ASPIRE Tools and IDE

Athens Information Technology

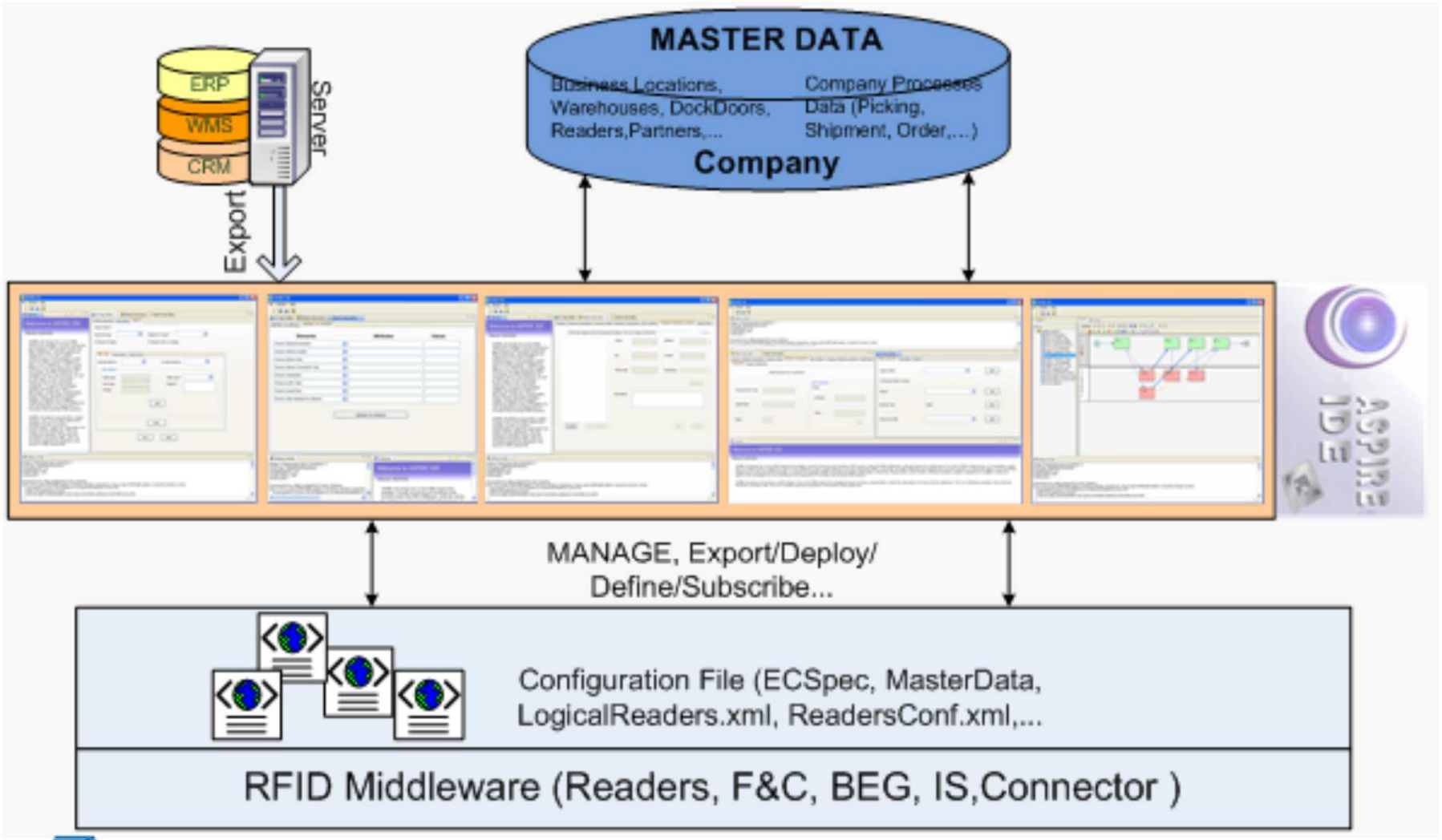
ASPIRE Tools

- ASPIRE has developed
  - A number of tools easing the development and configuration of RFID solutions
  - The tools are integrated in a single IDE for RFID solutions that can be added or removed as needed (plug-ins)

ASPIRE IDE

- Based on Eclipse RCP architecture
- Open and Extensible
- Versatile/Customizable to different needs and solutions
  - E.g., It can host from one-to-many tools
- The “Housing” for Integrating the various tools (plug-ins)

ASPIRE IDE Tools



ASPIRE IDE Tools

- ASPIRE IDE Management/Configuration Console
- Physical Reader Configuration Editor
- LR Spec Configurator
- Logical Reader Editor
- EC Spec Configurator
- EC Spec Editor
- ALE Configurator
- BEG Configurator
- Master Data Editor
- Business Process Workflow Editor
- Connector Editor/Configurator
- Debugging Capabilities

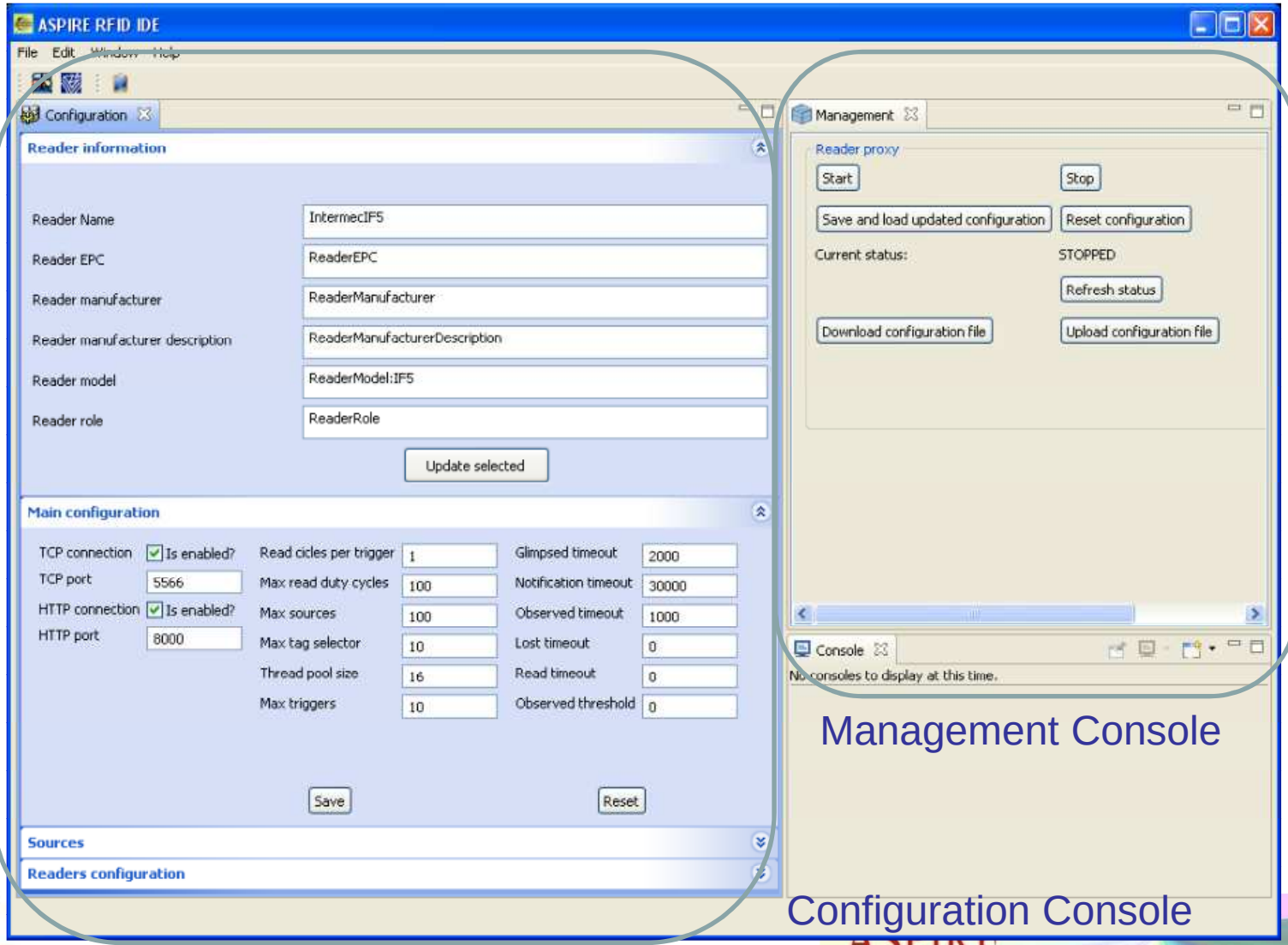
ASPIRE IDE Management Console (1)

- Based on JMX
  - Displays the current status of the *Reader Core proxy* component
    - DISCONNECTED
    - STOPPED
    - STARTED
- Refresh status
- Start / Stop
  - Starts/stops reader proxy operation

ASPIRE IDE Management Console (2)

- Reset configuration
  - Delete changes to the proxy
  - Restore the default configuration file
- Download configuration file / Upload configuration file
  - Backup/restore configuration as an XML file
- Save and load updated configuration
  - Load changes at runtime

ASPIRE IDE Management Console (3)



Management Console

Configuration Console

JMX Configuration Console (1)

- Inputs a valid, operational URL
- Changes are loaded when 

button is hit in the Management Console
- Reader Information
  - Identify the reader
  - Reader name is used by the F&C module to identify proxy

JMX Configuration Console (2)

- Main configuration
  - General purpose parameters
  - Defined in EPCglobal Reader Protocol v1.1
  - Default values should work in most of the cases
- Sources
  - Access a group of read points
  - Add new ones

JMX Configuration Console (3)

- Readers configuration
  - Add reader to the configuration
  - Add read point: for this reader
  - Clear fields
  - To edit a reader, first select it from the *Existing Readers* drop-down list

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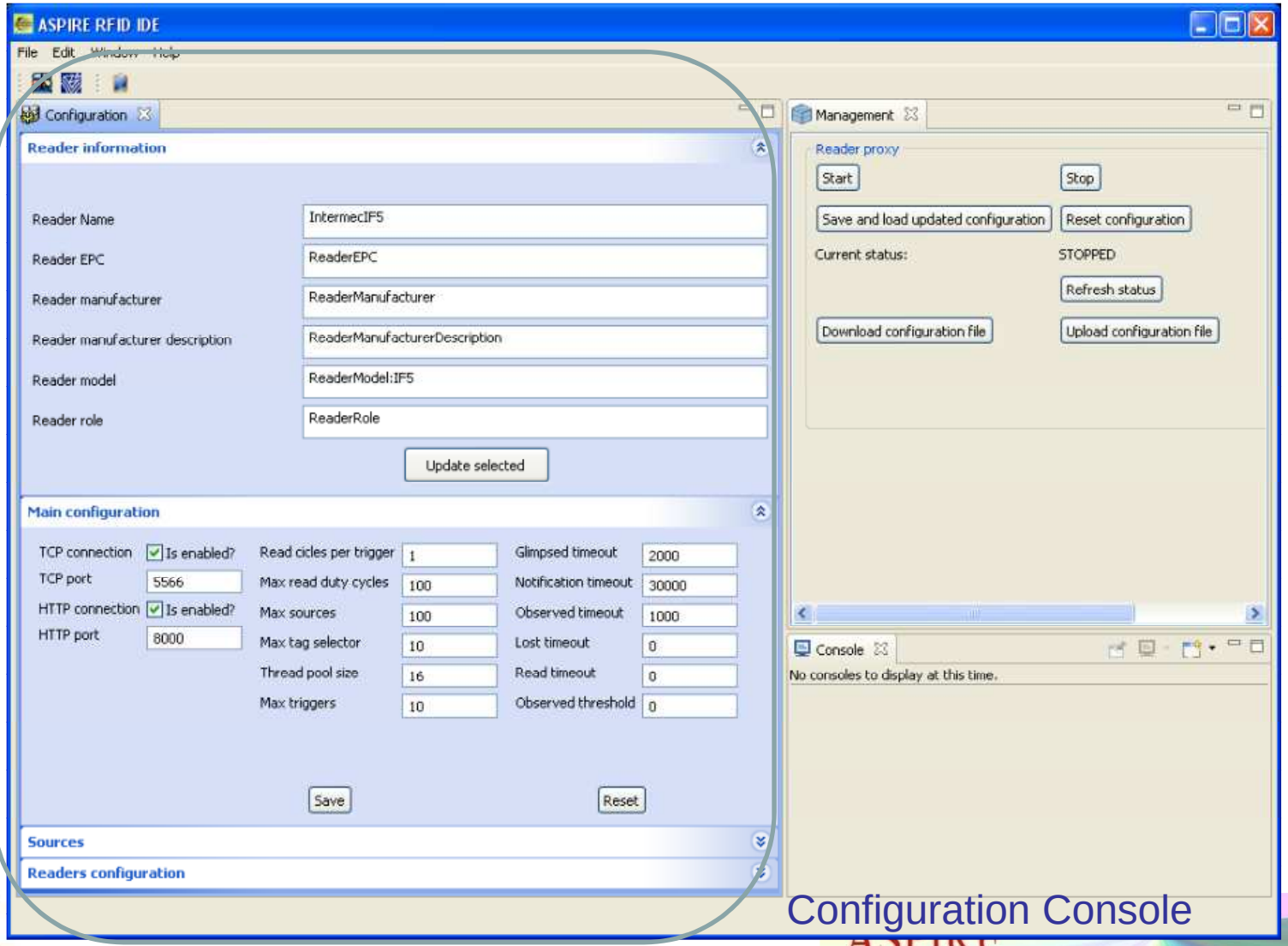
Physical Reader Configuration Editor (1)

- Physical Readers Management/Configuration Plug-In
  - Configure and manage physical readers across different vendors and models
  - For use with the AspireRfid Reader Core module
  - User can define reader metadata
    - Name, EPC, manufacturer, description, role

Physical Reader Configuration Editor (2)

- Physical Readers Manager/Configurator Plug-In
  - Through the JMX Management/Configuration Console
  - Define Technical Characteristics
    - Http or Tcp connection and port
    - Read Cycles per Trigger
    - …
    - as defined in the EPCglobal Reader Protocol standard

Physical Reader Configuration Editor (3)



Configuration Console

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LR Spec Configurator (1)

- Logical Reader Specifications Configurator Plug-In
  - Create/edit Logical Readers (static, dynamic and composite)
  - Define, subscribe and manage Logical Readers at the ALE level
  - “Hide” from upstream layers the details of how readers are physically configured

LR Spec Configurator (2)

- Supports
  - Reader Protocol
  - Low Level Reader Protocol
  - Hardware Abstraction Layer
  - Composite readers
- Provides a graphical interface for the EPC-ALE methods

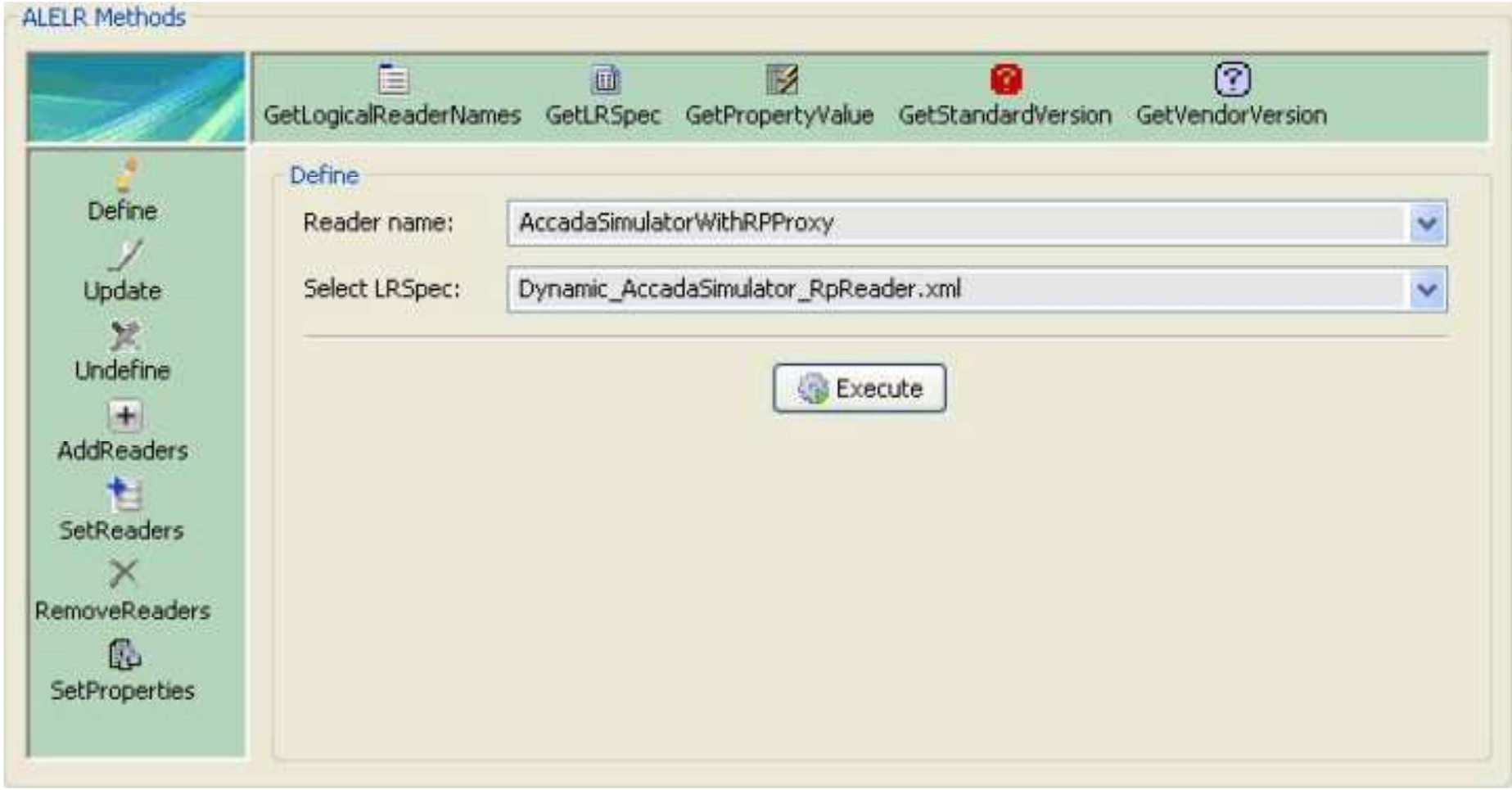
LR Spec Configurator (3)

Service Name	Input	Info
Define	name : String spec : LRSpec	Creates a new logical reader named name according to spec.
Update	name : String spec : LRSpec	Changes the definition of the logical reader named name to match the specification in the spec parameter.
Undefine	name : String	Removes the logical reader named name.
AddReaders	name : String readers : List<String>	Adds the specified logical readers to the list of component readers for the composite logical reader named name
SetReaders	name : String readers : List<String>	Changes the list of component readers for the composite logical reader named name to the specified list.
RemoveReaders	name : String readers : List<String>	Removes the specified logical readers from the list of component readers for the composite logical reader named name
SetProperties	name : String properties : List<LRProperty>	Changes properties for the logical reader named name to the specified list

LR Spec Configurator (4)

Service Name	Input	Info
getLogicalReaderNames	-	Returns an unordered list of the names of all logical readers that are visible to the caller
getLRSpec	name : String	Returns an LRSpec that describes the logical reader named name
getPropertyValue	name : String propertyName : String	Returns the current value of the specified property for the specified reader, or null if the specified reader does not have a property with the specified name
getStandardVersion	-	Returns a string that identifies what version of the specification this implementation of the ALE Logical Reader API complies with
getVendorVersion	-	Returns a string that identifies what vendor extensions of the ALE Logical Reader API this implementation provides

LR Spec Configurator (5)



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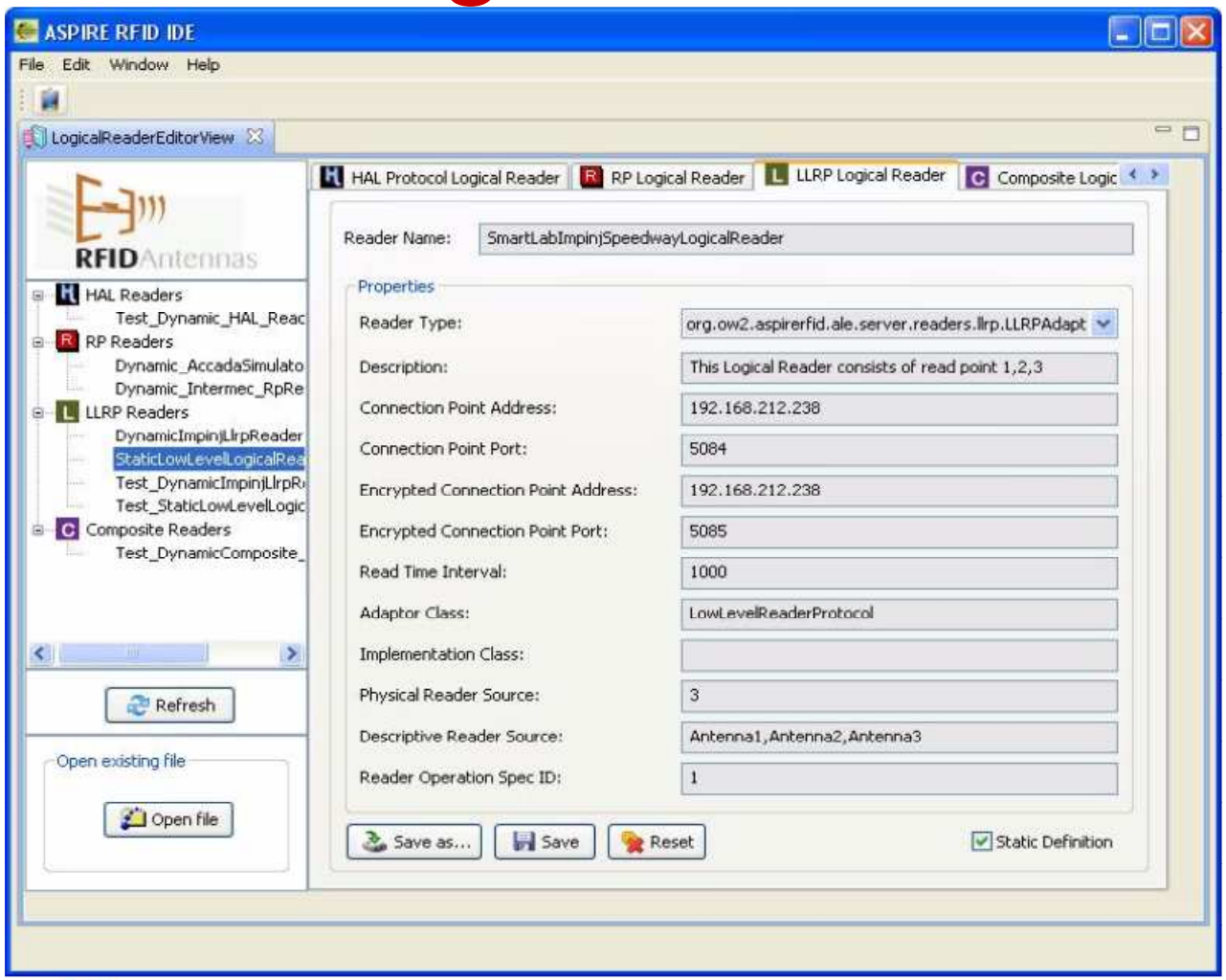
Logical Reader Editor (1)

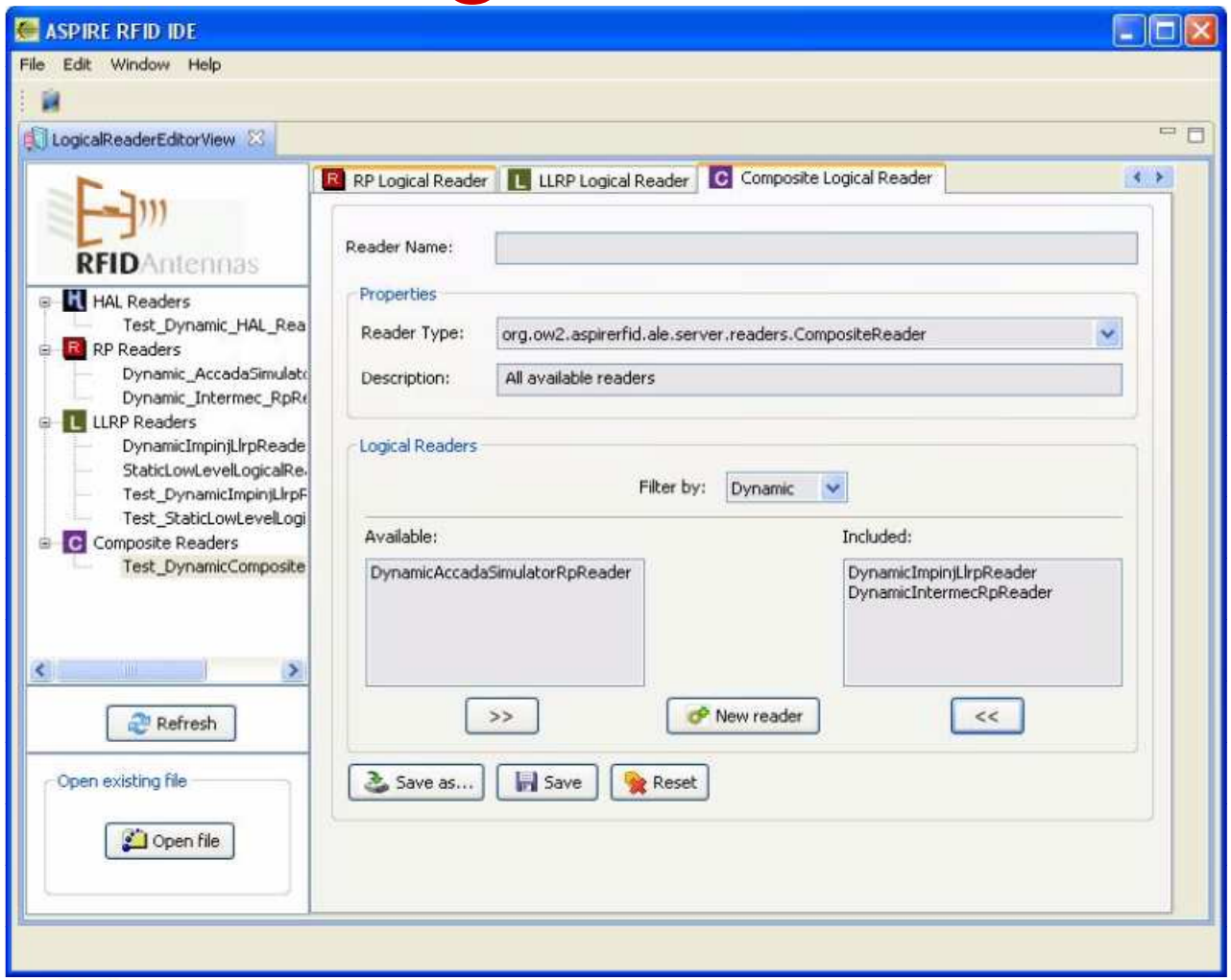
- Configure Logical Readers through
  - Hardware Abstraction Layer (HAL)
  - Reader Protocol (RP)
  - Low Level Reader Protocol (LLRP)
  - Composite

Logical Reader Editor (2)



- LLRP-compliant Logical Reader configuration

Logical Reader Editor (3)



- Composite Logical Reader configuration

Configure LR Spec Editor (1)

- Full Control over LR Spec Editor parameters
- EC Specs Directory
  - ECSpecs configure the server's filtering function
- LRSpecs can be static or dynamic

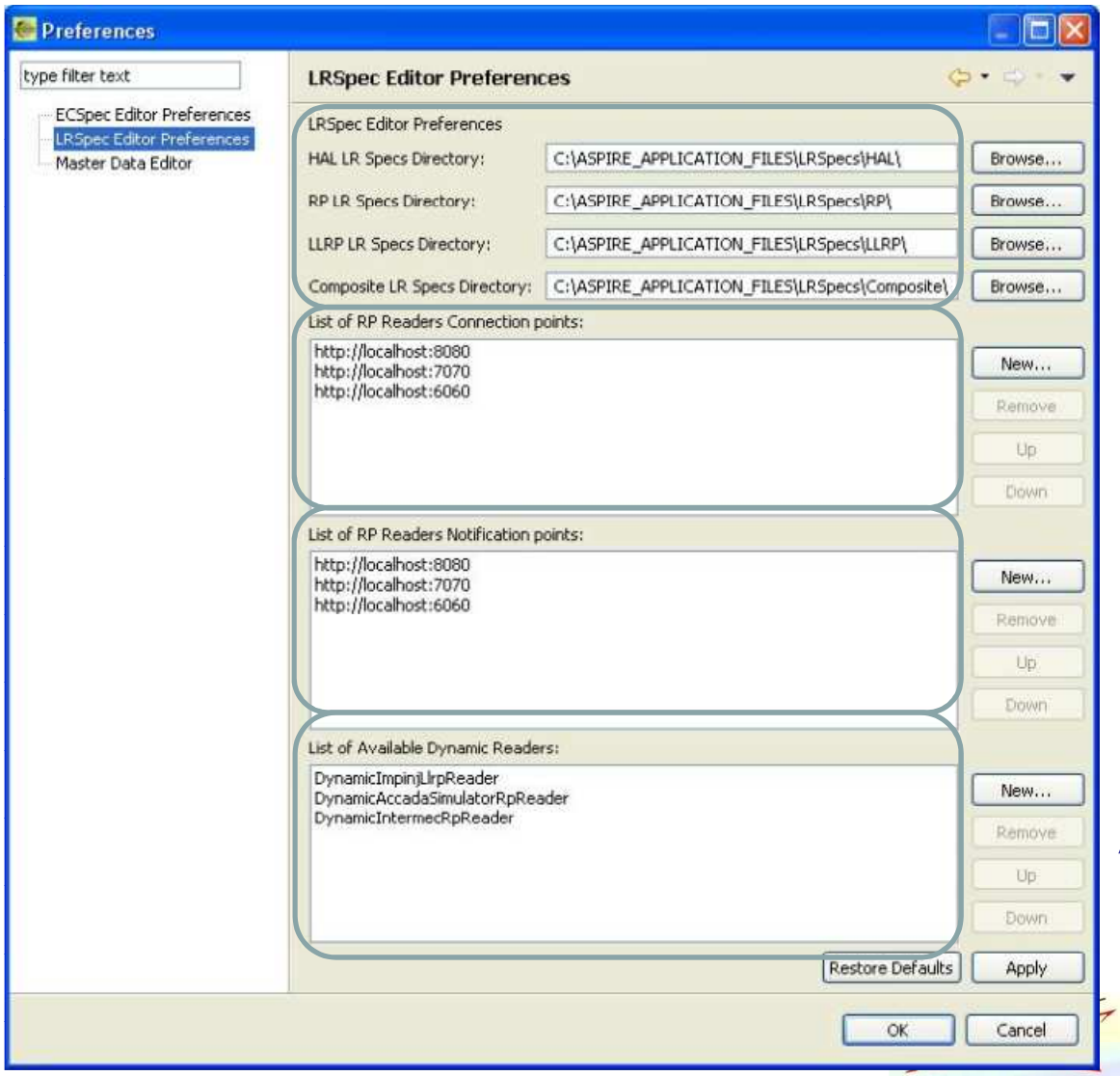
Configure LR Spec Editor (2)

- HAL LR Specs Directory
  - HAL readers specifications
- RP LR Specs Directory
  - RP LR readers specifications
- LLRP LR Specs Directory
  - LLRP readers specifications

Configure LR Spec Editor (3)

- RP Readers Connection points list
- RP Readers Notification Points list
- Available Dynamic Readers list
  - Easing configuration effort
    - Drop-down Lists available in the LR Spec Editor

Configure LR Spec Editor (4)



Specs directories

Connection URIs

Notification URIs

Available Readers

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EC Spec Configurator (1)

- ECSpec Configurator Plug-in
  - Create/edit specifications for collecting and filtering data
    - In a generic fashion (EPC-ALE V1.1 ECSpec compatible)
  - Define, Subscribe and Manage the Filtering specifications at the ALE level

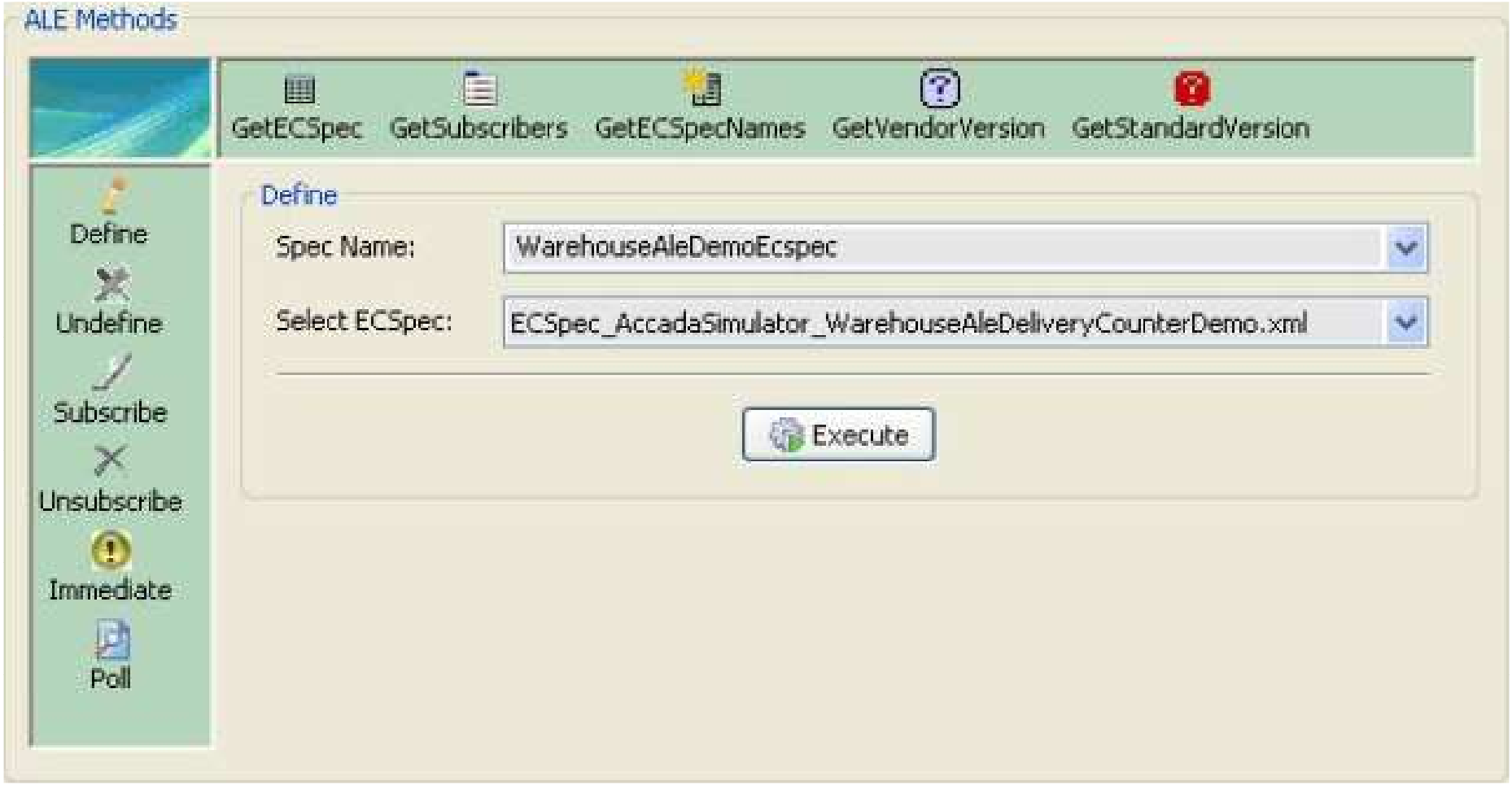
EC Spec Configurator (2)

Service Name	Input	Info
define	specName : String spec : ECSpec	Creates a new ECSpec having the name specName, according to spec
undefine	specName : String	Removes the ECSpec named specName that was previously created by the define method
subscribe	specName : String notificationURI : String	Adds a subscriber having the specified notificationURI to the set of current subscribers of the ECSpec named specName
unsubscribe	specName : String notificationURI : String	Removes a subscriber having the specified notificationURI from the set of current subscribers of the ECSpec named specName
poll	specName : String	Requests an activation of the ECSpec named specName, returning the results from the next event cycle to complete
immediate	spec : ECSpec	Creates an unnamed ECSpec according to spec, and immediately requests its activation

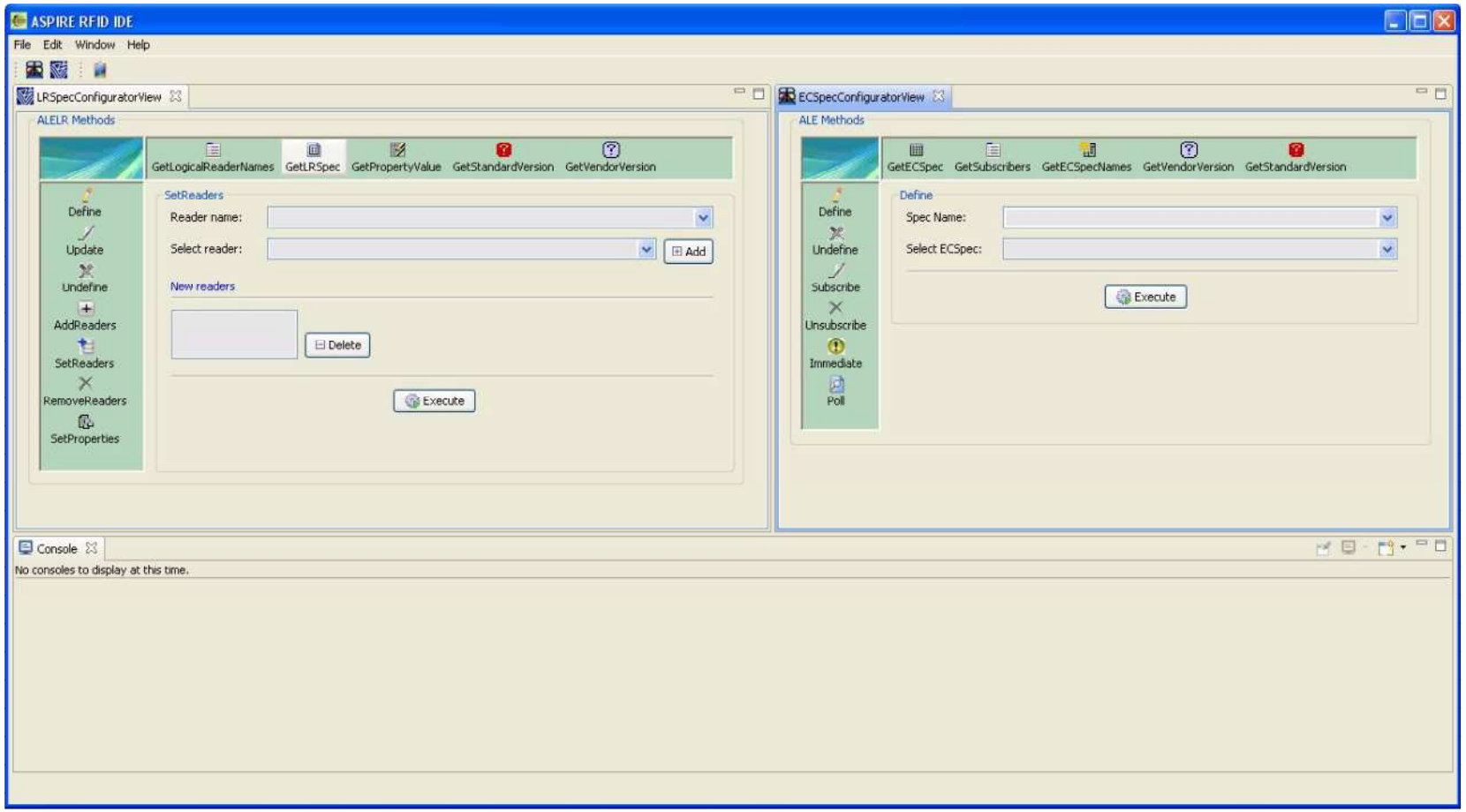
EC Spec Configurator (3)

Service Name	Input	Info
getECSpec	specName : String	Returns the ECSpec that was provided when the ECSpec named specName was created by the define method
getECSpecNames	-	Returns an unordered list of the names of all ECSpecs that are visible to the caller
getSubscribers	specName : String	Returns an unordered list of the notification URIs corresponding to each of the current subscribers for the ECSpec named specName
getStandardVersion	-	Returns the version of the specification that this Reading API implementation complies with
getVendorVersion	-	Returns a string that identifies what vendor extensions this implementation of the Reading API provides

EC Spec Configurator (4)



EC Spec Configurator (5)



- In combination with LR Spec Configurator offers full control over the ALE server

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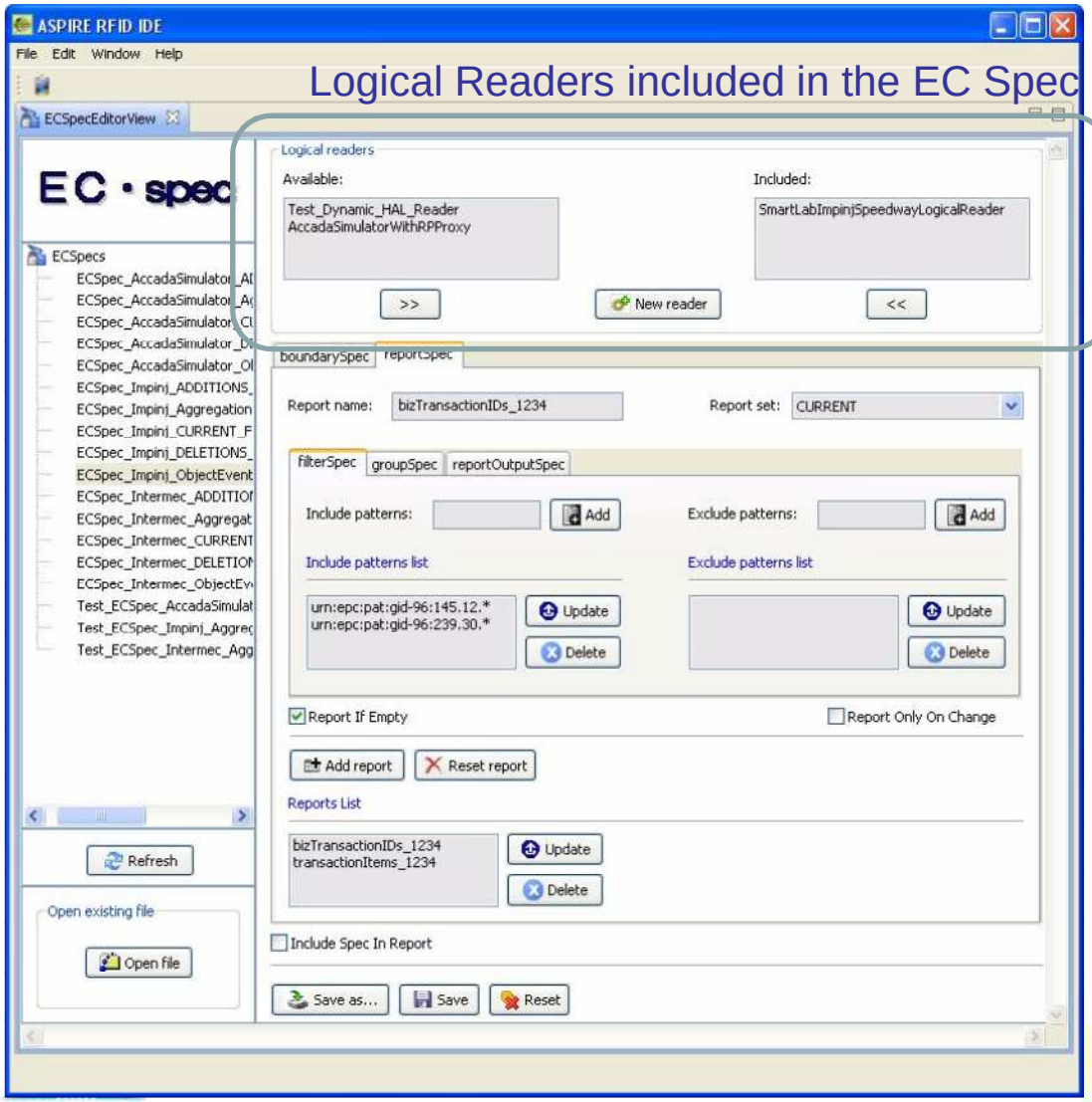
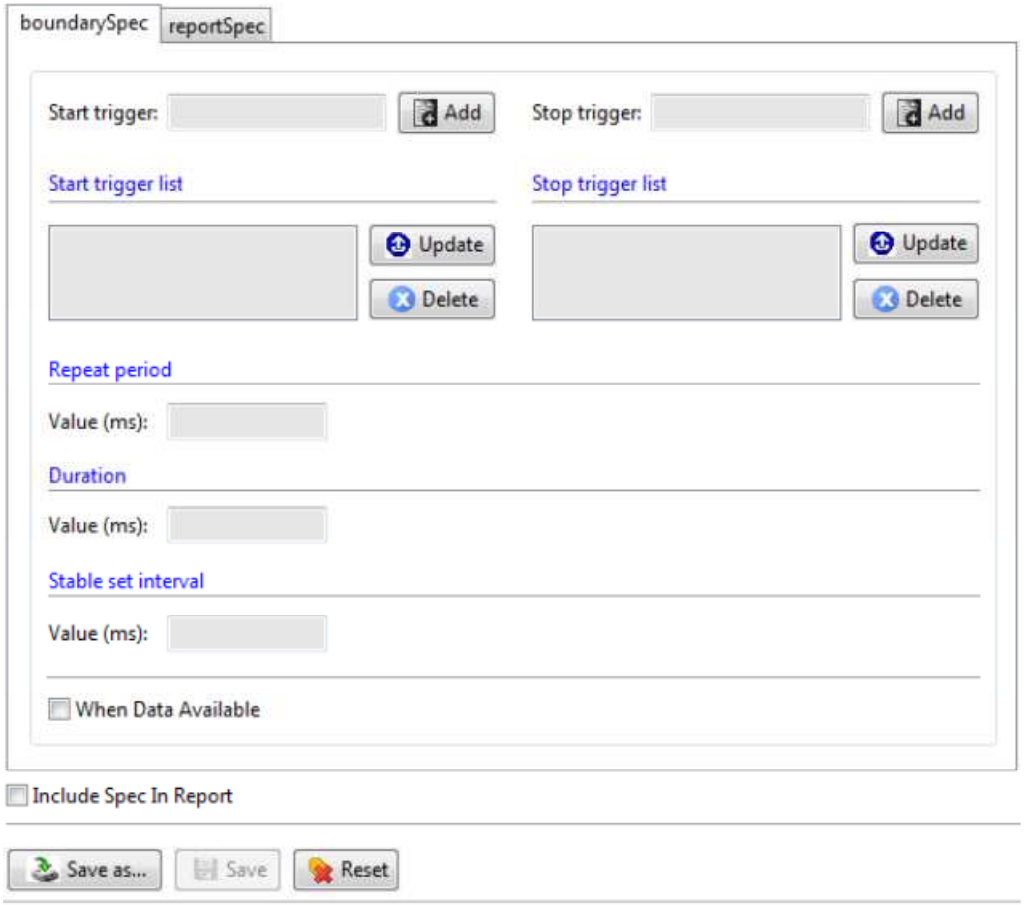
EC Spec Editor (1)



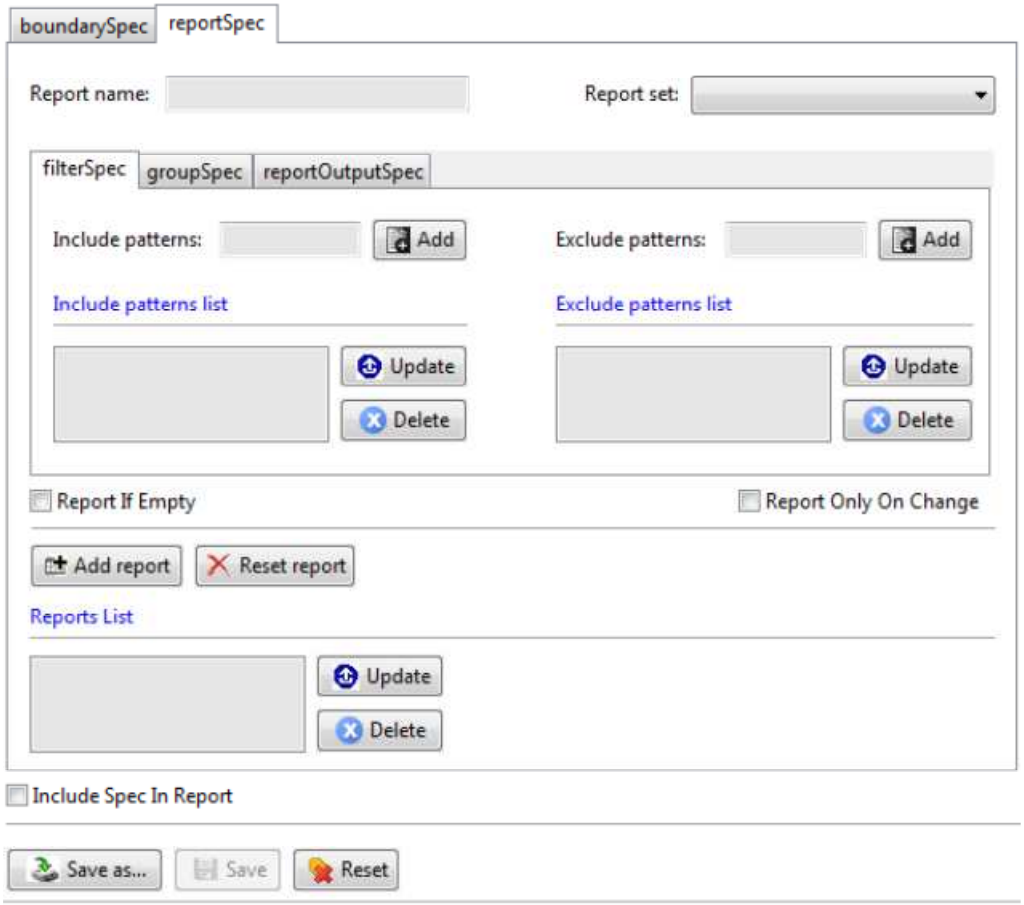
- Edit the event cycle specifications and corresponding reports

EC Spec Editor (2)



- Define Event Cycle boundaries
  - Period
  - Duration
  - Interval

EC Spec Editor (3)



- Define ECReport-related information
  - Filter specific EPCs

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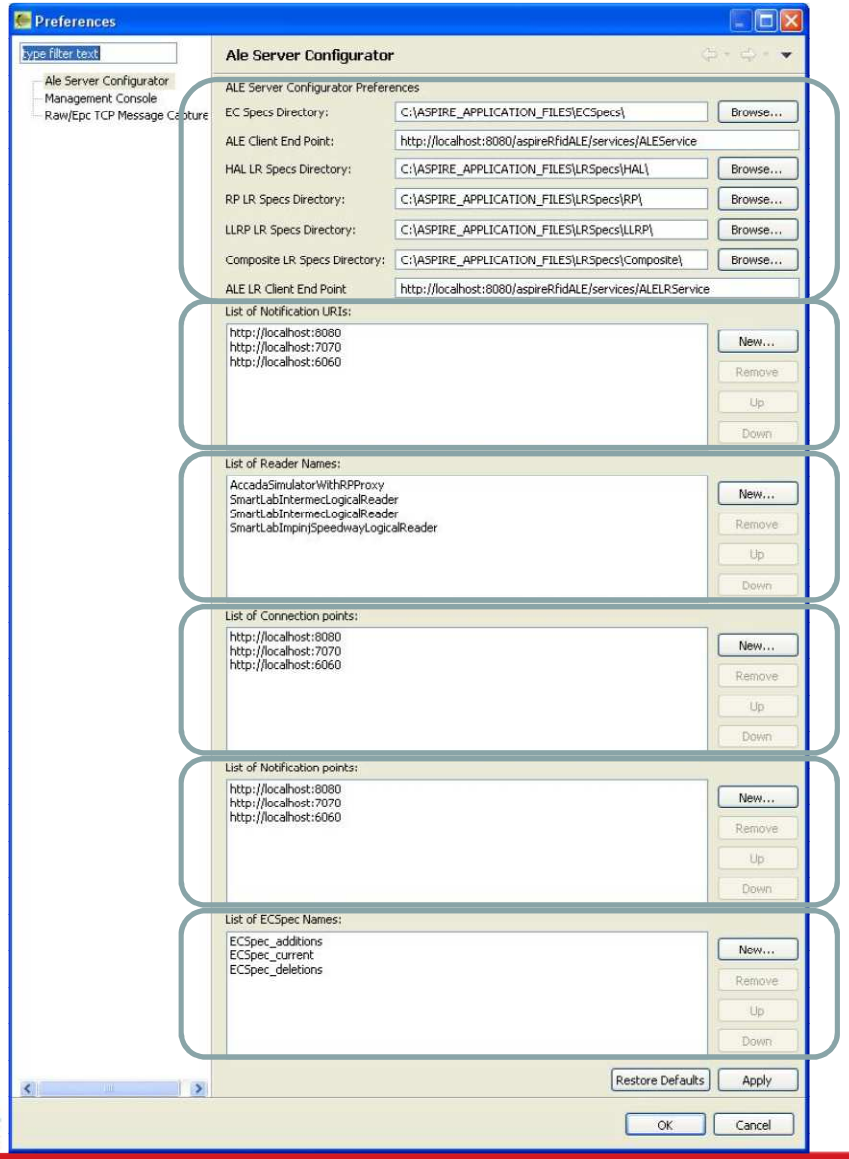
ALE Server Configurator (1)

- You can configure
  - EC Specs Directory
  - ALE Client EndPoint
  - LR Specs Directory
  - ALE LR Client EndPoint

ALE Server Configurator (2)



Specifications directories, client end points

Notification URIs

Reader names

Connector points

Notification points

EC Spec names

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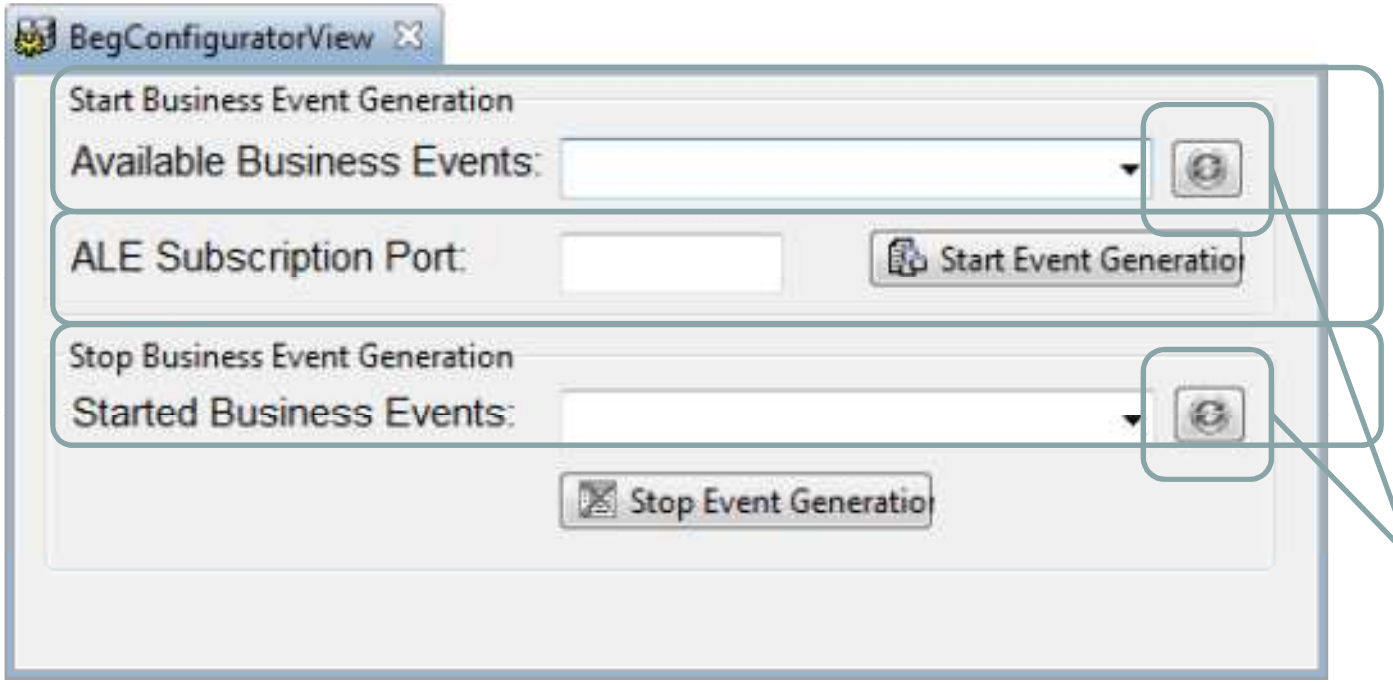
BEG Configurator (1)

- Business Event Generator Observation and Configurator Plug-In
  - Associate ALE reports with Business Events
  - Translate ECReports to EPCIS events
  - Trigger mechanisms for transforming tag streams using business semantics

BEG Configurator (2)



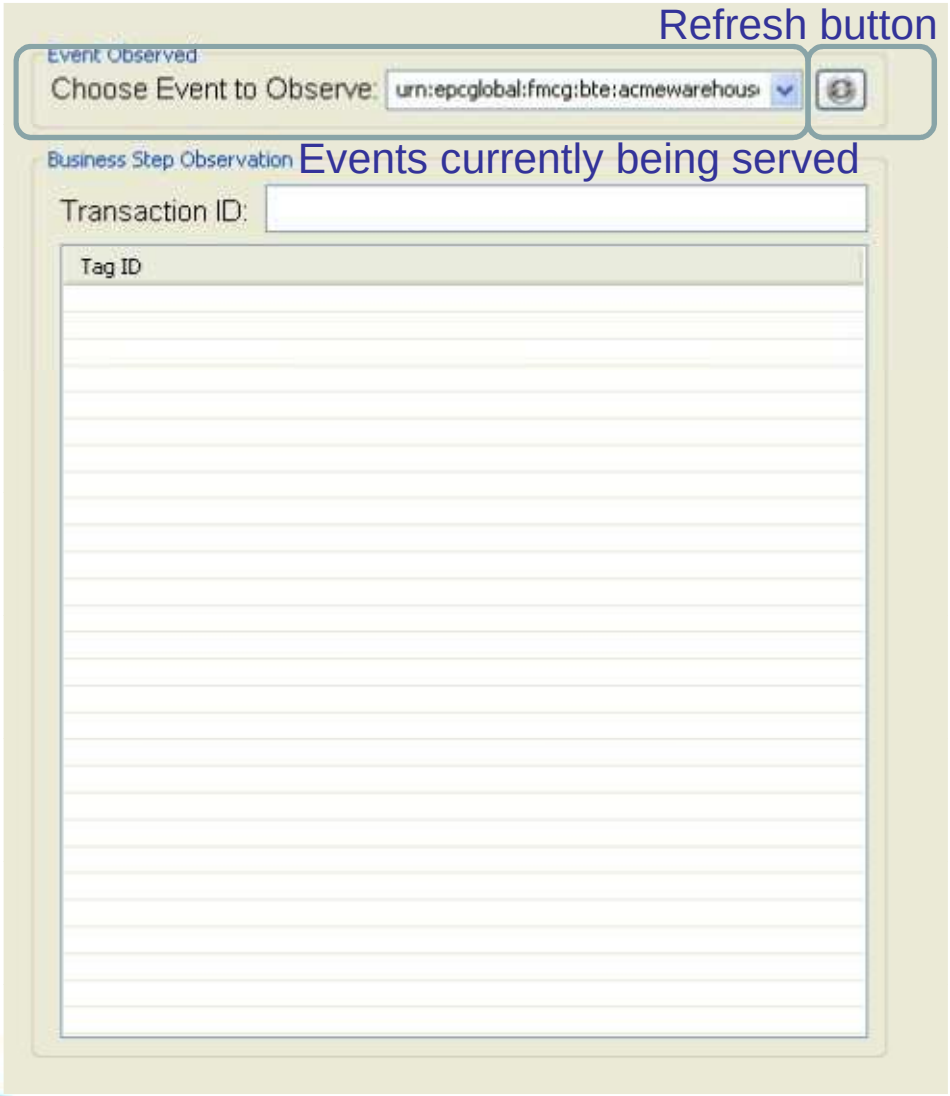
Events Defined in the ALE Server

ALE Server's port

Events being monitored

Refresh buttons

BEG Observation View

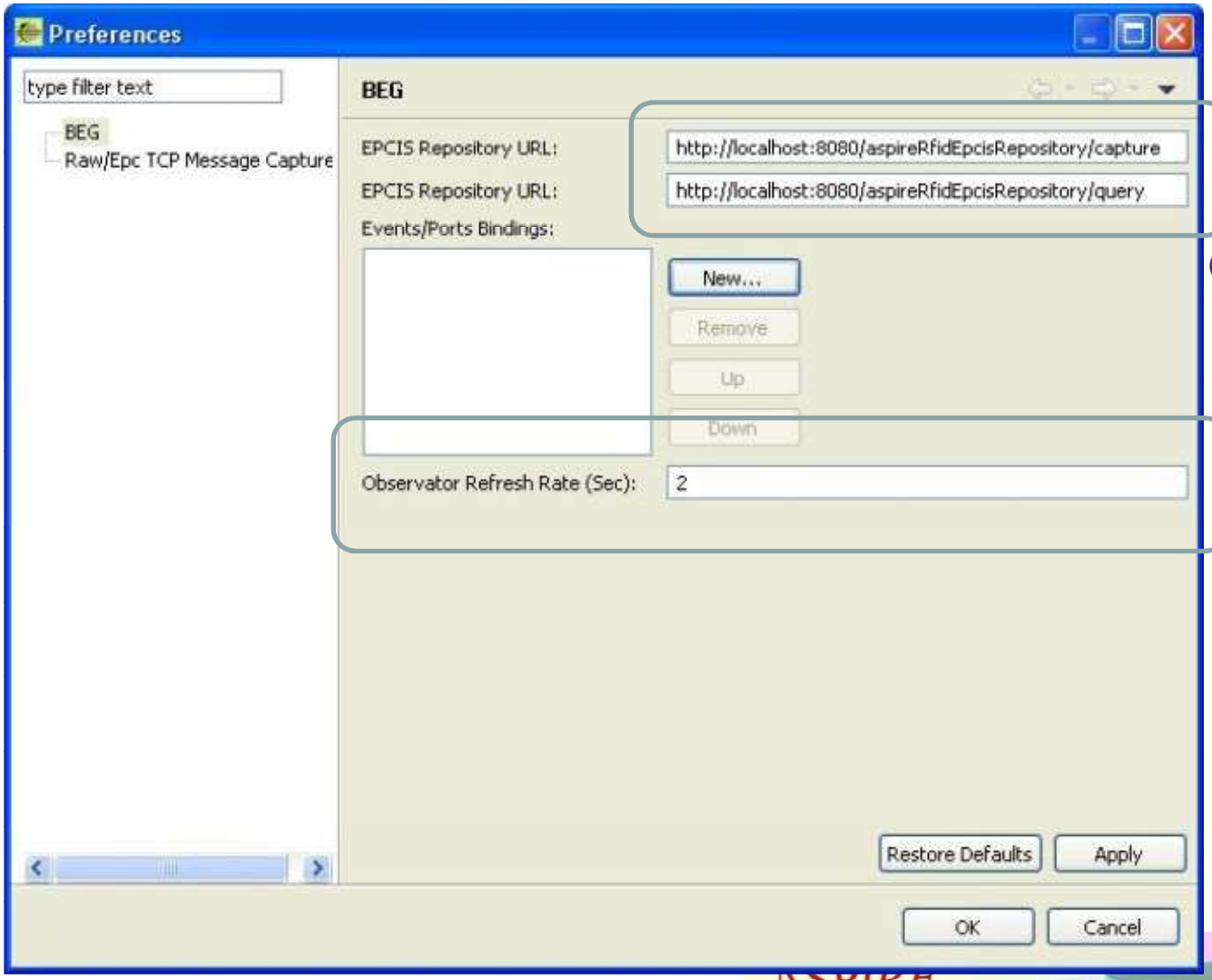


- Ability to monitor/capture specific business events in real-time

BEG Preferences (1)

- EPCIS Repository Capture End Point
  - End Point accepting connections for the Capture interface
- EPCIS Repository Query End Point
  - End Point accepting connections for the Query interface
- Observation View Refresh Rate
  - In seconds

BEG Preferences (2)



EPCIS Capture/Query Interfaces

Refresh rate

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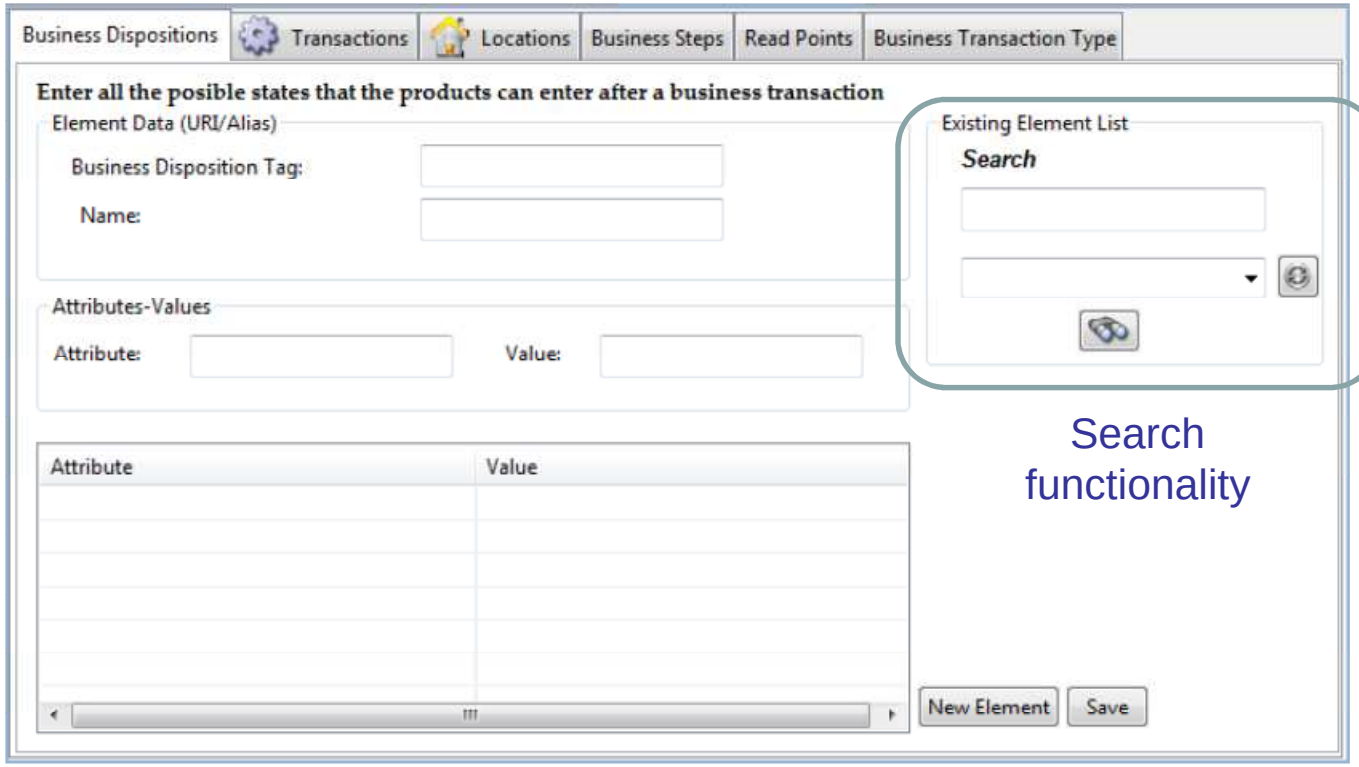
Master Data Editor (1)

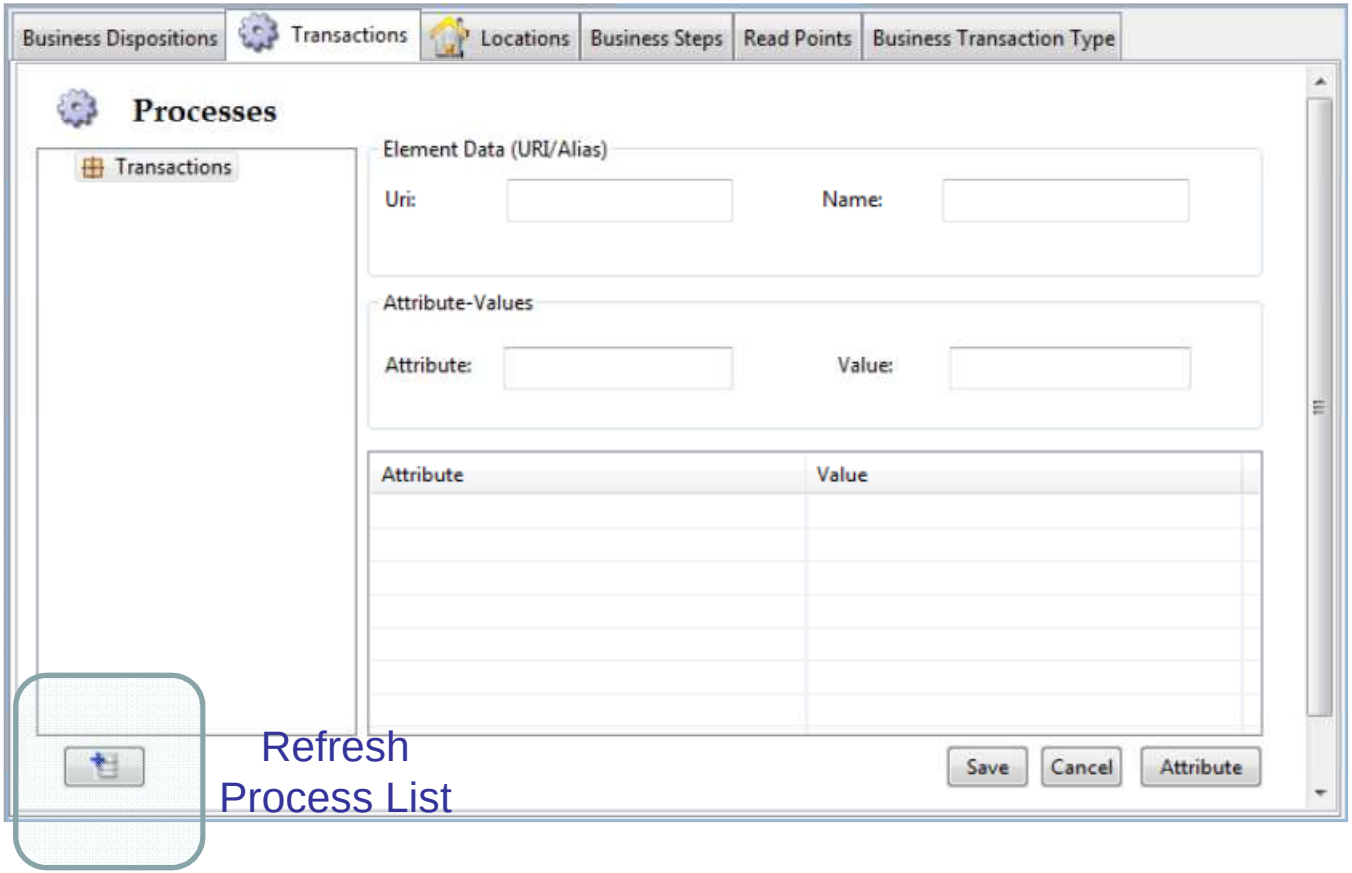
- Master Data Editor Plug-In
  - Allows editing of
    - Company warehouses and Containers
    - Locations
    - Readpoints
  - Also, data associated with business transactions
    - Business steps
    - Disposition states
    - Transaction types

Master Data Editor (2)



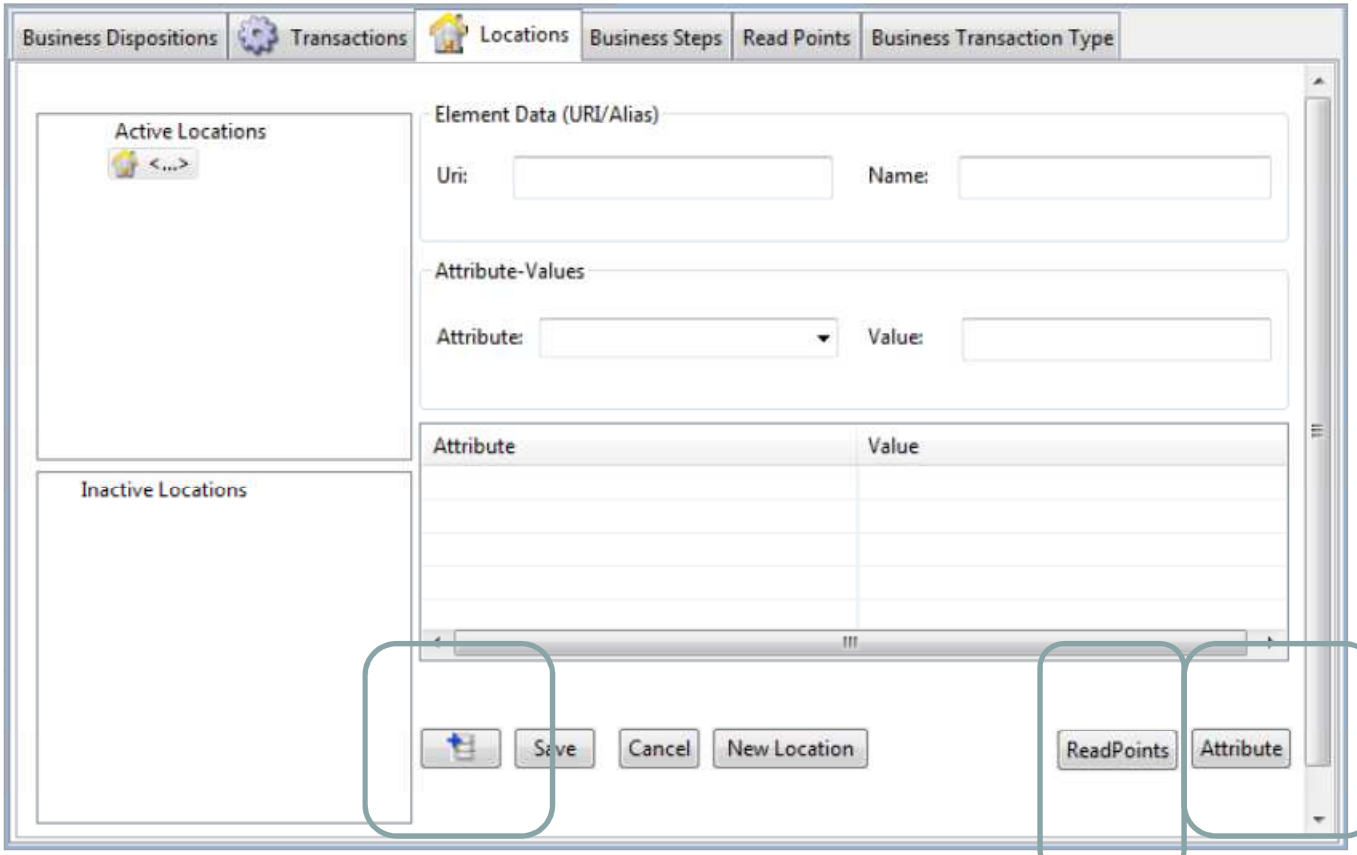
- Define
  - Tag names
  - Associated key-value pairs

Master Data Editor (3)



- Define
  - Transaction names
  - Corresponding URIs
  - Associated Key-Value pairs

Master Data Editor (4)



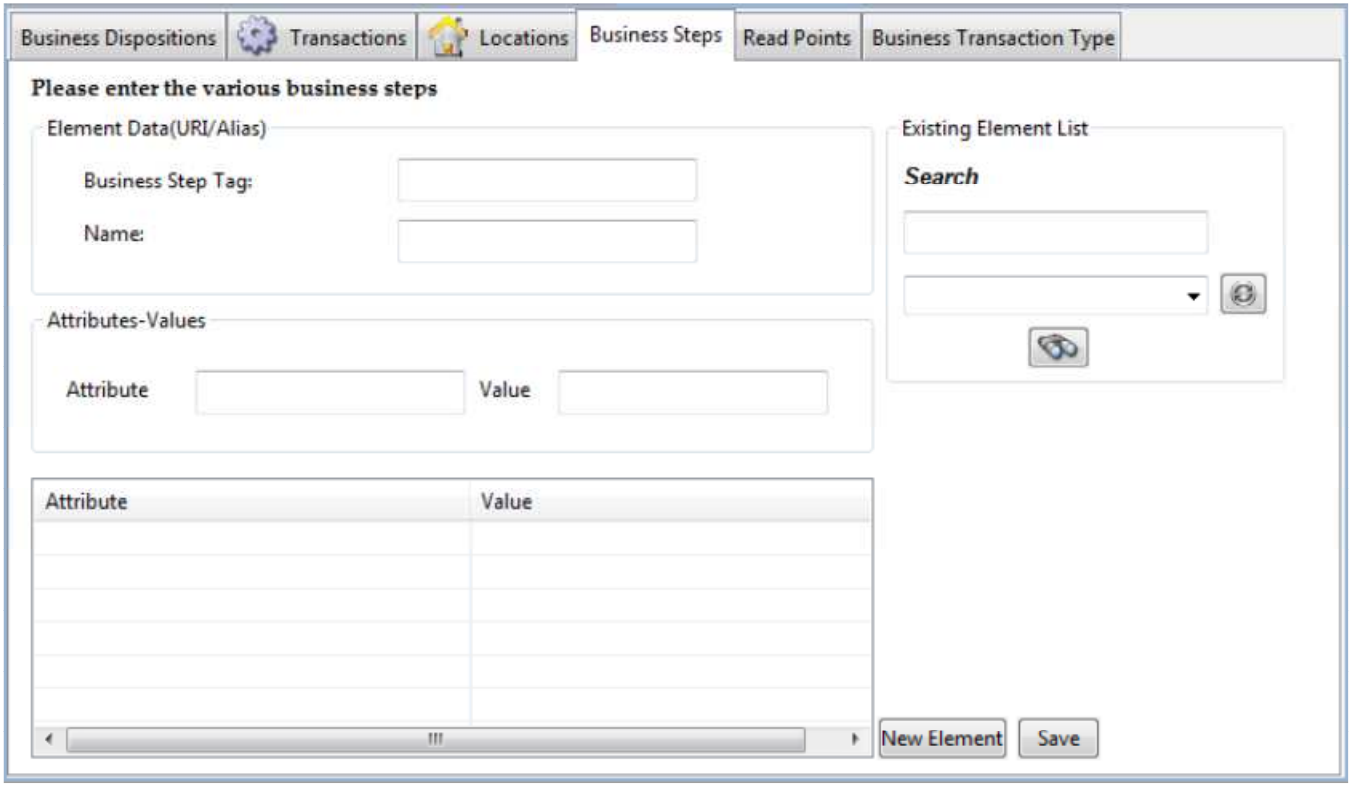
- Define
  - Location specific information
    - Active
    - Inactive

Add new attributes

Refresh Location List

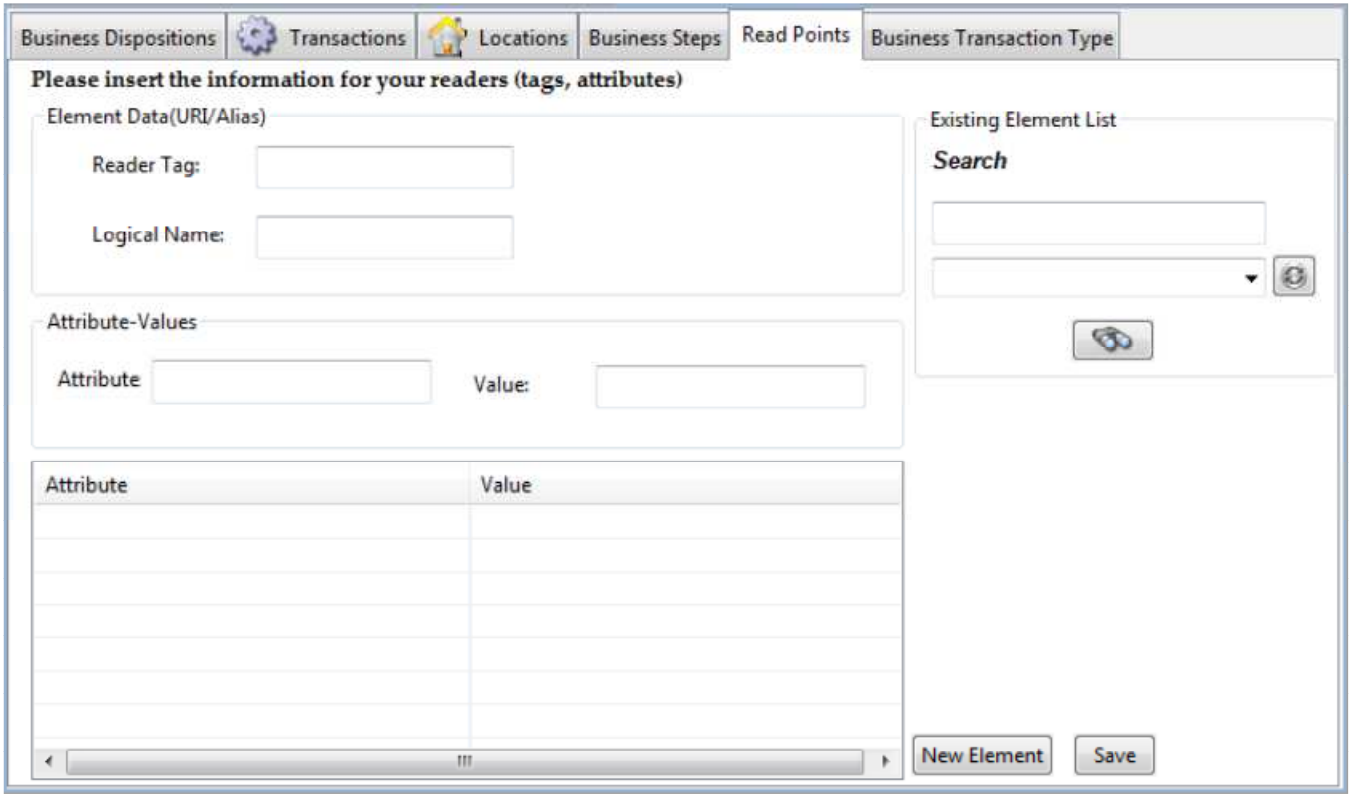
And new read points

Master Data Editor (5)



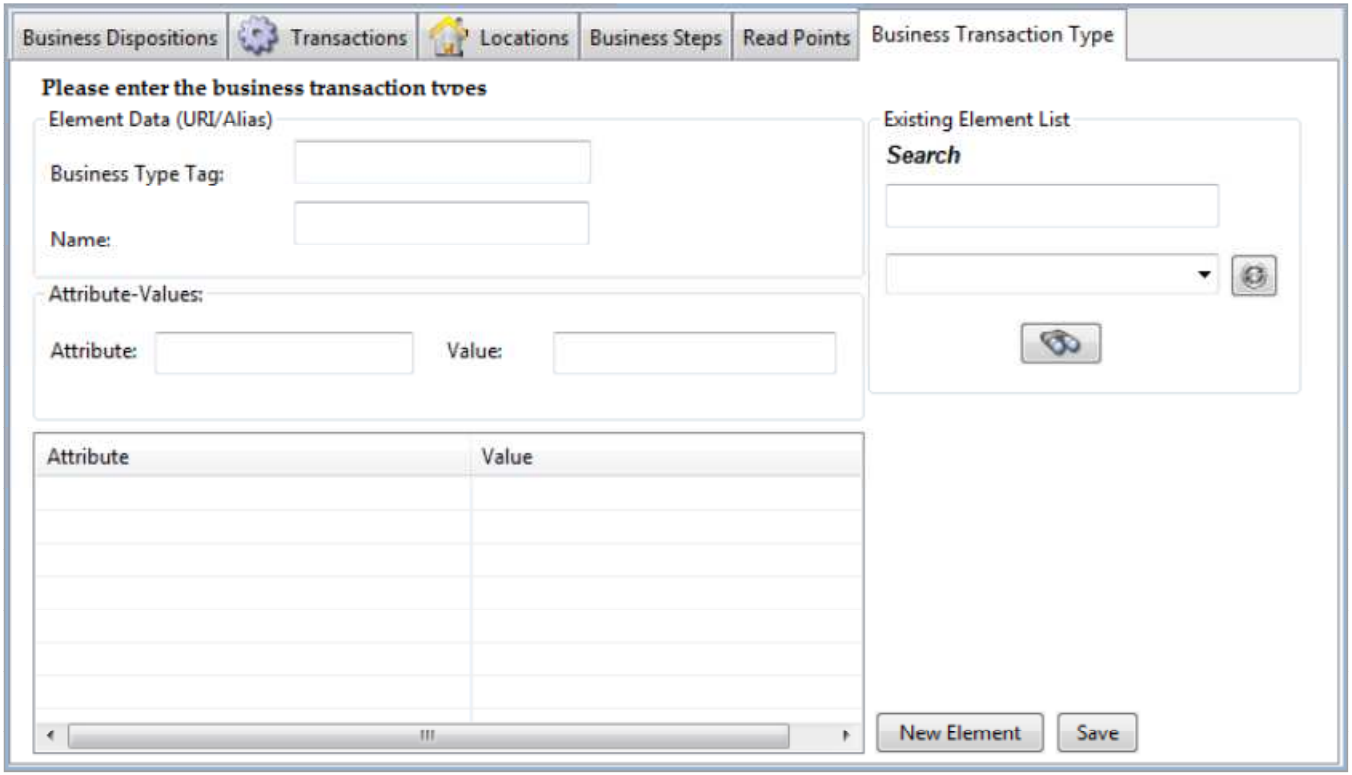
- Define
  - Business Steps information

Master Data Editor (6)



- Define
  - Read Points information

Master Data Editor (7)



- Define
  - Business Transaction Types information

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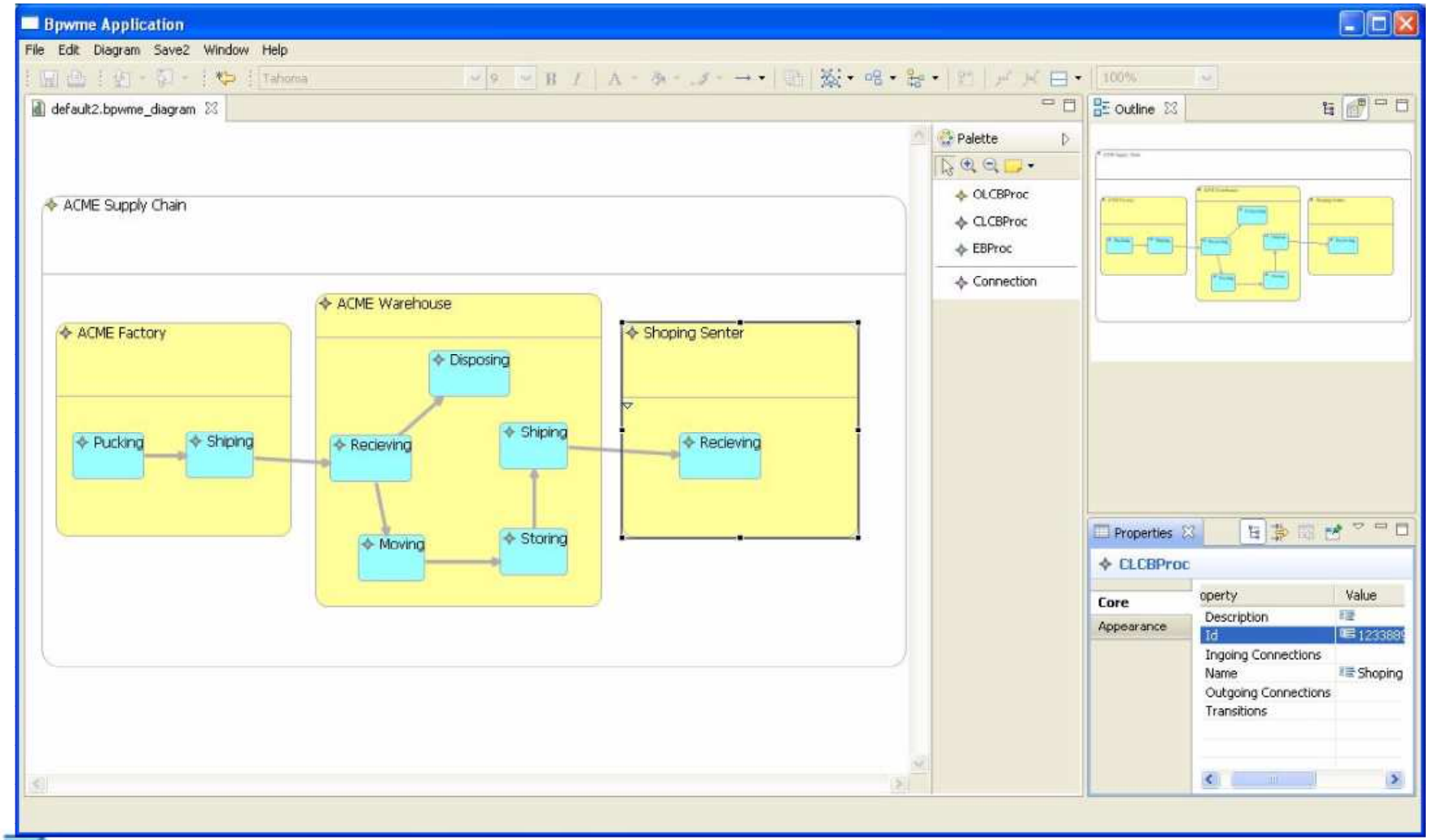
Business Process Workflow Editor (1)

- Idea
  - Encode system's behavior through a graphical representation
  - Provide a graphical interface for the ASPIRE Programmable Engine*
  - On-going process (under development)

*see lecture 7: ASPIRE Programmable Language and Engine

Business Process Workflow Editor (2)



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Connector Editor/Configurator (1)

- Provides
  - Support for services and events
  - Service abstraction
  - Functionality abstraction
  - Process management

Connector Editor/Configurator (2)

- Plugin (in-progress) provides
  - Edits/configures adaptors to corporate ICT business systems (e.g., ERP, WMS, corporate databases)

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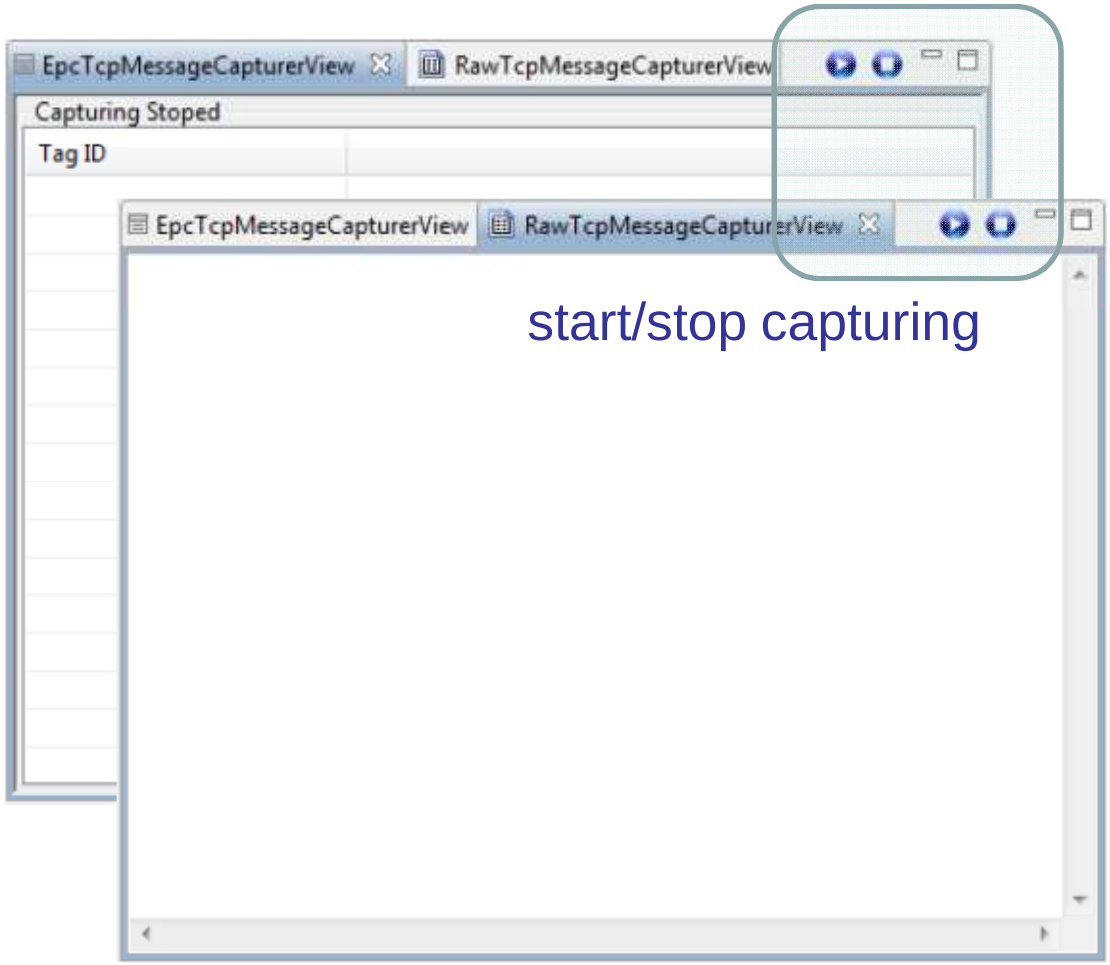

- Capture plain EPC messages exchanged
- Or even TCP

References – Additional Reading

- Documentation on the ASPIRE Wiki site
  - http://wiki.aspire.ow2.org/xwiki/bin/view/Main/Documentation
- ASPIRE Public Deliverable D3.3
- EPCglobal Reader Protocol Standard, Version 1.1
  - http://www.epcglobalinc.org/standards/rp/rp_1_1-standard-20060621.pdf