

Gazelle Testing Environment

Anne-Gaëlle Bergé
IHE Europe / Kereval

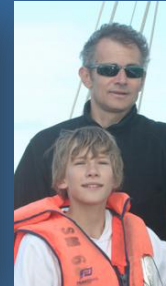


- **Gazelle team**
- **Overview**
- **Validation tools**
- **Simulators**
- **Test Management application**
- **Proxy**
- **Focus on specific tools**

THE TEAM

Gazelle development team

- Hosted by Kereval, a French company specialized in software testing
- Composed of 8 persons:
 - 1 Team manager
 - 6 Engineers
 - 1 Quality assurance engineer

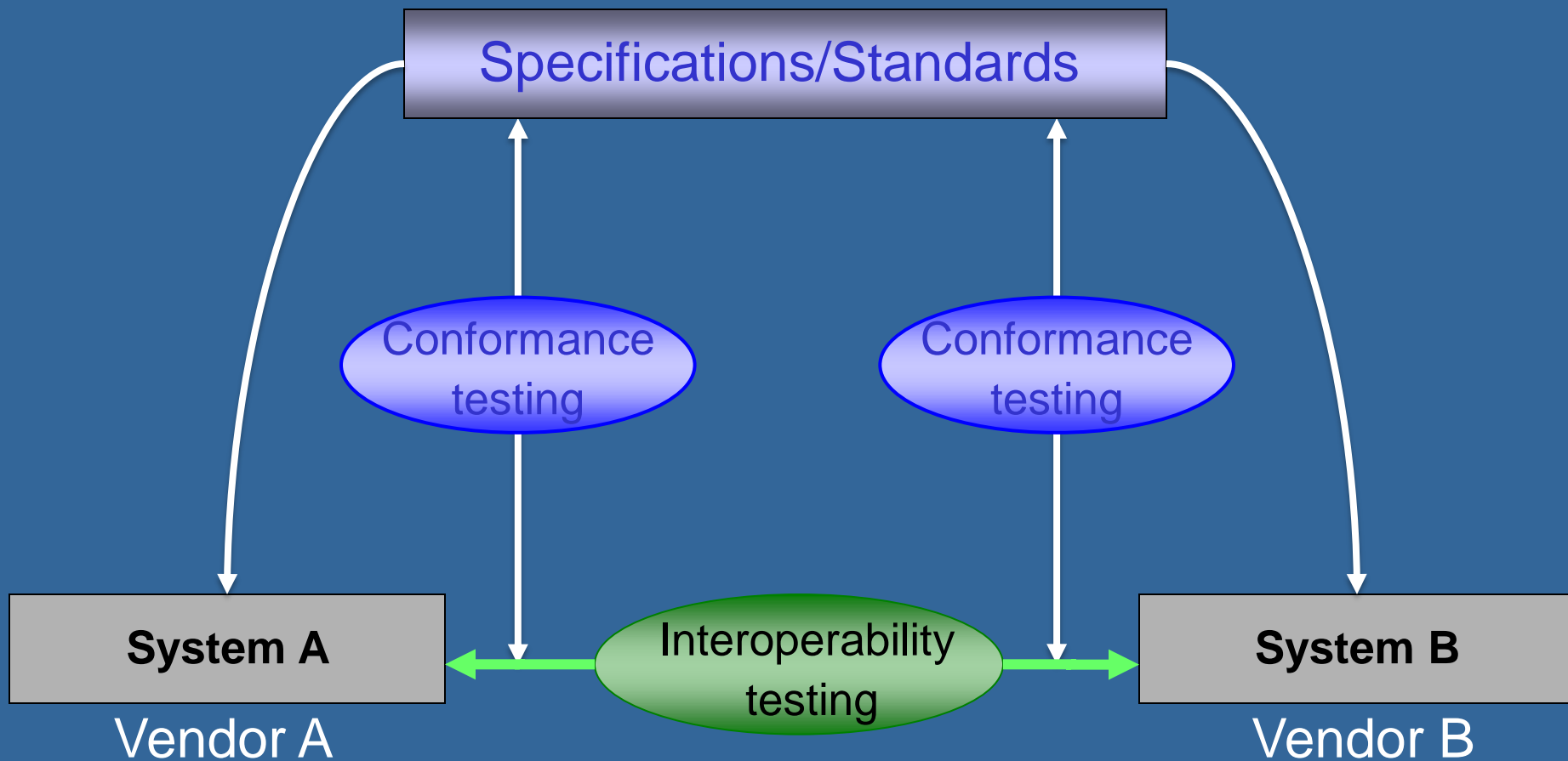




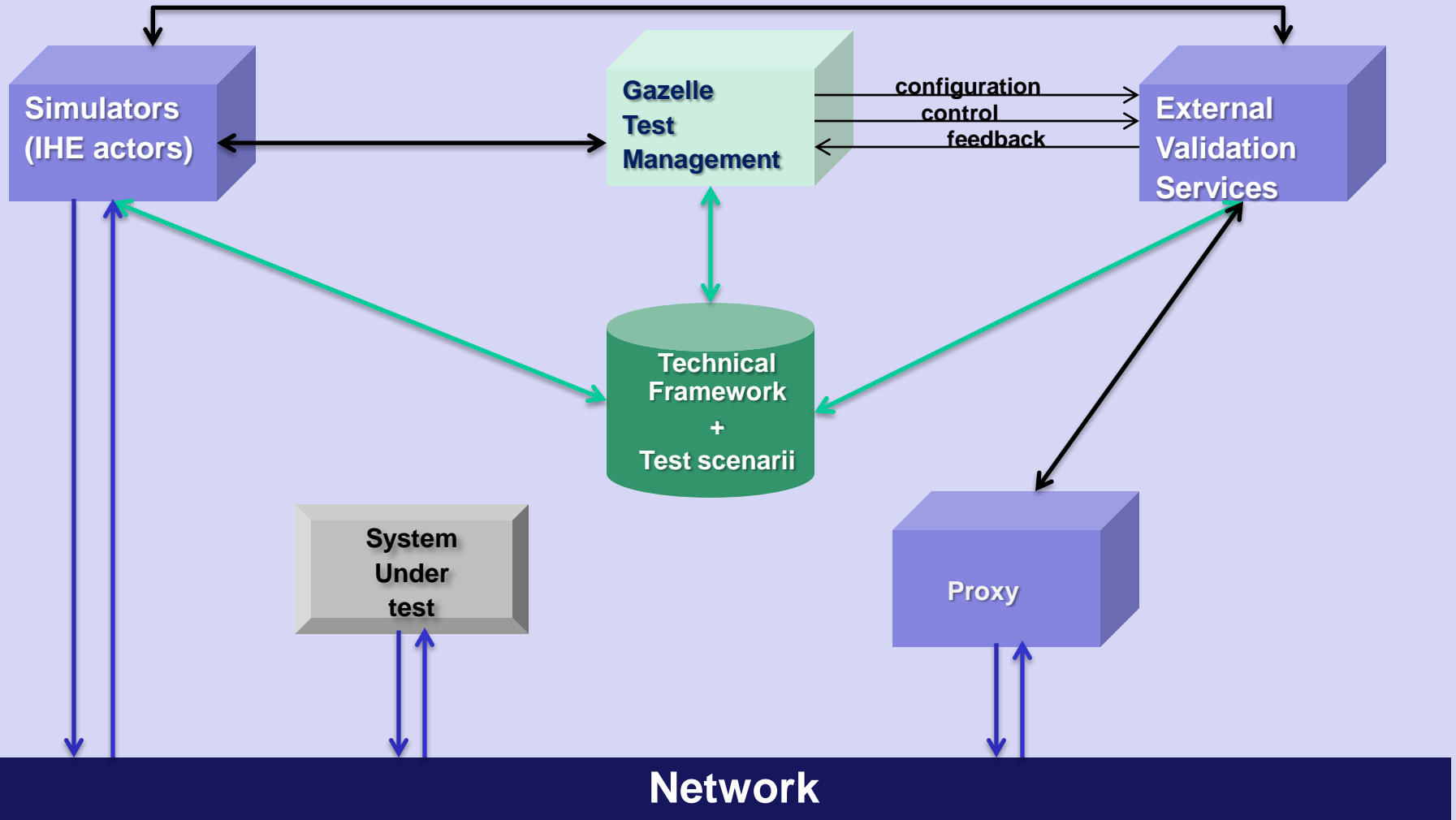
OVERVIEW

- **Gazelle**
 - a test management tool oriented toward interoperability and conformance testing
 - a suite of IHE actors simulators
 - a suite of IHE conformance tools

Conformance / Interoperability Testing



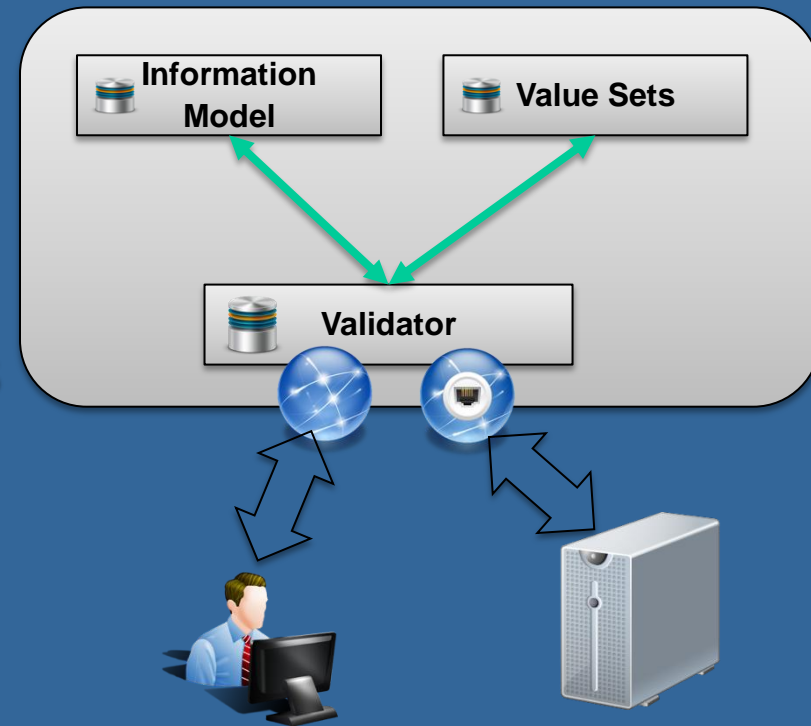
Gazelle architecture



- **Model of TF concepts**
 - Integration Profile
 - Actors
 - Transactions
- **Storage of test related information**
 - Test definitions
 - Test requirements
- **Assertion to be tested (not yet)**

VALIDATION TOOLS

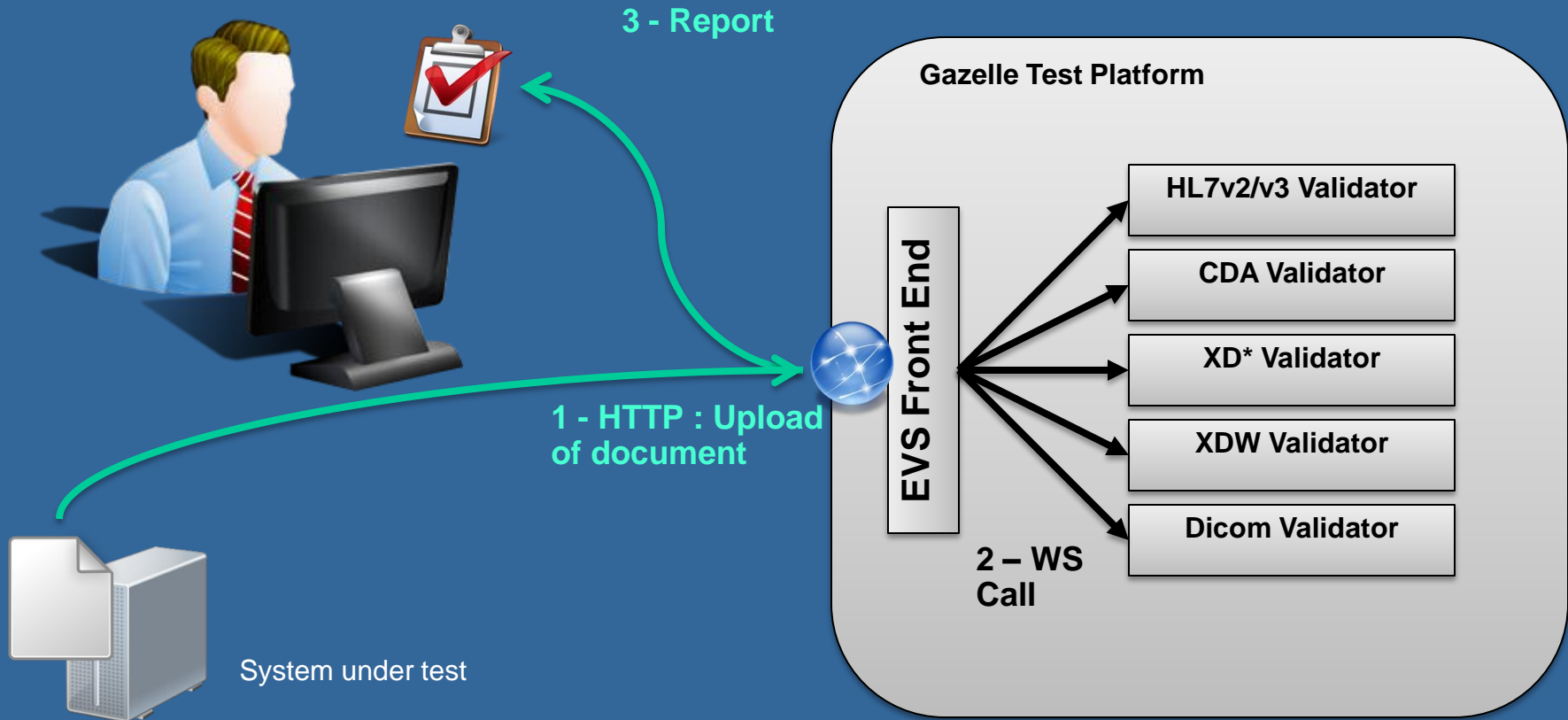
- **Goal**
 - Verify that messages/documents are conform to the specifications
- **Target**
 - Developers
 - Testers
 - Other tools like simulators
- **Interface**
 - GUI for users
 - Web services for tools



Existing validation tools

- HL7 CDA Structured Document
- HL7v2, HL7v3 messages
- IHE XD* transactions
- Sharing Value Set messages content
- Workflow documents
- ATNA audit messages
- X509 certificates
- SAML Assertions

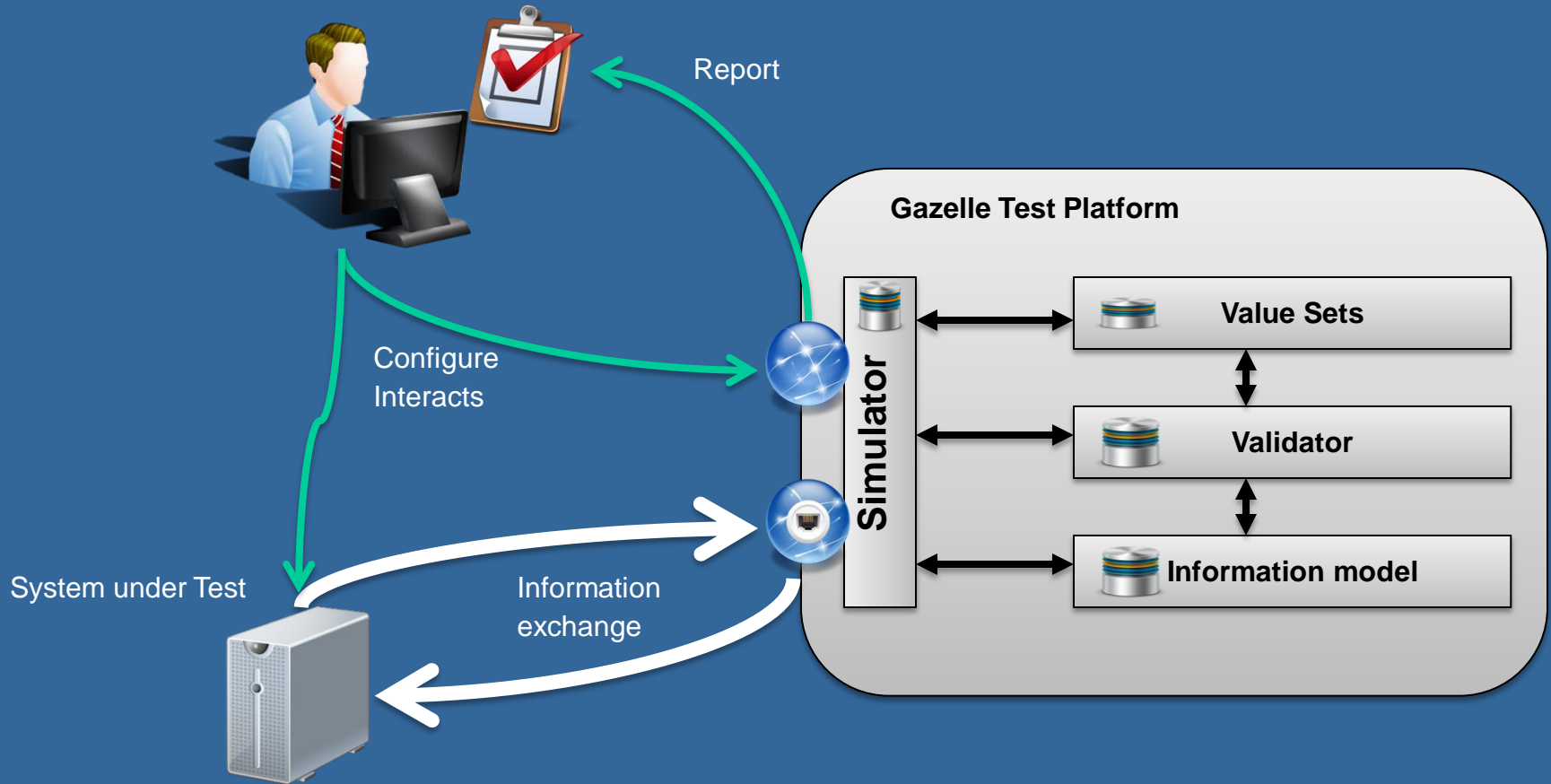
Standalone Document/Message Validation



SIMULATORS

- **Goal**
 - Test the interoperability of an application
 - Simulator is not a reference implementation
 - Simulator controlled to perform test cases
- **Target**
 - Developers
 - Testers
 - ➔ Simulators are accessible through the Internet for free
- **Interface**
 - GUI for humans to interact with the tool
 - Network socket for the protocol tested
 - Web service to call validation tool,
 - Dynamic access to coded value set

Simulator Architecture



Currently available simulators

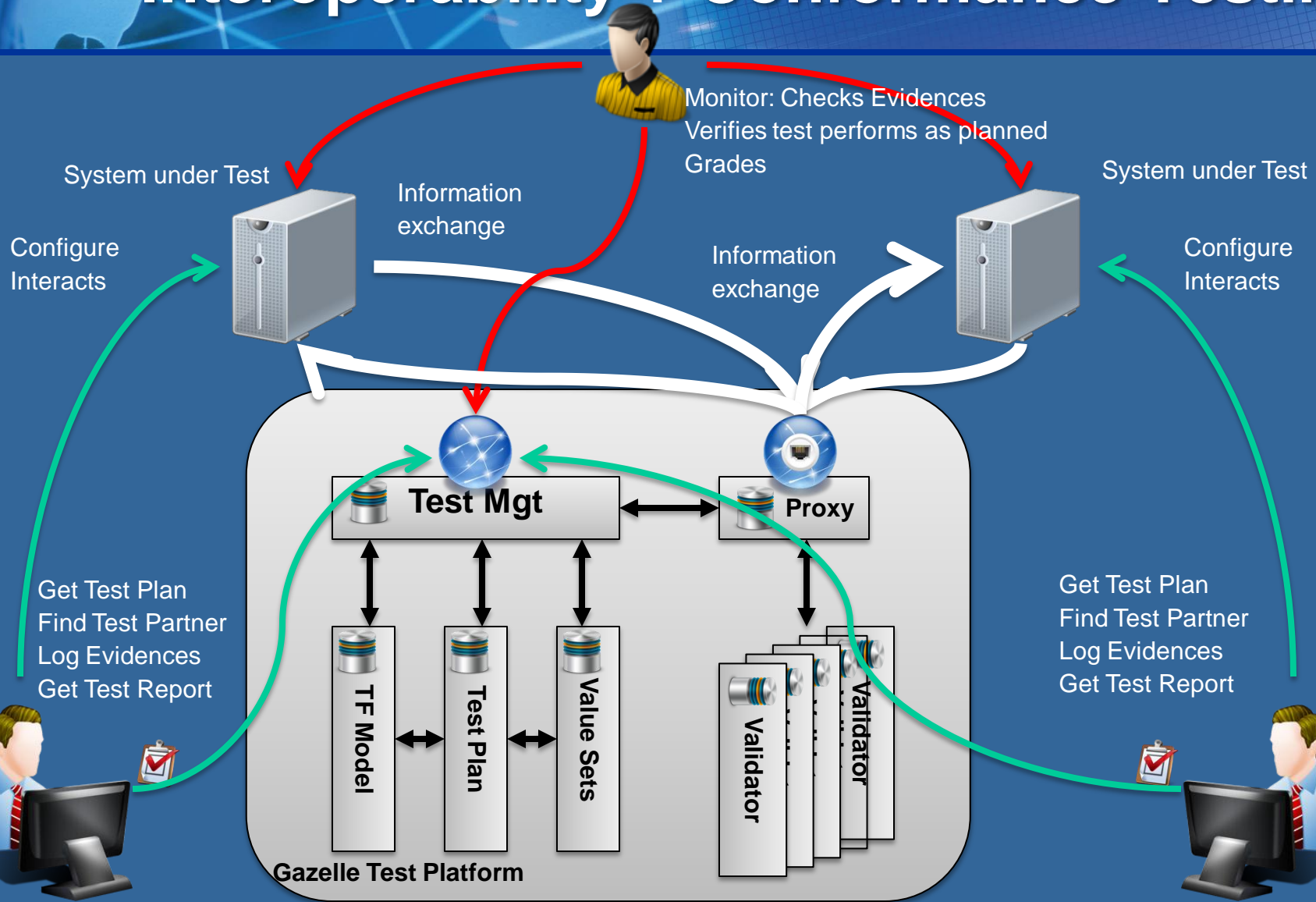
- **ITI**
 - PAM
 - PIX/PDQ
 - SVS
 - XD*
- **Laboratory**
 - LBL
 - LCSD
 - LTW
 - LAW
- **Radiology**
 - SWF (HL7-based transactions and worklist provider)
 - XDS-I (document consumer & document source)
- **Pharmacy**
 - HMW

TEST MANAGEMENT TOOL

Test Management Platform

- **Registration of systems**
 - What to test -> select test plan(s)
- **Provide list of test to perform**
 - Conformance testing (test to be executed before meeting the actual test partners)
 - Simulators + validators
 - Interoperability testing (test to be executed system to system)

Interoperability + Conformance Testing



- Capture messages before forwarding them
- Necessary for EVS services
- Today :
 - Dicom
 - HL7 V2
 - Webservices
- URL: <http://gazelle.ihe.net/proxy>

GAZELLE FIGURES

- **4 Running instances**
 - USA, Europe, Japan, Korea
- **20 FTE invested**
- **300 simultaneous users**
- **500 vendors using it**
- **541 test cases**
- **1000 users**
- **15000 CDA validation**
- **16000 test instances verified**

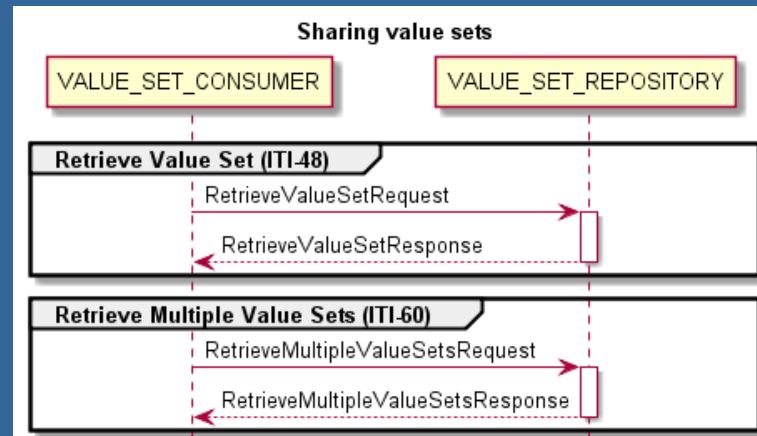
Demographic Data Server
Gazelle HL7v2.x Validator
SVS Simulator
Patient Manager
Order Manager

FOCUS ON SPECIFIC TOOLS

- **Generation of demographic data on the demand.**
 - Data available for a large set of countries
 - Provides names, address
- **User interface**
 - <http://gazelle.ihe.net/DDS>
- **Web service API**
 - Used by simulators
 - Used by Test Management for complex scenarii design (cross community access)

- **Gathers**
 - HL7 conformance profiles
 - HL7 tables
 - HL7v2.x validation based on conformance profile (uses HAPI library)
- **Web service API**
 - Input
 - Message to validate
 - Message profile
 - Some contextual data (not yet used)

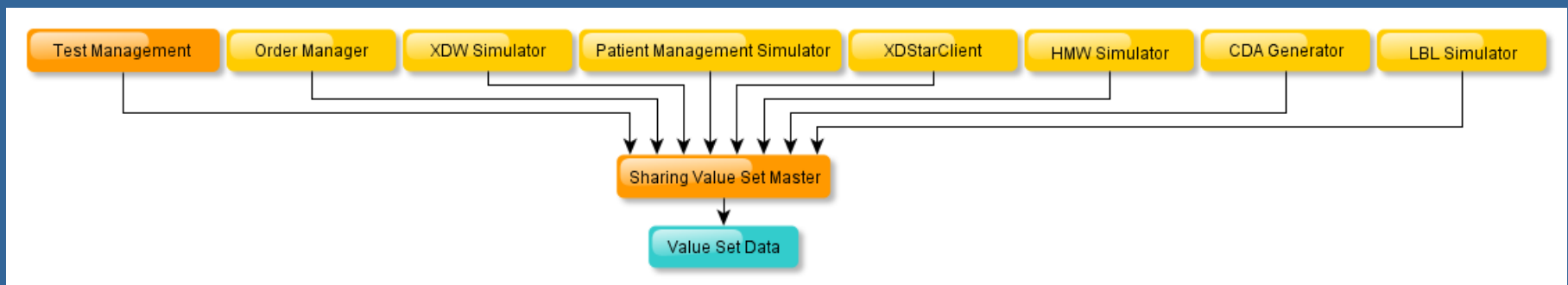
- ITI Sharing Value Set profile
 - Value Set Repository
 - Value Set Consumer



- Access the tool: <http://gazelle.ihe.net/SVSSimulator>

- **Extension developed for Gazelle needs**
 - Returns random concept from specific value set
 - <http://gazelle.ihe.net/RetrieveValueSetForSimulator?id=1.3.6.1.4.1.21367.101.103&random=true>
 - Returns concept knowing value set and code
 - <http://gazelle.ihe.net/RetrieveValueSetForSimulator?id=1.3.6.1.4.1.21367.101.103&code=A>

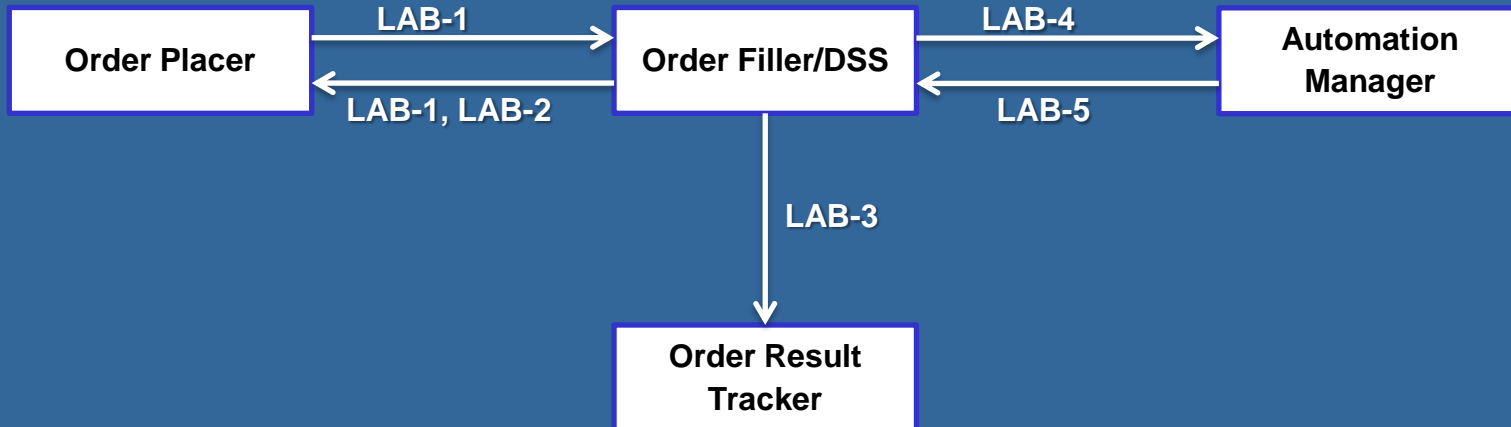
- **Examples of usage**
 - Populating a field of a message sent by a simulator
 - Checking a code is allowed (conformance testing)



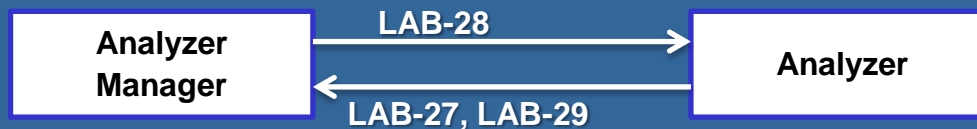
- **Integrates IHE profiles dealing with patient demographics and encounters**
 - Patient Administration Management (PAM)
 - Patient Demographics Query (PDQ)
 - Patient Identifier Cross-Referencing (PIX)
 - ADT actor involved in Radiology scheduled workflow
- **Testing SUT implementing one of those actors**
 - Interoperability: received messages are integrated (not only acknowledged)
 - Conformance: simulator is linked to HL7v2.x validation service

- **Purpose**
 - Cross-domain simulator
 - Management of
 - Patients
 - Radiology/Laboratory/Eye care orders
 - Laboratory work orders
 - Laboratory analytical work order steps
 - Laboratory results
 - Radiology/Eye care procedures
 - Radiology/Eye care modality work lists

Laboratory Testing Workflow



Laboratory Analytical Workflow



Internet testing for LAW profile

PRE-REQUISITES

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- Fix the version of the TF and CP to be used
- Review and update test cases
- Review and update simulator (LAW part of Order Manager) and HL7 conformance profiles
- Plan training on how to use Gazelle (webex)
- Plan the testing session (When ? How long ?)
- Create a new Internet testing session in Gazelle
- Register systems and enter their configurations within Gazelle
- Find monitors to review performed tests



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