Accada – Open Source EPC Network Prototyping Platform

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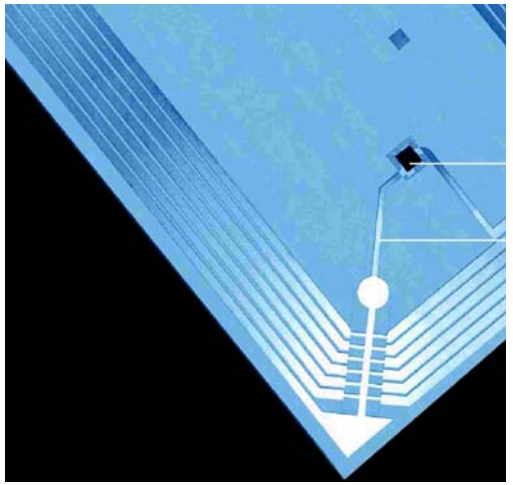
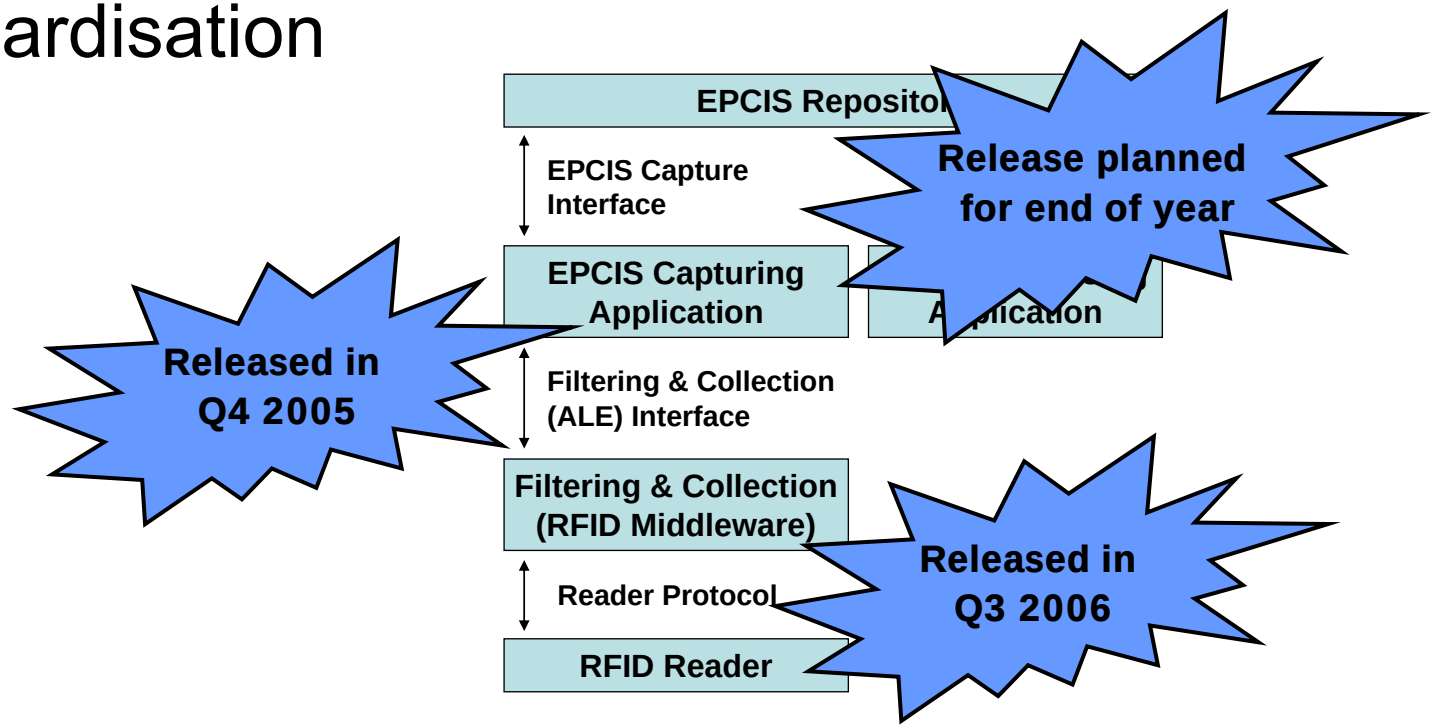


Introduction

- There has been a lot of progress in the EPCglobal community on EPC Network standardisation



Accada Objective

- Develop an open source RFID prototyping platform that implements the EPC Network specifications
  - To foster the rapid prototyping of RFID applications

- Target groups:
  - EPC Network Novices
    - Illustrate functionality with simple showcases
  - Researcher & Students
    - Provide common codebase for experimental software
  - Application Developer
    - Provide tools to facilitate development

Background

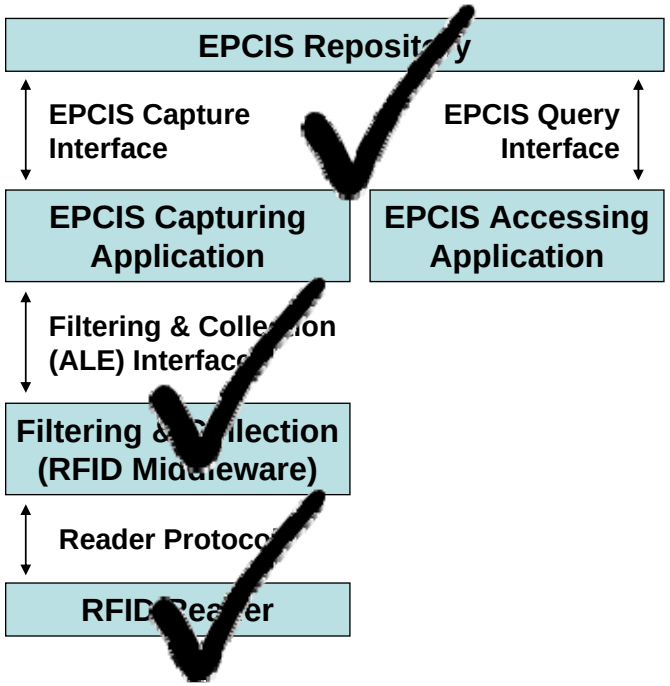
- Based on RFID middleware work started at the Swiss lab back in 2003 in the days of the Auto-ID Center
- Initial version implemented PML, which was developed within the lab

→Initiated by the Auto-ID Lab St. Gallen/ETH Zurich, but it is today an independent open source effort

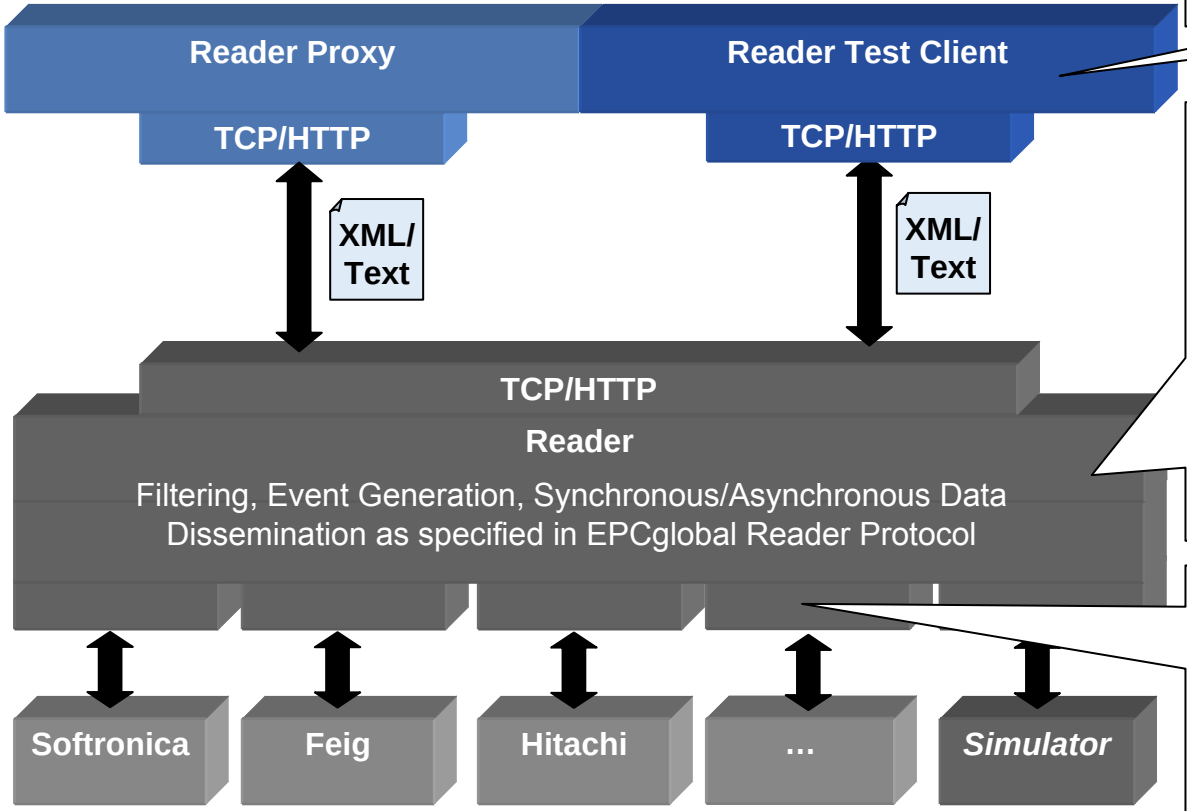
- With contributions from:
  - other Auto-ID Labs
  - external open source developers

Status

- Accada currently features three modules
  - EPCIS
  - Filtering & Collection Middleware
  - Reader



Reader Module

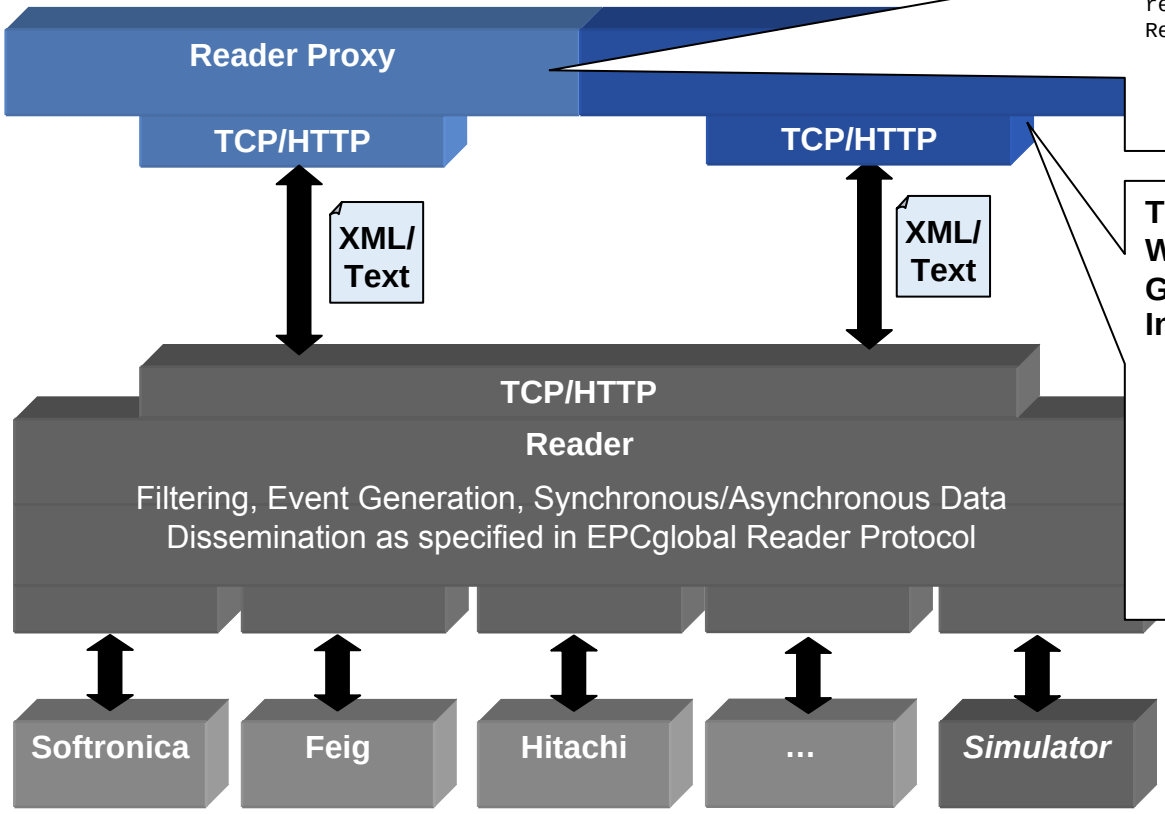


Tool Support:
- Java Proxy Library
- Graphical Test Client

Implements All Mandatory and Optional Features of the EPCglobal Reader Protocol Version 1.1:
- TCP and HTTP Transport Binding
- XML and Text Message Binding
- Tag Filtering
- Event Generation
- Notification Channels

Can be used in three modes:
- Surrogate
- Simulation
- Embedded

Reader Module

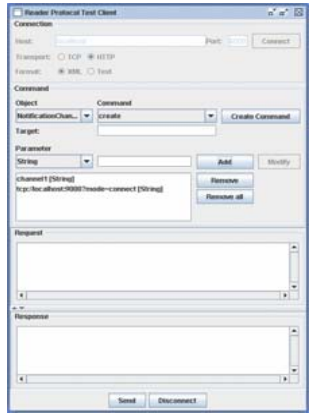


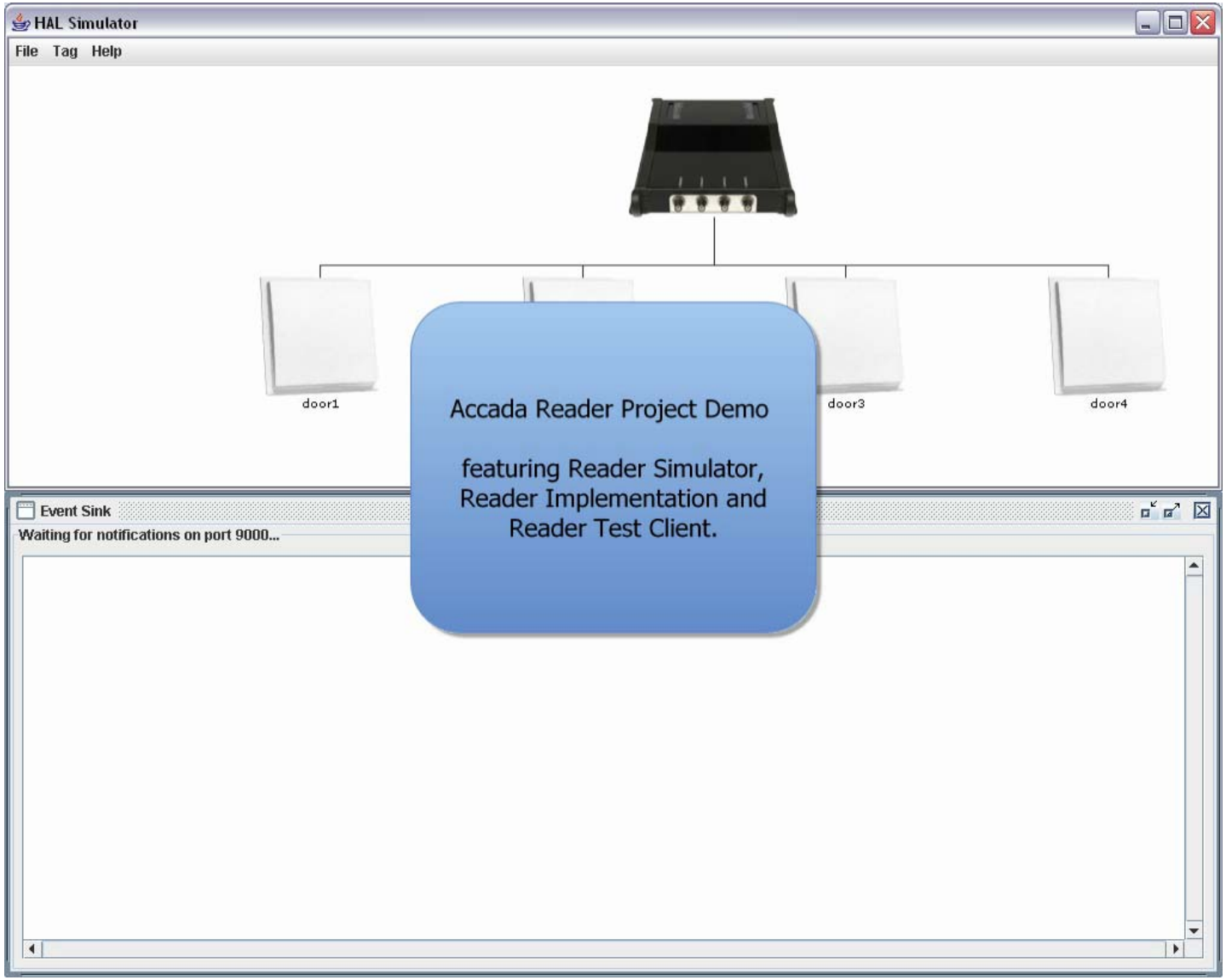
Reader Proxy – Java Interface to facilitate communication

```
// init handshake
Handshake handshake = new Handshake();
handshake.setTransportProtocol(Handshake.HTTP);
handshake.setMessageFormat(Handshake.FORMAT_XML);

// get reader device
readerDevice =
ReaderDeviceFactory.getReaderDevice(HOST,
                PORT, handshake);
```

Test Client With Graphical User Interface



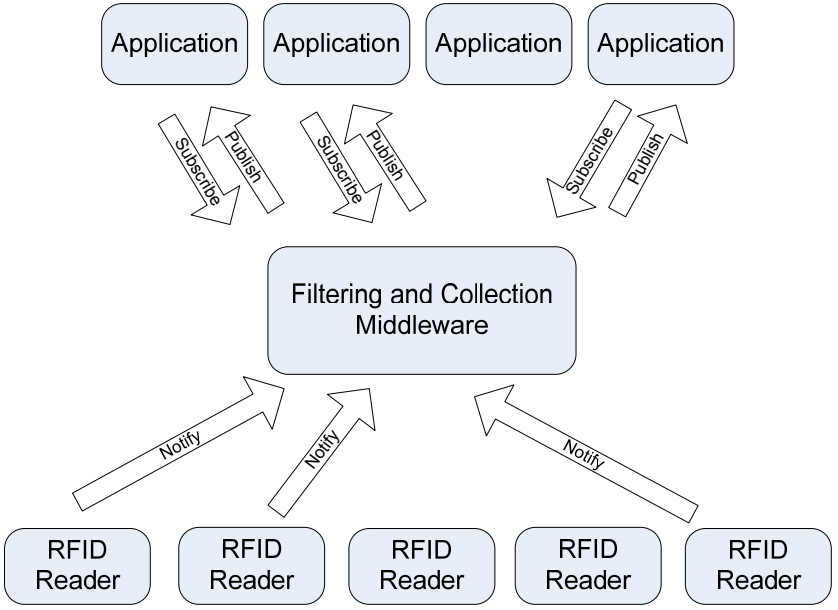

HAL Simulator
File Tag Help
door1
door3
door4
Accada Reader Project Demo
featuring Reader Simulator, Reader Implementation and Reader Test Client.
Event Sink
Waiting for notifications on port 9000...

USPs…

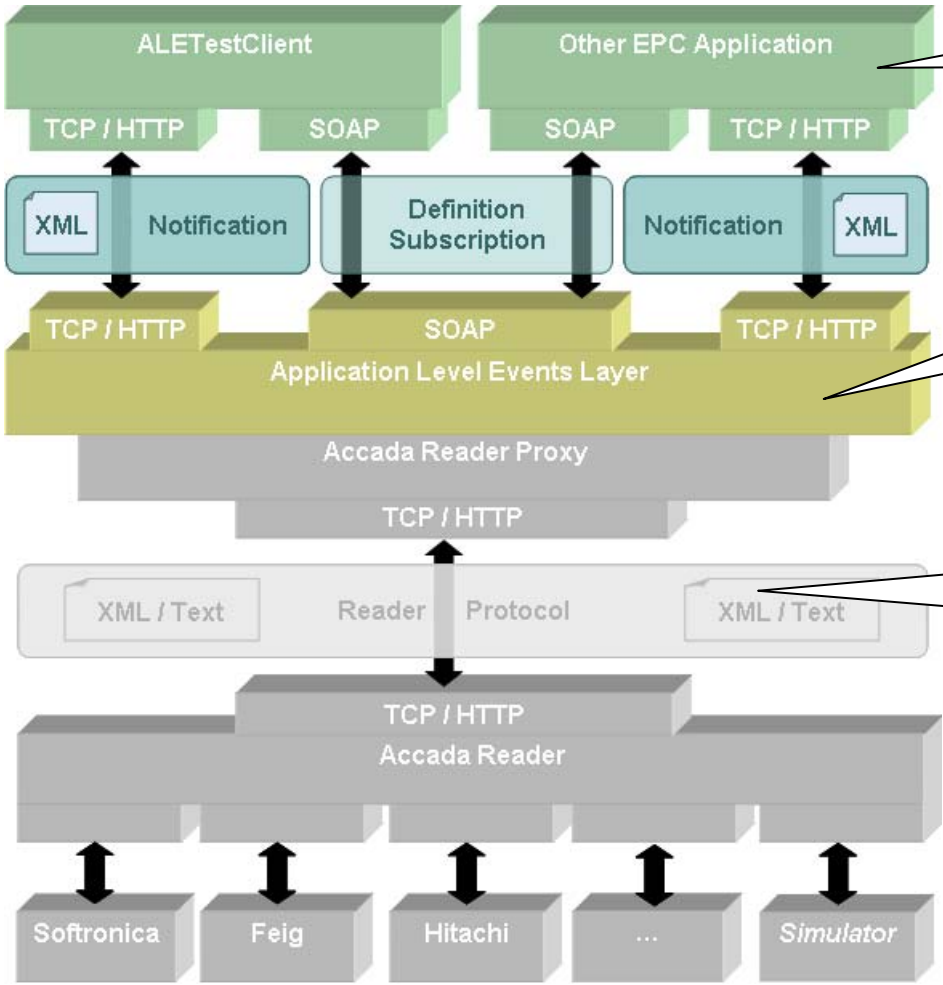
- Easy way to explore EPCglobal Reader Protocol Features
  - Use simulation engine
- Accelerated application development
  - No need to deal with low-level message transport bindings because of Java Reader Proxy
  - Use simulation framework without RFID hardware
  - Make readers speak the EPCglobal Reader Protocol with our reader module
- ….

Filtering & Collection Middleware Module

- Need to aggregate information across readers



Middleware Module

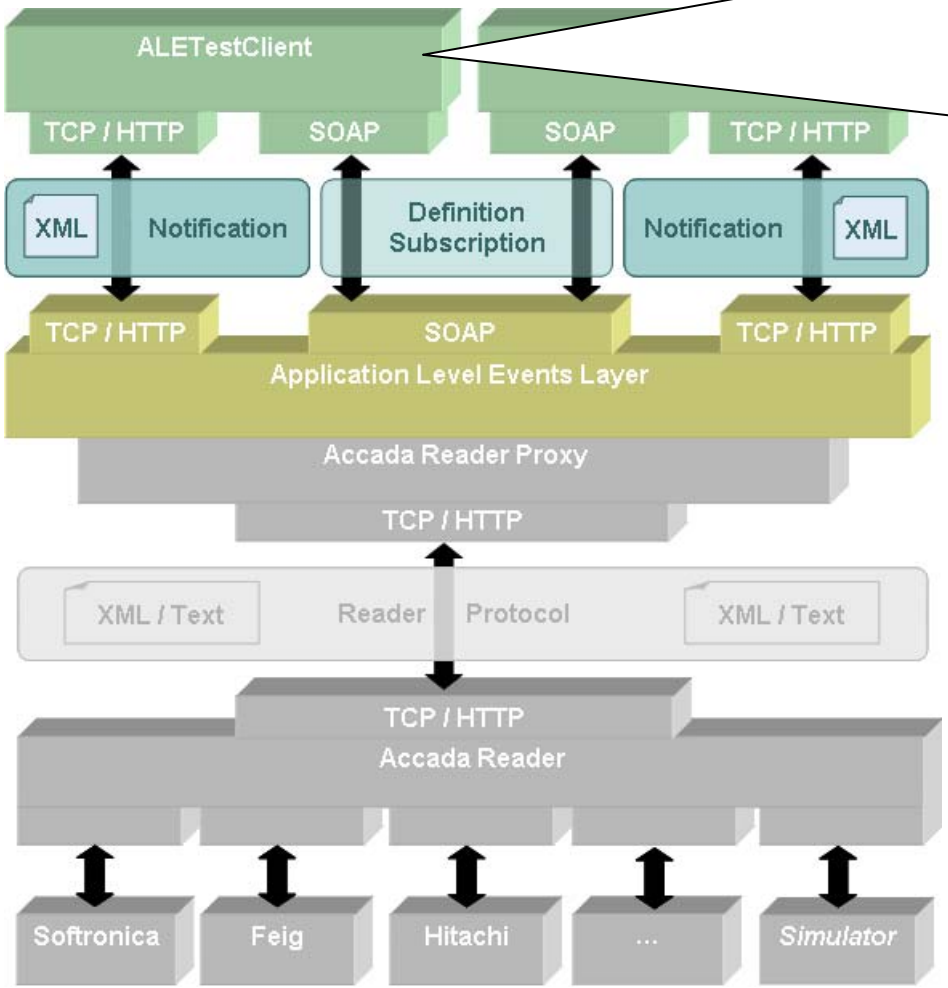


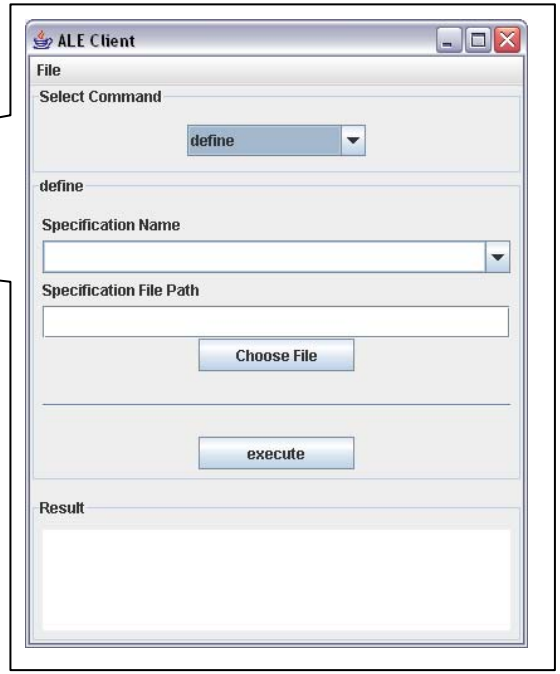
Tool Support:
- Web/Java Test Client
- ALE Proxy

Implements EPCglobal Application Level Events Specification Version 1.0:

Uses EPCglobal Reader Protocol to communicate with readers (Accada Reader module shown here)

Middleware Module





USPs.....

- Explore ALE Middleware functionality with our demos
- Simplify application development by combining Accada reader simulation framework with Accada middleware
- Test other ALE implementations with Accada ALE Test Client

Overview

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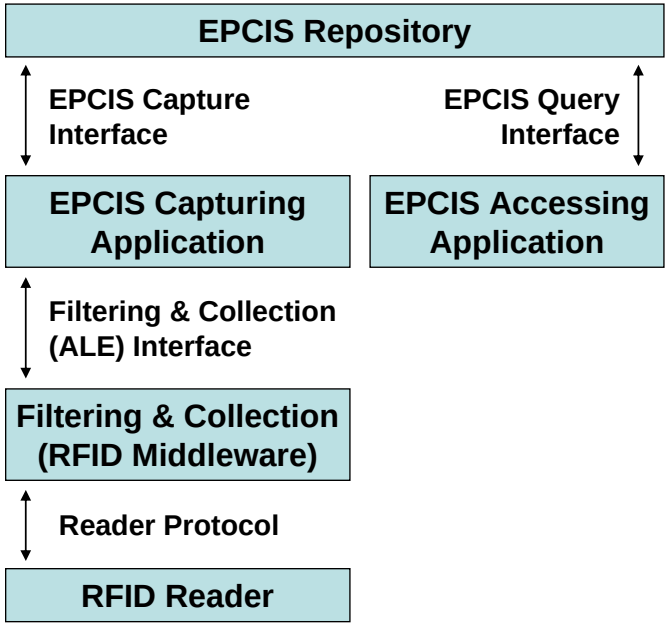
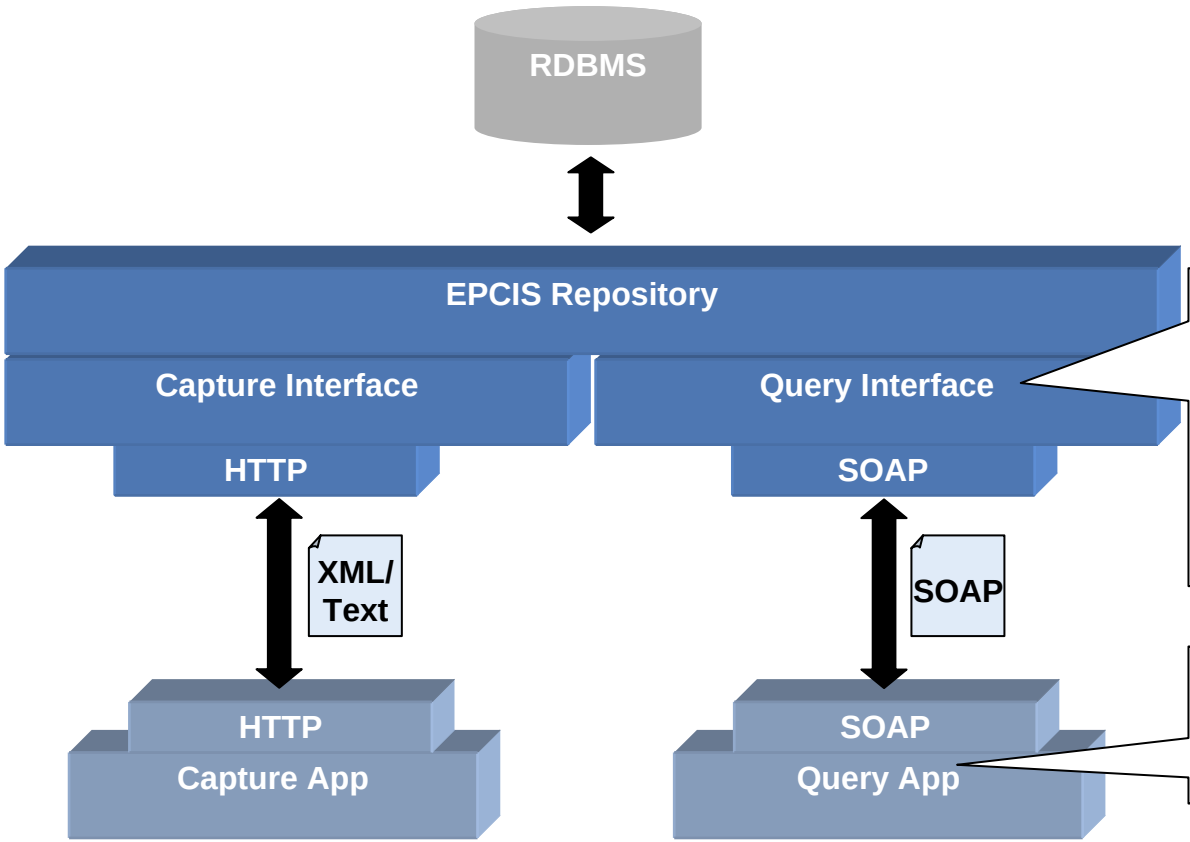
  - Filtering & Collection Middleware
  - Reader



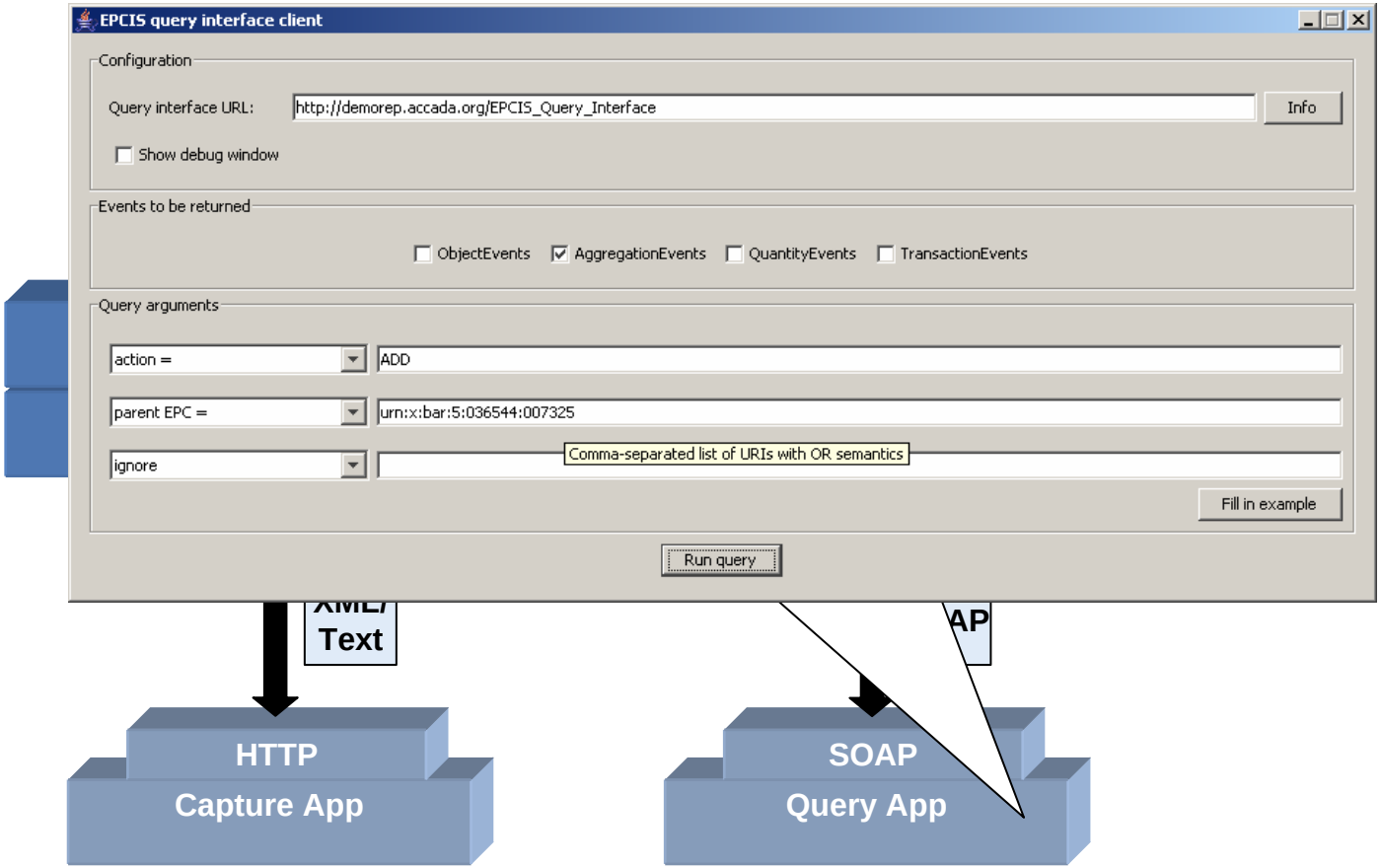
EPCIS module



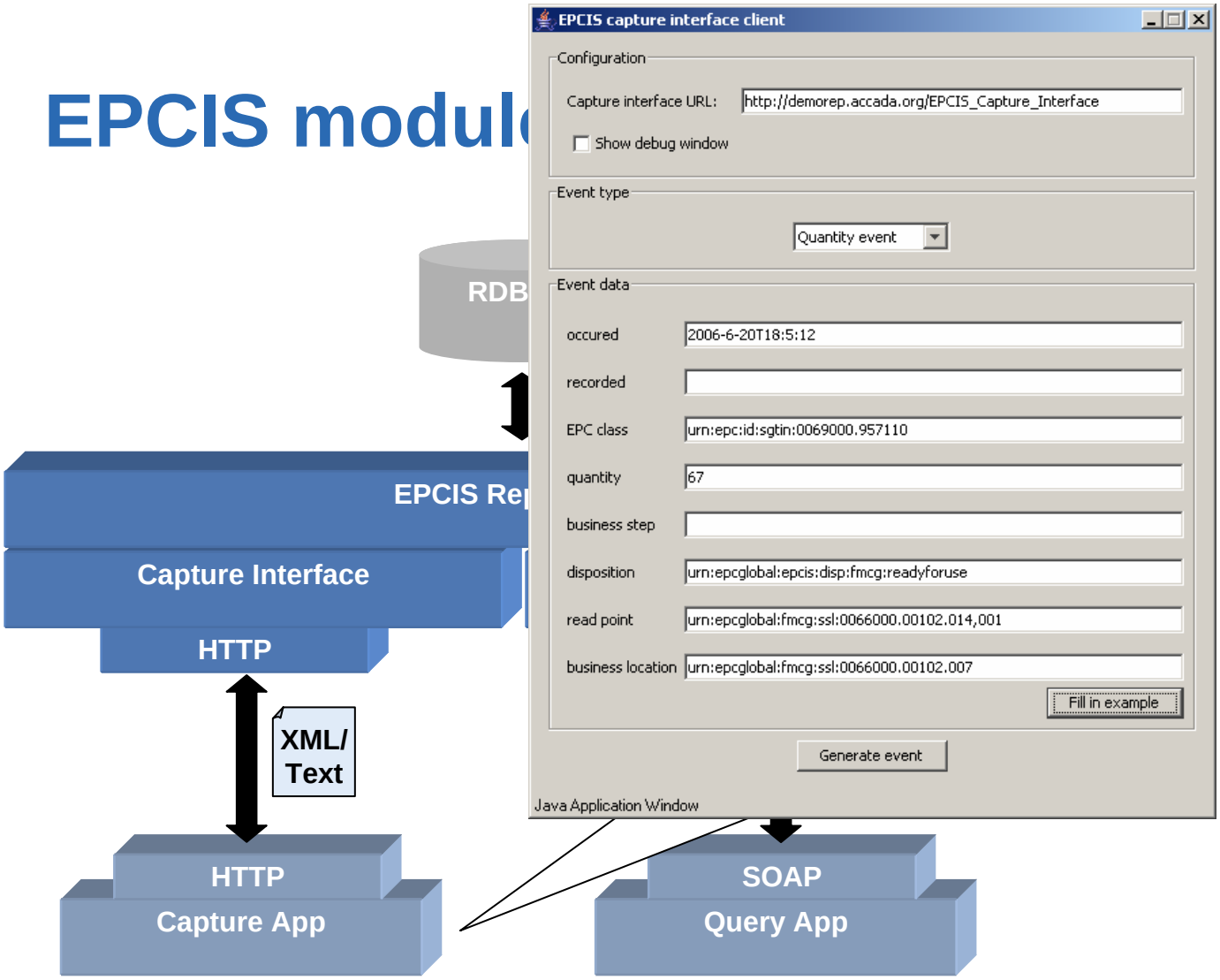
Accada EPCIS Repository implements Capture and Query Interfaces
- No master data queries yet
- Latest features not implemented yet

Two Sample Query and Capture Apps

EPCIS module



EPCIS modul


RDB
EPCIS Re
Capture Interface
HTTP
XML/
Text
HTTP
Capture App
SOAP
Query App
EPCIS capture interface client
Configuration
Capture interface URL:
http://demorep.accada.org/EPCIS_Capture_Interface
Show debug window
Event type
Quantity event
Event data
occured
2006-6-20T18:5:12
recorded
EPC class
urn:epc:id:sgtin:0069000.957110
quantity
67
business step
disposition
urn:epcglobal:epcis:disp:fmcg:readyforuse
read point
urn:epcglobal:fmcg:ssl:0066000.00102.014,001
business location
urn:epcglobal:fmcg:ssl:0066000.00102.007
Fill in example
Generate event
Java Application Window

Release Status

- Reader Module
  - Released alpha version as source and binary (Under BSD License)
  - Tested against conformance spec
- Middleware Module
  - Released alpha version as source and binary (Under BSD License)
  - Tested against conformance spec
- EPCIS Module
  - No source or binary released because spec is not released and not public yet
  - Online sample version only
  - Not tested against conformance spec (not available yet)

Next Steps

- Next major release will feature
  - Reader Management
  - Tag Data Translation
  - Improved Legacy Reader Support
- Certification of Reader and Middleware implementation

Project Information

- Based on Open Source Best Practises
  - Subversion Version Control
  - Maven Build Management
  - JUnit Unit Testing
  - Checkstyle Coding Standards
- Project & Development Team
  - Currently 5 full-time developers plus various part-time

Success Stories So Far

- Contribute 10+ Errors and Bugs to EPCglobal Reader Protocol Working Group
- In Use in 6 Different Research Groups
- Adopted By RFID Integrator for Rapid Prototyping Purposes
- Used in the BRIDGE Project – European Union sponsored RFID Research Project

Conclusion

- Open source EPC Network Prototyping Platform
- Three Accada modules currently available:
  - Reader
  - Middleware
  - EPCIS
- Goal: Completed EPC Network Implementation by December 2006
  - Featuring also Reader Management & Tag Data Translation

More information at:
www.accada.org

Accada

EPC Network Prototyping Platform