Building a Protocol validator for B2B Communications

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Protocol validator | Agenda

- Business problem
- Solution
- Architecture
- Building (certificates)
- Issues encountered
- Lessons learned

Validator | The business problem

- Deregulation of the Dutch Utility market

- Communication structure transition
  - Peer to Central
  - Peer-to-Peer

- How do we make sure this is working ?

Solution | Certification

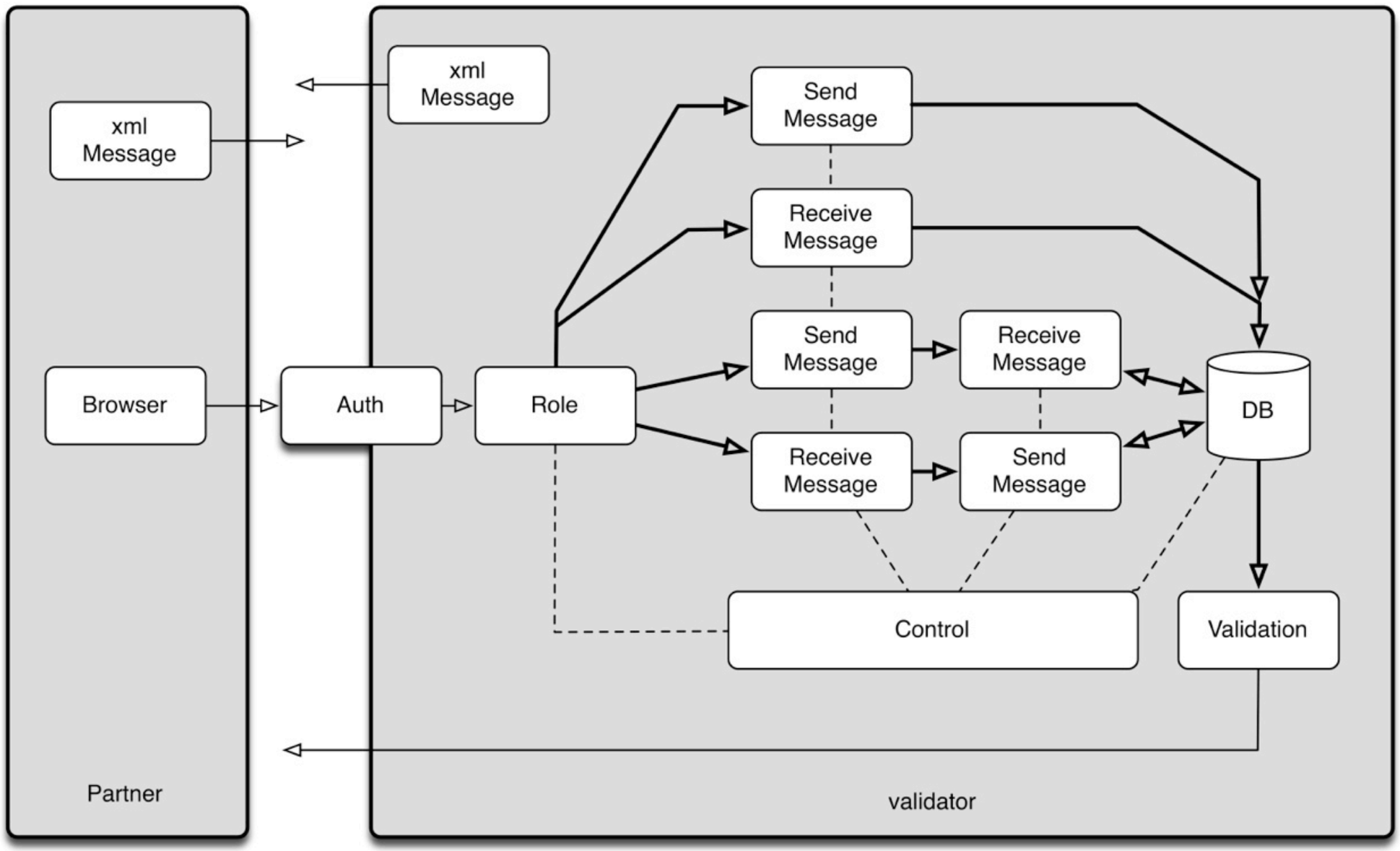
- Make sure all comms work
  - Certify **all** communication paths

- One central place for certification
  - All peers need to obtain certification
  - Protocol run-through
  - Both directions

Validator | Certification machine

- Define the protocol
  - Define the test set (roles)
- Establish a PKI
- Build the infrastructure and software
- Have all partners go through the procedure
  - All peers need to obtain certification

Validator | The Workflow



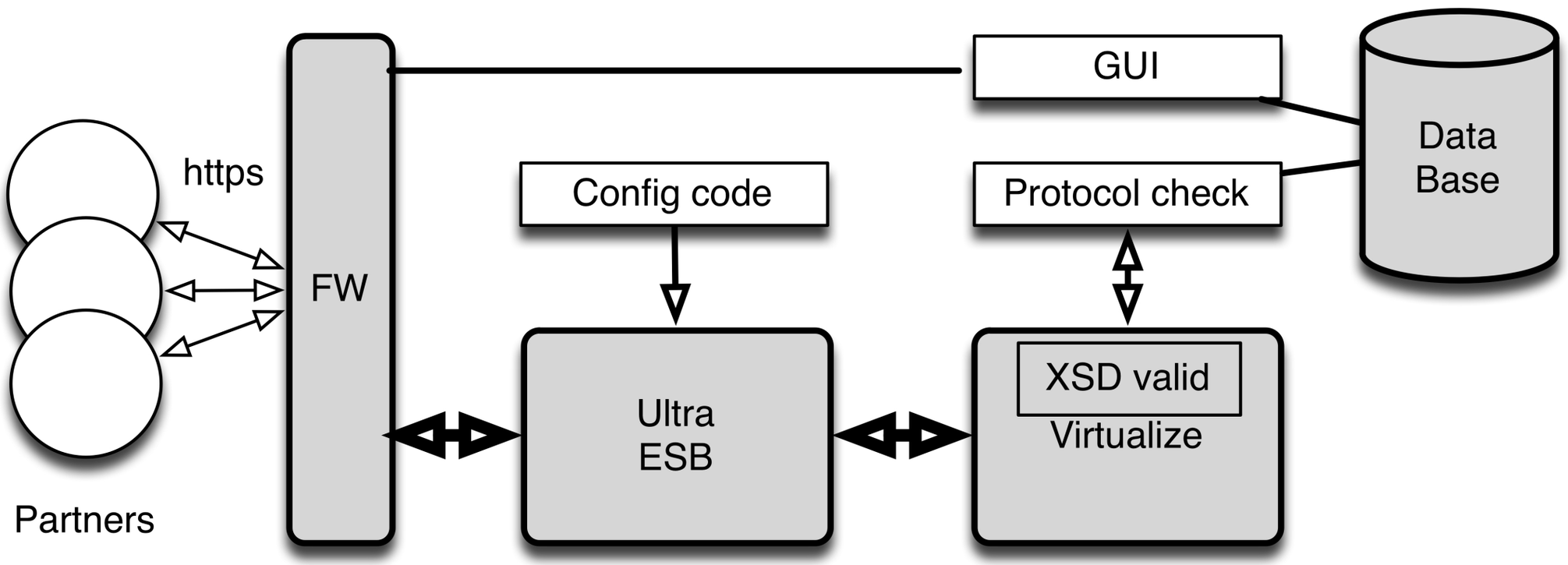
Validator | Protocols

- Message standard
  - Messages are encoded in XML
  - Transported over as2 (MIME encoded)
    - Authentication and Encryption
  - Wire protocol: https

System | Components

- Frontend
  - Ultra ESB (Adroitlogic)
    - Open Source Enterprise Service Bus
- Validator
  - Virtualize (Parasoft)
  - Service virtualization component
- Protocol analyzer: custom Python
- GUI: custom Java

System | Architecture



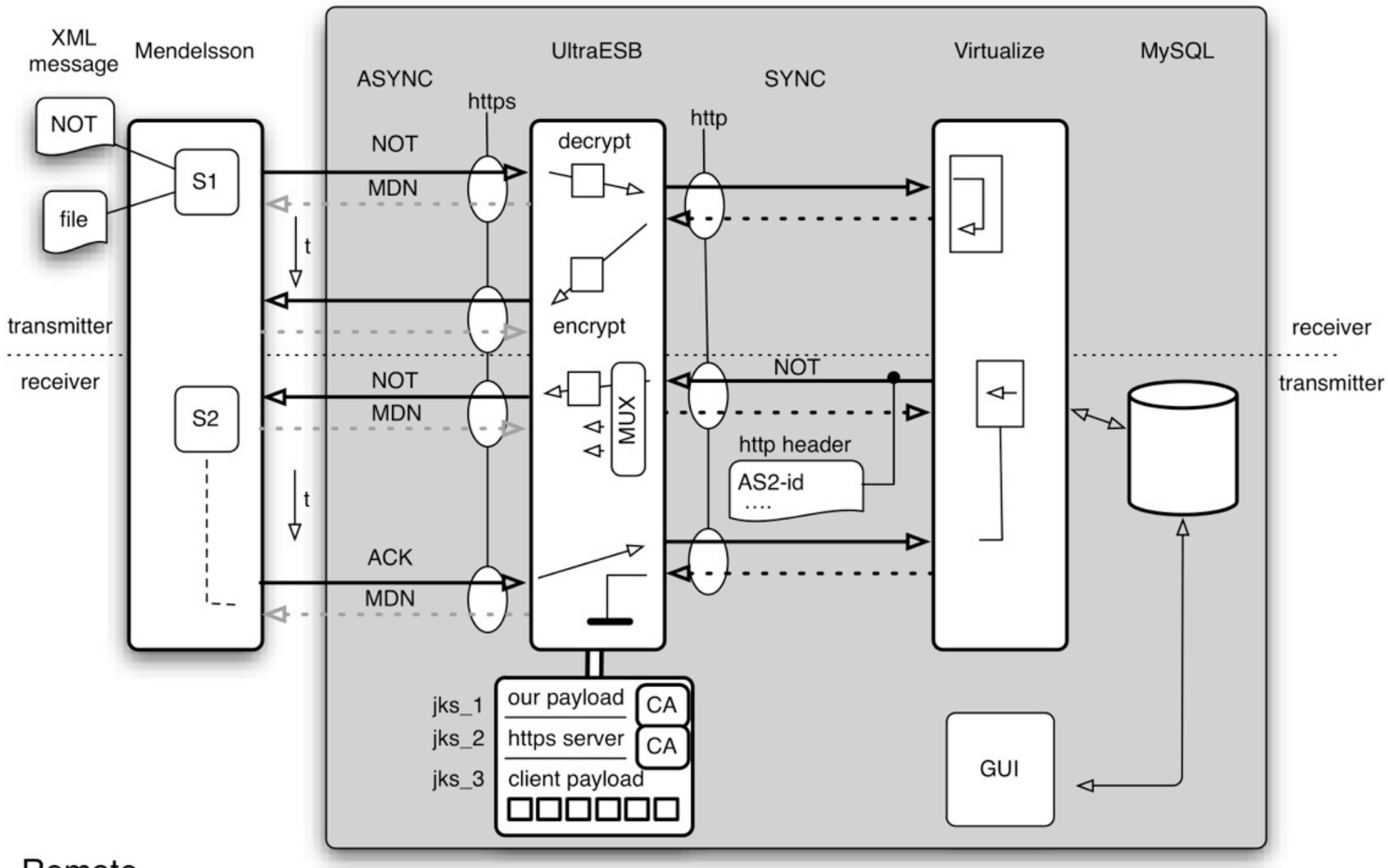
System | Infrastructure

- Windows 2008 server
- MySQL
- Eclipse
- Python
- Firewall tools

Validator | Tooling

- Eclipse development environment
- Mendelsson as2 simulator
- Keystore Explorer

Validator | Total System



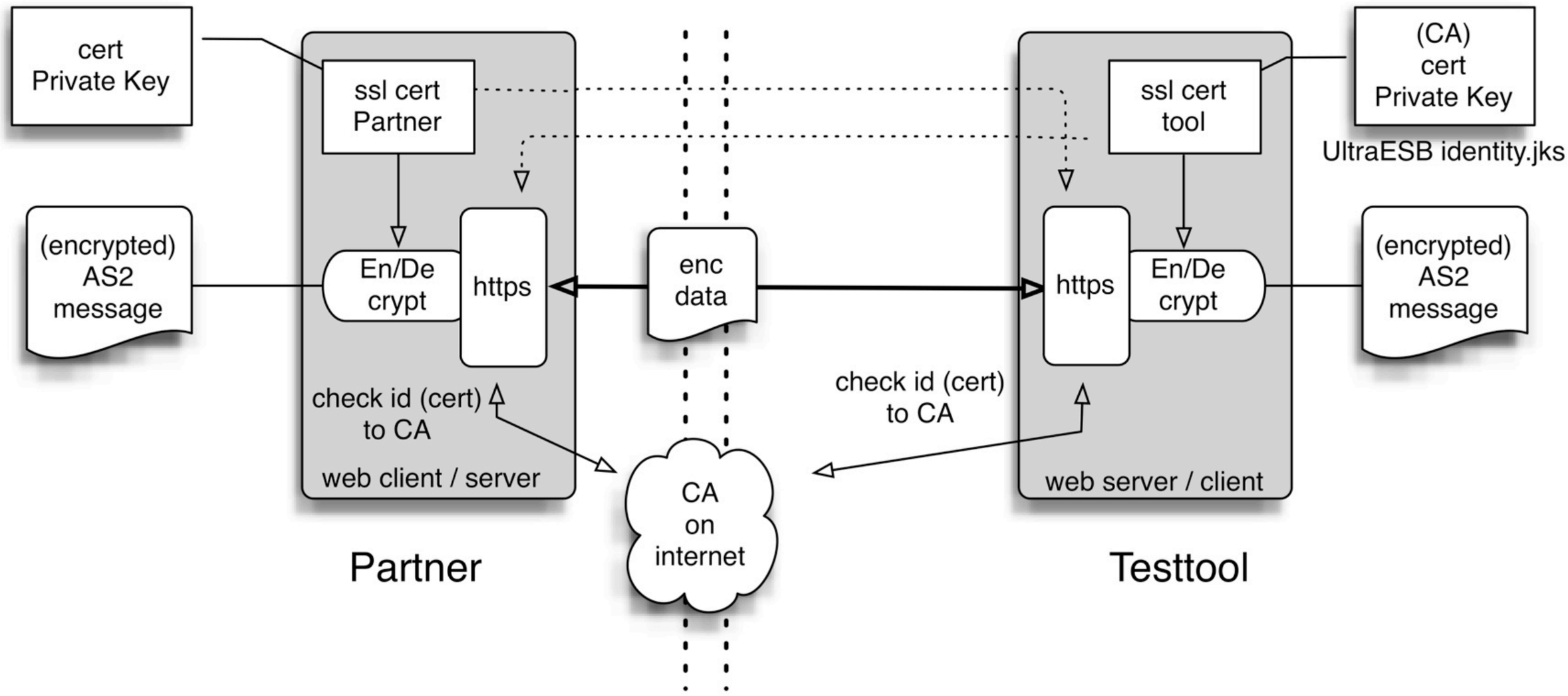
Building | Problems encountered

- sync / async messages
  - extra http header (gnd)
- Sequence of messages
  - validator code / database
- PKI
  - certificate aliases
  - multiple levels / keystores

Building | Certificates (1)

- Wire level
  - https server certificate
    - data (as2 endpoint) channel
    - control (web portal) channel
- Global PKI and CA
  - Authentication of server
  - Encryption of data

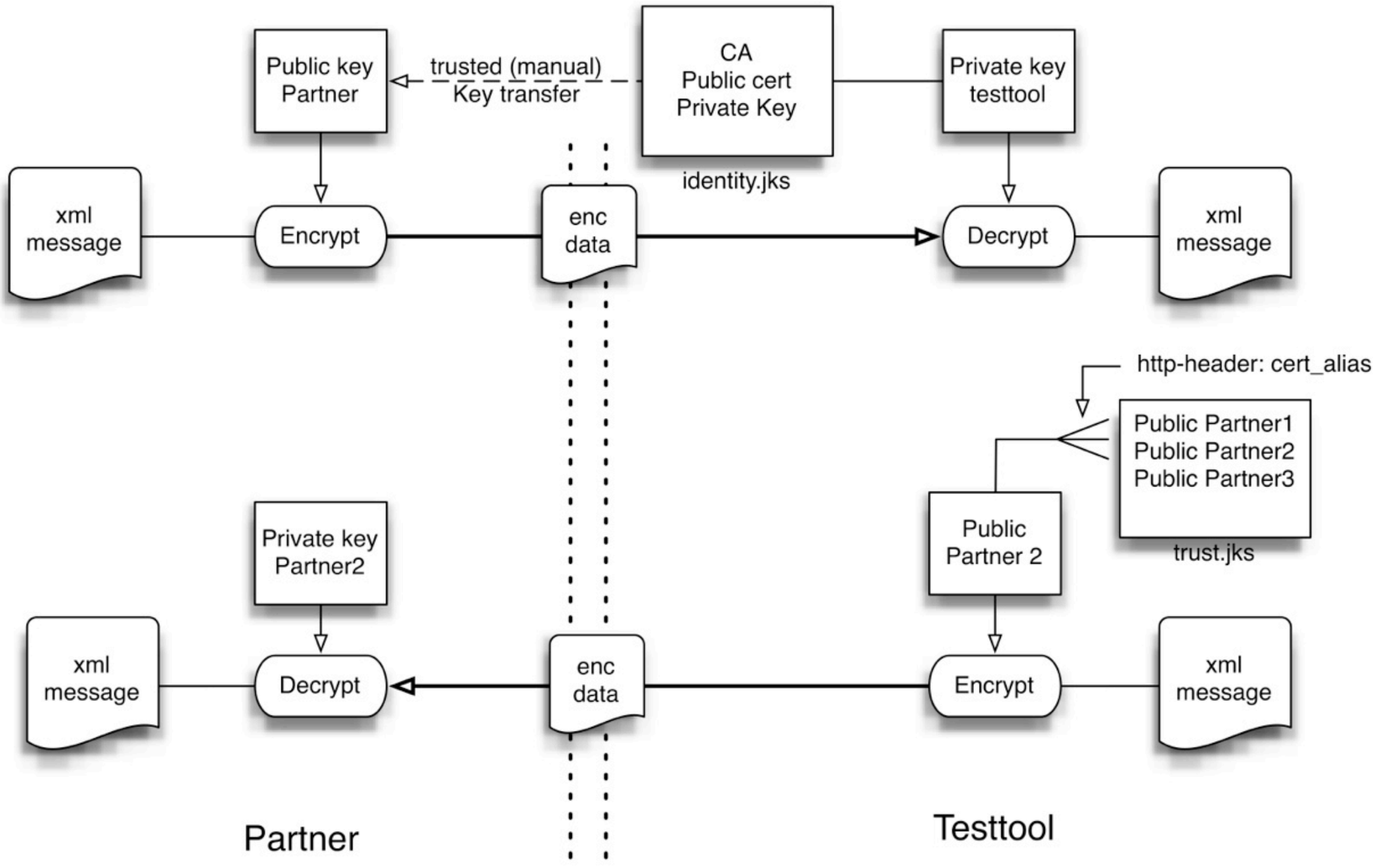
Validator | ssl



Building | Certificates (2)

- as2 level
- Private PKI
  - Authentication of trading partner
  - Encryption of the payload
    - MIME encoding
  - Make sure the partner has the right CA

Validator | Certificates



Building | Setup

- Test using Mendelsson
  - as2 simulator
    - Technical connection test
      - connect to frontend bus
      - send an (encrypted) message
      - receive an (encrypted) message
- Management of keystores
  - different keystores, different certificates, aliases

Building | Experiences

- Rapid prototyping
  - Off-the-shelf components
  - Not much coding needed

- Protocol was not completely fixed
  - Definition of test messages (xml)
  - Definition of test scenarios (sequence)

Building | Experiences

- Certificates
  - 2 levels
    - 2- step debugging
- PKI is difficult to understand
  - Certificate aliases

Building | Experiences

- Fast turn-around time
  - 3 weeks from start to prototype

- Communication to a lot of partners
  - Different backends

- Bugs in the components
  - Java logging / messages

Building | Lessons learned

- Architecture is important
  - modular design
  - reuse in mind
- COTS components
  - selection of the components
- XSD changes
- PKI

Building | Lessons learned

- Infrastructure
  - readyness, completeness
- Time schedule
  - Allow for debugging while in operation
- External partners
  - All wait until the last moment to get certified
  - All have different systems
  - Communication

Building | Summary

- Validating B2B communications in a deregulated utility business
  - Rapid prototyping using COTS
  - Flexible in Protocol
    - re-usable
    - **Generic** system for protocol validation

- As of 11/20/2012 all partners (>36) certified.

Questions | Lessons learned

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