool categories: Interoperability validators



# Testing tool categories: Simulators/stubs



# Testing tool categories: Other

| Category | Description |
|---|---|
| Software libraries | Software libraries may be used to build both eHealth systems as well as eHealth testing tools. An example is a library that supports encoding and decoding of HL7 messages. |
| Test data generators | A test data generator accelerates test data preparation by providing valid, input data to be used in testing. |
| Reference implementations | A reference implementation is, in general, an implementation of a specification (standard or profile) to be used as a definitive interpretation for that specification. |
| Support tools | During testing and debugging various support tools may be useful. While they do not test anything themselves, they may provide means of collecting the information that is needed to progress with testing. |
| Network sniffers | Sniffers are also known as network analyzers or protocol analyzers. |

# Testing tools considered out of scope

- ANTILOPE is focusing exclusively on testing that will improve interoperability of eHealth solutions
- Explicitly out of the scope are testing tools dealing with:
  - Performance, benchmarking,
  - Load testing
  - Security attacks

# Existing testing tools grouped

- Tools specific to IHE profiles
- Tools specific to Continua Health Alliance Profiles
- Generic tools useful for testing HL7. No associated profile.
- Tools not recommended for use

# Status and identified needs for improvement (1)

| Profile | Existing tool categories | Areas of improvement |
|---|---|---|
| IHE: ATNA | Data generator<br>Interoperability validator<br>Support tool<br>Simulator/stub | There is currently no conformance testing tool.<br>Syslog message generator for testing the ARR actor would facilitate test data preparation. Current validator is checking message content. Analysis of coverage of profile requirements is likely to improve the testing. |
| CHA: HRN | Conformance tester<br>Interoperability validator | Data generator: CESL to be added to HRN tools<br>Simulator/stub: No CESL HRN tools<br>PHMR document type to be added to interoperability validator<br>Coverage of HRN testing could be improved as there are HRN sender tests but there are no HRN receiver tests. |

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# Status and identified needs for improvements (2)

| Profile | Existing tool categories | Areas of improvement |
|---|---|---|
| IHE BPPC | Interoperability validator | A generator of valid Consent document is required.<br>A conformance tester would automate testing and ensure that requirements are well covered. In particular this would mean testing of Use Case workflow in addition to content checking. |
| IHE DIS | Interoperability validator | A generator of valid Dispensation documents is required. Dispensation should be generated from a given Prescription. Useful to test the Dispensation workflow.<br>Improved DIS testing tools should look to automate the testing while ensuring improved coverage of requirements. |
| IHE PAM | Interoperability validator<br>Simulator/stub | Automation of workflow for PAM profile. The tools available nowadays allow the validation of the exchanged messages and the simulation of the missing partners. Automation of the exchange can be used to test the “server” actors in these profiles and thus provide means of more exhaustive testing, requiring less human interactions. The goal may be achieved as improved interoperability validator and/or as conformance tester. |

# Summarising current status of testing tools and future targets

- Testing tools **already** exist for eEIF Use Cases
- The increased use of existing tools will **improve** interoperability of eHealth systems implementing eEIF Use Cases
- In addition to immediate use of existing tools, improved testing tools should be developed to increase the testing precision and productivity
- Improvements that could be targeted at this point in time are **already identified**
- A **Request For Proposal** to develop new or improved testing tools will be issued
- As the eEIF evolves, there should be a **continuous process** of review , development and deployment of improved testing tools

# More information

**For more information,**

**please refer to D3.1. document**

**available on the Antilope website**

**http://www.antilope-project.eu/**