



IronJacamar 1.1 User's Guide

Connecting your Enterprise Information Systems

IronJacamar 1.1 User's Guide: Connecting your Enterprise Information Systems

To all Java EE Connector Architecture users, and especially the IronJacamar community

Preface	ix
1. About IronJacamar	ix
2. Why IronJacamar ?	ix
3. Versions	ix
3.1. IronJacamar 1.1	ix
3.2. IronJacamar 1.0	x
4. The team	x
5. Thanks to	xi
6. License	xi
1. Introduction	1
1.1. What's New	1
1.1.1. Java Connector Architecture 1.7	1
1.1.2. Java Connector Architecture 1.6	2
1.2. Overview	2
1.2.1. Outbound resource adapter	2
1.2.2. Inbound resource adapter	4
2. Download	7
2.1. Download	7
2.2. Maven repository	7
2.3. Git Access	8
3. Installation	11
3.1. Compressed Tape Archive (.tar.gz)	11
3.2. Zip Archive (.zip)	11
3.3. Directory structure	12
3.4. WildFly	12
4. Configuration	13
4.1. IronJacamar server	13
4.1.1. Using the leak detector pool	14
4.1.2. Allow obtaining connections during MARKED_FOR_ROLLBACK	14
4.1.3. Disable enlistment trace	15
4.1.4. Disable delistResource calls	15
4.2. Logging service	16
4.3. Transaction service	16
4.4. JCA	16
4.4.1. Deployer	16
4.4.2. Work manager	21
4.4.3. Security	24
4.5. Datasources	25
4.6. Web server	26
5. Deployment	29
5.1. Packaging requirements	29
5.2. Deploying resource adapters	29
5.2.1. Resource adapter descriptor	31
5.2.2. Resource adapter extensions	36

5.2.3. Resource adapter statistics	38
5.3. Deploying datasources	39
5.3.1. Datasource descriptor	39
5.3.2. Datasource extensions	48
5.3.3. Datasource statistics	49
5.4. General deployment settings	50
5.4.1. Flush strategies	51
5.4.2. Capacity policies	51
6. Running	55
6.1. Starting the container	55
6.2. Stopping the container	56
6.3. Command line interface	56
6.3.1. Deploy	56
6.3.2. Undeploy	56
6.3.3. Shutdown	57
6.4. Apache Ant	57
6.4.1. Start	57
6.4.2. Stop	57
6.4.3. Deploy	57
6.4.4. Undeploy	57
6.4.5. Ping	58
6.5. Apache Maven	58
6.5.1. Start	58
6.5.2. Stop	58
6.5.3. Deploy	58
6.5.4. Undeploy	58
6.5.5. Ping	58
7. Validator	59
7.1. Introduction	59
7.2. Reports	59
7.3. Running the standalone validator	60
7.4. Apache Ant integration	60
7.4.1. Usage	60
7.5. Apache Maven integration	61
7.5.1. Usage	62
8. Code generator	63
8.1. Introduction	63
8.2. Functionality	63
8.3. Running the tool	63
8.3.1. Developer Input	64
8.4. Generated code	66
8.4.1. Apache Ant build environment	66
8.4.2. Apache Ant + Ivy build environment	67
8.4.3. Gradle build environment	67

8.4.4. Apache Maven build environment	67
9. Eclipse plugin	69
9.1. Installation of the plugin	69
9.2. Configuration of the plugin	69
9.3. The toolbar	70
9.4. The menu	71
9.5. Creating a new IronJacamar project	71
9.5.1. Project and package name	73
9.5.2. Creating a ResourceAdapter	74
9.5.3. Creating a ManagedConnectionFactory	75
9.5.4. Creating a MessageListener	76
9.5.5. Creating an AdminObject	77
9.5.6. Selecting the build environment	78
9.6. Validate IronJacamar project	78
9.7. Deploying an IronJacamar project	79
9.7.1. Deploying a RAR file to an IronJacamar server	79
9.7.2. Generate the -ra.xml and deploy it to IronJacamar server	79
10. Other tools	85
10.1. Resource adapter information tool	85
10.2. Migration tool	86
10.2.1. Resource adapters	86
10.2.2. Data sources	86
11. Embedded	89
11.1. Overview	89
11.2. Configuration	89
11.3. Usage	91
11.3.1. Simple usage	92
11.3.2. Advanced usage	102
12. EIS test server	109
12.1. Overview	109
12.2. Apache Ant	110
12.3. Apache Maven	111
13. Community	113
13.1. Website	113
13.2. User forum	113
13.3. Developer forum	113
13.4. Issue tracking	113
14. Troubleshooting	115
14.1. I think I have found a bug	115
14.2. I would like to implement a feature	115
14.3. How do I ?	116
A. Schemas	117
A.1. Java EE Connector Architecture 1.7	117
A.2. Java EE Connector Architecture 1.6	138

A.3. Java EE Connector Architecture 1.5	159
A.4. Java EE Connector Architecture 1.0	177
A.5. IronJacamar 1.0	186
A.6. IronJacamar 1.1	198
A.7. Resource adapters 1.0	213
A.8. Resource adapters 1.1	225
A.9. Datasources 1.0	241
A.10. Datasources 1.1	257
A.11. Datasources 1.2	274
B. Samples	293
B.1. HelloWorld example	293
B.1.1. Introduction	293
B.1.2. HelloWorld Resource Adapter	294
B.1.3. HelloWorld Managed Connection Factory	297
B.1.4. HelloWorld Managed Connection	301
B.1.5. HelloWorld Connection Factory	305
B.1.6. HelloWorld Connection Factory Implementation	306
B.1.7. HelloWorld Connection	307
B.1.8. HelloWorld Connection Implementation	308
B.1.9. HelloWorld Managed Connection MetaData	310
B.1.10. HelloWorld ironjacamar.xml	311
B.1.11. HelloWorld Connection Test Case	312
B.1.12. HelloWorld Ant build.xml	314
B.2. HelloWorld/Native example	318
B.2.1. Introduction	318
B.2.2. HelloWorld/Native Resource Adapter	319
B.2.3. HelloWorld/Native Managed Connection Factory	322
B.2.4. HelloWorld/Native Managed Connection	326
B.2.5. HelloWorld/Native Connection Factory	330
B.2.6. HelloWorld/Native Connection Factory Implementation	331
B.2.7. HelloWorld/Native Connection	332
B.2.8. HelloWorld/Native Connection Implementation	333
B.2.9. HelloWorld/Native Managed Connection MetaData	335
B.2.10. HelloWorld/Native ironjacamar.xml	336
B.2.11. HelloWorld/Native C	337
B.2.12. HelloWorld/Native Connection Test Case	337
B.2.13. HelloWorld/Native Ant build.xml	340
B.2.14. HelloWorld/Native cmake	344
B.3. HelloWorld/Lazy example	344
B.3.1. Introduction	344
B.3.2. HelloWorld/Lazy Resource Adapter	345
B.3.3. HelloWorld/Lazy Managed Connection Factory	348
B.3.4. HelloWorld/Lazy Managed Connection	352
B.3.5. HelloWorld/Lazy Connection Factory	357

B.3.6. HelloWorld/Lazy Connection Factory Implementation	358
B.3.7. HelloWorld/Lazy Connection	360
B.3.8. HelloWorld/Lazy Connection Implementation	361
B.3.9. HelloWorld/Lazy Managed Connection MetaData	363
B.3.10. HelloWorld/Lazy ironjacamar.xml	365
B.3.11. HelloWorld/Lazy Connection Test Case	365
B.3.12. HelloWorld/Lazy Ant build.xml	368
C. Datasources	373
C.1. PostgreSQL	373
C.2. PostgreSQL XA	373
C.3. MySQL	374
C.4. MySQL XA	374
C.5. H2	375
C.6. H2 XA	375
C.7. Derby	376
C.8. Derby XA	376
C.9. Oracle	377
C.10. Oracle XA	378
C.11. Microsoft SQLServer	378
C.12. Microsoft SQLServer XA	379
C.13. IBM DB2	379
C.14. IBM DB2 XA	380
D. Logging codes	383
D.1. Core: 000000 - 009999	383
D.2. Common: 010000 - 019999	387
D.3. Deployers: 020000 - 029999	388
E. Licenses	391
E.1. GNU Lesser General Public License 2.1	391
E.1.1. Preamble	391
E.1.2. Terms and Conditions for Copying, Distribution and Modification	393
E.1.3. How to Apply These Terms to Your New Libraries	399
E.2. Creative Commons Attribution–Share Alike 3.0 Unported License	400
E.2.1. Definitions	400
E.2.2. Fair Dealing Rights	402
E.2.3. License Grant	402
E.2.4. Restrictions	403
E.2.5. Representations, Warranties and Disclaimer	404
E.2.6. Termination	405
E.2.7. Miscellaneous	405
E.3. Apache License, Version 2.0	406
E.3.1. Definitions	406
E.3.2. Grant of Copyright License	407
E.3.3. Grant of Patent License	407
E.3.4. Redistribution	407

E.3.5. Submission of Contributions 408

E.3.6. Trademarks 408

E.3.7. Disclaimer of Warranty 408

E.3.8. Limitation of Liability 409

E.3.9. Accepting Warranty or Additional Liability 409

Preface

1. About IronJacamar

The goal of the IronJacamar project is to provide an implementation of the Java Connector Architecture 1.7 specification.

The specification can be found here: <http://www.jcp.org/en/jsr/detail?id=322>.

The IronJacamar project is licensed under the GNU LESSER GENERAL PUBLIC LICENSE 2.1 (LGPL 2.1) license.

2. Why IronJacamar ?

The Java EE Connector Architecture container can be viewed as a foundation inside an application server as it provides connectivity to the other containers such that they can communicate with EISes. Iron is often used as foundation in building houses too.

The Jacamar bird family which lives in Central and South America are glossy elegant birds with long bills and tails. Why we picked the Jacamar family is left as an exercise for the reader :)

3. Versions

This section contains the highlights of the IronJacamar releases. A full description of each release can be found through our issue tracking system at <http://issues.jboss.org/browse/JBJCA>.

3.1. IronJacamar 1.1

Highlights as compared to IronJacamar 1.0:

- Java EE Connector Architecture 1.7 certified (standalone / Java EE7)
- Lazy connection manager (JCA chapter 7.16)
- Distributed work manager (JCA chapter 10.3.11)
- Advanced pool capacity policies and flush strategies
- Enhanced Arquillian integration
- Eclipse development plugin
- Enterprise Information System testing server
- Resource adapter information tool
- Migration tools

3.2. IronJacamar 1.0

Highlights as compared to previous Java EE Connector Architecture containers inside JBoss Application Server:

- Java EE Connector Architecture 1.6 certified (standalone / Java EE6)
- POJO container environment
- New configuration schemas which focuses on usability
- Fast XML and annotation parsing for quick deployment
- Reauthentication support
- Prefill support for security backed domains
- Support for pool flushing strategies
- Embedded environment for ease of development with Arquillian and ShrinkWrap integration
- New management and statistics integration for components
- Code generator for resource adapters
- Validator tool for resource adapters

4. The team

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5. Thanks to

Adrian Brock, Carlo de Wolf, Gurkan Erdogan, Bruno Georges, Paul Gier, Jason Greene, Stefan Guilhen, Jonathan Halliday, Søren Hilmer, Ales Justin, Vicky Kak, Aslak Knutsen, Sacha Labourey, Mark Little, Alexey Loubyansky, Patrick MacDonald, Scott Marlow, Shelly McGowan, Andrig Miller, Marcus Moyses, Weston Price, Andrew Lee Rubinger, Heiko Rupp, Anil Saldhana, Scott Stark, Clebert Suconic, Andy Taylor, Vladimir Vasilev, Jeremy Whiting, Yang Yong and Leslie York.

6. License

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1

Introduction

The Java Connector Architecture (JCA) defines a standard architecture for connecting the Java EE platform to heterogeneous Enterprise Information Systems (EIS). Examples of EISs include Enterprise Resource Planning (ERP), mainframe transaction processing (TP), databases and messaging systems.

The connector architecture defines a set of scalable, secure, and transactional mechanisms that enable the integration of EISs with application servers and enterprise applications.

The connector architecture also defines a Common Client Interface (CCI) for EIS access. The CCI defines a client API for interacting with heterogeneous EISs.

The connector architecture enables an EIS vendor to provide a standard resource adapter for its EIS. A resource adapter is a system-level software driver that is used by a Java application to connect to an EIS. The resource adapter plugs into an application server and provides connectivity between the EIS, the application server, and the enterprise application. The resource adapter serves as a protocol adapter that allows any arbitrary EIS communication protocol to be used for connectivity. An application server vendor extends its system once to support the connector architecture and is then assured of seamless connectivity to multiple EISs. Likewise, an EIS vendor provides one standard resource adapter which has the capability to plug in to any application server that supports the connector architecture.

1.1. What's New

1.1.1. Java Connector Architecture 1.7

The Java Connector Architecture 1.7 specification adds the following areas:

- Adds an activation name for message endpoints to uniquely identify them
- Deployment annotations for connection factories and administration objects

Note

The deployment annotations are only meant for developer usage, and should not be used in test or production environments.

The IronJacamar standalone and embedded distributions doesn't support these annotations.

1.1.2. Java Connector Architecture 1.6

The Java Connector Architecture 1.6 specification adds the following major areas:

- **Ease of Development:** The use of annotations reduces or completely eliminates the need to deal with a deployment descriptor in many cases. The use of annotations also reduces the need to keep the deployment descriptor synchronized with changes to source code.
- **Generic work context contract:** A generic contract that enables a resource adapter to control the execution context of a Work instance that it has submitted to the application server for execution.
- **Security work context:** A standard contract that enables a resource adapter to establish security information while submitting a Work instance for execution to a WorkManager and while delivering messages to message endpoints residing in the application server.
- **Standalone Container Environment:** A defined set of services that makes up a standalone execution environment for resource adapters.

1.2. Overview

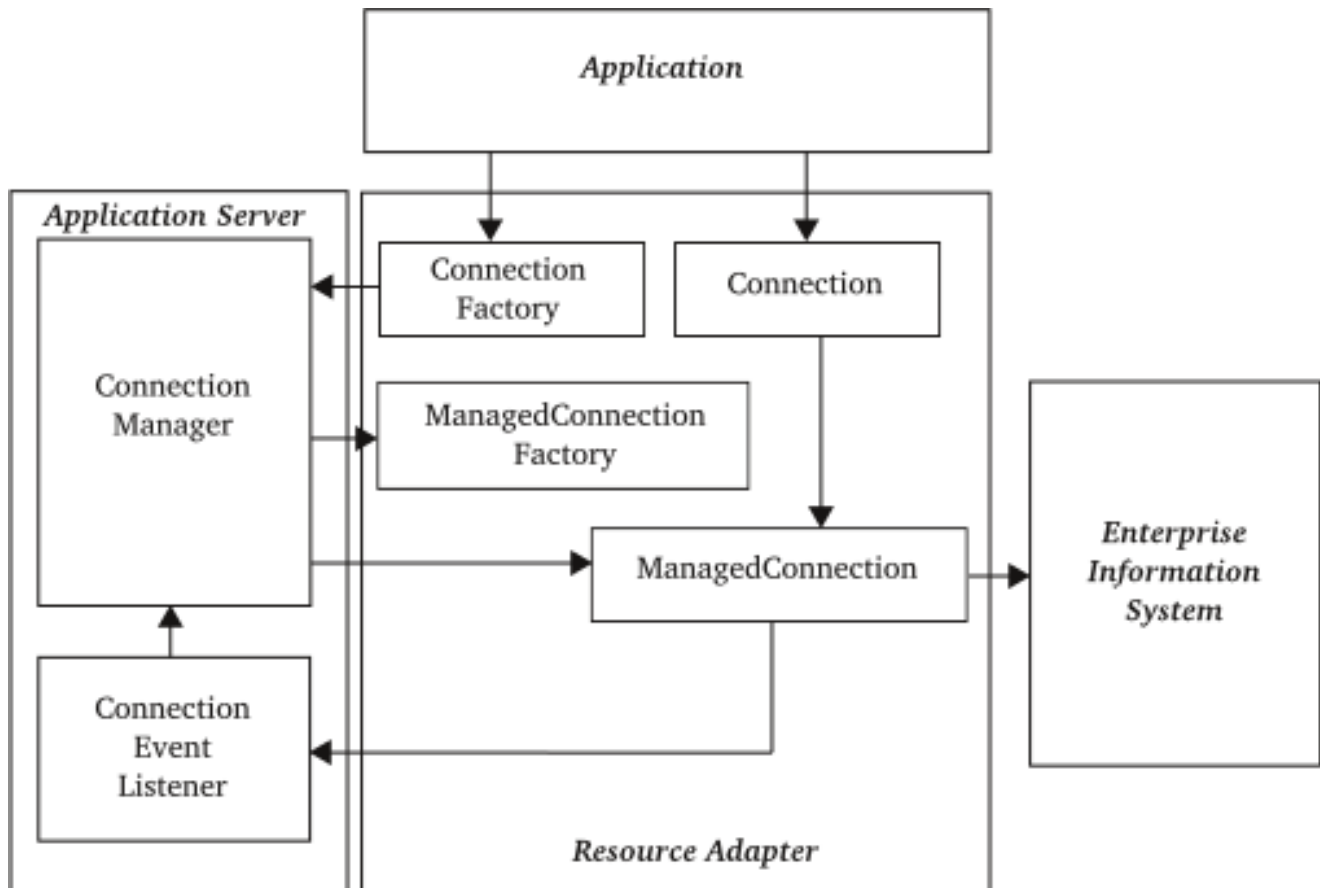
The Java EE Connector Architecture features three different types of resource adapters

- **Outbound:** The resource adapter allows the application to communicate to the Enterprise Information System (EIS).
- **Inbound:** The resource adapter allows messages to flow from the Enterprise Information System (EIS) to the application.
- **Bi-directional:** The resource adapter features both an outbound and an inbound part.

For more information about Java EE Connector Architecture see the specification.

1.2.1. Outbound resource adapter

The Java Connector Architecture specification consists of a number of outbound components:



The application uses the

- **ConnectionFactory:** The connection factory is looked up in Java Naming and Directory Interface (JNDI) and is used to create a connection.
- **Connection:** The connection contains the Enterprise Information System (EIS) specific operations.

The resource adapter contains

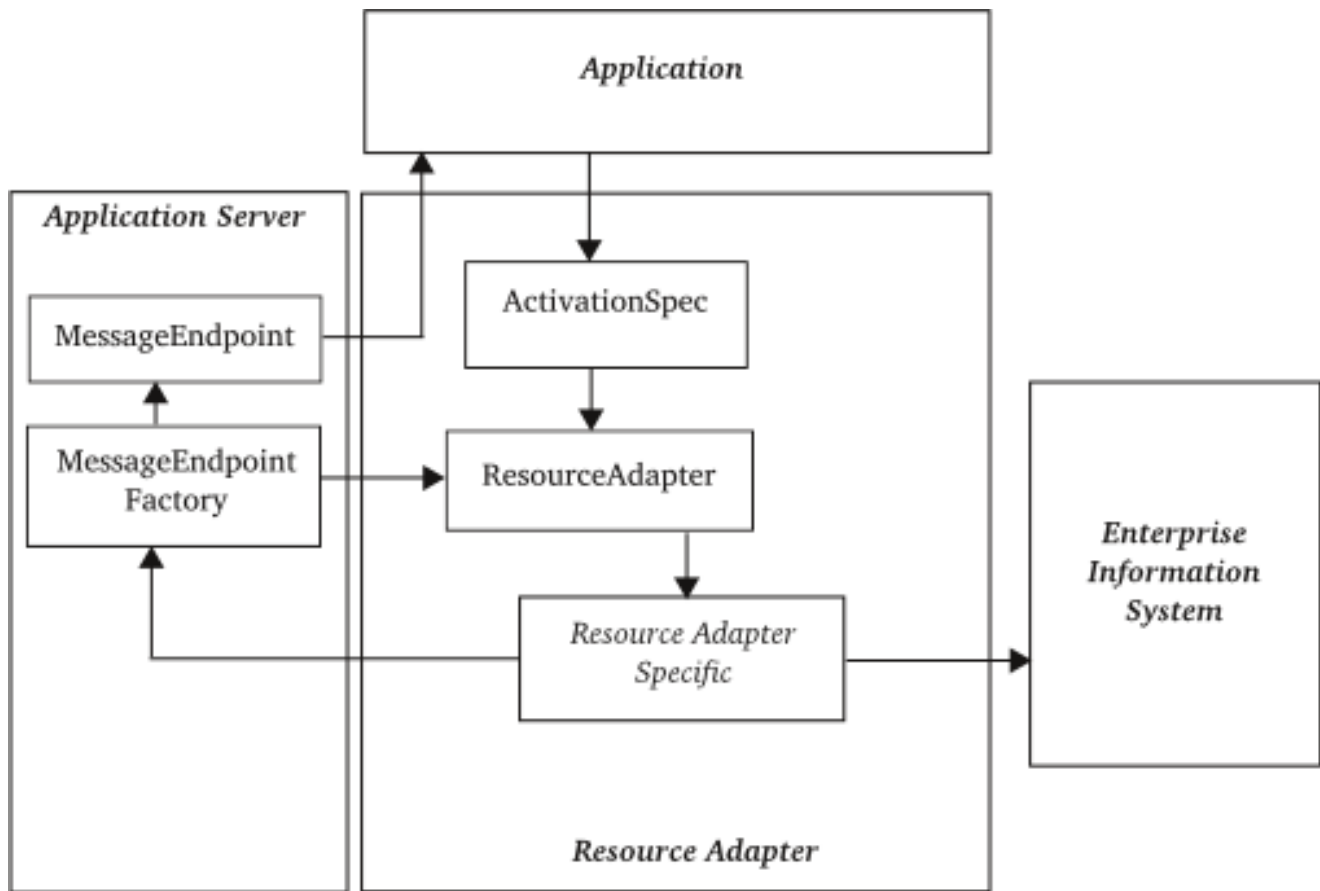
- **ManagedConnectionFactory:** The managed connection factory creates managed connections.
- **ManagedConnection:** The managed connection represents a physical connection to the target Enterprise Information System (EIS). The managed connection notifies the application server of events such as connection closed and connection error.

IronJacamar - the application server - contains

- **ConnectionManager:** The connection manager handles all managed connections in regards to pooling, transaction and security.
- **ConnectionEventListener:** The connection event listener allows the connection manager to know the status of each managed connection.

1.2.2. Inbound resource adapter

The Java Connector Architecture specification consists of a number of inbound components:



The application uses the

- **ActivationSpec:** The activation specification specifies the different properties that the application is looking for from the resource adapter and hence the Enterprise Information System (EIS). This specification can be hidden from the user by a facade provided by the application server.

The resource adapter contains

- **ResourceAdapter:** The resource adapter provides the activation point for inbound communication.
- **Resource adapter specific:** The resource adapter specific code handles communication with the Enterprise Information System (EIS) and deliver messages through the MessageEndpointFactory.

IronJacamar - the application server - contains

- **MessageEndpointFactory:** The MessageEndpointFactory is registered with the ResourceAdapter instance and creates the MessageEndpoint instances.

- **MessageEndpoint:** The MessageEndpoint contains the actual message from the Enterprise Information System (EIS) which the application uses. This could for example be a message driven Enterprise JavaBean (EJB/MDB).

2

Download

The official IronJacamar project page is <http://www.ironjacamar.org/> where you can download the software.

2.1. Download

The download location is: <http://www.ironjacamar.org/downloads/>

Each release is labelled with a version number and an identifier.

```
ironjacamar-<major>.<minor>.<patch>.<identifier>
```

where

- Major: The major version number. Signifies major changes in the implementation.
- Minor: The minor version number. Signifies functional changes to a major version.
- Patch: The patch version number. Signifies a binary compatible change to a minor version.
- Identifier: The identifier. Identifies the level of the quality of the release.
 - Final: Stable release
 - CR: Candidate for Release quality. The implementation is functional complete.
 - Beta: Beta quality. The implementation is almost functional complete.
 - Alpha: Alpha quality. The implementation is a snapshot of the development.

An example

```
ironjacamar-1.1.0.Final.tar.gz
```

which is a stable release of the project.

2.2. Maven repository

The IronJacamar distribution is deployed to the JBoss Nexus repository.

Repository: <http://repository.jboss.org/nexus/content/groups/public/>

Group id: `org.jboss.ironjacamar`

Table 2.1. Maven artifacts

Artifact	Description
<code>ironjacamar-arquillian-embedded</code>	The Arquillian extension for the embedded module
<code>ironjacamar-arquillian-embedded-byteman</code>	The Arquillian/Byteman extension for the embedded module
<code>ironjacamar-as</code>	WildFly integration tools
<code>ironjacamar-codegenerator</code>	The code generator
<code>ironjacamar-common-api</code>	The API for the common module
<code>ironjacamar-common-impl</code>	The implementation for the common module
<code>ironjacamar-common-spi</code>	The SPI for the common module
<code>ironjacamar-core-api</code>	The API / SPI for the core module
<code>ironjacamar-core-impl</code>	The implementation for the core module
<code>ironjacamar-depchain</code>	The dependency chain for the IronJacamar container
<code>ironjacamar-deployers-common</code>	The common classes for the deployer chains
<code>ironjacamar-deployers-fungal</code>	The deployers for the Fungal kernel based setup
<code>ironjacamar-embedded</code>	The embedded module
<code>ironjacamar-jdbc</code>	The core library for the JDBC resource adapters
<code>ironjacamar-spec-api</code>	The Java EE Connector Architecture 1.7 API
<code>ironjacamar-test-eis</code>	The Enterprise Information System test server
<code>ironjacamar-validator</code>	The validator module
<code>ironjacamar-validator-ant</code>	The Apache Ant tasks for the validator module
<code>ironjacamar-validator-cli</code>	The command line interface for the validator module
<code>jdbc-local</code>	A JDBC resource adapter backing standard datasources
<code>jdbc-xa</code>	A JDBC resource adapter backing XA datasources

2.3. Git Access

If you want to experiment with the latest developments you may checkout the latest code from Git. Be aware that the information provided in this manual might then not be accurate.

The Git repository is located at:

```
http://github.com/ironjacamar/ironjacamar
```

You can find additional information about this in the developer guide.

3

Installation

Once you have downloaded the distribution you need to install it in a location of your choice.

3.1. Compressed Tape Archive (.tar.gz)

Extract the distribution using

```
tar xzf ironjacamar-1.1.0.Final.tar.gz
```

The distribution will be located in a directory named

```
ironjacamar-1.1.0.Final
```

3.2. Zip Archive (.zip)

Extract the distribution using

```
unzip ironjacamar-1.1.0.Final.zip
```

or any program capable of handling Zip archives such as WinZip and WinRar.

The distribution will be located in a directory named

```
ironjacamar-1.1.0.Final
```

3.3. Directory structure

The IronJacamar container has the following directory structure:

- `bin`: Contains the scripts that starts the container.
- `config`: Contains the configuration of the container.
- `deploy`: Contains user deployments.
- `doc`: Contains the documentation.
- `lib`: Contains all the libraries needed by the container.
- `log`: Contains the log files for the container.
- `system`: Contains system deployments.
- `tmp`: Contains temporary files.

3.4. WildFly

The IronJacamar provides the Java EE Connector Architecture (JCA) container for WildFly 8 and future versions.

The container can be updated in WildFly by using the `as-upgrader.sh` script in the `doc/as` directory. This will allow an easy installation of IronJacamar patch releases to fix bugs in the application server environment.

The script can be used, like:

```
./as-upgrader.sh 1.1.0.Final /path/to/wildfly/installation
```

where `1.1.0.Final` is the version identifier of the IronJacamar container and the path points to the top-level directory of the WildFly installation. You can also use `1.1.1-SNAPSHOT` in order to upgrade to a patch snapshot build.

You can get an overview of all IronJacamar releases by searching our Nexus [<https://repository.jboss.org/nexus/>] repository.

Warning

Make sure that you understand the version policies specified in the developer guide before upgrading

4

Configuration

The configuration for the IronJacamar container is mainly located under the `config/` directory.

4.1. IronJacamar server

The IronJacamar server can be configured by including an `ironjacamar.properties` file next to the `ironjacamar-sjc.jar` in the `bin/` directory.

This file will allow to override the core options given to the kernel environment, if multiple instances of the IronJacamar container are going to run on the same machine, and network interface.

The options available

Table 4.1. IronJacamar options

Property	Type	Description
<code>name</code>	<code>String</code>	The name of the IronJacamar configuration
<code>management</code>	<code>boolean</code>	Should management be enabled
<code>parallel.deploy</code>	<code>boolean</code>	Should parallel deployment be enabled
<code>remote.access</code>	<code>boolean</code>	Should remote access be enabled
<code>remote.port</code>	<code>int</code>	The port for remote access
<code>remote.jmx.access</code>	<code>boolean</code>	Should remote access via JMX be enabled
<code>use.platform.mbeanserver</code>	<code>boolean</code>	Should the platform MBeanServer be used for management
<code>bean.management</code>	<code>boolean</code>	Should management for all beans be enabled

An example of an `ironjacamar.properties` file:

```
remote.access=true
```

```
remote.port=1302
```

4.1.1. Using the leak detector pool

IronJacamar features a connection pool implementation, which keeps track of connection allocations, and their release in order to provide feedback if a connection is obtained, but never released by the application. This will cause leaks, and lead to applications not being able to obtain any connections.

The leak detector pool provides a stack trace of the leaked connection allocation either during shutdown of the pool, or once the pool is flush using a flush strategy which kills all active connections.

The leak detector pool is configured using the `ironjacamar.mcp` system property with a value of

```
org.jboss.jca.core.connectionmanager.pool.mcp.LeakDumperManagedConnectionPool
```

This configuration applies to all connection pools used by IronJacamar.

The system property `ironjacamar.leaklog` can be used to have the leaks dumped out into a special file separate from the logging setup.

An example

```
-  
Dironjacamar.mcp=org.jboss.jca.core.connectionmanager.pool.mcp.LeakDumperManagedConnectionPool  
-Dironjacamar.leaklog=leaks.txt
```

4.1.2. Allow obtaining connections during MARKED_FOR_ROLLBACK

IronJacamar doesn't allow to obtain a connection once a transaction is in `MARKED_FOR_ROLLBACK` mode. This allows the container to fail eagerly, since any work after that point is wasted anyway.

However, certain applications depends on getting a connection to perform work.

IronJacamar has a system property called `ironjacamar.allow_marked_for_rollback` which can be set to `true` to enable this scenario.

Warning

This should not be considered best practice, and the application in question should be fixed by checking the transaction status.

4.1.3. Disable enlistment trace

IronJacamar records transaction enlistment traces in order to help to locate error situations that happens during enlistment of `XAResource` instances.

This has a performance overhead of course, so in certain situations you may want to disable these traces.

IronJacamar has a system property called `ironjacamar.disable_enlistment_trace` which can be set to `true` which does this.

Warning

By disabling the enlistment trace tracking down errors during transaction enlistment will become much more difficult. So, only add this system property if you know what you are doing.

4.1.4. Disable `delistResource` calls

IronJacamar calls `transaction.enlistResource(xaResource)` for the `ManagedConnection` when it is enlisting in the transaction.

IronJacamar will also call `transaction.delistResource(xaResource, flag)` once the `ManagedConnection` should be disassociated with the transaction. This typically happens on the transaction boundary (`beforeCompletion`) before the connection is returned to the pool (`afterCompletion`). This is done as part of the transaction specification contract.

However, in certain scenarios you may want to disable this call, as other `Synchronization` objects may still want the connection enlisted in the transaction, and hence it depends on the ordering of these objects.

IronJacamar has a system property called `ironjacamar.no_delist_resource` which is a `,` separated list of pool names where `delistResource` shouldn't be called. Disabling the `delistResource` call for all pools can be done by defining `ironjacamar.no_delist_resource_all`.

Warning

By disabling the `delistResource` call it is up to the resource manager and transaction manager to make sure that the connection is delisted from the transaction in all cases.

4.2. Logging service

The IronJacamar container uses JBoss Logging framework as the implementation.

The configuration is done in the

```
config/logging.properties
```

file.

Consult the JBoss Logging documentation [<http://www.jboss.org/community/wiki/JBossBootLogging>] on how the service can be configured.

4.3. Transaction service

The IronJacamar container uses Narayana its transaction implementation.

The configuration is done in the

```
config/transaction.xml
```

file.

Consult the Narayana documentation on how the service can be configured.

4.4. JCA

4.4.1. Deployer

The IronJacamar deployer is configured in the

```
config/bootstrap/jca.xml
```

file.

4.4.1.1. Configuration

The configuration of the resource adapter deployer chain is handled by a `org.jboss.jca.deployers.fungal.RAConfiguration` bean.

```

<bean name="RAConfiguration"
      class="org.jboss.jca.deployers.fungal.RAConfiguration">
  <property name="ArchiveValidation">true</property>
  <property name="ArchiveValidationFailOnWarn">false</property>
  <property name="ArchiveValidationFailOnError">true</property>
  <property name="BeanValidation">true</property>
  <property name="PrintStream">
    <inject bean="JBossStdioContext" property="Out"/>
  </property>
  <property name="DefaultBootstrapContext">
    <inject bean="DefaultBootstrapContext"/>
  </property>
  <property name="JndiStrategy"><inject bean="JndiStrategy"/></property>
  <property name="TransactionManager">
    <inject bean="RealTransactionManager"/>
  </property>
  <property name="MetadataRepository"><inject bean="MDR"/></property>
</bean>

```

Table 4.2. Resource adapter deployer configuration

Property	Type	Description
ArchiveValidation	boolean	Toggle archive validation for the deployment units. Default: true
ArchiveValidationFailOnWarn	boolean	Should an archive validation warning report fail the deployment. Default: false
ArchiveValidationFailOnError	boolean	Should an archive validation error report fail the deployment. Default: true
BeanValidation	boolean	Toggle bean validation (JSR-303) for the deployment units. Default: true
DefaultBootstrapContext	org.jboss.jca.core.api.bootstrap.CloneableBootstrapContext	Specifies the default bootstrap context for resource adapters
BootstrapContexts	Map<String, org.jboss.jca.	Bootstrap context map (unique name to a cloneable bootstrap context) which

Property	Type	Description
	<code>core.api.bootstrap.CloneableBootstrapContext></code>	allows developers to bind (through <code>ironjacamar.xml</code>) their resource adapter to a specific bootstrap context instance.
<code>PrintStream</code>	<code>java.io.PrintStream</code>	Specifies which print stream that should be used to handle the <code>LogWriterS</code>
<code>MetadataRepository</code>	<code>org.jboss.jca.core.spi.mdr.MetadataRepository</code>	The metadata repository
<code>ResourceAdapterRepository</code>	<code>org.jboss.jca.core.spi.rar.ResourceAdapterRepository</code>	The resource adapter repository
<code>ScopeDeployment</code>	<code>boolean</code>	Should each deployment be scoped (isolated) from the container. This feature allows deployment of libraries of a different version than used in the container environment. Default: <code>false</code>
<code>JndiStrategy</code>	<code>org.jboss.jca.core.spi.naming.JndiStrategy</code>	Specifies the JNDI strategy policy for binding the connection factories into the naming environment The JNDI strategies are located in the <code>org.jboss.jca.core.naming</code> package <ul style="list-style-type: none"> • <code>NoopJndiStrategy</code>: A no operation JNDI strategy which doesn't bind/unbind any objects • <code>SimpleJndiStrategy</code>: A simple JNDI strategy which can bind/unbind a single connection factory • <code>ExplicitJndiStrategy</code>: A JNDI strategy which can requires explicit JNDI names to bind/unbind a connection factory

4.4.1.2. Resource adapter deployer

The initial deployer for resource adapter archives is handled by a `org.jboss.jca.deployers.fungal.RADeployer` bean.

```
<bean name="RADeployer"
      interface="com.github.fungal.spi.deployers.Deployer"
      class="org.jboss.jca.deployers.fungal.RADeployer">
  <property name="Configuration"><inject bean="RAConfiguration"/></property>
  <depends>BeanValidation</depends>
  <depends>JBossStdioContextSelector</depends>
</bean>
```

This deployer will register the resource adapters with the metadata repository in the system.

Table 4.3. Resource adapter deployer

Property	Type	Description
Configuration	org.jboss.jca. deployers.fungal. RAConfiguration	The configuration for the deployer

4.4.1.3. Resource adapter metadata deployer

The deployer for deploying our `-ra.xml` deployment descriptor is handled by a `org.jboss.jca.deployers.fungal.RaXmlDeployer` bean.

The deployment descriptor is defined by the `resource-adapters-1_0.xsd` and `resource-adapters-1_1.xsd` schemas.

```
<bean name="RaXmlDeployer"
      interface="com.github.fungal.spi.deployers.Deployer"
      class="org.jboss.jca.deployers.fungal.RaXmlDeployer">
  <property name="Configuration"><inject bean="DeployerConfiguration"/></property>
  <property name="Kernel"><inject bean="Kernel"/></property>
  <depends>BeanValidation</depends>
  <depends>JBossStdioContextSelector</depends>
</bean>
```

This deployer will activate resource adapters based on the deployment information.

Table 4.4. Resource adapter metadata deployer

Property	Type	Description
Configuration	org.jboss.jca.deployers.fungal.RAConfiguration	The configuration for the deployer

4.4.1.4. Resource adapter activator

The deployer chain features an activator for resource adapter archives is handled by the `org.jboss.jca.deployers.fungal.RAAActivator` bean.

```
<bean name="RAActivator"
      class="org.jboss.jca.deployers.fungal.RAAActivator">
  <property name="Configuration"><inject bean="RAConfiguration"/></property>
  <property name="Kernel"><inject bean="Kernel"/></property>
  <property name="ExcludeArchives">
    <set elementClass="java.lang.String">
      <value>jdbc-local.rar</value>
      <value>jdbc-xa.rar</value>
    </set>
  </property>
  <depends>BeanValidation</depends>
  <depends>JBossStdioContextSelector</depends>
</bean>
```

This activator will activate any resource adapters which hasn't been activated yet unless they are in the excluded list.

Table 4.5. Resource adapter activator

Property	Type	Description
Configuration	org.jboss.jca.deployers.fungal.RAConfiguration	The configuration for the deployer
Enabled	boolean	Should the activator be enabled. Default is <code>true</code>
Kernel	com.github.fungal.api.Kernel	The kernel instance
ExcludeArchives	java.util.Set	A set of resource adapter archives which should be excluded from activation

4.4.2. Work manager

IronJacamar features a standard work manager on its default setup using one thread pool for short running jobs, and one thread pool for long running jobs identified by the `HintsContext.LONGRUNNING_HINT` with a value of `true`.

The configuration of the work manager and the necessary components can be viewed in the `jca.xml` file.

4.4.2.1. Distributed work manager

A distributed work manager is a work manager instance, which is able to reschedule work execution on another work manager instance on the network.

The distributed work manager has three additional components

- Policy -- When to distribute the work instance
- Selector -- To which work manager instance
- Transport -- How the work instance is transferred to control the distribution process.

Supported policies

- **Never** -- `org.jboss.jca.core.workmanager.policy.Never`
Never the distribute the `Work` instance to another node.
- **Always** -- `org.jboss.jca.core.workmanager.policy.Always`
Always the distribute the `Work` instance to another node.
- **WaterMark** -- `org.jboss.jca.core.workmanager.policy.WaterMark`
Distribute the `Work` instance to another node based on how many free worker threads the current node has available.

Supported selectors

- **FirstAvailable** -- `org.jboss.jca.core.workmanager.selector.FirstAvailable`
Select the first available node in the list
- **PingTime** -- `org.jboss.jca.core.workmanager.selector.PingTime`
Select the node with the lowest ping time
- **MaxFreeThreads** -- `org.jboss.jca.core.workmanager.selector.MaxFreeThreads`
Select the node with highest number of free worker threads

Supported transports

- Socket

--

`org.jboss.jca.core.workmanager.transport.remote.socket.SocketTransport`

Communication based on `java.net.Socket`, and hence TCP/IP

- JGroups

--

`org.jboss.jca.core.workmanager.transport.remote.jgroups.JGroupsTransport`

Communication based on the JGroups framework, and hence UDP (by default)

Below is an example of a socket based configuration where two instances `localhost:1299` and `localhost:1300` communicates, taken from the IronJacamar test suite.

```
<deployment>

<!-- DistributedWorkManagerThreadGroupSocket -->
<bean name="DistributedWorkManagerThreadGroupSocket"
      class="java.lang.ThreadGroup">
  <constructor>
    <parameter>dwm</parameter>
  </constructor>
  <ignoreStop/>
  <ignoreDestroy/>
</bean>

<!-- DistributedWorkManagerThreadFactorySocket -->
<bean name="DistributedWorkManagerThreadFactorySocket"
      interface="java.util.concurrent.ThreadFactory"
      class="org.jboss.threads.JBossThreadFactory">
  <constructor>
    <parameter><inject bean="DistributedWorkManagerThreadGroupSocket"/></parameter>
    <parameter>>false</parameter>
    <parameter>5</parameter>
    <parameter>work</parameter>
    <parameter><null/></parameter>
    <parameter><null/></parameter>
  </constructor>
</bean>

<!-- DistributedWorkManagerShortRunningThreadPoolSocket -->
<bean name="DistributedWorkManagerShortRunningThreadPoolSocket"
      class="org.jboss.threads.QueueExecutor">
  <constructor>
    <!-- Core threads -->
    <parameter>20</parameter>
    <!-- Max threads -->
    <parameter>100</parameter>
    <!-- 60 seconds keepalive -->
    <parameter>60</parameter>
    <parameter><inject bean="KeepAliveTimeUnit"/></parameter>
    <!-- Queue size -->
    <parameter>1024</parameter>
    <!-- Thread factory -->
    <parameter><inject bean="DistributedWorkManagerThreadFactorySocket"/></parameter>
    <!-- Blocking -->
```

```

        <parameter>true</parameter>
        <!-- Handoff executor -->
        <parameter><inject bean="RejectingExecutor" /></parameter>
    </constructor>
    <destroy method="shutdown" />
</bean>

<!-- DistributedWorkManagerPolicySocket -->
<bean name="DistributedWorkManagerPolicySocket"
      class="org.jboss.jca.core.workmanager.policy.Always">
</bean>

<!-- DistributedWorkManagerSelectorSocket -->
<bean name="DistributedWorkManagerSelectorSocket"
      class="org.jboss.jca.core.workmanager.selector.FirstAvailable">
</bean>

<!-- DistributedWorkManagerTransportSocket -->
<bean name="DistributedWorkManagerTransportSocket"
      class="org.jboss.jca.core.workmanager.transport.remote.socket.SocketTransport">
    <!-- The id -->
    <property name="Id">1</property>

    <!-- The executor -->
    <property name="ExecutorService">
        <inject bean="Kernel" property="ExecutorService" />
    </property>

    <!-- The host -->
    <property name="Host">127.0.0.1</property>

    <!-- The port -->
    <property name="Port">1299</property>

    <!-- The peers -->
    <property name="Peers">
        <set class="java.util.HashSet"
            elementClass="java.lang.String">
            <value>localhost:1300</value>
        </set>
    </property>

    <start method="startup" />
    <stop method="shutdown" />
</bean>

<!-- DistributedWorkManagerSocket -->
<bean name="DistributedWorkManagerSocket"
      interface="org.jboss.jca.core.api.workmanager.DistributedWorkManager"
      class="org.jboss.jca.core.workmanager.DistributedWorkManagerImpl">

    <!-- The name -->
    <property name="Name">DWM-Socket</property>

    <!-- The short running thread pool -->
    <property name="ShortRunningThreadPool">
        <inject bean="DistributedWorkManagerShortRunningThreadPoolSocket" />
    </property>

```

```
<!-- The XA terminator -->
<property name="XATerminator">
  <inject bean="TransactionIntegration" property="XATerminator"/>
</property>

<!-- The callback security module -->
<property name="CallbackSecurity">
  <inject bean="Callback"/>
</property>

<!-- The policy -->
<property name="Policy">
  <inject bean="DistributedWorkManagerPolicySocket"/>
</property>

<!-- The selector -->
<property name="Selector">
  <inject bean="DistributedWorkManagerSelectorSocket"/>
</property>

<!-- The transport -->
<property name="Transport">
  <inject bean="DistributedWorkManagerTransportSocket"/>
</property>

<!-- <destroy method="shutdown"/> -->
</bean>

<!-- DistributedBootstrapContextSocket -->
<bean name="DistributedBootstrapContextSocket"
  interface="org.jboss.jca.core.api.bootstrap.CloneableBootstrapContext"
  class="org.jboss.jca.core.bootstrapcontext.BaseCloneableBootstrapContext">
  <property name="Name">DWMBC-Socket</property>
  <property name="TransactionSynchronizationRegistry">
    <inject bean="TransactionSynchronizationRegistry"/>
  </property>
  <property name="WorkManagerName">
    <inject bean="DistributedWorkManagerSocket" property="Name"/>
  </property>
  <property name="XATerminator">
    <inject bean="TransactionIntegration" property="XATerminator"/>
  </property>
</bean>

</deployment>
```

4.4.3. Security

The Java EE Connector Architecture 1.6 specification allows units of `javax.resource.spi.Work` to be executed in a specific security context.

This is done through the use of Java Authentication Service Provider Interface for Containers (JSR-196) call backs using the `javax.security.auth.callback.Callback` interface.

The support is activated by letting the work instance implement the

```
javax.resource.spi.work.WorkContextProvider
```

interface and returning an instance of `javax.resource.spi.work.SecurityContext`.

The security callback is configured through the `>workmanager<` element for the deployment, either in `ironjacamar.xml` or in the `-ra.xml` file. See the schema definitions for further details.

There is support for creating a basic security domain which can provide a `javax.security.auth.Subject` instance to deployments that are using `<security-domain>` or `<security-domain-and-application>` in their setup.

A security domain can be configured through

```
<!-- SubjectFactory -->
<bean name="DefaultSecurityDomain"
      interface="org.jboss.security.SubjectFactory"
      class="org.jboss.jca.core.security.DefaultSubjectFactory">
  <property name="SecurityDomain">DefaultSecurityDomain</property>
  <property name="UserName">user</property>
  <property name="Password">password</property>
</bean>
```

beans.

4.5. Datasources

The IronJacamar project can deploy datasources using the `datasources-1_0.xsd`, `datasources-1_1.xsd` or `datasources-1_2.xsd` schemas.

The configuration is done in the

```
config/bootstrap/ds.xml
```

file.

Table 4.6. DsXmlDeployer

Property	Type	Description
JDBCLocal	String	The name of the jdbc-local.rar deployment
JDBCXA	String	The name of the jdbc-xa.rar deployment
TransactionManager	javax.transaction. TransactionManager	The transaction manager
MetadataRepository	org.jboss.jca. core.spi.mdr. MetadataRepository	The metadata repository
Kernel	com.github.fungal. api.Kernel	The kernel

The datasource deployer can be removed from the environment by removing the `ds.xml` file in

```
config/bootstrap/
```

as well as the reference in `config/bootstrap/bootstrap.xml` to the file.

Furthermore all `jdbc-*.rar` files in the `system/` directory should be removed too.

4.6. Web server

The IronJacamar project features a web server which is used to serve web archive deployments. More information about Jetty can be found at the homepage [<http://www.eclipse.org/jetty/>].

The configuration is done in the

```
system/web.xml
```

file.

```
<bean name="WebServer" class="org.jboss.jca.web.WebServer">  
  <property name="Host">${iron.jacamar.bindaddress:localhost}</property>  
  <property name="Port">8080</property>  
  <property name="ExecutorService"><inject bean="Kernel" property="ExecutorService"/></property>
```



```
</bean>
```

Table 4.7. Web server

Property	Type	Description
Host	String	Set the bind address for the web server Default: localhost
Port	int	Set the port for the web server Default: 8080
AcceptQueueSize	int	Set the accept queue size for the Jetty connector Default: 64
ExecutorService	java.util.concurrent. ExecutorService	The thread pool for the web server Default: The kernel thread pool

The web server can be removed from the environment by removing the `web.xml` file in

```
system/
```

Furthermore all `.war` files in the same directory should be removed too.

All the Jetty libraries can be removed by deleting the

```
lib/jetty
```

directory.

5

Deployment

The IronJacamar distribution contains a `deploy/` directory where all deployments should be deployed to.

5.1. Packaging requirements

A resource adapter archive is a structured Java Archive (JAR) file, which bundles all Java classes in JAR files, and optionally contains metadata, resources and native libraries.

A resource adapter archive name ends in the `.rar` extension.

An example of a resource adapter archive could look like

```
[jpederse@localhost]$ jar tf ra.rar
META-INF/ra.xml
readme.html
ra.jar
images/icon.jpg
win.dll
linux.so
```

See the Java EE Connector Architecture 1.7 specification chapter 20 for further requirements.

5.2. Deploying resource adapters

Resource adapters (`.rar`) are deployed by copying the resource adapter into the `deploy/` directory

```
cp example.rar ironjacamar-1.1.0.Final/deploy
```

on a Un*x based system or

```
copy example.rar ironjacamar-1.1.0.Final\deploy
```

on Windows.

The resource adapter can be configured and activated through a `META-INF/ironjacamar.xml` file in the archive. The format of the XML document is defined by the `ironjacamar_1_0.xsd` or `ironjacamar_1_1.xsd` schemas.

A resource adapter can also be configured and activated through deployment of a `-ra.xml` file in the `deploy/` directory - f.ex. `deploy/example-ra.xml`. The format of the XML document is defined by the `resource-adapters_1_0.xsd` or `resource-adapters_1_1.xsd` schemas - f.ex

```
<resource-adapters>
  <resource-adapter>
    <archive>example.rar</archive>
    <connection-definitions>
      <connection-definition jndi-name="java:/eis/example" class-name="com.example.ra.MCF"/>
    </connection-definitions>
  </resource-adapter>
</resource-adapters>
```

to bind the connection factory from `com.example.ra.MCF` under `java:/eis/example`.

See the schema appendix for additional details about the format.

Alternative the resource adapter deployments will be picked up by the `RAActivator` bean which bind a single connection factory under

```
java:/eis/<deploymentName>
```

- f.ex. `java:/eis/example` and a single admin object under

```
java:/eis/ao/<deploymentName>
```

- f.ex. `java:/eis/ao/example`.

5.2.1. Resource adapter descriptor

A resource adapter can be configured using two different ways

- META-INF/ironjacamar.xml for internal configuration
- -ra.xml for external configuration

to the resource adapter archive. Both formats share the same layout to ease configuration - only the top-level elements differ.

Table 5.1. Main elements

Element	Description
bean-validation-groups	Specifies bean validation group that should be used
bootstrap-context	Specifies the unique name of the bootstrap context that should be used
config-property	The config-property specifies resource adapter configuration properties.
transaction-support	Define the type of transaction supported by this resource adapter. Valid values are: NoTransaction, LocalTransaction, XATransaction
connection-definitions	Specifies the connection definitions
admin-objects	Specifies the administration objects

Table 5.2. Bean validation groups elements

Element	Description
bean-validation-group	Specifies the fully qualified class name for a bean validation group that should be used for validation

Table 5.3. Connection definition / admin object attributes

Attribute	Description
class-name	Specifies the the fully qualified class name of a managed connection factory or admin object
jndi-name	Specifies the JNDI name
enabled	Should the object in question be activated
use-java-context	Specifies if a java:/ JNDI context should be used
pool-name	Specifies the pool name for the object
use-ccm	Enable the cache connection manager
sharable	Defines the connection as sharable (lazy association) (1.1)

Attribute	Description
enlistment	Defines if the connection should use lazy enlistment if supported (1.1)

Table 5.4. Connection definition elements

Element	Description
config-property	The config-property specifies managed connection factory configuration properties.
pool	Specifies pooling settings
xa-pool	Specifies XA pooling settings
security	Specifies security settings
timeout	Specifies time out settings
validation	Specifies validation settings
recovery	Specifies the XA recovery settings

Table 5.5. Pool elements

Element	Description
min-pool-size	The min-pool-size element indicates the minimum number of connections a pool should hold. These are not created until a Subject is known from a request for a connection. This default to 0
initial-pool-size	The initial-pool-size element indicates the initial number of connections a pool should hold. These are not created until a Subject is known from a request for a connection. This default to 0 (1.1)
max-pool-size	The max-pool-size element indicates the maximum number of connections for a pool. No more than max-pool-size connections will be created in each sub-pool. This defaults to 20.
prefill	Whether to attempt to prefill the connection pool. Default is false
use-strict-min	Specifies if the min-pool-size should be considered strictly. Default false
flush-strategy	Specifies how the pool should be flush in case of an error. Valid values are: FailingConnectionOnly (default), InvalidIdleConnections (1.1), IdleConnections, Gracefully (1.1), EntirePool, AllInvalidIdleConnections (1.1),

Element	Description
	AllIdleConnections (1.1), AllGracefully (1.1), AllConnections (1.1)
capacity	Specifies the capacity policies (1.1)

Table 5.6. XA pool elements

Element	Description
min-pool-size	The min-pool-size element indicates the minimum number of connections a pool should hold. These are not created until a Subject is known from a request for a connection. This default to 0
initial-pool-size	The initial-pool-size element indicates the initial number of connections a pool should hold. These are not created until a Subject is known from a request for a connection. This default to 0 (1.1)
max-pool-size	The max-pool-size element indicates the maximum number of connections for a pool. No more than max-pool-size connections will be created in each sub-pool. This defaults to 20.
prefill	Whether to attempt to prefill the connection pool. Default is false
use-strict-min	Specifies if the min-pool-size should be considered strictly. Default false
flush-strategy	Specifies how the pool should be flush in case of an error. Valid values are: FailingConnectionOnly (default), InvalidIdleConnections (1.1), IdleConnections, Gracefully (1.1), EntirePool, AllInvalidIdleConnections (1.1), AllIdleConnections (1.1), AllGracefully (1.1), AllConnections (1.1)
capacity	Specifies the capacity policies (1.1)
is-same-rm-override	The is-same-rm-override element allows one to unconditionally set whether the javax.transaction.xa.XAResource.isSameRM(XAResource) returns true or false
interleaving	An element to enable interleaving for XA connection factories
no-tx-separate-pools	Oracle does not like XA connections getting used both inside and outside a JTA transaction. To workaround

Element	Description
	the problem you can create separate sub-pools for the different contexts
<code>pad-xid</code>	Should the Xid be padded
<code>wrap-xa-resource</code>	Should the XAResource instances be wrapped in an <code>org.jboss.jca.core.spi.transaction.xa.XAResourceWrapper</code> instance

Table 5.7. Security elements

Element	Description
<code>application</code>	Indicates that application supplied parameters (such as from <code>getConnection(user, pw)</code>) are used to distinguish connections in the pool.
<code>security-domain</code>	Indicates Subject (from security domain) are used to distinguish connections in the pool. The content of the security-domain is the name of the JAAS security manager that will handle authentication. This name correlates to the JAAS login-config.xml descriptor <code>application-policy/name</code> attribute.
<code>security-domain-and-application</code>	Indicates that either application supplied parameters (such as from <code>getConnection(user, pw)</code>) or Subject (from security domain) are used to distinguish connections in the pool. The content of the security-domain is the name of the JAAS security manager that will handle authentication. This name correlates to the JAAS login-config.xml descriptor <code>application-policy/name</code> attribute.

Table 5.8. Time out elements

Element	Description
<code>blocking-timeout-millis</code>	The <code>blocking-timeout-millis</code> element indicates the maximum time in milliseconds to block while waiting for a connection before throwing an exception. Note that this blocks only while waiting for a permit for a connection, and will never throw an exception if creating a new connection takes an inordinately long time. The default is 30000 (30 seconds).
<code>idle-timeout-minutes</code>	The <code>idle-timeout-minutes</code> elements indicates the maximum time in minutes a connection may be idle before being closed. The actual maximum time

Element	Description
	depends also on the IdleRemover scan time, which is 1/2 the smallest idle-timeout-minutes of any pool.
<code>allocation-retry</code>	The allocation retry element indicates the number of times that allocating a connection should be tried before throwing an exception. The default is 0.
<code>allocation-retry-wait-millis</code>	The allocation retry wait millis element indicates the time in milliseconds to wait between retrying to allocate a connection. The default is 5000 (5 seconds).
<code>xa-resource-timeout</code>	Passed to <code>XAResource.setTransactionTimeout()</code> . Default is zero which does not invoke the setter. Specified in seconds

Table 5.9. Validation elements

Element	Description
<code>background-validation</code>	An element to specify that connections should be validated on a background thread versus being validated prior to use
<code>background-validation-millis</code>	The background-validation-millis element specifies the amount of time, in milliseconds, that background validation will run.
<code>use-fast-fail</code>	Whether fail a connection allocation on the first connection if it is invalid (true) or keep trying until the pool is exhausted of all potential connections (false). Default is false

Table 5.10. Admin object elements

Element	Description
<code>config-property</code>	Specifies an administration object configuration property.

Table 5.11. Recovery elements

Element	Description
<code>recover-credential</code>	Specifies the user name / password pair or security domain that should be used for recovery.
<code>recover-plugin</code>	Specifies an implementation of the <code>org.jboss.jca.core.spi.recovery.RecoveryPlugin</code> class.

The deployment schemas are defined in `doc/ironjacamar_1_0.xsd`, `doc/ironjacamar_1_1.xsd`, `doc/resource-adapters_1_0.xsd` and `doc/resource-adapters_1_1.xsd`.

5.2.2. Resource adapter extensions

A resource adapter can make use of a couple of Java EE Connector Architecture extensions in the IronJacamar container in order to improve the integration.

The extensions include

- `org.jboss.jca.core.spi.recovery.RecoveryPlugin`: Plugin to provide feedback to the recovery module inside IronJacamar.
- `org.jboss.jca.core.spi.statistics.Statistics`: Plugin to identify a resource adapter component (`ResourceAdapter`, `ManagedConnectionFactory` and admin object) that provides statistics.

The following sections will describe these extensions points.

5.2.2.1. Recovery extension

The IronJacamar recovery extension allows the resource adapter deployment to give feedback to the container if a `ManagedConnection` can be used for recovery. This extension is used as part of XA recovery in the environment, and should therefore be implemented by all resource adapters capable of working in an `XATransaction` semantics.

The interface `org.jboss.core.spi.recovery.RecoveryPlugin` located in the `ironjacamar-core-api` artifact makes up the SPI for the extension.

The interface contains two methods that should be implemented in a resource adapter specific manner.

The method

```
public boolean isValid(Object c) throws ResourceException;
```

will return `true` if the connection can be used for recovery.

The method

```
public void close(Object c) throws ResourceException;
```

will close a connection that was used for recovery.

The recovery extension is activated by adding a recovery element to the deployment

```
<recovery>
  <recovery-plugin>com.mycompany.myproject.RecoveryPluginImpl</recovery-plugin>
</recovery>
```

The following recovery plugins are provided by IronJacamar

- `org.jboss.jca.core.recovery.DefaultRecoveryPlugin`: Default recovery plugin that tries to call a `close()` method on the underlying object
- `org.jboss.jca.core.recovery.ConfigurableRecoveryPlugin`: A recovery plugin where the results of the `isValid` and `close` can be specified
- `org.jboss.jca.core.recovery.ValidatingManagedConnectionFactoryRecoveryPlugin`: A recovery plugin that uses the `javax.resource.spi.ValidatingManagedConnectionFactory` interface to verify the connection

Note

The IronJacamar container will use a default implementation of the recovery SPI if an implementation isn't specified by the deployment.

5.2.2.2. Statistics extension

The IronJacamar statistics extension allows a resource adapter to expose statistics to the container and hence to the environment where IronJacamar is running. Statistics can be enabled for `ResourceAdapter`, `ManagedConnectionFactory` and admin object instances.

The extension include two interfaces `org.jboss.core.spi.statistics.Statistics` and `org.jboss.core.spi.statistics.StatisticsPlugin`. Both these interfaces are located in the `ironjacamar-core-api` artifact.

The `Statistics` interface will mark a resource adapter component as statistics capable and return the statistics plugin implementation instance.

The `StatisticsPlugin` interface contains methods to expose and describe each statistic that the plugin makes available. This information will then be made available to the environment where the IronJacamar container is running using the environment's preferred mechanism.

Note

The IronJacamar container will only expose core statistics for a deployment if no implementation of this extension is available.

5.2.3. Resource adapter statistics

Resource adapter deployments has the following core statistics values

Table 5.12. Core statistics

Name	Description
ActiveCount	The number of active connections. Each of the connections is either in use by an application or available in the pool
AvailableCount	The number of available connections in the pool
AverageBlockingTime	The average time spent blocking on obtaining an exclusive lock on the pool. The value is in milliseconds
AverageCreationTime	The average time spent creating a connection. The value is in milliseconds
AverageGetTime	The average time spent obtaining a connection. The value is in milliseconds
BlockingFailureCount	The number of times where there was a time out getting an exclusive lock on the pool
CreatedCount	The number of connections created
DestroyedCount	The number of connections destroyed
IdleCount	The number of connections currently idle
InUseCount	The number of connections currently in use
MaxCreationTime	The maximum time it took to create a connection. The value is in milliseconds
MaxGetTime	The maximum time it took to obtain a connection. The value is in milliseconds
MaxUsedCount	The maximum number of connections used
MaxWaitCount	The maximum number of requests waiting for a connection at the same time
MaxWaitTime	The maximum time spent waiting for an exclusive lock on the pool
TimedOut	The number of timed out connections
TotalBlockingTime	The total time spent waiting for an exclusive lock on the pool. The value is in milliseconds

Name	Description
TotalCreationTime	The total time spent creating connections. The value is in milliseconds
TotalGetTime	The total time spent obtaining connections. The value is in milliseconds
WaitCount	The number of requests that had to wait for a connection

5.3. Deploying datasources

Datasources (-ds.xml) are deployed by copying the definition into the `deploy/` directory

```
cp postgres-xa-ds.xml ironjacamar-1.1.0.Final/deploy
```

on a Un*x based system or

```
copy postgres-xa-ds.xml ironjacamar-1.1.0.Final\deploy
```

on Windows.

You will need to install the database JDBC driver into the `lib/` directory.

You can find examples of datasource definitions in the `doc/datasources` directory and the schemas: `doc/datasources_1_0.xsd`, `doc/datasources_1_1.xsd` and `doc/datasources_1_1.xsd`.

5.3.1. Datasource descriptor

Datasource descriptors are divided into

- `<datasource>` for a standard datasource
- `<xa-datasource>` for an XA capable datasource definitions.

A datasource descriptor supports the following parameters.

Table 5.13. Common datasource attributes

Attribute	Description
jndi-name	Specifies the JNDI name for the datasource

Attribute	Description
<code>pool-name</code>	Specifies the pool name for the datasource used for management
<code>enabled</code>	Specifies if the datasource should be enabled
<code>use-java-context</code>	Setting this to false will bind the DataSource into global JNDI
<code>spy</code>	Enable spy functionality on the JDBC layer - e.g. log all JDBC traffic to the datasource. The logging category <code>jboss.jdbc.spy</code> must be enabled too.
<code>use-ccm</code>	Enable the cached connection manager
<code>jta</code>	Enable JTA integration (only <datasource>)

Table 5.14. `datasource` elements

Element	Description
<code>connection-url</code>	The JDBC driver connection URL
<code>driver-class</code>	The fully qualified name of the JDBC driver class
<code>datasource-class</code>	The fully qualified name of the JDBC datasource class
<code>driver</code>	An unique name for the JDBC driver specified in the drivers section. Or the name of the .jar file if deployed as standalone deployment This element is mandatory when deploying in WildFly
<code>connection-property</code>	The connection-property element allows you to pass in arbitrary connection properties to the <code>Driver.connect(url, props)</code> method. Each connection-property specifies a string name/value pair with the property name coming from the name attribute and the value coming from the element content
<code>new-connection-sql</code>	Specify an SQL statement to execute whenever a connection is added to the connection pool
<code>transaction-isolation</code>	Set <code>java.sql.Connection</code> transaction isolation level to use. The constants defined by <code>transaction-isolation-values</code> are the possible transaction isolation levels and include: <code>TRANSACTION_READ_UNCOMMITTED</code> <code>TRANSACTION_READ_COMMITTED</code> <code>TRANSACTION_REPEATABLE_READ</code> <code>TRANSACTION_SERIALIZABLE</code> <code>TRANSACTION_NONE</code>
<code>url-delimiter</code>	Specifies the delimiter for URLs in connection-url for HA datasources

Element	Description
url-selector-strategy-class-name	A class that implements org.jboss.jca.adapters.jdbc.spi.URLSelectorStrategy
pool	Specifies the pooling settings
security	Specifies the security settings
validation	Specifies the validation settings
timeout	Specifies the time out settings
statement	Specifies the statement settings

Table 5.15. xa-datasource elements

Element	Description
xa-datasource-property	Specifies a property to assign to the XADataSource implementation class. Each property is identified by the name attribute and the property value is given by the xa-datasource-property element content. The property is mapped onto the XADataSource implementation by looking for a JavaBeans style getter method for the property name. If found, the value of the property is set using the JavaBeans setter with the element text translated to the true property type using the java.beans.PropertyEditor for the type
xa-datasource-class	The fully qualified name of the javax.sql.XADataSource implementation class
driver	An unique name for the JDBC driver specified in the drivers section. Or the name of the .jar file if deployed as standalone deployment. This element is mandatory when deploying in WildFly
url-delimiter	Specifies the delimiter for URLs in the connection url for HA datasources
url-property	Specifies the property for the URL property in the xa-datasource-property values (1.2)
url-selector-strategy-class-name	A class that implements org.jboss.jca.adapters.jdbc.spi.URLXASelectorStrategy
new-connection-sql	Specifies an SQL statement to execute whenever a connection is added to the connection pool
transaction-isolation	Set java.sql.Connection transaction isolation level to use. The constants defined by transaction-isolation-values are the possible transaction isolation levels and include: TRANSACTION_READ_UNCOMMITTED

Element	Description
	TRANSACTION_READ_COMMITTED TRANSACTION_REPEATABLE_READ TRANSACTION_SERIALIZABLE TRANSACTION_NONE
xa-pool	Specifies the pooling settings
security	Specifies the security settings
validation	Specifies the validation settings
timeout	Specifies the time out settings
statement	Specifies the statement settings
recovery	Specifies the recovery settings

Table 5.16. Pool settings

Element	Description
min-pool-size	The min-pool-size element indicates the minimum number of connections a pool should hold. These are not created until a Subject is known from a request for a connection. This default to 0
initial-pool-size	The initial-pool-size element indicates the initial number of connections a pool should hold. These are not created until a Subject is known from a request for a connection. This default to 0 (1.2)
max-pool-size	The max-pool-size element indicates the maximum number of connections for a pool. No more connections will be created in each sub-pool. This defaults to 20
prefill	Whether to attempt to prefill the connection pool. Empty element denotes a true value. Default is false
use-strict-min	Define if the min-pool-size should be considered a strictly. Default false
flush-strategy	Specifies how the pool should be flush in case of an error. Valid values are: <code>FailingConnectionOnly</code> (default), <code>InvalidIdleConnections</code> (1.2), <code>IdleConnections</code> , <code>Gracefully</code> (1.2), <code>EntirePool</code> , <code>AllInvalidIdleConnections</code> (1.2), <code>AllIdleConnections</code> (1.2), <code>AllGracefully</code> (1.2), <code>AllConnections</code> (1.2)
allow-multiple-users	Specifies if multiple users will access the datasource through the <code>getConnection(user, password)</code> method and hence if the internal pool type should account for that (1.1)

Element	Description
capacity	Specifies the capacity policies (1.2)
connection-listener	An org.jboss.jca.adapters.jdbc.spi.listener.ConnectionListener that provides a possible to listen for connection activation and passivation in order to perform actions before the connection is returned to the application or returned to the pool (1.2)

Table 5.17. XA pool settings

Element	Description
min-pool-size	The min-pool-size element indicates the minimum number of connections a pool should hold. These are not created until a Subject is known from a request for a connection. This default to 0
initial-pool-size	The initial-pool-size element indicates the initial number of connections a pool should hold. These are not created until a Subject is known from a request for a connection. This default to 0 (1.2)
max-pool-size	The max-pool-size element indicates the maximum number of connections for a pool. No more connections will be created in each sub-pool. This defaults to 20
prefill	Whether to attempt to prefill the connection pool. Empty element denotes a true value. Default is false
use-strict-min	Define if the min-pool-size should be considered a strictly. Default false
flush-strategy	Specifies how the pool should be flush in case of an error. Valid values are: FailingConnectionOnly (default), InvalidIdleConnections (1.2), IdleConnections, Gracefully (1.2), EntirePool, AllInvalidIdleConnections (1.2), AllIdleConnections (1.2), AllGracefully (1.2), AllConnections (1.2)
allow-multiple-users	Specifies if multiple users will access the datasource through the getConnection(user, password) method and hence if the internal pool type should account for that (1.1)
capacity	Specifies the capacity policies (1.2)
connection-listener	An org.jboss.jca.adapters.jdbc.spi.listener.ConnectionListener that provides a possible to listen for connection

Element	Description
	activation and passivation in order to perform actions before the connection is returned to the application or returned to the pool (1.2)
<code>is-same-rm-override</code>	The <code>is-same-rm-override</code> element allows one to unconditionally set whether the <code>javax.transaction.xa.XAResource.isSameRM(XAResource)</code> returns true or false
<code>interleaving</code>	An element to enable interleaving for XA connection factories
<code>no-tx-separate-pools</code>	Oracle does not like XA connections getting used both inside and outside a JTA transaction. To workaround the problem you can create separate sub-pools for the different contexts
<code>pad-xid</code>	Should the Xid be padded
<code>wrap-xa-resource</code>	Should the XAResource instances be wrapped in an <code>org.jboss.jca.core.spi.transaction.xa.XAResourceWrapper</code> instance

Table 5.18. Security settings

Element	Description
<code>user-name</code>	Specify the username used when creating a new connection.
<code>password</code>	Specify the password used when creating a new connection.
<code>security-domain</code>	Indicates Subject (from security domain) are used to distinguish connections in the pool. The content of the security-domain is the name of the JAAS security manager that will handle authentication. This name correlates to the JAAS login-config.xml descriptor application-policy/name attribute.
<code>reauth-plugin</code>	Defines a reauthentication plugin that can be used for reauthentication of physical connections.

Table 5.19. Validation settings

Element	Description
<code>valid-connection-checker</code>	An <code>org.jboss.jca.adapters.jdbc.spi.ValidConnectionChecker</code> that provides a <code>SQLException isValidConnection(Connection e)</code> method to validate

Element	Description
	is a connection is valid. An exception means the connection is destroyed. This overrides the check-valid-connection-sql when present
check-valid-connection-sql	Specify an SQL statement to check validity of a pool connection. This may be called when managed connection is taken from pool for use.
validate-on-match	The validate-on-match element indicates whether or not connection level validation should be done when a connection factory attempts to match a managed connection for a given set. This is typically exclusive to the use of background validation
background-validation	An element to specify that connections should be validated on a background thread versus being validated prior to use
background-validation-millis	The background-validation-millis element specifies the amount of time, in milliseconds, that background validation will run
use-fast-fail	Whether fail a connection allocation on the first connection if it is invalid (true) or keep trying until the pool is exhausted of all potential connections (false) default false
stale-connection-checker	An <code>org.jboss.jca.adapters.jdbc.spi.StaleConnectionChecker</code> that provides a <code>boolean isStaleConnection(SQLException e)</code> method which if it returns true will wrap the exception in an <code>org.jboss.jca.adapters.jdbc.StaleConnectionException</code> which is a subclass of <code>SQLException</code>
exception-sorter	An <code>org.jboss.jca.adapters.jdbc.spi.ExceptionSorter</code> that provides a <code>boolean isExceptionFatal(SQLException e)</code> method to validate is an exception should be broadcast to all <code>javax.resource.spi.ConnectionEventListener</code> as a <code>connectionErrorOccurred</code> message

Table 5.20. Time out settings

Element	Description
blocking-timeout-millis	The blocking-timeout-millis element indicates the maximum time in milliseconds to block while waiting for a connection before throwing an exception. Note that this blocks only while waiting for a permit for

Element	Description
	a connection, and will never throw an exception if creating a new connection takes an inordinately long time. The default is 30000 (30 seconds).
<code>idle-timeout-minutes</code>	The <code>idle-timeout-minutes</code> elements indicates the maximum time in minutes a connection may be idle before being closed. The actual maximum time depends also on the <code>IdleRemover</code> scan time, which is 1/2 the smallest <code>idle-timeout-minutes</code> of any pool.
<code>set-tx-query-timeout</code>	Whether to set the query timeout based on the time remaining until transaction timeout, any configured query timeout will be used if there is no transaction. The default is <code>false</code>
<code>query-timeout</code>	Any configured query timeout in seconds The default is no timeout
<code>use-try-lock</code>	Any configured timeout for internal locks on the resource adapter objects in seconds The default is a 60 second timeout
<code>allocation-retry</code>	The allocation retry element indicates the number of times that allocating a connection should be tried before throwing an exception. The default is 0.
<code>allocation-retry-wait-millis</code>	The allocation retry wait millis element indicates the time in milliseconds to wait between retrying to allocate a connection. The default is 5000 (5 seconds).
<code>xa-resource-timeout</code>	Passed to <code>XAResource.setTransactionTimeout()</code> Default is zero which does not invoke the setter. In seconds

Table 5.21. Statement settings

Element	Description
<code>track-statements</code>	Whether to check for unclosed statements when a connection is returned to the pool and result sets are closed when a statement is closed/return to the prepared statement cache. valid values are: <code>false</code> - do not track statements and results; <code>true</code> - track statements and result sets and warn when they are not closed; <code>nowarn</code> - track statements but do no warn about them being unclosed (the default)
<code>prepared-statement-cache-size</code>	The number of prepared statements per connection in an LRU cache

Element	Description
share-prepared-statements	Whether to share prepare statements, i.e. whether asking for same statement twice without closing uses the same underlying prepared statement. The default is false

Table 5.22. Recovery elements

Element	Description
recover-credential	Specifies the user name / password pair or security domain that should be used for recovery.
recover-plugin	Specifies an implementation of the <code>org.jboss.jca.core.spi.recovery.RecoveryPlugin</code> class.

Table 5.23. Driver attributes

Attribute	Description
name	An unique name for the JDBC driver
module	The module definition for the JDBC driver. The format of a module inside WildFly 8+ is <code>com.h2database.h2</code> which will map to the H2 installation under <code>modules/com/h2database/h2/main</code> . A ':' can be used to identify the slot - f.ex <code>com.h2database.h2:1.3.159</code> . The format for IronJacamar Standalone/Embedded is the name of the .jar file
major-version	The major version of the driver
minor-version	The minor version of the driver

Table 5.24. Driver elements

Element	Description
driver-class	The fully qualified class name of the driver class
datasource-class	The fully qualified class name of the datasource class
xa-datasource-class	The fully qualified class name of the XA datasource class

The datasource deployment schema is defined in `doc/datasources_1_0.xsd` and `doc/datasources_1_1.xsd`.

5.3.2. Datasource extensions

The datasource deployments can make use of a couple of extensions in the JDBC resource adapter to improve the connection validation and checking if an exception should reestablish the connection in question.

The extensions include

- `org.jboss.jca.adapters.jdbc.spi.ExceptionSorter`: Plugin to check if a `SQLException` is fatal for the connection on which it was thrown.
- `org.jboss.jca.adapters.jdbc.spi.StaleConnection`: Plugin to wrap stale `SQLException`'s in a `org.jboss.jca.adapters.jdbc.StaleConnectionException`.
- `org.jboss.jca.adapters.jdbc.spi.ValidConnection`: Plugin to Check if a connection is valid for use by the application.

Configuration of the extensions are done by using

- The `<exception-sorter>` tag for an `ExceptionSorter`
- The `<stale-connection-checker>` tag for a `StaleConnection`
- The `<valid-connection-checker>` tag for a `ValidConnection`

IronJacamar features implementations of these extensions for a couple of popular databases. Contributions in this area are most welcome either generic solutions or for a specific database.

Informix:

- `org.jboss.jca.adapters.jdbc.extensions.informix.InformixExceptionSorter`

Microsoft SQLServer:

- `org.jboss.jca.adapters.jdbc.extensions.mssql.MSSQLValidConnectionChecker`

PostgreSQL:

- `org.jboss.jca.adapters.jdbc.extensions.postgres.PostgreSQLExceptionSorter`
- `org.jboss.jca.adapters.jdbc.extensions.postgres.PostgreSQLValidConnectionChecker`

MySQL:

- `org.jboss.jca.adapters.jdbc.extensions.mysql.MySQLExceptionSorter`
- `org.jboss.jca.adapters.jdbc.extensions.mysql.MySQLReplicationValidConnectionChecker`
- `org.jboss.jca.adapters.jdbc.extensions.mysql.MySQLValidConnectionChecker`

IBM DB2:

- `org.jboss.jca.adapters.jdbc.extensions.db2.DB2ExceptionSorter`

- `org.jboss.jca.adapters.jdbc.extensions.db2.DB2StaleConnectionChecker`
- `org.jboss.jca.adapters.jdbc.extensions.db2.DB2ValidConnectionChecker`

Generic:

- `org.jboss.jca.adapters.jdbc.extensions.novendor.NullExceptionSorter`
- `org.jboss.jca.adapters.jdbc.extensions.novendor.NullStaleConnectionChecker`
- `org.jboss.jca.adapters.jdbc.extensions.novendor.NullValidConnectionChecker`
- `org.jboss.jca.adapters.jdbc.extensions.novendor.JDBC4ValidConnectionChecker`

Sybase:

- `org.jboss.jca.adapters.jdbc.extensions.sybase.SybaseExceptionSorter`
- `org.jboss.jca.adapters.jdbc.extensions.sybase.SybaseValidConnectionChecker`

Oracle:

- `org.jboss.jca.adapters.jdbc.extensions.oracle.OracleExceptionSorter`
- `org.jboss.jca.adapters.jdbc.extensions.oracle.OracleStaleConnectionChecker`
- `org.jboss.jca.adapters.jdbc.extensions.oracle.OracleValidConnectionChecker`

5.3.3. Datasource statistics

Datasources has the following core statistics values

Table 5.25. Core statistics

Name	Description
ActiveCount	The number of active connections. Each of the connections is either in use by an application or available in the pool
AvailableCount	The number of available connections in the pool
AverageBlockingTime	The average time spent blocking on obtaining an exclusive lock on the pool. The value is in milliseconds
AverageCreationTime	The average time spent creating a connection. The value is in milliseconds
AverageGetTime	The average time spent obtaining a connection. The value is in milliseconds
BlockingFailureCount	The number of times where there was a time out getting an exclusive lock on the pool
CreatedCount	The number of connections created
DestroyedCount	The number of connections destroyed
IdleCount	The number of connections currently idle
InUseCount	The number of connections currently in use

Name	Description
MaxCreationTime	The maximum time it took to create a connection. The value is in milliseconds
MaxGetTime	The maximum time it took to obtain a connection. The value is in milliseconds
MaxUsedCount	The maximum number of connections used
MaxWaitCount	The maximum number of requests waiting for a connection at the same time
MaxWaitTime	The maximum time spent waiting for an exclusive lock on the pool
TimedOut	The number of timed out connections
TotalBlockingTime	The total time spent waiting for an exclusive lock on the pool. The value is in milliseconds
TotalCreationTime	The total time spent creating connections. The value is in milliseconds
TotalGetTime	The total time spent obtaining connections. The value is in milliseconds
WaitCount	The number of requests that had to wait for a connection

Datasources has the following JDBC statistics values

Table 5.26. JDBC statistics

Name	Description
PreparedStatementCacheAccessCount	The number of times that the statement cache was accessed
PreparedStatementCacheAddCount	The number of statements added to the statement cache
PreparedStatementCacheCurrentSize	The number of prepared and callable statements currently cached in the statement cache
PreparedStatementCacheDeleteCount	The number of statements discarded from the cache
PreparedStatementCacheHitCount	The number of times that statements from the cache were used
PreparedStatementCacheMissCount	The number of times that a statement request could not be satisfied with a statement from the cache

5.4. General deployment settings

This section will provide an overview of general deployment settings that are shared between resource adapter activations, and datasource deployments.

5.4.1. Flush strategies

The flush strategy option for the connection pool defines how the pool should be flushed in case there is an error on a connection belonging to the pool.

In all cases the connection with the error is destroyed, and the pool is scheduled for prefill if supported.

Table 5.27. Flush strategies

Name	Description
<code>FailingConnectionOnly</code>	Only the connection with the error is destroyed. This is the default strategy.
<code>InvalidIdleConnections</code>	All idle connections are checked if they are invalid, based on the <code>javax.resource.spi.ValidatingManagedConnectionFactory</code> return value.
<code>IdleConnections</code>	All idle connections are destroyed.
<code>Gracefully</code>	All idle connections are destroyed, and all active connections will be destroyed upon return to the pool.
<code>EntirePool</code>	All connections are destroyed, including current active connections.
<code>AllInvalidIdleConnections</code>	Like <code>InvalidIdleConnections</code> , but across all credentials for the pool if supported.
<code>AllIdleConnections</code>	Like <code>IdleConnections</code> , but across all credentials for the pool if supported.
<code>AllGracefully</code>	Like <code>Gracefully</code> , but across all credentials for the pool if supported.
<code>AllConnections</code>	Like <code>EntirePool</code> , but across all credentials for the pool if supported.

5.4.2. Capacity policies

The policy for creating and destroying physical connections for a pool can be controlled by specifying which policy that should be used.

The default policies are only to create one connection per request, and to destroy all connections timed out when the idle timeout is scheduled.

5.4.2.1. Increment policies

The following increment policies are supported.

5.4.2.1.1. MaxPoolSize policy

The `org.jboss.jca.core.connectionmanager.pool.capacity.MaxPoolSizeIncrementer` policy will fill the pool to its max size for each request.

This policy is useful when you want to keep the maximum number of connections available all the time.

5.4.2.1.2. Size policy

The `org.jboss.jca.core.connectionmanager.pool.capacity.SizeIncrementer` policy will fill the pool by the specified number of connections for each request.

Table 5.28. Size policy properties

Name	Description
Size	The number of connections that should be created

This policy is useful when you want to increment with an additional number of connections per request in anticipation that the next request will also need a connection.

This is the default increment policy with a value of 1.

5.4.2.1.3. Watermark policy

The `org.jboss.jca.core.connectionmanager.pool.capacity.WatermarkIncrementer` policy will fill the pool to the specified number of connections for each request.

Table 5.29. Watermark policy properties

Name	Description
Watermark	The watermark level for the number of connections

This policy is useful when you want to keep a specified number of connections in the pool at all time.

5.4.2.2. Decrement policies

The following decrement policies are supported.

5.4.2.2.1. MinPoolSize policy

The `org.jboss.jca.core.connectionmanager.pool.capacity.MinPoolSizeDecrementer` policy will decrement the pool to its min size for each request.

This policy is useful when you want to limit the number of connections after each idle timeout request.

5.4.2.2.2. Size policy

The `org.jboss.jca.core.connectionmanager.pool.capacity.SizeDecrementer` policy will decrement the pool by the specified number of connections for each idle timeout request.

Table 5.30. Size policy properties

Name	Description
Size	The number of connections that should be created

This policy is useful when you want to decrement an additional number of connections per idle timeout request in anticipation that the pool usage will lower over time.

5.4.2.2.3. TimedOut policy

The `org.jboss.jca.core.connectionmanager.pool.capacity.TimedOutDecrementer` policy will removed all connections that have timed out from the pool for each idle timeout request.

This policy is the default decrement policy.

5.4.2.2.4. Watermark policy

The `org.jboss.jca.core.connectionmanager.pool.capacity.WatermarkDecrementer` policy will decrement the pool to the specified number of connections for each idle timeout request.

Table 5.31. Watermark policy properties

Name	Description
Watermark	The watermark level for the number of connections

This policy is useful when you want to keep a specified number of connections in the pool at all time.

6

Running

6.1. Starting the container

The IronJacamar container is started by entering the bin/ directory

```
cd ironjacamar-1.1.0.Final/bin
```

and executing

```
./run.sh
```

on a Un*x based system or

```
run.bat
```

on Windows.

The command takes an optional -b argument to define the binding address of the naming server

```
./run.sh -b 192.168.0.199
```

Once the container has started you should see a log entry like

```
13:33:10,999 INFO [Main] Server started in 941ms
```

in the console where the command was executed.

After the container has started you can browse to

```
http://localhost:8080
```

to view the project documentation and use the administration console.

6.2. Stopping the container

The IronJacamar container is stopped by pressing the `Ctrl-C` keys.

Once the container has stopped you should see a log entry like

```
13:35:06,752 INFO [Main] Server stopped in 29ms
```

in the console where the container was running.

Alternative the container can be stopped through the command line interface.

6.3. Command line interface

The IronJacamar container can be controlled by a command line interface.

If you are accessing a remote container you can use the `-h` option to specify the host name.

6.3.1. Deploy

You can deploy a resource adapter archive (.rar) using

```
java -jar fungal-cli.jar deploy <file>
```

where `file` specifies the resource adapter archive.

6.3.2. Undeploy

You can undeploy a resource adapter archive (.rar) using

```
java -jar fungal-cli.jar undeploy <file>
```

where `file` specifies the resource adapter archive.

6.3.3. Shutdown

You can shutdown the IronJacamar environment by

```
java -jar fungal-cli.jar shutdown
```

6.4. Apache Ant

The IronJacamar container can be controlled by Apache Ant tasks.

6.4.1. Start

The IronJacamar container can be started by the Apache Ant task `org.jboss.jca.sjc.ant.Start` which takes a `home` attribute to specify the home directory of the installation.

6.4.2. Stop

The IronJacamar container can be stopped by the Apache Ant task `org.jboss.jca.sjc.ant.Stop` which takes a `home` attribute to specify the home directory of the installation.

6.4.3. Deploy

Deployments to the IronJacamar container can be done by the Apache Ant task `org.jboss.jca.sjc.ant.Deploy` which takes a `file` attribute to specify the file that should be deployed. The task takes optional `host` and `port` attributes in order to specify the host and port where the IronJacamar container is located.

6.4.4. Undeploy

Undeploying from the IronJacamar container can be done by the Apache Ant task `org.jboss.jca.sjc.ant.Undeploy` which takes a `file` attribute to specify the file that should be undeployed. The task takes optional `host` and `port` attributes in order to specify the host and port where the IronJacamar container is located.

6.4.5. Ping

The IronJacamar container can be pinged for availability using the Apache Ant task `org.jboss.jca.sjc.ant.Ping`. The task takes optional `host` and `port` attributes in order to specify the host and port where the IronJacamar container is located.

6.5. Apache Maven

The IronJacamar container can be controlled by Apache Maven mojos.

6.5.1. Start

The IronJacamar container can be started by the Apache Maven mojo `org.jboss.jca.sjc.maven.Start` which takes a `home` element to specify the home directory of the installation.

6.5.2. Stop

The IronJacamar container can be stopped by the Apache Maven mojo `org.jboss.jca.sjc.maven.Stop` which takes a `home` element to specify the home directory of the installation.

6.5.3. Deploy

Deployments to the IronJacamar container can be done by the Apache Maven mojo `org.jboss.jca.sjc.maven.Deploy` which takes a `file` element to specify the file that should be deployed. The mojo takes optional `host` and `port` elements in order to specify the host and port where the IronJacamar container is located.

6.5.4. Undeploy

Undeploying from the IronJacamar container can be done by the Apache Maven mojo `org.jboss.jca.sjc.maven.Undeploy` which takes a `file` element to specify the file that should be undeployed. The mojo takes optional `host` and `port` elements in order to specify the host and port where the IronJacamar container is located.

6.5.5. Ping

The IronJacamar container can be pinged for availability using the Apache Maven mojo `org.jboss.jca.sjc.maven.Ping`. The mojo takes optional `host` and `port` elements in order to specify the host and port where the IronJacamar container is located.

7

Validator

7.1. Introduction

The IronJacamar container features a validator which checks resource adapter archives against the Java Connector Architecture (JCA) specification.

The validator is doing a static analysis of the resource adapter classes and checks them against the rules defined in the validator.

The validator is used in the deployer chain of the JCA container, and is available as a standalone tool, as an Apache Ant task and as a Apache Maven plugin too.

7.2. Reports

The validator works by scanning the resource adapter in question and output a report which lists which rules have been violated.

An example could be

```
Severity: ERROR
Section: 19.4.2
Description: A ResourceAdapter must implement a "public int hashCode()" method.
Code: com.mycompany.myproject.ResourceAdapterImpl

Severity: ERROR
Section: 19.4.2
Description: A ResourceAdapter must implement a "public boolean equals(Object)" method.
Code: com.mycompany.myproject.ResourceAdapterImpl
```

which means that `com.mycompany.myproject.ResourceAdapterImpl` is missing an `equals` and `hashCode` implementation.

Table 7.1. Validator report

Key	Description
Severity	Specifies the severity of the rule.

Key	Description
	<ul style="list-style-type: none">• ERROR: Critical error which must be fixed in order for the resource adapter to operate correctly.• WARN: Error which should be fixed in order for the resource adapter to operate correctly.
Section	A reference to a section in the Java Connector Architecture specification where the requirement is defined.
Description	A short description of the rule.
Code	The class which triggered the rule.

7.3. Running the standalone validator

The validator can be run on the command line by

```
cd doc/validator
./validator.sh <file>
```

The reports will be generated into the current directory under the name of `<file>.log`.

7.4. Apache Ant integration

The validator integrates with Apache Ant such that you can generate the reports directly from your build environment before deploying the resource adapter into the IronJacamar container.

First you have to define the `taskdef` for the task

```
<taskdef name="validator"
  classname="org.jboss.jca.validator.ant.ValidatorTask"
  classpathref="ironjacamar.lib.path.id"/>
```

See the Apache Ant documentation for additional instructions on installation.

7.4.1. Usage

```
<validator rarFile="${myArchive.rar}" outputDir="${report.dir}"/>
```

Table 7.2. Apache Ant: validator

Key	Value
rarFile	The resource adapter file
outputDir	The directory where the reports should be generated
classpath	A classpath to resolve additional dependencies against

7.5. Apache Maven integration

The validator integrates with Apache Maven such that you can generate the reports directly from your build environment before deploying the resource adapter into the IronJacamar container.

To be able to use the validator plugin in your Maven project, you will have to add the following plugin declaration in the pom.xml of your project:

```
<build>
  <plugins>
    <plugin>
      <groupId>org.jboss.ironjacamar</groupId>
      <artifactId>ironjacamar-validator-maven</artifactId>
      <!-- The version of the plugin you want to use -->
      <version>1.1.0.Final</version>
      <executions>
        <execution>
          <goals>
            <goal>validate</goal>
          </goals>
        </execution>
      </executions>
      <configuration>
        <!-- output directory-->
        <outputDir>./outputDir</outputDir>

        <!-- rar filename -->
        <rarFile>/path/to/myresourceadapter.rar</rarFile>

        <!-- optional classpath
        <classpath>
          <param>classpath1</param>
          <param>classpath2</param>
        </classpath>
        -->
      </configuration>
    </plugin>
  </plugins>
</build>
```

Note

By default, the `validator-maven` plugin is attached to the "package" phase of Maven.

See the Apache Maven documentation for additional instructions on installation.

7.5.1. Usage

Once you have configured your project's `pom.xml` to include the `validator-maven` plugin, as explained earlier, you can generate the report by running the `package` goal on your project.

```
mvn clean package
```

Table 7.3. Apache Maven: validator

Key	Value
<code>rarFile</code>	The resource adapter file
<code>outputDir</code>	The directory where the reports should be generated
<code>classpath</code>	A classpath to resolve additional dependencies against

8

Code generator

8.1. Introduction

The IronJacamar project includes a resource adapter code generator which can generate a complete code skeleton that will help developers get started with their development tasks.

8.2. Functionality

The code generator will generate a resource adapter code skeleton based on the user input. The code generator supports

- Resource adapter using JCA 1.7 annotations
- Resource adapter using JCA 1.7 metadata
- Resource adapter using JCA 1.6 annotations
- Resource adapter using JCA 1.6 metadata
- Resource adapter using JCA 1.5
- Resource adapter using JCA 1.0
- Apache Ant build environment
- Apache Ant + Ivy build environment
- Gradle build environment
- Apache Maven build environment
- Test suite environment

8.3. Running the tool

The code generator can be run on the command line by

```
./codegenerator.sh
```

from the `doc/codegenerator` directory.

The code generator supports the following arguments

Table 8.1. Code generator arguments

Argument	Description
-o	Specifies the output directory for the code skeleton.

The developer must then answer various questions regarding the properties of the resource adapter.

8.3.1. Developer Input

This section describes the questions that are asked in order to generate the code.

Table 8.2. Developer input

Question	Spec	Description	Type
Profile version (1.7/1.6/1.5/1.0)	All	Defines which Java EE Connector Architecture specification that the resource adapter should target	
Type (O/Outbound/I/ Inbound/B/Bidirectional)	JCA 1.5+	Defines if the resource adapter should contain outbound communication., inbound communication or both	
Package name	All	The package name of the resource adapter	
Transaction support (N/NoTransaction/L/ LocalTransaction/X/ XATransaction)	All	The transaction support level	
Reauthentication (Y/Yes/ N/No)	All	If the resource adapter supports reauthentication	
Use annotations (Y/Yes/ N/No)	JCA 1.6+	Should annotations be used for specifying the structure. If 'No' is selected a <code>META-INF/ra.xml</code> is generated	
Include a ResourceAdapter (Y/ Yes/N/No)	JCA 1.5+	Should an instance of a resource adapter class be included in the archive	Outbound
Resource adapter class name	JCA 1.5+	The class name of the resource adapter	Outbound or Bidirectional
Should the resource adapter class be Serializable (Y/Yes/N/ No)	JCA 1.5+	Should the resource adapter class be serializable	Outbound

Question	Spec	Description	Type
Managed connection factory class name	All	The class name of the managed connection factory	Outbound or Bidirectional
Managed connection class name	All	The class name of the managed connection	Outbound or Bidirectional
Connection interface class name	All	The class name of the connection interface	Outbound or Bidirectional
Connection implementation class name	All	The class name of the connection implementation	Outbound or Bidirectional
Connection factory interface class name	All	The class name of the connection factory interface	Outbound or Bidirectional
Connection factory implementation class name	All	The class name of the connection factory implementation	Outbound or Bidirectional
Resource adapter config properties	All	Include a configuration properties in the resource adapter instance	Outbound or Bidirectional
Managed connection factory config properties	All	Include a configuration properties in the managed connection factory instance	Outbound or Bidirectional
Use ResourceAdapterAssociation (Y/Yes/N/No)	All	Associate the managed connection factory instance with the resource adapter instance	Outbound or Bidirectional
Use CCI (Y/Yes/N/No)	All	Use the Common Client Interface for the connection / connection factory in the 'Outbound' part of the resource adapter	Outbound or Bidirectional
MessageListener interface name	JCA 1.5+	The name of the message listener interface for the activation	Inbound or Bidirectional
ActivationSpec class name	JCA 1.5+	The class name of the activation specification instance	Inbound or Bidirectional
ActivationSpec config properties	JCA 1.5+	Include configuration properties in the activation specification instance	Inbound or Bidirectional
Activation class name	JCA 1.5+	The class name of the activation instance	Inbound or Bidirectional

Question	Spec	Description	Type
Add methods to connection interface (Y/Yes/N/No) [N]:	All	Use for add methods to connection interface	Outbound or Bidirectional
Include an admin object (Y/Yes/N/No)	JCA 1.5+	Should an admin object be added to the project	
Use ResourceAdapterAssociation on admin object(Y/Yes/N/No)	JCA 1.5	Associate the admin object instance with the resource adapter instance	
Admin object interface name	JCA 1.5+	The interface name of the admin object	
Admin object class name	JCA 1.5+	The class name of the admin object	
Admin object config properties	JCA 1.5	Include a configuration properties in the admin object instance	
Generate a MBean class (Y/Yes/N/No)	All	Generate a MBean for the resource adapter	
Integrate EIS test server (Y/Yes/N/No)	All	Should the IronJacamar test EIS server be integrated	
Use JBoss Logging (Y/Yes/N/No) [N]:	All	Use JBoss Logging instead of Java Util Logging	
Build environment [A/Ant/I/Ant+Ivy/M/Maven/G/Gradle]	All	Type of build environment	

8.4. Generated code

The generated code will consist of the classes making up the resource adapter and a test suite environment based on the embedded distribution.

8.4.1. Apache Ant build environment

The following targets are supported in the Apache Ant build environment

Table 8.3. Apache Ant build environment

Target	Description
compile	Compiles all the files
rar	Builds the resource adapter archive
prepare-test	Prepares the test environment
test	Executes the tests

Target	Description
docs	Generates the documentation

8.4.2. Apache Ant + Ivy build environment

The following targets are supported in the Apache Ant + Ivy build environment

Table 8.4. Apache Ant + Ivy build environment

Target	Description
compile	Compiles all the files
rar	Builds the resource adapter archive
prepare-test	Prepares the test environment
test	Executes the tests
docs	Generates the documentation

8.4.3. Gradle build environment

The Gradle build environment currently support the standard tasks such as

Table 8.5. Gradle build environment

Target	Description
compile	Compiles all the files
test	Executes the tests

8.4.4. Apache Maven build environment

The following targets are supported in the Apache Maven build environment

Table 8.6. Apache Maven build environment

Target	Description
compile	Compiles all the files
test	Executes the tests

9

Eclipse plugin

The IronJacamar Eclipse plugin features development tools used for developing resource adapter applications for the IronJacamar standalone distribution, WildFly or JBoss Enterprise Application Platform 6+.

The plugin allows you to

- Generate a resource adapter skeleton
- Generate a deployment descriptor for a resource adapter
- Validate a resource adapter
- Deploy a resource adapter to an IronJacamar server instance
- Deploy a deployment descriptor to an IronJacamar server instance

9.1. Installation of the plugin

The plugin is installed by

```
cp ironjacamar-eclipse.jar $ECLIPSE_HOME/plugins
```

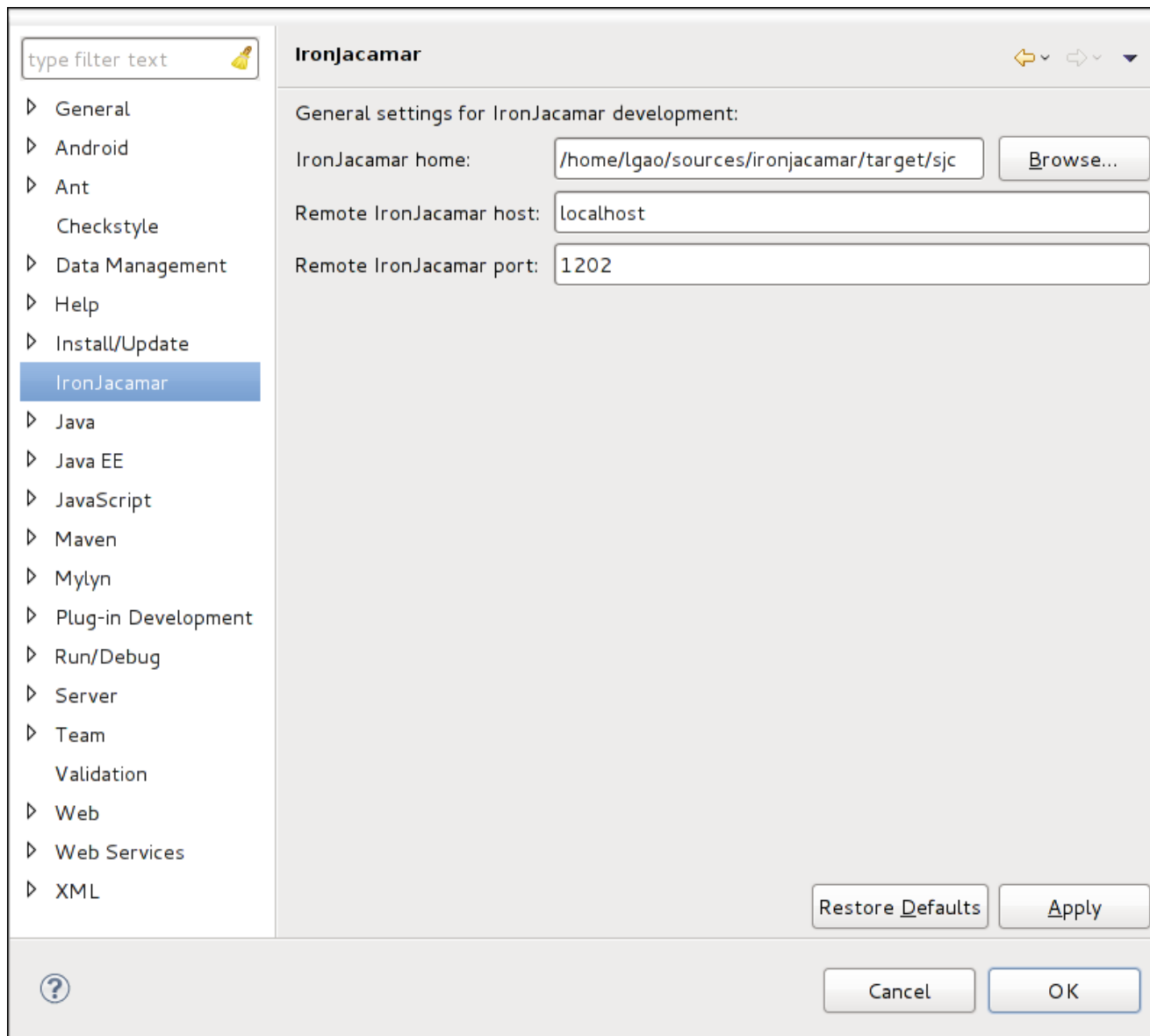
on Un*x systems, or by

```
copy ironjacamar-eclipse.jar %ECLIPSE_HOME%\plugins
```

on Windows.

9.2. Configuration of the plugin

Open "Window->Preferences" and select the IronJacamar category.



The IronJacamar home setting must point to the root directory of the IronJacamar installation, like

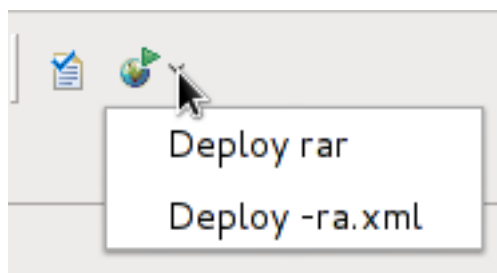
```
/opt/ironjacamar-1.1.0.Beta1
```

in order to configure the plugin.

The IronJacamar Eclipse plugin can deploy to a remote IronJacamar instance, by specifying the host and port settings.

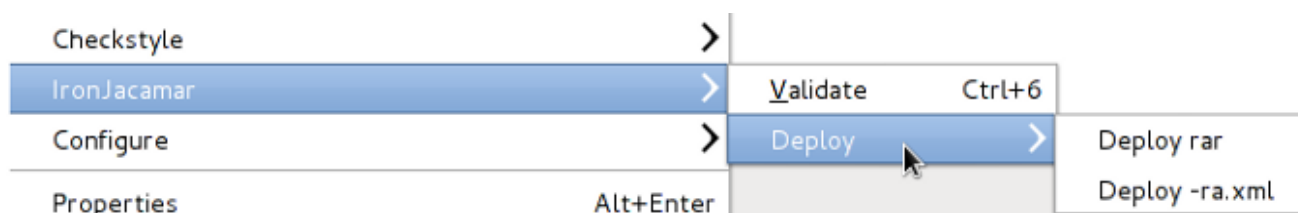
9.3. The toolbar

The IronJacamar Eclipse plugin provides a toolbar with deployment functionality.



9.4. The menu

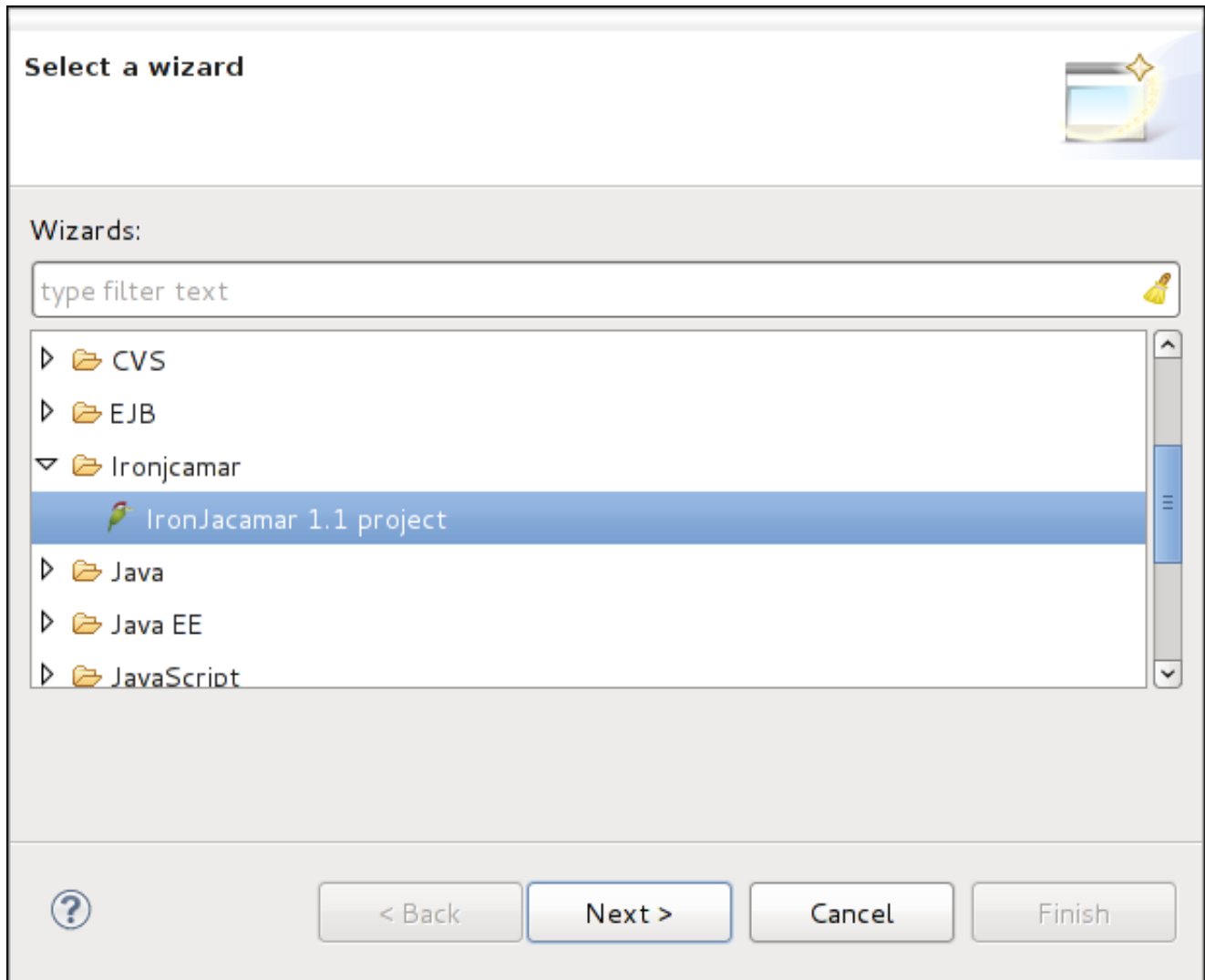
The IronJacamar Eclipse plugin provides a menu with validation and deployment functionality.



9.5. Creating a new IronJacamar project

A new IronJacamar project can be created by selecting File->New->Project... and go to the IronJacamar category.

Choose "IronJacamar 1.1 project" and follow the instructions to generate your resource adapter.



9.5.1. Project and package name

Create a resource adapter project
This wizard creates a new resource adapter project using IronJacamar

Project name:

HelloJCA

Package name:

org.jboss.jca.samples.hello

Profile version:

1.6

Type:

Outbound

Transaction support:

NoTransaction

Reauthentication:

☐

Use annotations:

☒

?

< Back

Next >

Cancel

Finish

Specify the project name and package name for the project. You can also select the JCA specification version, the type of the resource adapter (Outbound/Inbound/Bidirectional), the transaction support level, if the resource adapter will support reauthentication and if annotations used be used for a JCA 1.6+ based resource adapter.

9.5.2. Creating a ResourceAdapter

Resource adapter information
Define information about the resource adapter

Include a ResourceAdapter: ☒

Resource adapter class name:

Should the resource adapter class be Serializable: ☒

Resource adapter config properties:

Name	Type	Value

Add

Edit

Remove

?

< Back

Next >

Cancel

Finish

You can choose to include a `ResourceAdapter` class if the JCA profile version is 1.5, 1.6 or 1.7

9.5.3. Creating a ManagedConnectionFactory

Create a Managed Connection Factory
Define information for a managed connection factory

Managed connection factory class name:

AcmeManagedConnectionFactory

Managed connection factory config properties:

Name	Type	Value

Add

Edit

Remove

Use ResourceAdapterAssociation:

☒

Managed connection class name:

AcmeManagedConnection

Use CCI:

☐

Connection factory interface class name:

AcmeConnectionFactory

Connection factory implementation class name:

AcmeConnectionFactoryImpl

Connection interface class name:

AcmeConnection

Connection implementation class name:

AcmeConnectionImpl

?

< Back

Next >

Cancel

Finish

If the project is Outbound or Bidirectional then you can fill in the information for the outbound components.

9.5.4. Creating a MessageListener

Inbound communication
Define information about the inbound communication

MessageListener interface name:

ActivationSpec class name:

ActivationSpec config properties:


Name	Type	Value	Required

Add

Edit

Remove

Activation class name:



< Back

Next >

Cancel

Finish

If the project is Inbound or Bidirectional then you can fill in the information for the message listener and activation specification components.

9.5.5. Creating an AdminObject

Create an Admin Object
Define information for an admin object

Include an admin object: ☒

Use ResourceAdapterAssociation on admin object: ☒

Admin object interface name:

Admin object class name:

Admin object config properties:

Name	Type	Value

Add

Edit

Remove

?

< Back

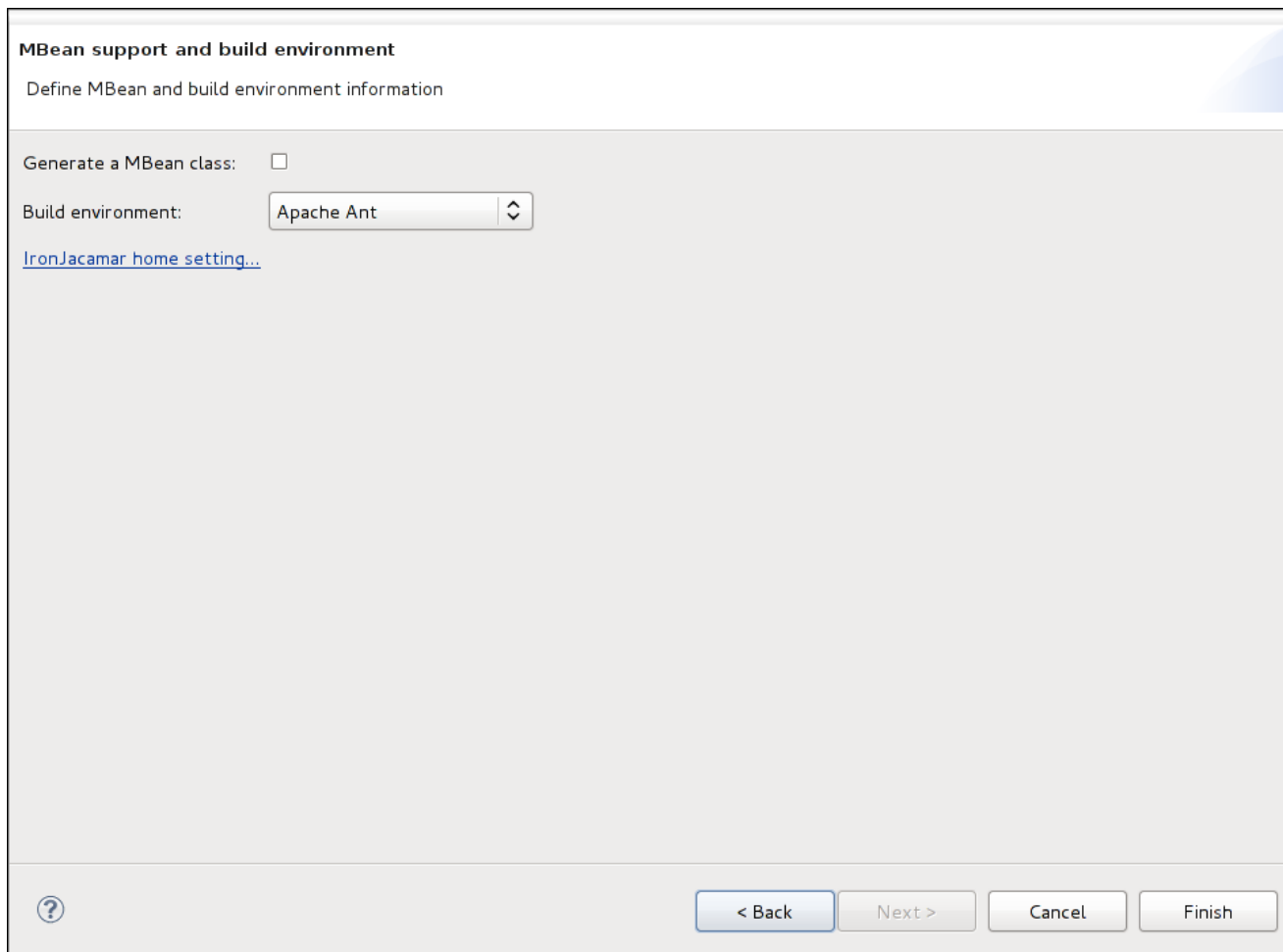
Next >

Cancel

Finish

This wizard creates an AdminObject for the project.

9.5.6. Selecting the build environment




MBean support and build environment
Define MBean and build environment information

Generate a MBean class: ☐

Build environment: Apache Ant

[IronJacamar home setting...](#)

 < Back Next > Cancel Finish

This wizard will let you choose the build environment to use for your project. Currently IronJacamar supports the Apache Ant, Apache Ant + Apache Ivy or Maven build environments. If Apache Ant is selected, all library files will be copied from your IronJacamar installation.

Note

Please make sure you have installed the Eclipse M2E plugin if you select Apache Maven as your build environment.

9.6. Validate IronJacamar project

The IronJacamar project can be validated by selecting it, and the Validate command in the toolbar will now be enabled. Click on the command to validate your project.

Another way to validate the IronJacamar project is to right click on the project, and select IronJacamar->Validate.

9.7. Deploying an IronJacamar project

The IronJacamar Eclipse plugin provides a way to deploy files to an IronJacamar server.

Note

Before any deploy operation, the IronJacamar server needs to be started, otherwise it will lead to an error dialog. Please refer to this for detail on how to start the IronJacamar server

9.7.1. Deploying a RAR file to an IronJacamar server

Select the IronJacamar project you just created. The Deploy drop down command in the toolbar will be enabled. Click on the command and select 'Deploy rar'.

Another way to deploy the RAR file is to right click on the project, and select IronJacamar->Deploy->Deploy rar from context menu

The command will build the RAR file first if it doesn't exist, then try to connect the IronJacamar server to deploy it.

9.7.2. Generate the -ra.xml and deploy it to IronJacamar server

Select the IronJacamar project you just created. The Deploy drop down command in the toolbar will be enabled. Click on the command and select 'Deploy -ra.xml'.

Another way to generate the -ra.xml file is to right click on the project, and select IronJacamar->Deploy->Deploy -ra.xml from context menu.

The command will build the RAR file first if it does not exist, then pop up a wizard to generate the -ra.xml according to the RAR file.

General information about hello-ra.xml
Configure general information for hello-ra.xml

General information

Archive

hello.rar

Transaction support

NoTransaction

Bootstrap context

Use bean validation groups:

Bean Validation Groups

Add

Edit

Remove

Resource adapter configuration properties:

Name	Type	Value

Edit

?

< Back

Next >

Cancel

Finish

There is a wizard page for each ManagedConnectionFactory if the resource adapter is outbound or bidirectional.

Information about Managed Connection Factory

Configure the Managed Connection Factory: org.jboss.jca.samples.hello.AcmeManagedConnectionFactory

Activate it ☒

General

Pool configuration

Security

Timeout

Validation

Recovery

General information

Managed connection factory Class: org.jboss.jca.samples.hello.AcmeManagedConnectionFactory

JNDI name:

Pool name:

Enable: ☒

Use java context: ☒

Use cached connection manager ☒

Managed connection factory configuration properties:

Name	Type	Value

Edit

?

< Back

Next >

Cancel

Finish

The ManagedConnectionFactory can be activated by selecting the 'Activate' checkbox.

There is a wizard page for each AdminObject if the resource adapter includes one or more instances.

Information about Admin Object

Configure Admin Object: org.jboss.jca.samples.hello.AcmeAdminObjectImpl

Activate it ☒

General information

Class name: org.jboss.jca.samples.hello.AcmeAdminObjectImpl

JNDI name:

Pool name:

Enable: ☒

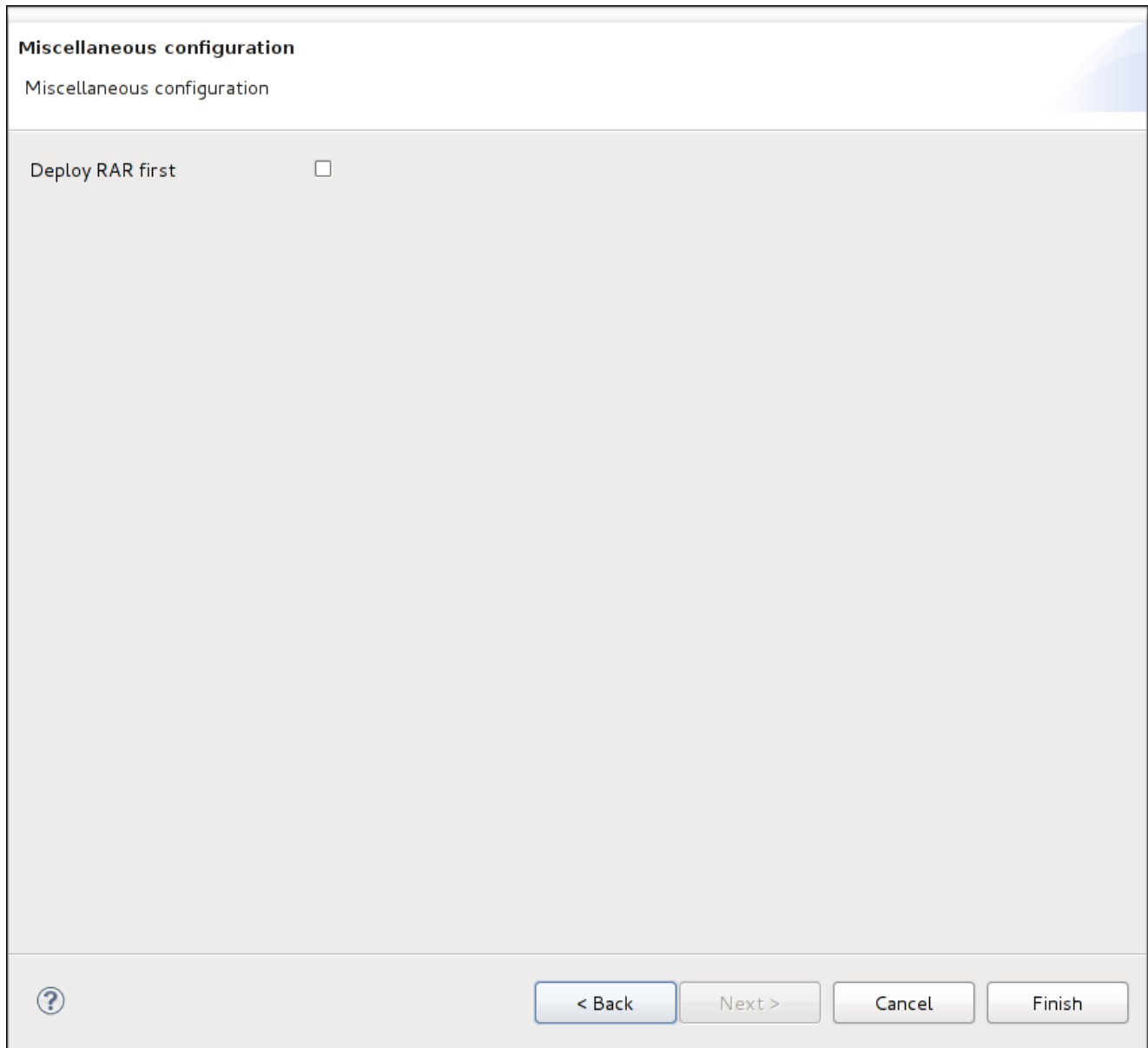
Use java context: ☒

Admin object configuration properties:

Name	Type	Value
------	------	-------

The AdminObject can be activated by selecting the 'Activate' checkbox.

There is a miscellaneous page also.



The image shows a 'Miscellaneous configuration' dialog box. It has a title bar with the text 'Miscellaneous configuration'. Below the title bar, there is a section labeled 'Miscellaneous configuration'. Inside this section, there is a checkbox labeled 'Deploy RAR first'. The checkbox is currently unchecked. At the bottom of the dialog box, there is a row of four buttons: a help button (represented by a question mark icon), a '< Back' button, a 'Next >' button, and a 'Finish' button. The 'Next >' button is disabled.

Miscellaneous configuration

Miscellaneous configuration

Deploy RAR first ☐

? < Back Next > Cancel Finish

If the Deploy RAR first option is selected, the plugin will try to deploy the RAR file to the IronJacamar server first, then deploy the generated -ra.xml file.

10

Other tools

10.1. Resource adapter information tool

The IronJacamar distribution features a resource adapter information tool, that can provide the important information about the resource adapter and a sample deployment descriptor.

The information about the resource adapter is generated using the following command:

```
./rar-info.sh myeis.rar
```

where the report will be located in `myeis-report.txt`. The tool can take an optional `-classpath` parameter such that additional external dependencies can be resolved against the resource adapter.

The report will contain information about

- The name of the resource adapter
- The Java EE Connector Architecture specification version
- The type of the resource adapter
- If the resource adapter supports reauthentication
- If the resource adapter is compliant (see the validator tool)
- If the resource adapter contains native libraries
- The structure of the resource adapter archive
- Overview of the resource adapter class
- Overview of the managed connection factory classes
- The connectory factory and connection API if common client interface isn't used
- Overview of the admin object classes
- Overview of the activation specification classes
- Metadata included, including the `MANIFEST.MF` file
- A sample deployment descriptor

The tool (`rar-info.sh`) is located in the `doc/as/` directory of the distribution.

10.2. Migration tool

The IronJacamar distribution features a migration tool, that can convert the deployment format used in JBoss Application Server prior to version 7, and JBoss Enterprise Application Platform versions prior to version 6.

Since there are different formats (XSDs) to deploy datasources and a resource adapters the tool can convert to both these formats.

The tool (`converter.sh`) is located in the `doc/as/` directory of the distribution.

10.2.1. Resource adapters

A resource adapter deployment is converted using the following command:

```
./converter.sh -ra old-ds.xml new-ra.xml
```

which will convert the file `old-ds.xml` to `new-ra.xml`. The content of `new-ra.xml` can then be copied into the `resource-adapters` subsystem in WildFly or used directly in the IronJacamar/Standalone distribution.

Note

Note that, the tool will do a best effort to convert all old attributes and elements to the new format. It will be necessary to make additional changes to the generated file. Please, consult this documentation for additional information.

10.2.1.1. WebLogic converter

The resource adapter converter tool can also convert the Oracle WebLogic `weblogic-ra.xml` files to the IronJacamar format.

The following command line can be used:

```
./converter.sh -ra --weblogic weblogic-ra.xml new-ra.xml
```

to get a best effort conversion of the Oracle WebLogic deployment file.

10.2.2. Data sources

A data source deployment is converted using the following command:

```
./converter.sh -ds old-ds.xml new-ds.xml
```

which will convert the file `old-ds.xml` to `new-ds.xml`. The content of `new-ds.xml` can then be copied into the `datasources` subsystem in WildFly or used directly in the IronJacamar/Standalone distribution.

Note

Note that, the tool will do a best effort to convert all old attributes and elements to the new format. It will be necessary to make additional changes to the generated file. Please, consult this documentation for additional information.

11

Embedded

11.1. Overview

The IronJacamar embedded configuration provides a way of running a JCA container in-VM.

The configuration is useful when you want a

- JCA container within your environment
- JCA container when doing unit testing

Especially the ability to unit test your resource adapter archives before deploying them into a testing or a production environment will benefit developers.

In order to enhance the experience with working with the embedded configuration the container integrates with the ShrinkWrap [<http://www.jboss.org/shrinkwrap>] and Arquillian [<http://arquillian.org/>] frameworks.

11.2. Configuration

You will need all the JAR files located in the

```
$IRON_JACAMAR_HOME/bin  
$IRON_JACAMAR_HOME/lib  
$IRON_JACAMAR_HOME/lib/embedded
```

directories on your application class loader - f.ex.

```
java -classpath allthejarfiles.jar yourapp
```

in order to use the embedded configuration.

If you want integration with the Arquillian framework you need to add the JAR files located in the

```
$IRON_JACAMAR_HOME/lib/embedded/arquillian
```

directory as well.

The Arquillian/Byteman integration is located in the

```
$IRON_JACAMAR_HOME/lib/embedded/arquillian/byteman
```

directory.

Furthermore you will need to configure Java Naming and Directory Interface (JNDI) and logging using for example property files.

Sample `jndi.properties` file:

```
java.naming.factory.initial=org.jnp.interfaces.LocalOnlyContextFactory
java.naming.factory.url.pkgs=org.jboss.naming:org.jnp.interfaces
```

Sample `logging.properties` file:

```
# Additional logger names to configure (root logger is always configured)
loggers=org.jboss.jca,org.jboss,org.jnp,com.arjuna

# Root logger level
logger.level=${iron.jacamar.log.level:INFO}
logger.handlers=CONSOLE, FILE

# org.jboss.jca
logger.org.jboss.jca.level=DEBUG

# org.jboss
logger.org.jboss.level=INFO

# org.jnp
logger.org.jnp.level=INFO

# com.arjuna
logger.com.arjuna.level=INFO

# Console handler configuration
handler.CONSOLE=org.jboss.logmanager.handlers.ConsoleHandler
handler.CONSOLE.properties=autoFlush
```



```
handler.CONSOLE.level=${iron.jacamar.log.console.level:INFO}
handler.CONSOLE.autoFlush=true
handler.CONSOLE.formatter=PATTERN

# File handler configuration
handler.FILE=org.jboss.logmanager.handlers.FileHandler
handler.FILE.level=${iron.jacamar.log.file.level:DEBUG}
handler.FILE.properties=autoFlush,fileName
handler.FILE.autoFlush=true
handler.FILE.fileName=${test.dir}/embedded/test.log
handler.FILE.formatter=PATTERN

# Formatter pattern configuration
formatter.PATTERN=org.jboss.logmanager.formatters.PatternFormatter
formatter.PATTERN.properties=pattern
formatter.PATTERN.pattern=%d{HH:mm:ss,SSS} %-5p [%c{1}] %m%n
```

These files need to be available to the application classloader.

Important

The IronJacamar code generator will generate a test suite based on the Arquillian functionality, so that setup can be used as a starting point for your own integration.

The setup will also show you how to use dependencies from the JBoss Nexus Maven repository instead if you choose the Maven or Ant+Ivy based build environment.

Note

Note that, if you want to be able to deploy datasources you will need to deploy the `jdbc-local.rar` for `<datasource>` support, or `jdbc-xa.rar` for `<xa-datasource>` support. Both archives can be found in the `system/` directory.

11.3. Usage

IronJacamar Embedded supports both a simple and an advanced usage model, using pre-assembled resource adapter archives (.rar) or dynamic resource adapter archives based on ShrinkWrap.

The embedded environment supports registering resource adapters and datasources in the platform `MBeanServer` by setting the system property `ironjacamar.embedded.management` to `true` before starting the environment.

11.3.1. Simple usage

The IronJacamar Embedded container environment supports the following open source testing projects:

1. Arquillian [<http://arquillian.org/>]
2. ShrinkWrap [<http://www.jboss.org/shrinkwrap>]

These extensions allow the developer to use the embedded platform with greater ease as there doesn't have to be a physical representation of the resource adapter archive located to the disk.

The Arquillian integration furthermore allows the developer to leave all the embedded container setup to the integration layer instead.

See the Arquillian [<http://arquillian.org/>] and ShrinkWrap [<http://www.jboss.org/shrinkwrap>] web sites for a detailed description of the projects and additional documentation.

11.3.1.1. Arquillian and ShrinkWrap

The code sample below shows an usage of deploying a ShrinkWrap resource adapter archive into the IronJacamar Embedded environment using Arquillian.

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * distribution for a full listing of individual contributors.
 *
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 * under the terms of the GNU Lesser General Public License as
 * published by the Free Software Foundation; either version 2.1 of
 * the License, or (at your option) any later version.
 *
 * This software is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 *
 * You should have received a copy of the GNU Lesser General Public
 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */

package org.jboss.jca.arquillian.unit;

import org.jboss.jca.arquillian.embedded.Configuration;
import org.jboss.jca.arquillian.rars.simple.TestConnection;
import org.jboss.jca.arquillian.rars.simple.TestConnectionFactory;

import java.util.UUID;

import javax.annotation.Resource;
```

```

import org.jboss.arquillian.container.test.api.Deployment;
import org.jboss.arquillian.junit.Arquillian;
import org.jboss.logging.Logger;
import org.jboss.shrinkwrap.api.ShrinkWrap;
import org.jboss.shrinkwrap.api.spec.JavaArchive;
import org.jboss.shrinkwrap.api.spec.ResourceAdapterArchive;

import org.junit.Test;
import org.junit.runner.RunWith;

import static org.junit.Assert.assertNotNull;

/**
 * Unit test for Arquillian integration
 *
 * @author <a href="mailto:jesper.pedersen@ironjacamar.org">Jesper Pedersen</a>
 */
@RunWith(Arquillian.class)
@Configuration(autoActivate = true)
public class ArquillianTestCase
{
    // -----|
    // Class Members -----|
    // -----|

    private static Logger log = Logger.getLogger(ArquillianTestCase.class);

    private static String deploymentName = "ArquillianTest";

    /**
     * Define the deployment
     * @return The deployment archive
     */
    @Deployment
    public static ResourceAdapterArchive createDeployment()
    {
        ResourceAdapterArchive raa =
            ShrinkWrap.create(ResourceAdapterArchive.class, deploymentName + ".rar");

        JavaArchive ja = ShrinkWrap.create(JavaArchive.class, UUID.randomUUID().toString() + ".jar");
        ja.addPackage(TestConnection.class.getPackage());

        raa.addAsLibrary(ja);
        raa.addAsManifestResource("simple.rar/META-INF/ra.xml", "ra.xml");

        return raa;
    }

    //-----|
    // Tests -----|
    //-----|

    @Resource(mappedName = "java:/eis/ArquillianTest")
    private TestConnectionFactory connectionFactory;

    /**
     * Basic
     * @exception Throwable Thrown if case of an error

```

```
*/
@Test
public void testBasic() throws Throwable
{
    assertNotNull(connectionFactory);

    TestConnection c = connectionFactory.getConnection();
    assertNotNull(c);

    c.callMe();
    c.close();
}
}
```

The class makes use of the `org.jboss.jca.embedded.arquillian.Configuration` annotation in order to specify that the deployed archive should be auto activated through the `RAActivator` bean.

Note

Note that, the name for the `ResourceAdapterArchive` must end with the `.rar` extension.

11.3.1.2. Arquillian and ShrinkWrap/Descriptors

The code sample below shows how to use Arquillian to deploy a ShrinkWrap resource adapter archive and activate the resource adapter using the ShrinkWrap/Descriptors API.

This example uses the `org.jboss.jca.embedded.arquillian.Configuration` annotation to explicit say not to auto activate the resource adapter archive.

```
/*
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 * distribution for a full listing of individual contributors.
 *
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 * published by the Free Software Foundation; either version 2.1 of
 * the License, or (at your option) any later version.
 *
 * This software is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 *
 * You should have received a copy of the GNU Lesser General Public
 * License along with this software; if not, write to the Free
```

```

* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/

package org.jboss.jca.embedded.unit;

import org.jboss.jca.arquillian.embedded.Configuration;
import org.jboss.jca.embedded.dsl.resourceadapters11.api.ConnectionDefinitionsType;
import org.jboss.jca.embedded.dsl.resourceadapters11.api.ResourceAdapterType;
import org.jboss.jca.embedded.dsl.resourceadapters11.api.ResourceAdaptersDescriptor;
import org.jboss.jca.embedded.rars.simple.TestConnection;
import org.jboss.jca.embedded.rars.simple.TestConnectionFactory;
import org.jboss.jca.embedded.rars.simple.TestConnectionFactoryImpl;
import org.jboss.jca.embedded.rars.simple.TestConnectionImpl;
import org.jboss.jca.embedded.rars.simple.TestManagedConnectionFactory;
import org.jboss.jca.embedded.rars.simple.TestResourceAdapter;

import java.util.UUID;

import javax.annotation.Resource;

import org.jboss.arquillian.container.test.api.Deployment;
import org.jboss.arquillian.junit.Arquillian;
import org.jboss.logging.Logger;
import org.jboss.shrinkwrap.api.ShrinkWrap;
import org.jboss.shrinkwrap.api.asset.StringAsset;
import org.jboss.shrinkwrap.api.spec.JavaArchive;
import org.jboss.shrinkwrap.api.spec.ResourceAdapterArchive;
import org.jboss.shrinkwrap.descriptor.api.Descriptors;
import org.jboss.shrinkwrap.descriptor.api.connector15.ConnectorDescriptor;
import org.jboss.shrinkwrap.descriptor.api.connector15.OutboundResourceAdapterType;
import org.jboss.shrinkwrap.descriptor.api.connector15.ResourceAdapterType;

import org.junit.Test;
import org.junit.runner.RunWith;

import static org.junit.Assert.assertNotNull;

/**
 * Unit test for ShrinkWrap/Descriptors integration
 *
 * @author <a href="mailto:jesper.pedersen@ironjacamar.org">Jesper Pedersen</a>
 */
@RunWith(Arquillian.class)
@Configuration(autoActivate = false)
public class ShrinkWrapDescriptorsTestCase
{
    // ----- ||
    // Class Members ----- ||
    // ----- ||

    private static Logger log = Logger.getLogger(ShrinkWrapDescriptorsTestCase.class);

    private static String deploymentName = "sd.rar";

    /**
     * Define the resource adapter archive
     * @return The archive
     */

```

```

@Deployment(order = 1)
public static ResourceAdapterArchive createArchive()
{
    ConnectorDescriptor raXml = Descriptors.create(ConnectorDescriptor.class, "ra.xml")
        .version("1.5");
    ResourceAdapterType rt = raXml.getOrCreateResourceAdapter()
        .resourceAdapterClass(TestResourceAdapter.class.getName());
    OutboundResourceAdapterType ort = rt.getOrCreateOutboundResourceAdapter()
        .transactionSupport("NoTransaction").reauthenticationSupport(false);
    org.jboss.shrinkwrap.descriptor.api.connector15.ConnectionDefinitionType cdt =
        ort.createConnectionDefinition()
            .managedConnectionFactoryClass(TestManagedConnectionFactory.class.getName())
            .connectionFactoryInterface(TestConnectionFactory.class.getName())
            .connectionFactoryImplClass(TestConnectionFactoryImpl.class.getName())
            .connectionInterface(TestConnection.class.getName())
            .connectionImplClass(TestConnectionImpl.class.getName());

    ResourceAdapterArchive raa =
        ShrinkWrap.create(ResourceAdapterArchive.class, deploymentName);

    JavaArchive ja = ShrinkWrap.create(JavaArchive.class, UUID.randomUUID().toString() + ".jar");
    ja.addPackage(TestConnection.class.getPackage());

    raa.addAsLibrary(ja);
    raa.addAsManifestResource(new StringAsset(raXml.exportAsString()), "ra.xml");

    return raa;
}

/**
 * Define the deployment descriptor
 * @return The descriptor
 */
@Deployment(order = 2)
public static ResourceAdaptersDescriptor createDeployment()
{
    ResourceAdaptersDescriptor dashRaXml = Descriptors.create(ResourceAdaptersDescriptor.class, "sd-
ra.xml");
    ResourceAdapterType rt = dashRaXml.createResourceAdapter().archive(deploymentName);
    ConnectionDefinitionsType cdst = rt.getOrCreateConnectionDefinitions();
    org.jboss.jca.embedded.dsl.resourceadapters11.api.ConnectionDefinitionType cdt =
        cdst.createConnectionDefinition()
            .className(TestManagedConnectionFactory.class.getName())
            .jndiName("java:/eis/TestConnectionFactory").poolName("TestConnectionFactory");

    return dashRaXml;
}

//-----||
// Tests -----||
//-----||

@Resource(mappedName = "java:/eis/TestConnectionFactory")
private TestConnectionFactory connectionFactory;

/**
 * Basic
 * @exception Throwable Thrown if case of an error
 */

```

```

@Test
public void testBasic() throws Throwable
{
    assertNotNull(connectionFactory);

    TestConnection c = connectionFactory.getConnection();
    assertNotNull(c);

    c.callMe();
    c.close();
}
}

```

11.3.1.3. Arquillian and Byteman

The code sample below shows how to use Arquillian to deploy a ShrinkWrap resource adapter archive and change the `allocateConnection` of `org.jboss.jca.core.connectionmanager.AbstractConnectionManager` to throw a `ResourceException` when the method is called.

The framework used to provide this functionality is called Byteman, which allows developers to change behavior of a method to for example throw an exception. This is called fault injection and can be used to increase code coverage of your project.

```

/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * distribution for a full listing of individual contributors.
 *
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 * under the terms of the GNU Lesser General Public License as
 * published by the Free Software Foundation; either version 2.1 of
 * the License, or (at your option) any later version.
 *
 * This software is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 *
 * You should have received a copy of the GNU Lesser General Public
 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */

package org.jboss.jca.arquillian.unit;

import org.jboss.jca.arquillian.embedded.Configuration;
import org.jboss.jca.arquillian.rars.simple.TestConnection;
import org.jboss.jca.arquillian.rars.simple.TestConnectionFactory;

```

```
import org.jboss.jca.embedded.dsl.InputStreamDescriptor;

import java.util.UUID;

import javax.annotation.Resource;
import javax.resource.ResourceException;

import org.jboss.arquillian.container.test.api.Deployment;
import org.jboss.arquillian.extension.byteman.api.BMRule;
import org.jboss.arquillian.junit.Arquillian;
import org.jboss.logging.Logger;
import org.jboss.shrinkwrap.api.ShrinkWrap;
import org.jboss.shrinkwrap.api.spec.JavaArchive;
import org.jboss.shrinkwrap.api.spec.ResourceAdapterArchive;
import org.jboss.shrinkwrap.descriptor.api.Descriptor;

import org.junit.Test;
import org.junit.runner.RunWith;

import static org.junit.Assert.assertNotNull;
import static org.junit.Assert.fail;

/**
 * Unit test for Byteman integration
 *
 * @author <a href="mailto:jesper.pedersen@ironjacamar.org">Jesper Pedersen</a>
 */
@RunWith(Arquillian.class)
@Configuration(autoActivate = false)
public class BytemanBMTestCase
{
    // ----- ||
    // Class Members ----- ||
    // ----- ||

    private static Logger log = Logger.getLogger(BytemanBMTestCase.class);

    /**
     * Define the deployment
     * @return The deployment archive
     */
    @Deployment(order = 1)
    public static ResourceAdapterArchive createDeployment()
    {
        ResourceAdapterArchive raa =
            ShrinkWrap.create(ResourceAdapterArchive.class, "byteman.rar");

        JavaArchive ja = ShrinkWrap.create(JavaArchive.class, UUID.randomUUID().toString() + ".jar");
        ja.addPackage(TestConnection.class.getPackage());

        raa.addAsLibrary(ja);
        raa.addAsManifestResource("simple.rar/META-INF/ra.xml", "ra.xml");

        return raa;
    }

    /**
     * Define the activation
     * @return The deployment archive
     */
}
```



```

    */
    @Deployment(order = 2)
    public static Descriptor createDescriptor()
    {
        ClassLoader cl = BytemanBMTestCase.class.getClassLoader();
        InputStreamDescriptor isd = new InputStreamDescriptor("byteman-ra.xml",
                                                            cl.getResourceAsStream("byteman-ra.xml"));

        return isd;
    }

    //-----||
    // Tests -----||
    //-----||

    @Resource(mappedName = "java:/eis/BytemanTest")
    private TestConnectionFactory connectionFactory;

    /**
     * Byteman
     * @exception Throwable Thrown if case of an error
     */
    @Test
    @BMRule(name = "Throw exception on allocateConnection",
            targetClass = "org.jboss.jca.core.connectionmanager.AbstractConnectionManager",
            targetMethod = "allocateConnection",
            action = "throw new javax.resource.ResourceException()")
    public void testByteman() throws Throwable
    {
        assertNotNull(connectionFactory);

        TestConnection c = null;
        try
        {
            c = connectionFactory.getConnection();
            fail("Got a connection");
        }
        catch (ResourceException re)
        {
            // Ok
        }
        catch (Throwable t)
        {
            fail(t.getMessage());
            throw t;
        }
        finally
        {
            if (c != null)
                c.close();
        }
    }
}

```

See the Byteman [<http://www.jboss.org/byteman>] web site for a detailed description of the project and additional documentation.

11.3.1.4. Arquillian and @ArquillianResource

The Arquillian integration allows the internally used `org.jboss.jca.embedded.Embedded` or `javax.naming.Context` instances to be injected into the test case using

```
import org.jboss.jca.embedded.Embedded;
import javax.naming.Context;
import org.jboss.arquillian.test.api.ArquillianResource;

@RunWith(Arquillian.class)
public class ResourceProviderTestCase
{
    @ArquillianResource
    private Embedded embedded;

    @ArquillianResource
    private Context context;
```

This will allow direct access to the APIs inside the test case.

11.3.1.5. IronJacamar integration

The code sample below shows how to use Arquillian to deploy a ShrinkWrap resource adapter archive and inject the IronJacamar metadata repository into the test case such that assertions can be made.

The IronJacamar container features various components that makes up the entire Java EE Connector Architecture container. The available list of components can be viewed in the configuration of the container or through the management console under the `Kernel` category.

```
/**
 * IronJacamar, a Java EE Connector Architecture implementation
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 * as indicated by the @author tags. See the copyright.txt file in the
 * distribution for a full listing of individual contributors.
 *
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 * published by the Free Software Foundation; either version 2.1 of
 * the License, or (at your option) any later version.
 *
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 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 *
 * You should have received a copy of the GNU Lesser General Public
```

```

* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/

package org.jboss.jca.arquillian.unit;

import org.jboss.jca.arquillian.embedded.Configuration;
import org.jboss.jca.arquillian.embedded.Inject;
import org.jboss.jca.arquillian.rars.simple.TestConnection;
import org.jboss.jca.arquillian.rars.simple.TestConnectionFactory;
import org.jboss.jca.core.spi.mdr.MetadataRepository;

import java.util.UUID;

import javax.annotation.Resource;

import org.jboss.arquillian.container.test.api.Deployment;
import org.jboss.arquillian.junit.Arquillian;
import org.jboss.logging.Logger;
import org.jboss.shrinkwrap.api.ShrinkWrap;
import org.jboss.shrinkwrap.api.spec.JavaArchive;
import org.jboss.shrinkwrap.api.spec.ResourceAdapterArchive;

import org.junit.Test;
import org.junit.runner.RunWith;

import static org.junit.Assert.assertNotNull;
import static org.junit.Assert.assertTrue;

/**
 * Unit test for Arquillian integration and injecting
 *
 * @author <a href="mailto:jesper.pedersen@ironjacamar.org">Jesper Pedersen</a>
 */
@RunWith(Arquillian.class)
@Configuration(autoActivate = true)
public class InjectTestCase
{
    // -----|
    // Class Members -----|
    // -----|

    private static Logger log = Logger.getLogger(InjectTestCase.class);

    /**
     * Define the deployment
     * @return The deployment archive
     */
    @Deployment
    public static ResourceAdapterArchive createDeployment()
    {
        ResourceAdapterArchive raa =
            ShrinkWrap.create(ResourceAdapterArchive.class, "ArquillianTest.rar");

        JavaArchive ja = ShrinkWrap.create(JavaArchive.class, UUID.randomUUID().toString() + ".jar");
        ja.addPackage(TestConnection.class.getPackage());

        raa.addAsLibrary(ja);
    }
}

```

```
        raa.addAsManifestResource("simple.rar/META-INF/ra.xml", "ra.xml");

        return raa;
    }

    //-----||
    // Tests -----||
    //-----||

    @Resource(mappedName = "java:/eis/ArquillianTest")
    private TestConnectionFactory connectionFactory;

    @Inject(name = "MDR")
    private MetadataRepository mdr;

    /**
     * Basic
     * @exception Throwable Thrown if case of an error
     */
    @Test
    public void testBasic() throws Throwable
    {
        assertNotNull(connectionFactory);
        assertNotNull(mdr);
        assertNotNull(mdr.getResourceAdapters());
        assertTrue(mdr.getResourceAdapters().size() == 1);
    }
}
```

11.3.2. Advanced usage

11.3.2.1. ShrinkWrap

The code sample below shows an advanced usage of deploying a ShrinkWrap resource adapter archive into the IronJacamar Embedded environment.

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * distribution for a full listing of individual contributors.
 *
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 * published by the Free Software Foundation; either version 2.1 of
 * the License, or (at your option) any later version.
 *
 * This software is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 */
```

```

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* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/

package org.jboss.jca.embedded.unit;

import org.jboss.jca.embedded.Embedded;
import org.jboss.jca.embedded.EmbeddedFactory;
import org.jboss.jca.embedded.rars.simple.TestConnection;
import org.jboss.jca.embedded.rars.simple.TestConnectionFactory;

import java.util.UUID;

import javax.naming.Context;
import javax.naming.InitialContext;
import javax.naming.NamingException;

import org.jboss.logging.Logger;
import org.jboss.shrinkwrap.api.ShrinkWrap;
import org.jboss.shrinkwrap.api.spec.JavaArchive;
import org.jboss.shrinkwrap.api.spec.ResourceAdapterArchive;

import org.junit.AfterClass;
import org.junit.BeforeClass;
import org.junit.Test;
import org.junit.Assert.*;

/**
 * Test cases for deploying resource adapter archives (.RAR)
 * using ShrinkWrap
 *
 * @author <a href="mailto:jesper.pedersen@ironjacamar.org">Jesper Pedersen</a>
 */
public class ShrinkWrapTestCase
{
    // ----- ||
    // Class Members ----- ||
    // ----- ||

    private static Logger log = Logger.getLogger(ShrinkWrapTestCase.class);

    private static final String JNDI_PREFIX = "java:/eis/";

    /**
     * Embedded
     */
    private static Embedded embedded;

    // ----- ||
    // Tests ----- ||
    // ----- ||

    /**
     * Basic ShrinkWrap ResourceAdapterArchive test case
     * @exception Throwable Thrown if case of an error
     */
    @Test

```

```

public void testBasic() throws Throwable
{
    Context context = null;

    String name = UUID.randomUUID().toString();

    ResourceAdapterArchive raa =
        ShrinkWrap.create(ResourceAdapterArchive.class, name + ".rar");

    JavaArchive ja = ShrinkWrap.create(JavaArchive.class, UUID.randomUUID().toString() + ".jar");
    ja.addPackage(TestConnection.class.getPackage());

    raa.addAsLibrary(ja);
    raa.addAsManifestResource("simple.rar/META-INF/ra.xml", "ra.xml");

    try
    {
        embedded.deploy(raa);

        context = new InitialContext();
        TestConnectionFactory tcf = (TestConnectionFactory)context.lookup(JNDI_PREFIX + name);
        assertNotNull(tcf);

        TestConnection tc = tcf.getConnection();
        tc.callMe();
        tc.close();
    }
    catch (Exception t)
    {
        log.error(t.getMessage(), t);
        fail(t.getMessage());
    }
    finally
    {
        if (context != null)
        {
            try
            {
                context.close();
            }
            catch (NamingException ne)
            {
                // Ignore
            }
        }

        embedded.undeploy(raa);
    }
}

// -----||
// Lifecycle Methods -----||
// -----||

/**
 * Lifecycle start, before the suite is executed
 * @throws Throwable throwable exception
 */
@BeforeClass

```

```

public static void beforeClass() throws Throwable
{
    // Create and set an embedded JCA instance
    embedded = EmbeddedFactory.create();

    // Startup
    embedded.startup();
}

/**
 * Lifecycle stop, after the suite is executed
 * @throws Throwable throwable exception
 */
@AfterClass
public static void afterClass() throws Throwable
{
    // Shutdown embedded
    embedded.shutdown();

    // Set embedded to null
    embedded = null;
}
}

```

Note

Note that, the name for the `ResourceAdapterArchive` must end with the `.rar` extension.

11.3.2.2. Embedded

The code sample below shows a simple usage of deploying a pre-assembled resource adapter archive into the IronJacamar Embedded environment.

```

import org.jboss.jca.embedded.Embedded;
import org.jboss.jca.embedded.EmbeddedFactory;

import java.net.URL;

import javax.naming.Context;
import javax.naming.InitialContext;
import javax.naming.NamingException;

import org.junit.AfterClass;
import org.junit.BeforeClass;
import org.junit.Test;
import static org.junit.Assert.*;

public class MyTestCase
{

```

```
/** Embedded */
private static Embedded embedded;

/** JNDI prefix */
private static final String JNDI_PREFIX = "java:/eis/";

/**
 * Simple test to verify deployment of myresourceadapter.rar
 * @throws Throwable throwable exception
 */
@Test
public void testDeployment() throws Throwable
{
    URL archive = MyTestCase.class.getResource("myresourceadapter.rar");
    Context context = null;

    try
    {
        embedded.deploy(archive);

        context = new InitialContext();
        Object o = context.lookup(JNDI_PREFIX + "myresourceadapter");
        assertNotNull(o);
    }
    catch (Throwable t)
    {
        fail(t.getMessage());
    }
    finally
    {
        embedded.undeploy(archive);

        if (context != null)
        {
            try
            {
                context.close();
            }
            catch (NamingException ne)
            {
                // Ignore
            }
        }
    }
}

@BeforeClass
public static void beforeClass() throws Throwable
{
    // Create an embedded JCA instance
    embedded = EmbeddedFactory.create();

    // Startup
    embedded.startup();
}

@AfterClass
public static void afterClass() throws Throwable
{
}
```



```
// Shutdown
embedded.shutdown();
}
}
```

Note

Note that, the url for the archive must end with the `.rar` extension - either representing a file or a directory.

See the IronJacamar Embedded API documentation for additional functionality.

11.3.2.3. Automatic activation of archives

IronJacamar features a bean called `RAActivator` which will automatic create a JNDI binding for connection factories and administration objects. However, sometimes it is of benefit to define these bindings in a `-ra.xml` file, and therefore `RAActivator` has to be disabled during that deployment phase.

This done by using the following code snippet

```
import org.jboss.jca.deployers.fungal.RAActivator;

// Disable RAActivator
RAActivator raa = embedded.lookup("RAActivator", RAActivator.class);

if (raa == null)
    throw new IllegalStateException("RAActivator not defined");

raa.setEnabled(false);

embedded.deploy("myrar.rar");
embedded.deploy("myrar-ra.xml");

raa.setEnabled(true);
```

which disables the bean, does the deployments and then reenables the bean again.

12

EIS test server

Testing an Enterprise Information System can be a complex task, as their installation can quite complex and specific to a certain platform architecture.

As Java developers, and resource adapter developers in particular, we are interested in a setup that will allow us to test the resource adapter against the EIS with as little difficulty as possible.

Having access to a component that easy integrates into our testing environment, and acts as the EIS in question is of benefit.

12.1. Overview

The IronJacamar EIS test server provides a framework for emulating an Enterprise Information System such that no installation is needed.

The EIS test server contains the following interface

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
 * Copyright 2012, Red Hat Inc, and individual contributors
 * as indicated by the @author tags. See the copyright.txt file in the
 * distribution for a full listing of individual contributors.
 *
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.test.eis;

import java.io.InputStream;
```

```
import java.io.OutputStream;

/**
 * This interface represents a session between a resource adapter
 * and an Enterprise Information System
 *
 * Once the <code>handle</code> method returns the socket where
 * the communication takes place is closed
 *
 * @author <a href="mailto:jesper.pedersen@ironjacamar.org">Jesper Pedersen</a>
 */
public interface Handler
{
    /**
     * Handle an interaction with a client
     * @param is The input stream
     * @param os The output stream
     */
    public void handle(InputStream is, OutputStream os);
}
```

which represents a session between the resource adapter and the EIS.

The `java.io.InputStream` is the incoming communication coming from the resource adapter, and the `java.io.OutputStream` is the EIS' response to the request.

Once the method returns the socket between the resource adapter and the EIS is closed.

This means that the implementation of the `Handler` interface will represent the binary protocol between the resource adapter and the EIS. To the resource adapter it will look as it is communicating with the real Enterprise Information System installation.

12.2. Apache Ant

The Apache Ant tasks for starting and stopping the EIS test server are defined as the following

```
<taskdef name="start"
  classname="org.jboss.jca.test.eis.ant.Start"
  classpathref="main.lib.path.id"/>

<taskdef name="stop"
  classname="org.jboss.jca.test.eis.ant.Stop"
  classpathref="main.lib.path.id"/>
```

where `main.lib.path.id` contains the `ironjacamar-test-eis.jar` file.

The `start` task is used, like

```
<start host="localhost" port="1400"
  handler="org.jboss.jca.test.eis.EchoHandler">
  <classpath>
    <pathelement location="${build.eis.dir}/test"/>
  </classpath>
</start>
```

which starts the EIS test server on `localhost` using port `1400` with an implementation of the Handler interface of `org.jboss.jca.test.eis.EchoHandler` and a classpath of `${build.eis.dir}/test`.

The `stop` task is used, like

```
<stop host="localhost" port="1400"/>
```

which stops the EIS test server on `localhost` using port `1400`.

Between the `start` and `stop` tasks the resource adapters unit tests can be executed.

12.3. Apache Maven

The Apache Maven mojos for starting and stopping the EIS test server are defined as the following

```
<build>
  <plugins>
    <plugin>
      <groupId>org.jboss.ironjacamar</groupId>
      <artifactId>ironjacamar-test-eis</artifactId>
      <!-- The version of the plugin you want to use -->
      <version>1.1.0.Final</version>
      <executions>
        <execution>
          <goals>
            <goal>start</goal>
          </goals>
        </execution>
      </executions>
      <configuration>
        <host>localhost</host>
        <port>1400</port>
        <handler>org.jboss.jca.test.eis.EchoHandler</handler>
```

```
<classpath>
  <param>target/test-classes</param>
</classpath>
</configuration>
</plugin>
<plugin>
  <groupId>org.jboss.ironjacamar</groupId>
  <artifactId>ironjacamar-test-eis</artifactId>
  <!-- The version of the plugin you want to use -->
  <version>1.1.0.Final</version>
  <executions>
    <execution>
      <goals>
        <goal>stop</goal>
      </goals>
    </execution>
  </executions>
  <configuration>
    <host>localhost</host>
    <port>1400</port>
  </configuration>
</plugin>
</plugins>
</build>
```

The `start` mojo will run in the `process-test-classes` phase, and the `stop` mojo will run in the `test` phase.

13

Community

13.1. Website

The website contains the latest information about the project and links to important information.

The website is located at <http://www.ironjacamar.org/>

13.2. User forum

The user forum is where we discuss matters about the usage of the IronJacamar project.

Our forum is located at <http://community.jboss.org/en/ironjacamar>

13.3. Developer forum

The developer forum is where we discuss the implementation of the IronJacamar project. This means the internals of the project and not how the project is used.

User questions doesn't belong here - they should go in the user forum instead.

The forum is located at <http://community.jboss.org/en/ironjacamar/dev>

13.4. Issue tracking

We are using JIRA to manage our issues in the project.

These are divided into the following categories

- Feature Request: A feature that you would like see implemented.
- Bug: A software defect.

For all of these you should post your request to our user forum first.

The rest of the categories are for team use only.

Our issue tracking system located at <http://issues.jboss.org/browse/JBJCA>

14

Troubleshooting

14.1. I think I have found a bug

If you think you have found a bug you should verify this by posting to our forum first.

Our forum is located at <http://community.jboss.org/en/ironjacamar>

You can also search our issue tracking system located at <http://issues.jboss.org/browse/JBJCA>

14.2. I would like to implement a feature

So you have found an area where you are missing a feature and would like to submit a patch for it, great !

There are a couple of steps to get a feature included

First, you should create a new thread in our development forum where you describe the feature, its design and implementation.

Once there is an agreement on the feature and the design you should proceed with creating the patch.

To maximize your chances of getting the feature in the official build as soon as possible make sure that you run through the following steps:

```
ant clean test
ant clean checkstyle
ant clean findbugs
ant clean jacoco
```

All these should show that,

1. All your test cases for the feature is passing
2. Your code is correctly formatted according to project rules

3. There isn't any bug reports from the Findbugs environment
4. There is full code coverage based on the JaCoCo report

when done, create a JIRA task (Feature Request) in our JIRA environment and attach the unified diff formatted patch. See the developer guide for additional details.

Happy Coding !

14.3. How do I ?

We can't cover every single issue in this guide, so feel free to drop by our forums to see if a solution has already been provided. Otherwise feel free to ask your question there.

Our forum is located at <http://community.jboss.org/en/ironjacamar>

Appendix A. Schemas

All the IronJacamar schemas are deployed under <http://www.ironjacamar.org/schema/>.

A.1. Java EE Connector Architecture 1.7

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://xmlns.jcp.org/xml/ns/javaee"
  xmlns:javaee="http://xmlns.jcp.org/xml/ns/javaee"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified"
  version="1.7">
  <xsd:annotation>
  <xsd:documentation>
```

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```
</xsd:documentation>
</xsd:annotation>

<xsd:annotation>
  <xsd:documentation>

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    "Portions Copyrighted [year] [name of copyright owner]"

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    CDDL, the GPL Version 2 or to extend the choice of license to its
    licensees as provided above. However, if you add GPL Version 2
    code and therefore, elected the GPL Version 2 license, then the
    option applies only if the new code is made subject to such
    option by the copyright holder.

  </xsd:documentation>
</xsd:annotation>

<xsd:annotation>
  <xsd:documentation>
    <![CDATA[[
      This is the XML Schema for the Connector 1.7 deployment
      descriptor. The deployment descriptor must be named
      "META-INF/ra.xml" in the connector's rar file. All Connector
      deployment descriptors must indicate the connector resource
      adapter schema by using the Java EE namespace:

      http://xmlns.jcp.org/xml/ns/javaee
```

and by indicating the version of the schema by using the version element as shown below:

```
<connector xmlns="http://xmlns.jcp.org/xml/ns/javaee"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
    http://xmlns.jcp.org/xml/ns/javaee/connector_1_7.xsd"
version="1.7">
...
</connector>
```

The instance documents may indicate the published version of the schema using the `xsi:schemaLocation` attribute for Java EE namespace with the following location:

```
http://xmlns.jcp.org/xml/ns/javaee/connector_1_7.xsd
```

```
]]>
</xsd:documentation>
</xsd:annotation>
```

```
<xsd:annotation>
  <xsd:documentation>
```

The following conventions apply to all Java EE deployment descriptor elements unless indicated otherwise.

- In elements that specify a pathname to a file within the same JAR file, relative filenames (i.e., those not starting with "/") are considered relative to the root of the JAR file's namespace. Absolute filenames (i.e., those starting with "/") also specify names in the root of the JAR file's namespace. In general, relative names are preferred. The exception is .war files where absolute names are preferred for consistency with the Servlet API.

```
</xsd:documentation>
</xsd:annotation>
```

```
<xsd:include schemaLocation="javaee_7.xsd"/>
```

```
<!-- ***** -->
```

```
<xsd:element name="connector"
  type="javaee:connectorType">
  <xsd:annotation>
    <xsd:documentation>
```

The connector element is the root element of the deployment descriptor for the resource adapter. This element includes general information - vendor name, resource adapter version, icon - about the resource adapter module. It also includes information specific to the implementation of the resource adapter library as specified through the element `resourceadapter`.

```
</xsd:documentation>
</xsd:annotation>
```

```
</xsd:element>

<!-- ***** -->

<xsd:complexType name="activationSpecType">
  <xsd:annotation>
    <xsd:documentation>

      The activationSpecType specifies an activation
      specification. The information includes fully qualified
      Java class name of an activation specification and a set of
      required configuration property names.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="activationSpec-class"
      type="javaee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[[
            The element activationSpec-class specifies the fully
            qualified Java class name of the activation
            specification class. This class must implement the
            javax.resource.spi.ActivationSpec interface. The
            implementation of this class is required to be a
            JavaBean.

            Example:
              <activationSpec-class>com.wombat.ActivationSpecImpl
            </activationSpec-class>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="required-config-property"
      type="javaee:required-config-propertyType"
      minOccurs="0"
      maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation>

          The required-config-property element is deprecated since
          Connectors 1.6 specification. The resource adapter
          implementation is recommended to use the @NotNull
          Bean Validation annotation or its XML validation
          descriptor equivalent to indicate that a configuration
          property is required to be specified by the deployer.
          See the Connectors specification for more information.

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="config-property"
      type="javaee:config-propertyType"
      minOccurs="0"
      maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

```

</xsd:sequence>
<xsd:attribute name="id"
               type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="adminobjectType">
  <xsd:annotation>
    <xsd:documentation>

      The adminobjectType specifies information about an
      administered object. Administered objects are specific to a
      messaging style or message provider. This contains
      information on the Java type of the interface implemented by
      an administered object, its Java class name and its
      configuration properties.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="adminobject-interface"
                 type="javaee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[[
            The element adminobject-interface specifies the
            fully qualified name of the Java type of the
            interface implemented by an administered object.

            Example:
              <adminobject-interface>javax.jms.Destination
              </adminobject-interface>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="adminobject-class"
                 type="javaee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[[
            The element adminobject-class specifies the fully
            qualified Java class name of an administered object.

            Example:
              <adminobject-class>com.wombat.DestinationImpl
              </adminobject-class>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="config-property"
                 type="javaee:config-propertyType"
                 minOccurs="0"
                 maxOccurs="unbounded"/>

```

```
</xsd:sequence>
<xsd:attribute name="id"
               type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="authentication-mechanismType">
  <xsd:annotation>
    <xsd:documentation>

      The authentication-mechanismType specifies an authentication
      mechanism supported by the resource adapter. Note that this
      support is for the resource adapter and not for the
      underlying EIS instance. The optional description specifies
      any resource adapter specific requirement for the support of
      security contract and authentication mechanism.

      Note that BasicPassword mechanism type should support the
      javax.resource.spi.security.PasswordCredential interface.
      The Kerbv5 mechanism type should support the
      org.ietf.jgss.GSSCredential interface or the deprecated
      javax.resource.spi.security.GenericCredential interface.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description"
                 type="javaee:descriptionType"
                 minOccurs="0"
                 maxOccurs="unbounded" />
    <xsd:element name="authentication-mechanism-type"
                 type="javaee:xsdStringType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[[
            The element authentication-mechanism-type specifies
            type of an authentication mechanism.

            The example values are:

            <authentication-mechanism-type>BasicPassword
            </authentication-mechanism-type>

            <authentication-mechanism-type>Kerbv5
            </authentication-mechanism-type>

            Any additional security mechanisms are outside the
            scope of the Connector architecture specification.

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="credential-interface"
                 type="javaee:credential-interfaceType" />
  </xsd:sequence>
<xsd:attribute name="id"
```



```

                                type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="config-property-nameType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[
        The config-property-nameType contains the name of a
        configuration property.

        The connector architecture defines a set of well-defined
        properties all of type java.lang.String. These are as
        follows.

        ServerName
        PortNumber
        UserName
        Password
        ConnectionURL

        A resource adapter provider can extend this property set to
        include properties specific to the resource adapter and its
        underlying EIS.

        Possible values include
            ServerName
            PortNumber
            UserName
            Password
            ConnectionURL

        Example: <config-property-name>ServerName</config-property-name>

      ]]>
    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:restriction base="javaee:xsdStringType" />
  </xsd:simpleContent>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="config-property-typeType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[
        The config-property-typeType contains the fully
        qualified Java type of a configuration property.

        The following are the legal values:
        java.lang.Boolean, java.lang.String, java.lang.Integer,
        java.lang.Double, java.lang.Byte, java.lang.Short,
        java.lang.Long, java.lang.Float, java.lang.Character
      ]]>
    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:restriction base="javaee:xsdStringType" />
  </xsd:simpleContent>
</xsd:complexType>

```

```
Used in: config-property

Example:
<config-property-type>java.lang.String</config-property-type>

]]>
</xsd:documentation>
</xsd:annotation>
<xsd:simpleContent>
  <xsd:restriction base="javaee:string">
    <xsd:enumeration value="java.lang.Boolean"/>
    <xsd:enumeration value="java.lang.String"/>
    <xsd:enumeration value="java.lang.Integer"/>
    <xsd:enumeration value="java.lang.Double"/>
    <xsd:enumeration value="java.lang.Byte"/>
    <xsd:enumeration value="java.lang.Short"/>
    <xsd:enumeration value="java.lang.Long"/>
    <xsd:enumeration value="java.lang.Float"/>
    <xsd:enumeration value="java.lang.Character"/>
  </xsd:restriction>
</xsd:simpleContent>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="config-propertyType">
  <xsd:annotation>
    <xsd:documentation>

      The config-propertyType contains a declaration of a single
      configuration property that may be used for providing
      configuration information.

      The declaration consists of an optional description, name,
      type and an optional value of the configuration property. If
      the resource adapter provider does not specify a value than
      the deployer is responsible for providing a valid value for
      a configuration property.

      Any bounds or well-defined values of properties should be
      described in the description element.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description"
      type="javaee:descriptionType"
      minOccurs="0"
      maxOccurs="unbounded"/>
    <xsd:element name="config-property-name"
      type="javaee:config-property-nameType"/>
    <xsd:element name="config-property-type"
      type="javaee:config-property-typeType"/>
    <xsd:element name="config-property-value"
      type="javaee:xsdStringType"
      minOccurs="0">
  </xsd:sequence>
</xsd:complexType>
  <xsd:documentation>
```

```
<![CDATA[ [
The element config-property-value contains the value
of a configuration entry. Note, it is possible for a
resource adapter deployer to override this
configuration information during deployment.
```

Example:

```
<config-property-value>WombatServer</config-property-value>
```

```
]]>
```

```
</xsd:documentation>
```

```
</xsd:annotation>
```

```
</xsd:element>
```

```
<xsd:element name="config-property-ignore"
            type="javaee:true-falseType"
            minOccurs="0"
            maxOccurs="1">
```

```
<xsd:annotation>
```

```
<xsd:documentation>
```

The element config-property-ignore is used to specify whether the configuration tools must ignore considering the configuration property during auto-discovery of Configuration properties. See the Connector specification for more details. If unspecified, the container must not ignore the configuration property during auto-discovery.

This element must be one of the following, "true" or "false".

```
</xsd:documentation>
```

```
</xsd:annotation>
```

```
</xsd:element>
```

```
<xsd:element name="config-property-supports-dynamic-updates"
            type="javaee:true-falseType"
            minOccurs="0"
            maxOccurs="1">
```

```
<xsd:annotation>
```

```
<xsd:documentation>
```

The element config-property-supports-dynamic-updates is used to specify whether the configuration property allows its value to be updated, by application server's configuration tools, during the lifetime of the JavaBean instance. See the Connector specification for more details. If unspecified, the container must not dynamically reconfigure the property.

This element must be one of the following, "true" or "false".

```
</xsd:documentation>
```

```
</xsd:annotation>
```

```
</xsd:element>
```

```
<xsd:element name="config-property-confidential"
            type="javaee:true-falseType"
            minOccurs="0"
            maxOccurs="1">
```

```
<xsd:annotation>
```

```
<xsd:documentation>
```

The element config-property-confidential is used to specify whether the configuration property is confidential and recommends application server's configuration tools to use special

visual aids for editing them. See the Connector specification for more details. If unspecified, the container must not treat the property as confidential.

This element must be one of the following, "true" or "false".

```
</xsd:documentation>
</xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id"
               type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="connection-definitionType">
  <xsd:annotation>
    <xsd:documentation>

      The connection-definitionType defines a set of connection
      interfaces and classes pertaining to a particular connection
      type. This also includes configurable properties for
      ManagedConnectionFactory instances that may be produced out
      of this set.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="managedconnectionfactory-class"
                 type="javaee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[[
            The element managedconnectionfactory-class specifies
            the fully qualified name of the Java class that
            implements the
            javax.resource.spi.ManagedConnectionFactory interface.
            This Java class is provided as part of resource
            adapter's implementation of connector architecture
            specified contracts. The implementation of this
            class is required to be a JavaBean.

            Example:
            <managedconnectionfactory-class>
              com.wombat.ManagedConnectionFactoryImpl
            </managedconnectionfactory-class>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="config-property"
                 type="javaee:config-propertyType"
                 minOccurs="0"
                 maxOccurs="unbounded" />
    <xsd:element name="connectionfactory-interface"
                 type="javaee:fully-qualified-classType">
      <xsd:annotation>
```

```

<xsd:documentation>
  <![CDATA[[
    The element connectionfactory-interface specifies
    the fully qualified name of the ConnectionFactory
    interface supported by the resource adapter.

    Example:
    <connectionfactory-interface>com.wombat.ConnectionFactory
    </connectionfactory-interface>

    OR

    <connectionfactory-interface>javax.resource.cci.ConnectionFactory
    </connectionfactory-interface>

  ]]>
</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="connectionfactory-impl-class"
  type="javaee:fully-qualified-classType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[[
        The element connectionfactory-impl-class specifies
        the fully qualified name of the ConnectionFactory
        class that implements resource adapter
        specific ConnectionFactory interface.

        Example:

        <connectionfactory-impl-class>com.wombat.ConnectionFactoryImpl
        </connectionfactory-impl-class>

      ]]>
    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="connection-interface"
  type="javaee:fully-qualified-classType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[[
        The connection-interface element specifies the fully
        qualified name of the Connection interface supported
        by the resource adapter.

        Example:

        <connection-interface>javax.resource.cci.Connection
        </connection-interface>

      ]]>
    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="connection-impl-class"
  type="javaee:fully-qualified-classType">
  <xsd:annotation>

```

```
<xsd:documentation>
  <![CDATA[[
    The connection-impl-classType specifies the fully
    qualified name of the Connection class that
    implements resource adapter specific Connection
    interface. It is used by the connection-impl-class
    elements.

    Example:

        <connection-impl-class>com.wombat.ConnectionImpl
        </connection-impl-class>

    ]]>
  </xsd:documentation>
</xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id"
               type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="connectorType">
  <xsd:annotation>
    <xsd:documentation>

      The connectorType defines a resource adapter.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="module-name"
                 type="javaee:string"
                 minOccurs="0">
      <xsd:annotation>
        <xsd:documentation>

          The element module-name specifies the name of the
          resource adapter.

          If there is no module-name specified, the module-name
          is determined as defined in Section EE.8.1.1 and EE.8.1.2
          of the Java Platform, Enterprise Edition (Java EE)
          Specification, version 6.

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:group ref="javaee:descriptionGroup"/>
    <xsd:element name="vendor-name"
                 type="javaee:xsdStringType"
                 minOccurs="0">
      <xsd:annotation>
        <xsd:documentation>

          The element vendor-name specifies the name of
```

resource adapter provider vendor.

If there is no vendor-name specified, the application server must consider the default "" (empty string) as the name of the resource adapter provider vendor.

```

</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="eis-type"
              type="javaee:xsdStringType"
              minOccurs="0">
<xsd:annotation>
  <xsd:documentation>

```

The element eis-type contains information about the type of the EIS. For example, the type of an EIS can be product name of EIS independent of any version info.

This helps in identifying EIS instances that can be used with this resource adapter.

If there is no eis-type specified, the application server must consider the default "" (empty string) as the type of the EIS.

```

</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="resourceadapter-version"
              type="javaee:xsdStringType"
              minOccurs="0">
<xsd:annotation>
  <xsd:documentation>

```

The element resourceadapter-version specifies a string-based version of the resource adapter from the resource adapter provider.

If there is no resourceadapter-version specified, the application server must consider the default "" (empty string) as the version of the resource adapter.

```

</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="license"
              type="javaee:licenseType"
              minOccurs="0"/>
<xsd:element name="resourceadapter"
              type="javaee:resourceadapterType"/>
<xsd:element name="required-work-context"
              type="javaee:fully-qualified-classType"
              minOccurs="0"
              maxOccurs="unbounded">
<xsd:annotation>
  <xsd:documentation>

```

The element `required-work-context` specifies a fully qualified class name that implements `WorkContext` interface, that the resource adapter requires the application server to support.

```
</xsd:documentation>
</xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="version"
               type="javaee:dewey-versionType"
               fixed="1.7"
               use="required">
<xsd:annotation>
  <xsd:documentation>
```

The version indicates the version of the schema to be used by the deployment tool. This element doesn't have a default, and the resource adapter developer/deployer is required to specify it. The element allows the deployment tool to choose which schema to validate the descriptor against.

```
</xsd:documentation>
</xsd:annotation>
</xsd:attribute>
<xsd:attribute name="metadata-complete"
               type="xsd:boolean">
<xsd:annotation>
  <xsd:documentation>
```

The `metadata-complete` attribute defines whether the deployment descriptor for the resource adapter module is complete, or whether the class files available to the module and packaged with the resource adapter should be examined for annotations that specify deployment information.

If `metadata-complete` is set to `"true"`, the deployment tool of the application server must ignore any annotations that specify deployment information, which might be present in the class files of the application. If `metadata-complete` is not specified or is set to `"false"`, the deployment tool must examine the class files of the application for annotations, as specified by this specification. If the deployment descriptor is not included or is included but not marked `metadata-complete`, the deployment tool will process annotations.

Application servers must assume that `metadata-complete` is true for resource adapter modules with deployment descriptor version lower than 1.6.

```
</xsd:documentation>
</xsd:annotation>
</xsd:attribute>
<xsd:attribute name="id"
               type="xsd:ID"/>
</xsd:complexType>
```

```
<!-- ***** -->
```



```

<xsd:complexType name="credential-interfaceType">
  <xsd:annotation>
    <xsd:documentation>

      The credential-interfaceType specifies the
      interface that the resource adapter implementation
      supports for the representation of the
      credentials. This element(s) that use this type,
      i.e. credential-interface, should be used by
      application server to find out the Credential
      interface it should use as part of the security
      contract.

      The possible values are:

      javax.resource.spi.security.PasswordCredential
      org.ietf.jgss.GSSCredential
      javax.resource.spi.security.GenericCredential

    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:restriction base="javaee:fully-qualified-classType">
      <xsd:enumeration value="javax.resource.spi.security.PasswordCredential"/>
      <xsd:enumeration value="org.ietf.jgss.GSSCredential"/>
      <xsd:enumeration value="javax.resource.spi.security.GenericCredential"/>
    </xsd:restriction>
  </xsd:simpleContent>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="inbound-resourceadapterType">
  <xsd:annotation>
    <xsd:documentation>

      The inbound-resourceadapterType specifies information
      about an inbound resource adapter. This contains information
      specific to the implementation of the resource adapter
      library as specified through the messageadapter element.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="messageadapter"
      type="javaee:messageadapterType"
      minOccurs="0">
      <xsd:unique name="messagelistener-type-uniqueness">
        <xsd:annotation>
          <xsd:documentation>

            The messagelistener-type element content must be
            unique in the messageadapter. Several messagelisteners
            can not use the same messagelistener-type.

          </xsd:documentation>
        </xsd:annotation>
      <xsd:selector xpath="javaee:messagelistener"/>

```

```
<xsd:field xpath="javaee:listener-type"/>
</xsd:unique>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id"
               type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="licenseType">
  <xsd:annotation>
    <xsd:documentation>

      The licenseType specifies licensing requirements for the
      resource adapter module. This type specifies whether a
      license is required to deploy and use this resource adapter,
      and an optional description of the licensing terms
      (examples: duration of license, number of connection
      restrictions). It is used by the license element.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description"
                 type="javaee:descriptionType"
                 minOccurs="0"
                 maxOccurs="unbounded"/>
    <xsd:element name="license-required"
                 type="javaee:true-falseType">
      <xsd:annotation>
        <xsd:documentation>

          The element license-required specifies whether a
          license is required to deploy and use the
          resource adapter. This element must be one of
          the following, "true" or "false".

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
  <xsd:attribute name="id"
                 type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="messageadapterType">
  <xsd:annotation>
    <xsd:documentation>

      The messageadapterType specifies information about the
      messaging capabilities of the resource adapter. This
      contains information specific to the implementation of the
      resource adapter library as specified through the
      listener element.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description"
                 type="javaee:descriptionType"
                 minOccurs="0"
                 maxOccurs="unbounded"/>
    <xsd:element name="license-required"
                 type="javaee:true-falseType">
      <xsd:annotation>
        <xsd:documentation>

          The element license-required specifies whether a
          license is required to deploy and use the
          resource adapter. This element must be one of
          the following, "true" or "false".

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
  <xsd:attribute name="id"
                 type="xsd:ID"/>
</xsd:complexType>
```

```

    </xsd:documentation>
</xsd:annotation>
<xsd:sequence>
  <xsd:element name="messagelistener"
    type="javaee:messagelistenerType"
    maxOccurs="unbounded"/>
</xsd:sequence>
<xsd:attribute name="id"
  type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="messagelistenerType">
  <xsd:annotation>
    <xsd:documentation>

      The messagelistenerType specifies information about a
      specific message listener supported by the messaging
      resource adapter. It contains information on the Java type
      of the message listener interface and an activation
      specification.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="messagelistener-type"
      type="javaee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[[
            The element messagelistener-type specifies the fully
            qualified name of the Java type of a message
            listener interface.

            Example:

              <messagelistener-type>javax.jms.MessageListener
              </messagelistener-type>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="activationspec"
      type="javaee:activationspecType"/>
  </xsd:sequence>
  <xsd:attribute name="id"
    type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="outbound-resourceadapterType">
  <xsd:annotation>
    <xsd:documentation>

```

The `outbound-resourceadapterType` specifies information about an outbound resource adapter. The information includes fully qualified names of classes/interfaces required as part of the connector architecture specified contracts for connection management, level of transaction support provided, one or more authentication mechanisms supported and additional required security permissions.

If any of the outbound resource adapter elements (`transaction-support`, `authentication-mechanism`, `reauthentication-support`) is specified through this element or metadata annotations, and no `connection-definition` is specified as part of this element or through annotations, the application server must consider this an error and fail deployment.

If there is no `authentication-mechanism` specified as part of this element or metadata annotations, then the resource adapter does not support any standard security authentication mechanisms as part of security contract. The application server ignores the security part of the system contracts in this case.

If there is no `transaction-support` specified as part of this element or metadata annotation, then the application server must consider that the resource adapter does not support either the resource manager local or JTA transactions and must consider the transaction support as `NoTransaction`. Note that resource adapters may specify the level of transaction support to be used at runtime for a `ManagedConnectionFactory` through the `TransactionSupport` interface.

If there is no `reauthentication-support` specified as part of this element or metadata annotation, then the application server must consider that the resource adapter does not support re-authentication of `ManagedConnections`.

```
</xsd:documentation>
</xsd:annotation>
<xsd:sequence>
  <xsd:element name="connection-definition"
    type="javaee:connection-definitionType"
    maxOccurs="unbounded"
    minOccurs="0"/>
  <xsd:element name="transaction-support"
    type="javaee:transaction-supportType"
    minOccurs="0"/>
  <xsd:element name="authentication-mechanism"
    type="javaee:authentication-mechanismType"
    minOccurs="0"
    maxOccurs="unbounded"/>
  <xsd:element name="reauthentication-support"
    type="javaee:true-falseType"
    minOccurs="0">
    <xsd:annotation>
      <xsd:documentation>
```

The element `reauthentication-support` specifies whether the resource adapter implementation supports re-authentication of existing `Managed-Connection` instance. Note that this information is for the resource adapter implementation and not for the

underlying EIS instance. This element must have either a "true" or "false" value.

```

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
  <xsd:attribute name="id"
    type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="required-config-propertyType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[[
        The required-config-propertyType contains a declaration
        of a single configuration property used for specifying a
        required configuration property name. It is used
        by required-config-property elements.

        Usage of this type is deprecated from Connectors 1.6 specification.
        Refer to required-config-property element for more information.

        Example:

        <required-config-property>
        <config-property-name>Destination</config-property-name>
        </required-config-property>

      ]]>
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description"
      type="javaee:descriptionType"
      minOccurs="0"
      maxOccurs="unbounded" />
    <xsd:element name="config-property-name"
      type="javaee:config-property-nameType" />
  </xsd:sequence>
  <xsd:attribute name="id"
    type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="resourceadapterType">
  <xsd:annotation>
    <xsd:documentation>

      The resourceadapterType specifies information about the
      resource adapter. The information includes fully qualified
      resource adapter Java class name, configuration properties,
      information specific to the implementation of the resource
    
```

adapter library as specified through the outbound-resourceadapter and inbound-resourceadapter elements, and an optional set of administered objects.

```
</xsd:documentation>
</xsd:annotation>
<xsd:sequence>
  <xsd:element name="resourceadapter-class"
    type="javaee:fully-qualified-classType"
    minOccurs="0">
    <xsd:annotation>
      <xsd:documentation>

        The element resourceadapter-class specifies the
        fully qualified name of a Java class that implements
        the javax.resource.spi.ResourceAdapter
        interface. This Java class is provided as part of
        resource adapter's implementation of connector
        architecture specified contracts. The implementation
        of this class is required to be a JavaBean.

      </xsd:documentation>
    </xsd:annotation>
  </xsd:element>
  <xsd:element name="config-property"
    type="javaee:config-propertyType"
    minOccurs="0"
    maxOccurs="unbounded"/>
  <xsd:element name="outbound-resourceadapter"
    type="javaee:outbound-resourceadapterType"
    minOccurs="0">
    <xsd:unique name="connectionfactory-interface-uniqueness">
      <xsd:annotation>
        <xsd:documentation>

          The connectionfactory-interface element content
          must be unique in the outbound-resourceadapter.
          Multiple connection-definitions can not use the
          same connectionfactory-type.

        </xsd:documentation>
      </xsd:annotation>
      <xsd:selector xpath="javaee:connection-definition"/>
      <xsd:field xpath="javaee:connectionfactory-interface"/>
    </xsd:unique>
  </xsd:element>
  <xsd:element name="inbound-resourceadapter"
    type="javaee:inbound-resourceadapterType"
    minOccurs="0"/>
  <xsd:element name="adminobject"
    type="javaee:adminobjectType"
    minOccurs="0"
    maxOccurs="unbounded">
    <xsd:unique name="adminobject-type-uniqueness">
      <xsd:annotation>
        <xsd:documentation>

          The adminobject-interface and adminobject-class element content must be
          unique in the resourceadapterType. Several admin objects
```

can not use the same adminobject-interface and adminobject-class.

```

    </xsd:documentation>
  </xsd:annotation>
  <xsd:selector xpath="javaee:adminobject"/>
  <xsd:field xpath="javaee:adminobject-interface"/>
  <xsd:field xpath="javaee:adminobject-class"/>
</xsd:unique>
</xsd:element>
<xsd:element name="security-permission"
  type="javaee:security-permissionType"
  minOccurs="0"
  maxOccurs="unbounded"/>
</xsd:sequence>
<xsd:attribute name="id"
  type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="security-permissionType">
  <xsd:annotation>
    <xsd:documentation>

      The security-permissionType specifies a security
      permission that is required by the resource adapter code.

      The security permission listed in the deployment descriptor
      are ones that are different from those required by the
      default permission set as specified in the connector
      specification. The optional description can mention specific
      reason that resource adapter requires a given security
      permission.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description"
      type="javaee:descriptionType"
      minOccurs="0"
      maxOccurs="unbounded"/>
    <xsd:element name="security-permission-spec"
      type="javaee:xsdStringType">
      <xsd:annotation>
        <xsd:documentation>

          The element security-permission-spec specifies a security
          permission based on the Security policy file
          syntax. Refer to the following URL for Sun's
          implementation of the security permission
          specification:

          http://docs.oracle.com/javase/6/docs/technotes/guides/security/PolicyFiles.html

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>

```

```
<xsd:attribute name="id"
               type="xsd:ID" />
</xsd:complexType>

</xsd:schema>
```

A.2. Java EE Connector Architecture 1.6

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns="http://www.w3.org/2001/XMLSchema"
             targetNamespace="http://java.sun.com/xml/ns/javaee"
             xmlns:javaee="http://java.sun.com/xml/ns/javaee"
             xmlns:xsd="http://www.w3.org/2001/XMLSchema"
             elementFormDefault="qualified"
             attributeFormDefault="unqualified"
             version="1.6">
  <xsd:annotation>
    <xsd:documentation>

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      CDDL, the GPL Version 2 or to extend the choice of license to its
      licensees as provided above. However, if you add GPL Version 2
```


code and therefore, elected the GPL Version 2 license, then the option applies only if the new code is made subject to such option by the copyright holder.

```
</xsd:documentation>
</xsd:annotation>
```

```
<xsd:annotation>
  <xsd:documentation>
```

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```
</xsd:documentation>
</xsd:annotation>
```

```
<xsd:annotation>
  <xsd:documentation>
```

```
<![CDATA[[
This is the XML Schema for the Connector 1.6 deployment
descriptor. The deployment descriptor must be named
"META-INF/ra.xml" in the connector's rar file. All Connector
deployment descriptors must indicate the connector resource
adapter schema by using the Java EE namespace:
```

`http://java.sun.com/xml/ns/javaee`

and by indicating the version of the schema by using the version element as shown below:

```
<connector xmlns="http://java.sun.com/xml/ns/javaee"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
    http://java.sun.com/xml/ns/javaee/connector_1_6.xsd"
version="1.6">
...
</connector>
```

The instance documents may indicate the published version of the schema using the `xsi:schemaLocation` attribute for Java EE namespace with the following location:

`http://java.sun.com/xml/ns/javaee/connector_1_6.xsd`

```
]]>
</xsd:documentation>
</xsd:annotation>

<xsd:annotation>
    <xsd:documentation>
```

The following conventions apply to all Java EE deployment descriptor elements unless indicated otherwise.

- In elements that specify a pathname to a file within the same JAR file, relative filenames (i.e., those not starting with `"/`) are considered relative to the root of the JAR file's namespace. Absolute filenames (i.e., those starting with `"/`) also specify names in the root of the JAR file's namespace. In general, relative names are preferred. The exception is `.war` files where absolute names are preferred for consistency with the Servlet API.

```
</xsd:documentation>
</xsd:annotation>

<xsd:include schemaLocation="javaee_6.xsd"/>
```

```
<!-- ***** -->
```

```
<xsd:element name="connector"
    type="javaee:connectorType">
    <xsd:annotation>
        <xsd:documentation>
```

The `connector` element is the root element of the deployment descriptor for the resource adapter. This element includes general information - vendor name, resource adapter version, icon - about the resource adapter module. It also includes information specific to the implementation of the resource adapter library as specified through the element `resourceadapter`.

```

    </xsd:documentation>
  </xsd:annotation>
</xsd:element>

<!-- ***** -->

<xsd:complexType name="activationspecType">
  <xsd:annotation>
    <xsd:documentation>

      The activationspecType specifies an activation
      specification. The information includes fully qualified
      Java class name of an activation specification and a set of
      required configuration property names.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="activationspec-class"
      type="javaee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[[
            The element activationspec-class specifies the fully
            qualified Java class name of the activation
            specification class. This class must implement the
            javax.resource.spi.ActivationSpec interface. The
            implementation of this class is required to be a
            JavaBean.

            Example:
              <activationspec-class>com.wombat.ActivationSpecImpl
            </activationspec-class>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="required-config-property"
      type="javaee:required-config-propertyType"
      minOccurs="0"
      maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation>

          The required-config-property element is deprecated since
          Connectors 1.6 specification. The resource adapter
          implementation is recommended to use the @NotNull
          Bean Validation annotation or its XML validation
          descriptor equivalent to indicate that a configuration
          property is required to be specified by the deployer.
          See the Connectors specification for more information.

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="config-property"

```

```
        type="javaee:config-propertyType"
        minOccurs="0"
        maxOccurs="unbounded" />
    </xsd:sequence>
    <xsd:attribute name="id"
        type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="adminobjectType">
    <xsd:annotation>
        <xsd:documentation>

            The adminobjectType specifies information about an
            administered object. Administered objects are specific to a
            messaging style or message provider. This contains
            information on the Java type of the interface implemented by
            an administered object, its Java class name and its
            configuration properties.

        </xsd:documentation>
    </xsd:annotation>
    <xsd:sequence>
        <xsd:element name="adminobject-interface"
            type="javaee:fully-qualified-classType">
            <xsd:annotation>
                <xsd:documentation>
                    <![CDATA[
                        The element adminobject-interface specifies the
                        fully qualified name of the Java type of the
                        interface implemented by an administered object.

                        Example:
                            <adminobject-interface>javax.jms.Destination
                            </adminobject-interface>

                    ]]>
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="adminobject-class"
            type="javaee:fully-qualified-classType">
            <xsd:annotation>
                <xsd:documentation>
                    <![CDATA[
                        The element adminobject-class specifies the fully
                        qualified Java class name of an administered object.

                        Example:
                            <adminobject-class>com.wombat.DestinationImpl
                            </adminobject-class>

                    ]]>
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="config-property"
```

```

        type="javaee:config-propertyType"
        minOccurs="0"
        maxOccurs="unbounded"/>
</xsd:sequence>
<xsd:attribute name="id"
               type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="authentication-mechanismType">
  <xsd:annotation>
    <xsd:documentation>

      The authentication-mechanismType specifies an authentication
      mechanism supported by the resource adapter. Note that this
      support is for the resource adapter and not for the
      underlying EIS instance. The optional description specifies
      any resource adapter specific requirement for the support of
      security contract and authentication mechanism.

      Note that BasicPassword mechanism type should support the
      javax.resource.spi.security.PasswordCredential interface.
      The Kerbv5 mechanism type should support the
      org.ietf.jgss.GSSCredential interface or the deprecated
      javax.resource.spi.security.GenericCredential interface.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description"
                 type="javaee:descriptionType"
                 minOccurs="0"
                 maxOccurs="unbounded"/>
    <xsd:element name="authentication-mechanism-type"
                 type="javaee:xsdStringType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[[
            The element authentication-mechanism-type specifies
            type of an authentication mechanism.

            The example values are:

            <authentication-mechanism-type>BasicPassword
            </authentication-mechanism-type>

            <authentication-mechanism-type>Kerbv5
            </authentication-mechanism-type>

            Any additional security mechanisms are outside the
            scope of the Connector architecture specification.

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="credential-interface"

```

```
                type="javaee:credential-interfaceType"/>
</xsd:sequence>
<xsd:attribute name="id"
                type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="config-property-nameType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[[
        The config-property-nameType contains the name of a
        configuration property.

        The connector architecture defines a set of well-defined
        properties all of type java.lang.String. These are as
        follows.

        ServerName
        PortNumber
        UserName
        Password
        ConnectionURL

        A resource adapter provider can extend this property set to
        include properties specific to the resource adapter and its
        underlying EIS.

        Possible values include
          ServerName
          PortNumber
          UserName
          Password
          ConnectionURL

        Example: <config-property-name>ServerName</config-property-name>

      ]]>
    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:restriction base="javaee:xsdStringType"/>
  </xsd:simpleContent>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="config-property-typeType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[[
        The config-property-typeType contains the fully
        qualified Java type of a configuration property.

        The following are the legal values:
        java.lang.Boolean, java.lang.String, java.lang.Integer,
```

```

    java.lang.Double, java.lang.Byte, java.lang.Short,
    java.lang.Long, java.lang.Float, java.lang.Character

    Used in: config-property

    Example:
    <config-property-type>java.lang.String</config-property-type>

    ]]>
  </xsd:documentation>
</xsd:annotation>
<xsd:simpleContent>
  <xsd:restriction base="javaee:string">
    <xsd:enumeration value="java.lang.Boolean"/>
    <xsd:enumeration value="java.lang.String"/>
    <xsd:enumeration value="java.lang.Integer"/>
    <xsd:enumeration value="java.lang.Double"/>
    <xsd:enumeration value="java.lang.Byte"/>
    <xsd:enumeration value="java.lang.Short"/>
    <xsd:enumeration value="java.lang.Long"/>
    <xsd:enumeration value="java.lang.Float"/>
    <xsd:enumeration value="java.lang.Character"/>
  </xsd:restriction>
</xsd:simpleContent>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="config-propertyType">
  <xsd:annotation>
    <xsd:documentation>

      The config-propertyType contains a declaration of a single
      configuration property that may be used for providing
      configuration information.

      The declaration consists of an optional description, name,
      type and an optional value of the configuration property. If
      the resource adapter provider does not specify a value than
      the deployer is responsible for providing a valid value for
      a configuration property.

      Any bounds or well-defined values of properties should be
      described in the description element.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description"
      type="javaee:descriptionType"
      minOccurs="0"
      maxOccurs="unbounded"/>
    <xsd:element name="config-property-name"
      type="javaee:config-property-nameType"/>
    <xsd:element name="config-property-type"
      type="javaee:config-property-typeType"/>
    <xsd:element name="config-property-value"
      type="javaee:xsdStringType"

```

```
        minOccurs="0">
<xsd:annotation>
  <xsd:documentation>
    <![CDATA[[
      The element config-property-value contains the value
      of a configuration entry. Note, it is possible for a
      resource adapter deployer to override this
      configuration information during deployment.

      Example:
      <config-property-value>WombatServer</config-property-value>

    ]]>
  </xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="config-property-ignore"
  type="javaee:true-falseType"
  minOccurs="0"
  maxOccurs="1">
  <xsd:annotation>
    <xsd:documentation>

      The element config-property-ignore is used to specify
      whether the configuration tools must ignore considering the
      configuration property during auto-discovery of
      Configuration properties. See the Connector specification for
      more details. If unspecified, the container must not ignore
      the configuration property during auto-discovery.
      This element must be one of the following, "true" or "false".

    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="config-property-supports-dynamic-updates"
  type="javaee:true-falseType"
  minOccurs="0"
  maxOccurs="1">
  <xsd:annotation>
    <xsd:documentation>

      The element config-property-supports-dynamic-updates is used to specify
      whether the configuration property allows its value to be updated, by
      application server's configuration tools, during the lifetime of
      the JavaBean instance. See the Connector specification for
      more details. If unspecified, the container must not dynamically
      reconfigure the property.
      This element must be one of the following, "true" or "false".

    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="config-property-confidential"
  type="javaee:true-falseType"
  minOccurs="0"
  maxOccurs="1">
  <xsd:annotation>
    <xsd:documentation>
```


The element `config-property-confidential` is used to specify whether the configuration property is confidential and recommends application server's configuration tools to use special visual aids for editing them. See the Connector specification for more details. If unspecified, the container must not treat the property as confidential.

This element must be one of the following, "true" or "false".

```

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
  <xsd:attribute name="id"
                type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="connection-definitionType">
  <xsd:annotation>
    <xsd:documentation>

      The connection-definitionType defines a set of connection
      interfaces and classes pertaining to a particular connection
      type. This also includes configurable properties for
      ManagedConnectionFactory instances that may be produced out
      of this set.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="managedconnectionfactory-class"
                  type="javaee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[[
            The element managedconnectionfactory-class specifies
            the fully qualified name of the Java class that
            implements the
            javax.resource.spi.ManagedConnectionFactory interface.
            This Java class is provided as part of resource
            adapter's implementation of connector architecture
            specified contracts. The implementation of this
            class is required to be a JavaBean.

            Example:
            <managedconnectionfactory-class>
              com.wombat.ManagedConnectionFactoryImpl
            </managedconnectionfactory-class>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="config-property"
                  type="javaee:config-propertyType"
                  minOccurs="0"
                  maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>

```

```
<xsd:element name="connectionfactory-interface"
             type="javaee:fully-qualified-classType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[[
        The element connectionfactory-interface specifies
        the fully qualified name of the ConnectionFactory
        interface supported by the resource adapter.

        Example:
        <connectionfactory-interface>com.wombat.ConnectionFactory
        </connectionfactory-interface>

        OR

        <connectionfactory-interface>javax.resource.cci.ConnectionFactory
        </connectionfactory-interface>

      ]]>
    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="connectionfactory-impl-class"
             type="javaee:fully-qualified-classType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[[
        The element connectionfactory-impl-class specifies
        the fully qualified name of the ConnectionFactory
        class that implements resource adapter
        specific ConnectionFactory interface.

        Example:

        <connectionfactory-impl-class>com.wombat.ConnectionFactoryImpl
        </connectionfactory-impl-class>

      ]]>
    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="connection-interface"
             type="javaee:fully-qualified-classType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[[
        The connection-interface element specifies the fully
        qualified name of the Connection interface supported
        by the resource adapter.

        Example:

        <connection-interface>javax.resource.cci.Connection
        </connection-interface>

      ]]>
    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
```

```

<xsd:element name="connection-impl-class"
             type="javaee:fully-qualified-classType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[
        The connection-impl-classType specifies the fully
        qualified name of the Connection class that
        implements resource adapter specific Connection
        interface. It is used by the connection-impl-class
        elements.

        Example:

          <connection-impl-class>com.wombat.ConnectionImpl
          </connection-impl-class>

        ]]>
      </xsd:documentation>
    </xsd:annotation>
  </xsd:element>
</xsd:sequence>
<xsd:attribute name="id"
               type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="connectorType">
  <xsd:annotation>
    <xsd:documentation>

      The connectorType defines a resource adapter.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="module-name"
                 type="javaee:string"
                 minOccurs="0">
      <xsd:annotation>
        <xsd:documentation>

          The element module-name specifies the name of the
          resource adapter.

          If there is no module-name specified, the module-name
          is determined as defined in Section EE.8.1.1 and EE.8.1.2
          of the Java Platform, Enterprise Edition (Java EE)
          Specification, version 6.

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:group ref="javaee:descriptionGroup"/>
    <xsd:element name="vendor-name"
                 type="javaee:xsdStringType"
                 minOccurs="0">
      <xsd:annotation>

```

```
<xsd:documentation>

    The element vendor-name specifies the name of
    resource adapter provider vendor.

    If there is no vendor-name specified, the application
    server must consider the default "" (empty string) as
    the name of the resource adapter provider vendor.

</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="eis-type"
             type="javaee:xsdStringType"
             minOccurs="0">
<xsd:annotation>
<xsd:documentation>

    The element eis-type contains information about the
    type of the EIS. For example, the type of an EIS can
    be product name of EIS independent of any version
    info.

    This helps in identifying EIS instances that can be
    used with this resource adapter.

    If there is no eis-type specified, the application
    server must consider the default "" (empty string) as
    the type of the EIS.

</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="resourceadapter-version"
             type="javaee:xsdStringType"
             minOccurs="0">
<xsd:annotation>
<xsd:documentation>

    The element resourceadapter-version specifies a string-based version
    of the resource adapter from the resource adapter
    provider.

    If there is no resourceadapter-version specified, the application
    server must consider the default "" (empty string) as
    the version of the resource adapter.

</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="license"
             type="javaee:licenseType"
             minOccurs="0"/>
<xsd:element name="resourceadapter"
             type="javaee:resourceadapterType"/>
<xsd:element name="required-work-context"
             type="javaee:fully-qualified-classType"
             minOccurs="0"
```

```

        maxOccurs="unbounded">
<xsd:annotation>
  <xsd:documentation>

    The element required-work-context specifies a fully qualified class
    name that implements WorkContext interface, that the resource adapter
    requires the application server to support.

  </xsd:documentation>
</xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="version"
               type="javaee:dewey-versionType"
               fixed="1.6"
               use="required">
<xsd:annotation>
  <xsd:documentation>

    The version indicates the version of the schema to be used by the
    deployment tool. This element doesn't have a default, and the resource adapter
    developer/deployer is required to specify it. The element allows the deployment
    tool to choose which schema to validate the descriptor against.

  </xsd:documentation>
</xsd:annotation>
</xsd:attribute>
<xsd:attribute name="metadata-complete"
               type="xsd:boolean">
<xsd:annotation>
  <xsd:documentation>

    The metadata-complete attribute defines whether the deployment
    descriptor for the resource adapter module is complete, or whether
    the class files available to the module and packaged with the resource
    adapter should be examined for annotations that specify deployment
    information.

    If metadata-complete is set to "true", the deployment tool of the
    application server must ignore any annotations that specify deployment
    information, which might be present in the class files of the
    application. If metadata-complete is not specified or is set to "false",
    the deployment tool must examine the class files of the application for
    annotations, as specified by this specification. If the
    deployment descriptor is not included or is included but not marked
    metadata-complete, the deployment tool will process annotations.

    Application servers must assume that metadata-complete is true for
    resource adapter modules with deployment descriptor version
    lower than 1.6.

  </xsd:documentation>
</xsd:annotation>
</xsd:attribute>
<xsd:attribute name="id"
               type="xsd:ID"/>
</xsd:complexType>

```

```
<!-- ***** -->

<xsd:complexType name="credential-interfaceType">
  <xsd:annotation>
    <xsd:documentation>

      The credential-interfaceType specifies the
      interface that the resource adapter implementation
      supports for the representation of the
      credentials. This element(s) that use this type,
      i.e. credential-interface, should be used by
      application server to find out the Credential
      interface it should use as part of the security
      contract.

      The possible values are:

      javax.resource.spi.security.PasswordCredential
      org.ietf.jgss.GSSCredential
      javax.resource.spi.security.GenericCredential

    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:restriction base="javaee:fully-qualified-classType">
      <xsd:enumeration value="javax.resource.spi.security.PasswordCredential"/>
      <xsd:enumeration value="org.ietf.jgss.GSSCredential"/>
      <xsd:enumeration value="javax.resource.spi.security.GenericCredential"/>
    </xsd:restriction>
  </xsd:simpleContent>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="inbound-resourceadapterType">
  <xsd:annotation>
    <xsd:documentation>

      The inbound-resourceadapterType specifies information
      about an inbound resource adapter. This contains information
      specific to the implementation of the resource adapter
      library as specified through the messageadapter element.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="messageadapter"
      type="javaee:messageadapterType"
      minOccurs="0">
      <xsd:unique name="messagelistener-type-uniqueness">
        <xsd:annotation>
          <xsd:documentation>

            The messagelistener-type element content must be
            unique in the messageadapter. Several messagelisteners
            can not use the same messagelistener-type.

          </xsd:documentation>
        </xsd:annotation>
      </xsd:unique>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

```

        </xsd:documentation>
    </xsd:annotation>
    <xsd:selector xpath="javaee:messagelistener"/>
    <xsd:field xpath="javaee:messagelistener-type"/>
</xsd:unique>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id"
               type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="licenseType">
    <xsd:annotation>
        <xsd:documentation>

            The licenseType specifies licensing requirements for the
            resource adapter module. This type specifies whether a
            license is required to deploy and use this resource adapter,
            and an optional description of the licensing terms
            (examples: duration of license, number of connection
            restrictions). It is used by the license element.

        </xsd:documentation>
    </xsd:annotation>
    <xsd:sequence>
        <xsd:element name="description"
                     type="javaee:descriptionType"
                     minOccurs="0"
                     maxOccurs="unbounded"/>
        <xsd:element name="license-required"
                     type="javaee:true-falseType">
            <xsd:annotation>
                <xsd:documentation>

                    The element license-required specifies whether a
                    license is required to deploy and use the
                    resource adapter. This element must be one of
                    the following, "true" or "false".

                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
    </xsd:sequence>
    <xsd:attribute name="id"
                   type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="messageadapterType">
    <xsd:annotation>
        <xsd:documentation>

            The messageadapterType specifies information about the
            messaging capabilities of the resource adapter. This

```

```
contains information specific to the implementation of the
resource adapter library as specified through the
messagelistener element.

</xsd:documentation>
</xsd:annotation>
<xsd:sequence>
  <xsd:element name="messagelistener"
    type="javaee:messagelistenerType"
    maxOccurs="unbounded" />
</xsd:sequence>
<xsd:attribute name="id"
  type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="messagelistenerType">
  <xsd:annotation>
    <xsd:documentation>

      The messagelistenerType specifies information about a
      specific message listener supported by the messaging
      resource adapter. It contains information on the Java type
      of the message listener interface and an activation
      specification.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="messagelistener-type"
      type="javaee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[
            The element messagelistener-type specifies the fully
            qualified name of the Java type of a message
            listener interface.

            Example:

            <messagelistener-type>javax.jms.MessageListener
            </messagelistener-type>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="activation-spec"
      type="javaee:activation-specType" />
  </xsd:sequence>
  <xsd:attribute name="id"
    type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->
```



```
<xsd:complexType name="outbound-resourceadapterType">
```

```
<xsd:annotation>
```

```
<xsd:documentation>
```

The outbound-resourceadapterType specifies information about an outbound resource adapter. The information includes fully qualified names of classes/interfaces required as part of the connector architecture specified contracts for connection management, level of transaction support provided, one or more authentication mechanisms supported and additional required security permissions.

If any of the outbound resource adapter elements (transaction-support, authentication-mechanism, reauthentication-support) is specified through this element or metadata annotations, and no connection-definition is specified as part of this element or through annotations, the application server must consider this an error and fail deployment.

If there is no authentication-mechanism specified as part of this element or metadata annotations, then the resource adapter does not support any standard security authentication mechanisms as part of security contract. The application server ignores the security part of the system contracts in this case.

If there is no transaction-support specified as part of this element or metadata annotation, then the application server must consider that the resource adapter does not support either the resource manager local or JTA transactions and must consider the transaction support as NoTransaction. Note that resource adapters may specify the level of transaction support to be used at runtime for a ManagedConnectionFactory through the TransactionSupport interface.

If there is no reauthentication-support specified as part of this element or metadata annotation, then the application server must consider that the resource adapter does not support re-authentication of ManagedConnections.

```
</xsd:documentation>
```

```
</xsd:annotation>
```

```
<xsd:sequence>
```

```
<xsd:element name="connection-definition"
  type="javaee:connection-definitionType"
  maxOccurs="unbounded"
  minOccurs="0"/>
```

```
<xsd:element name="transaction-support"
  type="javaee:transaction-supportType"
  minOccurs="0"/>
```

```
<xsd:element name="authentication-mechanism"
  type="javaee:authentication-mechanismType"
  minOccurs="0"
  maxOccurs="unbounded"/>
```

```
<xsd:element name="reauthentication-support"
  type="javaee:true-falseType"
  minOccurs="0">
```

```
<xsd:annotation>
```

```
<xsd:documentation>
```

The element reauthentication-support specifies whether the resource adapter implementation supports

re-authentication of existing Managed- Connection instance. Note that this information is for the resource adapter implementation and not for the underlying EIS instance. This element must have either a "true" or "false" value.

```
</xsd:documentation>
</xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id"
               type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="required-config-propertyType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[[
        The required-config-propertyType contains a declaration
        of a single configuration property used for specifying a
        required configuration property name. It is used
        by required-config-property elements.

        Usage of this type is deprecated from Connectors 1.6 specification.
        Refer to required-config-property element for more information.

        Example:

        <required-config-property>
        <config-property-name>Destination</config-property-name>
        </required-config-property>

        ]]>
      </xsd:documentation>
    </xsd:annotation>
    <xsd:sequence>
      <xsd:element name="description"
                  type="javaee:descriptionType"
                  minOccurs="0"
                  maxOccurs="unbounded"/>
      <xsd:element name="config-property-name"
                  type="javaee:config-property-nameType"/>
    </xsd:sequence>
    <xsd:attribute name="id"
                  type="xsd:ID"/>
  </xsd:complexType>

  <!-- ***** -->

  <xsd:complexType name="resourceadapterType">
    <xsd:annotation>
      <xsd:documentation>

        The resourceadapterType specifies information about the
```

resource adapter. The information includes fully qualified resource adapter Java class name, configuration properties, information specific to the implementation of the resource adapter library as specified through the outbound-resourceadapter and inbound-resourceadapter elements, and an optional set of administered objects.

```

</xsd:documentation>
</xsd:annotation>
<xsd:sequence>
  <xsd:element name="resourceadapter-class"
    type="javaee:fully-qualified-classType"
    minOccurs="0">
    <xsd:annotation>
      <xsd:documentation>

        The element resourceadapter-class specifies the
        fully qualified name of a Java class that implements
        the javax.resource.spi.ResourceAdapter
        interface. This Java class is provided as part of
        resource adapter's implementation of connector
        architecture specified contracts. The implementation
        of this class is required to be a JavaBean.

      </xsd:documentation>
    </xsd:annotation>
  </xsd:element>
  <xsd:element name="config-property"
    type="javaee:config-propertyType"
    minOccurs="0"
    maxOccurs="unbounded"/>
  <xsd:element name="outbound-resourceadapter"
    type="javaee:outbound-resourceadapterType"
    minOccurs="0">
    <xsd:unique name="connectionfactory-interface-uniqueness">
      <xsd:annotation>
        <xsd:documentation>

          The connectionfactory-interface element content
          must be unique in the outbound-resourceadapter.
          Multiple connection-definitions can not use the
          same connectionfactory-type.

        </xsd:documentation>
      </xsd:annotation>
      <xsd:selector xpath="javaee:connection-definition"/>
      <xsd:field xpath="javaee:connectionfactory-interface"/>
    </xsd:unique>
  </xsd:element>
  <xsd:element name="inbound-resourceadapter"
    type="javaee:inbound-resourceadapterType"
    minOccurs="0"/>
  <xsd:element name="adminobject"
    type="javaee:adminobjectType"
    minOccurs="0"
    maxOccurs="unbounded">
    <xsd:unique name="adminobject-type-uniqueness">
      <xsd:annotation>
        <xsd:documentation>

```

The adminobject-interface and adminobject-class element content must be unique in the resourceadapterType. Several admin objects can not use the same adminobject-interface and adminobject-class.

```
</xsd:documentation>
</xsd:annotation>
<xsd:selector xpath="javaee:adminobject"/>
<xsd:field xpath="javaee:adminobject-interface"/>
<xsd:field xpath="javaee:adminobject-class"/>
</xsd:unique>
</xsd:element>
<xsd:element name="security-permission"
  type="javaee:security-permissionType"
  minOccurs="0"
  maxOccurs="unbounded"/>
</xsd:sequence>
<xsd:attribute name="id"
  type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="security-permissionType">
  <xsd:annotation>
    <xsd:documentation>

      The security-permissionType specifies a security
      permission that is required by the resource adapter code.

      The security permission listed in the deployment descriptor
      are ones that are different from those required by the
      default permission set as specified in the connector
      specification. The optional description can mention specific
      reason that resource adapter requires a given security
      permission.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description"
      type="javaee:descriptionType"
      minOccurs="0"
      maxOccurs="unbounded"/>
    <xsd:element name="security-permission-spec"
      type="javaee:xsdStringType">
      <xsd:annotation>
        <xsd:documentation>

          The element security-permission-spec specifies a security
          permission based on the Security policy file
          syntax. Refer to the following URL for Sun's
          implementation of the security permission
          specification:

          http://java.sun.com/javase/6/docs/technotes/guides/security/PolicyFiles.html

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

```

        </xsd:annotation>
      </xsd:element>
    </xsd:sequence>
    <xsd:attribute name="id"
                  type="xsd:ID" />
  </xsd:complexType>

<!-- ***** -->

<xsd:complexType name="transaction-supportType">
  <xsd:annotation>
    <xsd:documentation>

      The transaction-supportType specifies the level of
      transaction support provided by the resource adapter. It is
      used by transaction-support elements.

      The value must be one of the following:

      NoTransaction
      LocalTransaction
      XATransaction

    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:restriction base="javaee:string">
      <xsd:enumeration value="NoTransaction" />
      <xsd:enumeration value="LocalTransaction" />
      <xsd:enumeration value="XATransaction" />
    </xsd:restriction>
  </xsd:simpleContent>
</xsd:complexType>

</xsd:schema>

```

A.3. Java EE Connector Architecture 1.5

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns="http://www.w3.org/2001/XMLSchema"
            targetNamespace="http://java.sun.com/xml/ns/j2ee"
            xmlns:j2ee="http://java.sun.com/xml/ns/j2ee"
            xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            elementFormDefault="qualified"
            attributeFormDefault="unqualified"
            version="1.5">
  <xsd:annotation>
    <xsd:documentation>
      @(#)connector_1_5.xsds      1.27 06/17/03
    </xsd:documentation>
  </xsd:annotation>

```

```
<xsd:annotation>
  <xsd:documentation>

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    licensees as provided above. However, if you add GPL Version 2
    code and therefore, elected the GPL Version 2 license, then the
    option applies only if the new code is made subject to such
    option by the copyright holder.

  </xsd:documentation>
</xsd:annotation>

<xsd:annotation>
  <xsd:documentation>
    <![CDATA[

    This is the XML Schema for the Connector 1.5 deployment
    descriptor. The deployment descriptor must be named
    "META-INF/ra.xml" in the connector's rar file. All Connector
    deployment descriptors must indicate the connector resource
    adapter schema by using the J2EE namespace:

    http://java.sun.com/xml/ns/j2ee

    and by indicating the version of the schema by
    using the version element as shown below:
```

```

<connector xmlns="http://java.sun.com/xml/ns/j2ee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://java.sun.com/xml/ns/j2ee
http://java.sun.com/xml/ns/j2ee/connector_1_5.xsd"
  version="1.5">
  ...
</connector>

```

The instance documents may indicate the published version of the schema using the `xsi:schemaLocation` attribute for J2EE namespace with the following location:

`http://java.sun.com/xml/ns/j2ee/connector_1_5.xsd`

```

]]>
</xsd:documentation>
</xsd:annotation>

```

```

<xsd:annotation>
  <xsd:documentation>

```

The following conventions apply to all J2EE deployment descriptor elements unless indicated otherwise.

- In elements that specify a pathname to a file within the same JAR file, relative filenames (i.e., those not starting with "/") are considered relative to the root of the JAR file's namespace. Absolute filenames (i.e., those starting with "/") also specify names in the root of the JAR file's namespace. In general, relative names are preferred. The exception is .war files where absolute names are preferred for consistency with the Servlet API.

```

</xsd:documentation>
</xsd:annotation>

```

```

<xsd:include schemaLocation="j2ee_1_4.xsd"/>

```

```

<!-- ***** -->

```

```

<xsd:element name="connector" type="j2ee:connectorType">
  <xsd:annotation>
    <xsd:documentation>

```

The connector element is the root element of the deployment descriptor for the resource adapter. This element includes general information - vendor name, resource adapter version, icon - about the resource adapter module. It also includes information specific to the implementation of the resource adapter library as specified through the element `resourceadapter`.

```

    </xsd:documentation>
  </xsd:annotation>

</xsd:element>

```

```
<!-- ***** -->

<xsd:complexType name="activationSpecType">
  <xsd:annotation>
    <xsd:documentation>

      The activationSpecType specifies an activation
      specification. The information includes fully qualified
      Java class name of an activation specification and a set of
      required configuration property names.

    </xsd:documentation>
  </xsd:annotation>

  <xsd:sequence>
    <xsd:element name="activationSpec-class"
      type="j2ee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[

            The element activationSpec-class specifies the fully
            qualified Java class name of the activation
            specification class. This class must implement the
            javax.resource.spi.ActivationSpec interface. The
            implementation of this class is required to be a
            JavaBean.

            Example:
            <activationSpec-class>com.wombat.ActivationSpecImpl
            </activationSpec-class>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="required-config-property"
      type="j2ee:required-config-propertyType"
      minOccurs="0"
      maxOccurs="unbounded" />
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="adminObjectType">
  <xsd:annotation>
    <xsd:documentation>

      The adminObjectType specifies information about an
      administered object. Administered objects are specific to a
      messaging style or message provider. This contains
      information on the Java type of the interface implemented by
      an administered object, its Java class name and its
      configuration properties.

    </xsd:documentation>
  </xsd:annotation>
```



```

<xsd:sequence>
  <xsd:element name="adminobject-interface"
    type="j2ee:fully-qualified-classType">
    <xsd:annotation>
      <xsd:documentation>
        <![CDATA[

          The element adminobject-interface specifies the
          fully qualified name of the Java type of the
          interface implemented by an administered object.

          Example:
          <adminobject-interface>javax.jms.Destination
          </adminobject-interface>

        ]]>
      </xsd:documentation>
    </xsd:annotation>

    </xsd:element>
    <xsd:element name="adminobject-class"
      type="j2ee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[

            The element adminobject-class specifies the fully
            qualified Java class name of an administered object.

            Example:
            <adminobject-class>com.wombat.DestinationImpl
            </adminobject-class>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>

    <xsd:element name="config-property"
      type="j2ee:config-propertyType"
      minOccurs="0"
      maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="authentication-mechanismType">
  <xsd:annotation>
    <xsd:documentation>

      The authentication-mechanismType specifies an authentication
      mechanism supported by the resource adapter. Note that this
      support is for the resource adapter and not for the
      underlying EIS instance. The optional description specifies
      any resource adapter specific requirement for the support of
      security contract and authentication mechanism.
    
```

Note that BasicPassword mechanism type should support the javax.resource.spi.security.PasswordCredential interface. The Kerbv5 mechanism type should support the org.ietf.jgss.GSSCredential interface or the deprecated javax.resource.spi.security.GenericCredential interface.

```

    </xsd:documentation>
</xsd:annotation>

<xsd:sequence>
  <xsd:element name="description"
    type="j2ee:descriptionType"
    minOccurs="0"
    maxOccurs="unbounded" />
  <xsd:element name="authentication-mechanism-type"
    type="j2ee:xsdStringType">
<xsd:annotation>
  <xsd:documentation>
    <![CDATA[

      The element authentication-mechanism-type specifies
      type of an authentication mechanism.

      The example values are:

      <authentication-mechanism-type>BasicPassword
      </authentication-mechanism-type>

      <authentication-mechanism-type>Kervb5
      </authentication-mechanism-type>

      Any additional security mechanisms are outside the
      scope of the Connector architecture specification.

    ]]>
  </xsd:documentation>
</xsd:annotation>

</xsd:element>
<xsd:element name="credential-interface"
  type="j2ee:credential-interfaceType"/>
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="config-property-nameType">
  <xsd:annotation>
    <xsd:documentation>
      <![CDATA[

        The config-property-nameType contains the name of a
        configuration property.

        The connector architecture defines a set of well-defined
        properties all of type java.lang.String. These are as
        follows.

```

```

    ServerName
    PortNumber
    UserName
    Password
    ConnectionURL

```

A resource adapter provider can extend this property set to include properties specific to the resource adapter and its underlying EIS.

Possible values include

```

    ServerName
    PortNumber
    UserName
    Password
    ConnectionURL

```

Example: <config-property-name>ServerName</config-property-name>

```

]]>
</xsd:documentation>
</xsd:annotation>
<xsd:simpleContent>
  <xsd:restriction base="j2ee:xsdStringType"/>
</xsd:simpleContent>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="config-property-typeType">
  <xsd:annotation>
    <xsd:documentation>

      The config-property-typeType contains the fully
      qualified Java type of a configuration property.

      The following are the legal values:
      java.lang.Boolean, java.lang.String, java.lang.Integer,
      java.lang.Double, java.lang.Byte, java.lang.Short,
      java.lang.Long, java.lang.Float, java.lang.Character

    Used in: config-property

    Example:
    <config-property-type>java.lang.String</config-property-type>

  ]]>
  </xsd:documentation>
</xsd:annotation>
<xsd:simpleContent>
  <xsd:restriction base="j2ee:string">
    <xsd:enumeration value="java.lang.Boolean"/>
    <xsd:enumeration value="java.lang.String"/>
    <xsd:enumeration value="java.lang.Integer"/>
    <xsd:enumeration value="java.lang.Double"/>
    <xsd:enumeration value="java.lang.Byte"/>
    <xsd:enumeration value="java.lang.Short"/>

```

```
<xsd:enumeration value="java.lang.Long"/>
<xsd:enumeration value="java.lang.Float"/>
<xsd:enumeration value="java.lang.Character"/>
  </xsd:restriction>
</xsd:simpleContent>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="config-propertyType">
  <xsd:annotation>
    <xsd:documentation>

      The config-propertyType contains a declaration of a single
      configuration property that may be used for providing
      configuration information.

      The declaration consists of an optional description, name,
      type and an optional value of the configuration property. If
      the resource adapter provider does not specify a value than
      the deployer is responsible for providing a valid value for
      a configuration property.

      Any bounds or well-defined values of properties should be
      described in the description element.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description"
      type="j2ee:descriptionType"
      minOccurs="0"
      maxOccurs="unbounded" />
    <xsd:element name="config-property-name"
      type="j2ee:config-property-nameType" />
    <xsd:element name="config-property-type"
      type="j2ee:config-property-typeType" />
    <xsd:element name="config-property-value"
      type="j2ee:xsdStringType"
      minOccurs="0">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[

            The element config-property-value contains the value
            of a configuration entry. Note, it is possible for a
            resource adapter deployer to override this
            configuration information during deployment.

            Example:
            <config-property-value>WombatServer</config-property-value>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
```

```

<!-- ***** -->

<xsd:complexType name="connection-definitionType">
  <xsd:annotation>
    <xsd:documentation>

      The connection-definitionType defines a set of connection
      interfaces and classes pertaining to a particular connection
      type. This also includes configurable properties for
      ManagedConnectionFactory instances that may be produced out
      of this set.

    </xsd:documentation>
  </xsd:annotation>

  <xsd:sequence>
    <xsd:element name="managedconnectionfactory-class"
      type="j2ee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[

            The element managedconnectionfactory-class specifies
            the fully qualified name of the Java class that
            implements the
            javax.resource.spi.ManagedConnectionFactory interface.
            This Java class is provided as part of resource
            adapter's implementation of connector architecture
            specified contracts. The implementation of this
            class is required to be a JavaBean.

            Example:
            <managedconnectionfactory-class>
            com.wombat.ManagedConnectionFactoryImpl
            </managedconnectionfactory-class>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="config-property"
      type="j2ee:config-propertyType"
      minOccurs="0"
      maxOccurs="unbounded"/>
    <xsd:element name="connectionfactory-interface"
      type="j2ee:fully-qualified-classType">
      <xsd:annotation>
        <xsd:documentation>
          <![CDATA[

            The element connectionfactory-interface specifies
            the fully qualified name of the ConnectionFactory
            interface supported by the resource adapter.

            Example:
            <connectionfactory-interface>com.wombat.ConnectionFactory
            </connectionfactory-interface>

          ]]>
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>

```

```
OR

<connectionfactory-interface>javax.resource.cci.ConnectionFactory
</connectionfactory-interface>

]]>
</xsd:documentation>
</xsd:annotation>
</xsd:element>

<xsd:element name="connectionfactory-impl-class"
  type="j2ee:fully-qualified-classType">
<xsd:annotation>
  <xsd:documentation>
    <![CDATA[

      The element connectionfactory-impl-class specifies
      the fully qualified name of the ConnectionFactory
      class that implements resource adapter
      specific ConnectionFactory interface.

      Example:

      <connectionfactory-impl-class>com.wombat.ConnectionFactoryImpl
      </connectionfactory-impl-class>

    ]]>
    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="connection-interface"
  type="j2ee:fully-qualified-classType">
<xsd:annotation>
  <xsd:documentation>
    <![CDATA[

      The connection-interface element specifies the fully
      qualified name of the Connection interface supported
      by the resource adapter.

      Example:

      <connection-interface>javax.resource.cci.Connection
      </connection-interface>

    ]]>
    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="connection-impl-class"
  type="j2ee:fully-qualified-classType">
<xsd:annotation>
  <xsd:documentation>
    <![CDATA[

      The connection-impl-classType specifies the fully
      qualified name of the Connection class that
      implements resource adapter specific Connection
      interface. It is used by the connection-impl-class
```

elements.

Example:

```

<connection-impl-class>com.wombat.ConnectionImpl
</connection-impl-class>

]]>
  </xsd:documentation>
</xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="connectorType">
  <xsd:annotation>
    <xsd:documentation>

      The connectorType defines a resource adapter.

    </xsd:documentation>
  </xsd:annotation>

  <xsd:sequence>
    <xsd:group ref="j2ee:descriptionGroup"/>
    <xsd:element name="vendor-name"
      type="j2ee:xsdStringType">
      <xsd:annotation>
        <xsd:documentation>

          The element vendor-name specifies the name of
          resource adapter provider vendor.

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="eis-type"
      type="j2ee:xsdStringType">
      <xsd:annotation>
        <xsd:documentation>

          The element eis-type contains information about the
          type of the EIS. For example, the type of an EIS can
          be product name of EIS independent of any version
          info.

          This helps in identifying EIS instances that can be
          used with this resource adapter.

        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="resourceadapter-version"
      type="j2ee:xsdStringType">
      <xsd:annotation>
        <xsd:documentation>

```

The element `resourceadapter-version` specifies a string-based version of the resource adapter from the resource adapter provider.

```
</xsd:documentation>
</xsd:annotation>

</xsd:element>
<xsd:element name="license"
  type="j2ee:licenseType"
  minOccurs="0"/>
<xsd:element name="resourceadapter"
  type="j2ee:resourceadapterType"/>

</xsd:sequence>
<xsd:attribute name="version"
  type="j2ee:dewey-versionType"
  fixed="1.5"
  use="required">
  <xsd:annotation>
<xsd:documentation>
```

The version specifies the version of the connector architecture specification that is supported by this resource adapter. This information enables deployer to configure the resource adapter to support deployment and runtime requirements of the corresponding connector architecture specification.

```
</xsd:documentation>
</xsd:annotation>
</xsd:attribute>
<xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
```

```
<!-- ***** -->
```

```
<xsd:complexType name="credential-interfaceType">
  <xsd:annotation>
    <xsd:documentation>
```

The `credential-interfaceType` specifies the interface that the resource adapter implementation supports for the representation of the credentials. This element(s) that use this type, i.e. `credential-interface`, should be used by application server to find out the `Credential` interface it should use as part of the security contract.

The possible values are:

```
javax.resource.spi.security.PasswordCredential
org.ietf.jgss.GSSCredential
javax.resource.spi.security.GenericCredential
```

```
</xsd:documentation>
</xsd:annotation>
```



```

<xsd:simpleContent>
  <xsd:restriction base="j2ee:fully-qualified-classType">
<xsd:enumeration
  value="javax.resource.spi.security.PasswordCredential"/>
<xsd:enumeration
  value="org.ietf.jgss.GSSCredential"/>
<xsd:enumeration
  value="javax.resource.spi.security.GenericCredential"/>
  </xsd:restriction>
</xsd:simpleContent>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="inbound-resourceadapterType">
  <xsd:annotation>
    <xsd:documentation>

      The inbound-resourceadapterType specifies information
      about an inbound resource adapter. This contains information
      specific to the implementation of the resource adapter
      library as specified through the messageadapter element.

    </xsd:documentation>
  </xsd:annotation>

  <xsd:sequence>
    <xsd:element name="messageadapter"
      type="j2ee:messageadapterType"
      minOccurs="0">
<xsd:unique name="messagelistener-type-uniqueness">
  <xsd:annotation>
    <xsd:documentation>

      The messagelistener-type element content must be
      unique in the messageadapter. Several messagelisteners
      can not use the same messagelistener-type.

    </xsd:documentation>
  </xsd:annotation>
  <xsd:selector xpath="j2ee:messagelistener"/>
  <xsd:field xpath="j2ee:messagelistener-type"/>
</xsd:unique>
  </xsd:element>
</xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="licenseType">
  <xsd:annotation>
    <xsd:documentation>

      The licenseType specifies licensing requirements for the
      resource adapter module. This type specifies whether a
      license is required to deploy and use this resource adapter,
      and an optional description of the licensing terms
      (examples: duration of license, number of connection

```

```
restrictions). It is used by the license element.

    </xsd:documentation>
</xsd:annotation>

<xsd:sequence>
  <xsd:element name="description"
    type="j2ee:descriptionType"
    minOccurs="0"
    maxOccurs="unbounded" />
  <xsd:element name="license-required"
    type="j2ee:true-falseType">
<xsd:annotation>
  <xsd:documentation>

    The element license-required specifies whether a
    license is required to deploy and use the
    resource adapter. This element must be one of
    the following, "true" or "false".

    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="messageadapterType">
  <xsd:annotation>
    <xsd:documentation>

    The messageadapterType specifies information about the
    messaging capabilities of the resource adapter. This
    contains information specific to the implementation of the
    resource adapter library as specified through the
    messagelistener element.

    </xsd:documentation>
  </xsd:annotation>

  <xsd:sequence>
    <xsd:element name="messagelistener"
      type="j2ee:messagelistenerType"
      maxOccurs="unbounded" />
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="messagelistenerType">
  <xsd:annotation>
    <xsd:documentation>

    The messagelistenerType specifies information about a
    specific message listener supported by the messaging
    resource adapter. It contains information on the Java type
```

of the message listener interface and an activation specification.

```

    </xsd:documentation>
</xsd:annotation>

<xsd:sequence>
  <xsd:element name="messagelistener-type"
    type="j2ee:fully-qualified-classType">
<xsd:annotation>
  <xsd:documentation>
    <![CDATA[

      The element messagelistener-type specifies the fully
      qualified name of the Java type of a message
      listener interface.

      Example:

      <messagelistener-type>javax.jms.MessageListener
      </messagelistener-type>

    ]]>
    </xsd:documentation>
  </xsd:annotation>

  </xsd:element>
  <xsd:element name="activationspec"
    type="j2ee:activationspecType"/>
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="outbound-resourceadapterType">
  <xsd:annotation>
    <xsd:documentation>

      The outbound-resourceadapterType specifies information about
      an outbound resource adapter. The information includes fully
      qualified names of classes/interfaces required as part of
      the connector architecture specified contracts for
      connection management, level of transaction support
      provided, one or more authentication mechanisms supported
      and additional required security permissions.

      If there is no authentication-mechanism specified as part of
      resource adapter element then the resource adapter does not
      support any standard security authentication mechanisms as
      part of security contract. The application server ignores
      the security part of the system contracts in this case.

    </xsd:documentation>
  </xsd:annotation>

  <xsd:sequence>
    <xsd:element name="connection-definition"
      type="j2ee:connection-definitionType"

```

```

        maxOccurs="unbounded" />
<xsd:element name="transaction-support"
    type="j2ee:transaction-supportType" />
<xsd:element name="authentication-mechanism"
    type="j2ee:authentication-mechanismType"
    minOccurs="0"
    maxOccurs="unbounded" />
<xsd:element name="reauthentication-support"
    type="j2ee:true-falseType">
<xsd:annotation>
    <xsd:documentation>

        The element reauthentication-support specifies
        whether the resource adapter implementation supports
        re-authentication of existing Managed- Connection
        instance. Note that this information is for the
        resource adapter implementation and not for the
        underlying EIS instance. This element must have
        either a "true" or "false" value.

    </xsd:documentation>
</xsd:annotation>

</xsd:element>
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="required-config-propertyType">
    <xsd:annotation>
        <xsd:documentation>
            <![CDATA[

                The required-config-propertyType contains a declaration
                of a single configuration property used for specifying a
                required configuration property name. It is used
                by required-config-property elements.

                Example:

                <required-config-property>Destination</required-config-property>

            ]]>
        </xsd:documentation>
    </xsd:annotation>

    <xsd:sequence>
        <xsd:element name="description"
            type="j2ee:descriptionType"
            minOccurs="0"
            maxOccurs="unbounded" />
        <xsd:element name="config-property-name"
            type="j2ee:config-property-nameType" />
    </xsd:sequence>
    <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

```

```

<!-- ***** -->

<xsd:complexType name="resourceadapterType">
  <xsd:annotation>
    <xsd:documentation>

      The resourceadapterType specifies information about the
      resource adapter. The information includes fully qualified
      resource adapter Java class name, configuration properties,
      information specific to the implementation of the resource
      adapter library as specified through the
      outbound-resourceadapter and inbound-resourceadapter
      elements, and an optional set of administered objects.

    </xsd:documentation>
  </xsd:annotation>

  <xsd:sequence>
    <xsd:element name="resourceadapter-class"
      type="j2ee:fully-qualified-classType"
      minOccurs="0">

      The element resourceadapter-class specifies the
      fully qualified name of a Java class that implements
      the javax.resource.spi.ResourceAdapter
      interface. This Java class is provided as part of
      resource adapter's implementation of connector
      architecture specified contracts. The implementation
      of this class is required to be a JavaBean.

    </xsd:documentation>
  </xsd:annotation>

  </xsd:element>
  <xsd:element name="config-property"
    type="j2ee:config-propertyType"
    minOccurs="0"
    maxOccurs="unbounded" />
  <xsd:element name="outbound-resourceadapter"
    type="j2ee:outbound-resourceadapterType"
    minOccurs="0">
  <xsd:unique name="connectionfactory-interface-uniqueness">
    <xsd:annotation>
      <xsd:documentation>

        The connectionfactory-interface element content
        must be unique in the outbound-resourceadapter.
        Multiple connection-definitions can not use the
        same connectionfactory-type.

      </xsd:documentation>
    </xsd:annotation>
    <xsd:selector xpath="j2ee:connection-definition"/>
    <xsd:field xpath="j2ee:connectionfactory-interface"/>
  </xsd:unique>
  </xsd:element>
  <xsd:element name="inbound-resourceadapter"

```

```

        type="j2ee:inbound-resourceadapterType"
        minOccurs="0" />
<xsd:element name="adminobject"
    type="j2ee:adminobjectType"
    minOccurs="0"
    maxOccurs="unbounded" />
<xsd:element name="security-permission"
    type="j2ee:security-permissionType"
    minOccurs="0"
    maxOccurs="unbounded" />
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->

<xsd:complexType name="security-permissionType">
    <xsd:annotation>
        <xsd:documentation>

            The security-permissionType specifies a security
            permission that is required by the resource adapter code.

            The security permission listed in the deployment descriptor
            are ones that are different from those required by the
            default permission set as specified in the connector
            specification. The optional description can mention specific
            reason that resource adapter requires a given security
            permission.

        </xsd:documentation>
    </xsd:annotation>

    <xsd:sequence>
        <xsd:element name="description"
            type="j2ee:descriptionType"
            minOccurs="0"
            maxOccurs="unbounded" />
        <xsd:element name="security-permission-spec"
            type="j2ee:xsdStringType">
    <xsd:annotation>
        <xsd:documentation>

            The element security-permission-spec specifies a security
            permission based on the Security policy file
            syntax. Refer to the following URL for Sun's
            implementation of the security permission
            specification:

            http://java.sun.com/products/jdk/1.4/docs/guide/security/PolicyFiles.html#FileSyntax
        </xsd:documentation>
    </xsd:annotation>
        </xsd:element>
    </xsd:sequence>
    <xsd:attribute name="id" type="xsd:ID" />
</xsd:complexType>

<!-- ***** -->

```

```

<xsd:complexType name="transaction-supportType">
  <xsd:annotation>
    <xsd:documentation>

The transaction-supportType specifies the level of
transaction support provided by the resource adapter. It is
used by transaction-support elements.

The value must be one of the following:

        NoTransaction
        LocalTransaction
        XATransaction

    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:restriction base="j2ee:string">
      <xsd:enumeration value="NoTransaction"/>
      <xsd:enumeration value="LocalTransaction"/>
      <xsd:enumeration value="XATransaction"/>
    </xsd:restriction>
  </xsd:simpleContent>
</xsd:complexType>

</xsd:schema>

```

A.4. Java EE Connector Architecture 1.0

```

<!--
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```
-->
```

```
<!--
This is the XML DTD for the Connector 1.0 deployment descriptor.
All Connector 1.0 deployment descriptors must include a DOCTYPE
of the following form:

    <!DOCTYPE connector PUBLIC
        "-//Sun Microsystems, Inc.//DTD Connector 1.0//EN"
        "http://java.sun.com/dtd/connector_1_0.dtd">

-->
```

```
<!--
The following conventions apply to all J2EE deployment descriptor
elements unless indicated otherwise.

- In elements that contain PCDATA, leading and trailing whitespace
  in the data may be ignored.

- In elements whose value is an "enumerated type", the value is
  case sensitive.

- In elements that specify a pathname to a file within the same
  JAR file, relative filenames (i.e., those not starting with "/")
  are considered relative to the root of the JAR file's namespace.
  Absolute filenames (i.e., those starting with "/") also specify
  names in the root of the JAR file's namespace. In general, relative
  names are preferred. The exception is .war files where absolute
  names are preferred for consistency with the servlet API.

-->
```

```
<!--
The connector element is the root element of the deployment descriptor
for the resource adapter. This element includes general information - vendor
name, version, specification version supported, icon - about the
resource adapter module. It also includes information specific to the
implementation of the resource adapter library as specified through
the element resourceadapter.

-->
```

```
<!--ELEMENT connector (display-name?, description?, icon?, vendor-name,
spec-version, eis-type, version, license?, resourceadapter)>
```

```
<!--
The element authentication-mechanism specifies an authentication mechanism
supported by the resource adapter. Note that this support is for
the resource adapter and not for the underlying EIS instance. The
```


optional description specifies any resource adapter specific requirement for the support of security contract and authentication mechanism.

Note that BasicPassword mechanism type should support the `javax.resource.spi.security.PasswordCredential` interface. The Kerbv5 mechanism type should support the `javax.resource.spi.security.GenericCredential` interface.

Used in: resourceadapter

-->

```
<!--ELEMENT authentication-mechanism (
description?, authentication-mechanism-type, credential-interface)>
```

<!--

The element authentication-mechanism-type specifies type of an authentication mechanism.

The example values are:

```
<authentication-mechanism-type>BasicPassword
</authentication-mechanism-type>
<authentication-mechanism-type>Kerbv5
</authentication-mechanism-type>
```

Any additional security mechanisms are outside the scope of the Connector architecture specification.

Used in: authentication-mechanism

-->

```
<!--ELEMENT authentication-mechanism-type (#PCDATA)>
```

<!--

The element config-property contains a declaration of a single configuration property for a ManagedConnectionFactory instance.

Each ManagedConnectionFactory instance creates connections to a specific EIS instance based on the properties configured on the ManagedConnectionFactory instance. The configurable properties are specified only once in the deployment descriptor, even though a resource adapter can be used to configure multiple ManagedConnectionFactory instances (that create connections to different instances of the same EIS).

The declaration consists of an optional description, name, type and an optional value of the configuration property. If the resource adapter provider does not specify a value than the deployer is responsible for providing a valid value for a configuration property.

Any bounds or well-defined values of properties should be described in the description element.

Used in: resourceadapter

-->

```
<!--ELEMENT config-property (description?, config-property-name,
config-property-type, config-property-value?)>
```

<!--

The element config-property-name contains the name of a configuration property.

The connector architecture defines a set of well-defined properties all of type `java.lang.String`. These are as follows:

```
<config-property-name>ServerName</config-property-name>
<config-property-name>PortNumber</config-property-name>
<config-property-name>UserName</config-property-name>
<config-property-name>Password</config-property-name>
<config-property-name>ConnectionURL</config-property-name>
```

A resource adapter provider can extend this property set to include properties specific to the resource adapter and its underlying EIS.

Used in: `config-property`

Example: `<config-property-name>ServerName</config-property-name>`
-->

```
<!--ELEMENT config-property-name (#PCDATA)-->
```

<!--

The element `config-property-type` contains the fully qualified Java type of a configuration property as required by `ManagedConnectionFactory` instance.

The following are the legal values of `config-property-type`:

```
java.lang.Boolean, java.lang.String, java.lang.Integer,
java.lang.Double, java.lang.Byte, java.lang.Short,
java.lang.Long, java.lang.Float, java.lang.Character
```

Used in: `config-property`

Example: `<config-property-type>java.lang.String</config-property-type>`
-->

```
<!--ELEMENT config-property-type (#PCDATA)-->
```

<!--

The element `config-property-value` contains the value of a configuration entry.

Used in: `config-property`

Example: `<config-property-value>WombatServer</config-property-value>`
-->

```
<!--ELEMENT config-property-value (#PCDATA)-->
```

<!--

The element `connection-impl-class` specifies the fully-qualified name of the `Connection` class that implements resource adapter specific `Connection` interface.

Used in: `resourceadapter`

Example: `<connection-impl-class>com.wombat.ConnectionImpl</connection-impl-class>`
-->

-->

```
<!--ELEMENT connection-impl-class (#PCDATA)-->
```

<!--

The element `connection-interface` specifies the fully-qualified name of the `Connection` interface supported by the resource adapter.

Used in: resourceadapter

Example: <connection-interface>javax.resource.cci.Connection
</connection-interface>

-->

<!--ELEMENT connection-interface (#PCDATA)-->

<!--

The element connectionfactory-impl-class specifies the fully-qualified name of the ConnectionFactory class that implements resource adapter specific ConnectionFactory interface.

Used in: resourceadapter

Example: <connectionfactory-impl-class>com.wombat.ConnectionFactoryImpl
</connectionfactory-impl-class>

-->

<!--ELEMENT connectionfactory-impl-class (#PCDATA)-->

<!--

The element connectionfactory-interface specifies the fully-qualified name of the ConnectionFactory interface supported by the resource adapter.

Used in: resourceadapter

Example: <connectionfactory-interface>com.wombat.ConnectionFactory
</connectionfactory-interface>

OR

<connectionfactory-interface>javax.resource.cci.ConnectionFactory
</connectionfactory-interface>

-->

<!--ELEMENT connectionfactory-interface (#PCDATA)-->

<!--

The element credential-interface specifies the interface that the resource adapter implementation supports for the representation of the credentials. This element should be used by application server to find out the Credential interface it should use as part of the security contract.

The possible values are:

<credential-interface>javax.resource.spi.security.PasswordCredential
</credential-interface>

<credential-interface>javax.resource.spi.security.GenericCredential
</credential-interface>

Used in: authentication-mechanism

-->

<!--ELEMENT credential-interface (#PCDATA)-->

<!--

The description element is used to provide text describing the parent element. The description element should include any information that the resource adapter rar file producer wants to provide to the consumer of the resource adapter rar file (i.e., to the Deployer). Typically, the tools used by the resource adapter rar file consumer will display the description when processing the parent element that contains the description.

Used in: authentication-mechanism, config-property, connector, license, security-permission

-->

<!--ELEMENT description (#PCDATA)-->

<!--

The display-name element contains a short name that is intended to be displayed by tools. The display name need not be unique.

Used in: connector

Example:

<display-name>Employee Self Service</display-name>

-->

<!--ELEMENT display-name (#PCDATA)-->

<!--

The element eis-type contains information about the type of the EIS. For example, the type of an EIS can be product name of EIS independent of any version info.

This helps in identifying EIS instances that can be used with this resource adapter.

Used in: connector

-->

<!--ELEMENT eis-type (#PCDATA)-->

<!--

The icon element contains small-icon and large-icon elements that specify the file names for small and a large GIF or JPEG icon images used to represent the parent element in a GUI tool.

Used in: connector

-->

<!--ELEMENT icon (small-icon?, large-icon?)-->

<!--

The large-icon element contains the name of a file containing a large (32 x 32) icon image. The file name is a relative path within the resource adapter's rar file.

The image may be either in the JPEG or GIF format.

The icon can be used by tools.

Used in: icon

Example:

<large-icon>employee-service-icon32x32.jpg</large-icon>

-->

<!--ELEMENT large-icon (#PCDATA)-->

<!--

The element license specifies licensing requirements for the resource adapter module. This element specifies whether a license is required

to deploy and use this resource adapter, and an optional description of the licensing terms (examples: duration of license, number of connection restrictions).

Used in: connector

-->

<!ELEMENT license (description?, license-required)>

<!--

The element license-required specifies whether a license is required to deploy and use the resource adapter. This element must be one of the following:

`<license-required>true</license-required>`

`<license-required>false</license-required>`

Used in: license

-->

<!ELEMENT license-required (#PCDATA)>

<!--

The element managedconnectionfactory-class specifies the fully qualified name of the Java class that implements the javax.resource.spi.ManagedConnectionFactory interface. This Java class is provided as part of resource adapter's implementation of connector architecture specified contracts.

Used in: resourceadapter

Example:

`<managedconnectionfactory-class>com.wombat.ManagedConnectionFactoryImpl`

`</managedconnectionfactory-class>`

-->

<!ELEMENT managedconnectionfactory-class (#PCDATA)>

<!--

The element reauthentication-support specifies whether the resource adapter implementation supports re-authentication of existing ManagedConnectionFactory instance. Note that this information is for the resource adapter implementation and not for the underlying EIS instance.

This element must be one of the following:

`<reauthentication-support>true</reauthentication-support>`

`<reauthentication-support>false</reauthentication-support>`

Used in: resourceadapter

-->

<!ELEMENT reauthentication-support (#PCDATA)>

<!--

The element resourceadapter specifies information about the resource adapter. The information includes fully-qualified names of class/interfaces required as part of the connector architecture specified contracts, level of transaction support provided, configurable properties for ManagedConnectionFactory instances, one or more authentication mechanisms supported and additional required security permissions.

If there is no authentication-mechanism specified as part of resource adapter element then the resource adapter does not

support any standard security authentication mechanisms as part of security contract. The application server ignores the security part of the system contracts in this case.

Used in: connector

-->

```
<!--ELEMENT resourceadapter (
managedconnectionfactory-class, connectionfactory-interface,
connectionfactory-impl-class, connection-interface,
connection-impl-class, transaction-support, config-property*,
authentication-mechanism*, reauthentication-support, security-permission*
)>
```

<!--

The element security permission specifies a security permission that is required by the resource adapter code.

The security permission listed in the deployment descriptor are ones that are different from those required by the default permission set as specified in the connector specification. The optional description can mention specific reason that resource adapter requires a given security permission.

Used in: resourceadapter

-->

```
<!--ELEMENT security-permission (description?, security-permission-spec)>
```

<!--

The element permission-spec specifies a security permission based on the Security policy file syntax. Refer to the following URL for Sun's implementation of the security permission specification:

<http://java.sun.com/products/jdk/1.3/docs/guide/security/PolicyFiles.html#FileSyntax>

Used in: security-permission

-->

```
<!--ELEMENT security-permission-spec (#PCDATA)>
```

<!--

The small-icon element contains the name of a file containing a small (16 x 16) icon image. The file name is a relative path within the resource adapter's rar file.

The image may be either in the JPEG or GIF format.
The icon can be used by tools.

Used in: icon

Example:

```
<small-icon>employee-service-icon16x16.jpg</small-icon>
```

-->

```
<!--ELEMENT small-icon (#PCDATA)>
```

<!--

The element spec-version specifies the version of the connector architecture specification that is supported by this resource adapter. This information enables deployer to configure the resource

adapter to support deployment and runtime requirements of the corresponding connector architecture specification.

Used in: connector

Example:

```
<spec-version>1.0</spec-version>
```

```
-->
```

```
<!--ELEMENT spec-version (#PCDATA)>
```

```
<!--
```

The transaction-support element specifies the level of transaction support provided by the resource adapter.

The value of transaction-support must be one of the following:

```
<transaction-support>NoTransaction</transaction-support>
```

```
<transaction-support>LocalTransaction</transaction-support>
```

```
<transaction-support>XATransaction</transaction-support>
```

Used in: resourceadapter

```
-->
```

```
<!--ELEMENT transaction-support (#PCDATA)>
```

```
<!--
```

The element vendor-name specifies the name of resource adapter provider vendor.

Used in: connector

Example:

```
<vendor-name>Wombat Corp.</vendor-name>
```

```
-->
```

```
<!--ELEMENT vendor-name (#PCDATA)>
```

```
<!--
```

The element version specifies a string-based version of the resource adapter from the resource adapter provider.

Used in: connector

Example:

```
<version>1.0</version>
```

```
-->
```

```
<!--ELEMENT version (#PCDATA)>
```

```
<!--
```

The ID mechanism is to allow tools that produce additional deployment information (i.e., information beyond the standard deployment descriptor information) to store the non-standard information in a separate file, and easily refer from these tool-specific files to the information in the standard deployment descriptor.

Tools are not allowed to add the non-standard information into the standard deployment descriptor.

```
-->
```

```
<!--ATTLIST authentication-mechanism id ID #IMPLIED>
```

```
<!--ATTLIST authentication-mechanism-type id ID #IMPLIED>
```

```
<!--ATTLIST config-property id ID #IMPLIED>
```

```
<!--ATTLIST config-property-name id ID #IMPLIED>
```

```
<!--ATTLIST config-property-type id ID #IMPLIED>
<!--ATTLIST config-property-value id ID #IMPLIED>
<!--ATTLIST connection-impl-class id ID #IMPLIED>
<!--ATTLIST connection-interface id ID #IMPLIED>
<!--ATTLIST connectionfactory-impl-class id ID #IMPLIED>
<!--ATTLIST connectionfactory-interface id ID #IMPLIED>
<!--ATTLIST connector id ID #IMPLIED>
<!--ATTLIST credential-interface id ID #IMPLIED>
<!--ATTLIST description id ID #IMPLIED>
<!--ATTLIST display-name id ID #IMPLIED>
<!--ATTLIST eis-type id ID #IMPLIED>
<!--ATTLIST icon id ID #IMPLIED>
<!--ATTLIST large-icon id ID #IMPLIED>
<!--ATTLIST license id ID #IMPLIED>
<!--ATTLIST license-required id ID #IMPLIED>
<!--ATTLIST managedconnectionfactory-class id ID #IMPLIED>
<!--ATTLIST reauthentication-support id ID #IMPLIED>
<!--ATTLIST resourceadapter id ID #IMPLIED>
<!--ATTLIST security-permission id ID #IMPLIED>
<!--ATTLIST security-permission-spec id ID #IMPLIED>
<!--ATTLIST small-icon id ID #IMPLIED>
<!--ATTLIST spec-version id ID #IMPLIED>
<!--ATTLIST transaction-support id ID #IMPLIED>
<!--ATTLIST vendor-name id ID #IMPLIED>
<!--ATTLIST version id ID #IMPLIED>
```

A.5. IronJacamar 1.0

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified"
  targetNamespace="http://www.ironjacamar.org/doc/schema"
  xmlns="http://www.ironjacamar.org/doc/schema"
  version="1.0">

  <xs:complexType name="boolean-presenceType"></xs:complexType>

  <xs:complexType name="config-propertyType" mixed="true">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies an override for a config-property element in ra.xml or a @ConfigProperty
        ]]>
      </xs:documentation>
    </xs:annotation>
    <xs:simpleContent>
      <xs:extension base="xs:token">
        <xs:attribute use="required" name="name" type="xs:token">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Specifies the name of the config-property
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:attribute>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
```



```

        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:extension>
</xs:simpleContent>
</xs:complexType>

<xs:complexType name="ironjacamarType">
    <xs:sequence>
        <xs:element name="bean-validation-groups" type="bean-validation-
groupsType" minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        Specifies bean validation group that should be used
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="bootstrap-context" type="xs:token" minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        Specifies the unique name of the bootstrap context that should be used
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The config-property specifies resource adapter configuration properties.
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="transaction-support" type="transaction-supportType" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        Specifies the transaction support level of the resource adapter
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="connection-definitions" type="connection-
definitionsType" minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        Specifies the connection definitions
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="admin-objects" type="admin-objectsType" minOccurs="0" maxOccurs="1">
            <xs:annotation>

```

```
<xs:documentation>
  <![CDATA[[
    Specifies the administration objects
  ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:simpleType name="transaction-supportType">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Define the type of transaction supported by this resource adapter.
        Valid values are: NoTransaction, LocalTransaction, XATransaction
      ]]>
    </xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:token">
    <xs:enumeration value="NoTransaction" />
    <xs:enumeration value="LocalTransaction" />
    <xs:enumeration value="XATransaction" />
  </xs:restriction>
</xs:simpleType>

<xs:attributeGroup name="common-attribute">
  <xs:attribute name="class-name" type="xs:token" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the the fully qualified class name of a managed connection factory
          or admin object
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="jndi-name" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the JNDI name
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

  <xs:attribute name="enabled" type="xs:boolean" default="true" form="unqualified" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Should the object in question be activated
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute default="true" name="use-java-context" type="xs:boolean">
    <xs:annotation>
      <xs:documentation>
```

```

        <![CDATA[[
            Specifies if a java:/ JNDI context should be used
        ]]>
    </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="pool-name" type="xs:token" use="optional">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the pool name for the object
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:attributeGroup>

<xs:complexType name="admin-objectType">
    <xs:sequence>
        <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        Specifies an administration object configuration property.
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
    <xs:attributeGroup ref="common-attribute"></xs:attributeGroup>
</xs:complexType>

<xs:complexType name="timeoutType">
    <xs:sequence>
        <xs:element name="blocking-timeout-millis" type="xs:nonNegativeInteger" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The blocking-timeout-millis element indicates the maximum time in
                        milliseconds to block while waiting for a connection before throwing an exception.
                        Note that this blocks only while waiting for a permit for a connection, and
                        will never throw an exception if creating a new connection takes an inordinately
                        long time. The default is 30000 (30 seconds).
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="idle-timeout-minutes" type="xs:nonNegativeInteger" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The idle-timeout-minutes elements indicates the maximum time in minutes
                        a connection may be idle before being closed. The actual maximum time depends
                        also on the IdleRemover scan time, which is 1/2 the smallest idle-timeout-minutes
                        of any pool.
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>

```

```

</xs:element>

<xs:element name="allocation-
retry" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The allocation retry element indicates the number of times that allocating
        a connection should be tried before throwing an exception. The default is
        0.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>

<xs:element name="allocation-retry-wait-
millis" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The allocation retry wait millis element indicates the time in milliseconds
        to wait between retrying to allocate a connection. The default is 5000 (5 seconds).
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>

<xs:element name="xa-resource-
timeout" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Passed to XAResource.setTimeout(). Default is zero which does not
        invoke the setter.
        Specified in seconds - e.g. 5 minutes
        <xa-resource-timeout>300</xa-resource-timeout>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="validationType">
  <xs:sequence>
    <xs:element name="background-validation" type="xs:boolean" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            An element to specify that connections should be validated on a background
            thread versus being validated prior to use
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="background-validation-millis" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The background-validation-millis element specifies the amount of
            time, in millis, that background validation will run.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```

        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="use-fast-fail" type="xs:boolean" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Whether fail a connection allocation on the first connection if it
            is invalid (true) or keep trying until the pool is exhausted of all potential
            connections (false). Default is false. e.g. <use-fast-fail>true</use-fast-fail>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="connection-definitionsType">
  <xs:sequence>
    <xs:element name="connection-definition" type="connection-
definitionType" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies a connection definition
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="connection-definitionType">
  <xs:sequence>
    <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The config-property specifies managed connection factory configuration properties.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:choice>
      <xs:element name="pool" type="poolType" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies pooling settings
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="xa-pool" type="xa-poolType" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies xa-pooling settings
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:choice>
  </xs:sequence>
</xs:complexType>

```

```

    ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:choice>
<xs:element name="security" type="securityType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies security settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="timeout" type="timeoutType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies timeout settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validation" type="validationType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies validation settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="recovery" type="recoverType" minOccurs="0" maxOccurs="1"></xs:element>
</xs:sequence>
<xs:attribute name="use-ccm" type="xs:boolean" default="true" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Enable cached connection manager
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attributeGroup ref="common-attribute"></xs:attributeGroup>
</xs:complexType>

<xs:complexType name="poolType">
  <xs:sequence>
    <xs:element name="min-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The min-pool-size element indicates the minimum number of connections
            a pool should hold. This default to 0. Ex: <min-pool-size>1</min-pool-size>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="max-pool-size" type="xs:nonNegativeInteger" minOccurs="0">

```

```

<xs:annotation>
  <xs:documentation>
    <![CDATA[[
      The max-pool-size element indicates the maximum number of connections
      for a pool. No more than max-pool-size connections will be created in each sub-pool.
      This defaults to 20.
    ]]>
  </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="prefill" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Whether to attempt to prefill the connection pool.
        Default is false. e.g. <prefill>false</prefill>.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="use-strict-min" type="xs:boolean" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies if the min-pool-size should be considered strictly.
        Default false
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="flush-strategy" type="xs:token" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies how the pool should be flush in case of an error.
        Valid values are: FailingConnectionOnly (default), IdleConnections, EntirePool
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="xa-poolType">
  <xs:complexContent>
    <xs:extension base="poolType">
      <xs:sequence>
        <xs:element name="is-same-rm-override" type="xs:boolean" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                The is-same-rm-override element allows one to unconditionally
                set whether the javax.transaction.xa.XAResource.isSameRM(XAResource) returns
                true or false. Ex: <is-same-rm-override>true</is-same-rm-override>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="interleaving" type="boolean-presenceType" minOccurs="0">

```

```

<xs:annotation>
  <xs:documentation>
    <![CDATA[[
      An element to enable interleaving for XA connection factories
      Ex: <interleaving/>
    ]]>
  </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="no-tx-separate-pools" type="boolean-presenceType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Oracle does not like XA connections getting used both inside and outside
        a JTA transaction.
        To workaround the problem you can create separate sub-pools for the
        different contexts
        using <no-tx-separate-pools/>
        Ex: <no-tx-separate-pools/>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="pad-xid" type="xs:boolean" default="false" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Should the Xid be padded
        Ex: <pad-xid>true</pad-xid>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="wrap-xa-resource" type="xs:boolean" default="true" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Should the XAResource instances be wrapped in a org.jboss.tm.XAResourceWrapper
        instance
        Ex: <wrap-xa-resource>true</wrap-xa-resource>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>

<xs:complexType name="securityType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="application" type="boolean-presenceType" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Indicates that app supplied parameters (such as from getConnection(user, pw))
              are used to distinguish connections in the pool.
            Ex:

```



```

        <application/>
    ]]>
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Indicates Subject (from security domain) are used to distinguish connections
in the pool.

                The content of the security-domain is the name of the JAAS security manager
that will handle
                authentication. This name correlates to the JAAS login-config.xml descriptor
                application-policy/name attribute.
                Ex:
                <security-domain>HsqlDbRealm</security-domain>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>

        <xs:element name="security-domain-and-
application" type="xs:token" minOccurs="0" maxOccurs="1">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Indicates that either app supplied parameters (such as from
                getConnection(user, pw)) or Subject (from security domain) are used to
                distinguish connections in the pool. The content of the
                security-domain is the name of the JAAS security manager that will handle
                authentication. This name correlates to the JAAS login-config.xml descriptor
                application-policy/name attribute.

                Ex:
                <security-domain-and-application>HsqlDbRealm</security-domain-and-application>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:choice>
</xs:sequence>
</xs:complexType>

<xs:complexType name="admin-objectsType">
    <xs:sequence>
        <xs:element name="admin-object" type="admin-
objectType" minOccurs="1" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        Specifies the setup for an admin object
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>

```

```

<xs:complexType name="bean-validation-groupsType">
  <xs:sequence>
    <xs:element name="bean-validation-
group" type="xs:token" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the fully qualified class name for a bean validation group that
            should be used for validation
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="recoverType">
  <xs:sequence>
    <xs:element name="recover-credential" type="credentialType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the security options used when creating a connection during recovery.
            Note: if this credential are not specified the security credential are used
            for recover too
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="recover-plugin" type="extensionType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the extension plugin used in spi (core.spi.xa)
            which can be implemented by various plugins to provide better feedback to
            the XA recovery system.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="no-recovery" type="xs:boolean" default="false" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specify if the xa-datasource should be excluded from recovery.
          Default false.
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="extensionType">
  <xs:sequence>
    <xs:element name="config-property" type="config-propertyType"></xs:element>
  </xs:sequence>
  <xs:attribute name="class-name" type="xs:token" use="required"></xs:attribute>
</xs:complexType>
<xs:complexType name="credentialType">
  <xs:sequence>

```

```

<xs:element name="user-name" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify the username used when creating a new connection.
        Ex: <user-name>sa</user-name>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="password" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify the password used when creating a new connection.
        Ex: <password>sa-pass</password>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Indicates Subject (from security domain) are used to distinguish connections
        in the pool.

        The content of the security-domain is the name of the JAAS security manager
        that will handle
        authentication. This name correlates to the JAAS login-config.xml descriptor
        application-policy/name attribute.
        Ex:
        <security-domain>HsqlDbRealm</security-domain>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:element name="ironjacamar" type="ironjacamarType">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the fully qualified class name for a bean validation group that
        should be used for validation
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:schema>

```

A.6. IronJacamar 1.1

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified"
  targetNamespace="http://www.ironjacamar.org/doc/schema"
  xmlns="http://www.ironjacamar.org/doc/schema"
  version="1.0">

  <xs:complexType name="boolean-presenceType"></xs:complexType>

  <xs:complexType name="config-propertyType" mixed="true">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies an override for a config-property element in ra.xml or a @ConfigProperty
        ]]>
      </xs:documentation>
    </xs:annotation>
    <xs:simpleContent>
      <xs:extension base="xs:token">
        <xs:attribute use="required" name="name" type="xs:token">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Specifies the name of the config-property
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:attribute>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>

  <xs:complexType name="ironjacamarType">
    <xs:sequence>
      <xs:element name="bean-validation-groups" type="bean-validation-
groupsType" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies bean validation group that should be used
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="bootstrap-context" type="xs:token" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies the unique name of the bootstrap context that should be used
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```

```

        <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                The config-property specifies resource adapter configuration properties.
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="transaction-support" type="transaction-supportType" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the transaction support level of the resource adapter
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="workmanager" type="workmanagerType" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the settings for the WorkManager used by this resource adapter
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
    <xs:element name="connection-definitions" type="connection-
definitionsType" minOccurs="0" maxOccurs="1">
        <xs:annotation>
            <xs:documentation>
                <![CDATA[[
                    Specifies the connection definitions
                ]]>
            </xs:documentation>
        </xs:annotation>
</xs:element>
<xs:element name="admin-objects" type="admin-objectsType" minOccurs="0" maxOccurs="1">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the administration objects
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:simpleType name="transaction-supportType">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Define the type of transaction supported by this resource adapter.
                Valid values are: NoTransaction, LocalTransaction, XATransaction
            ]]>
        </xs:documentation>
    </xs:annotation>

```

```
<xs:restriction base="xs:token">
  <xs:enumeration value="NoTransaction" />
  <xs:enumeration value="LocalTransaction" />
  <xs:enumeration value="XATransaction" />
</xs:restriction>
</xs:simpleType>

<xs:attributeGroup name="common-attribute">
  <xs:attribute name="class-name" type="xs:token" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the the fully qualified class name of a managed connection factory
          or admin object
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="jndi-name" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the JNDI name
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

  <xs:attribute name="enabled" type="xs:boolean" default="true" form="unqualified" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Should the object in question be activated
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute default="true" name="use-java-context" type="xs:boolean">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies if a java:/ JNDI context should be used
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="pool-name" type="xs:token" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the pool name for the object
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:attributeGroup>

<xs:complexType name="admin-objectType">
  <xs:sequence>
```

```

        <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies an administration object configuration property.
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attributeGroup ref="common-attribute"></xs:attributeGroup>
</xs:complexType>

<xs:complexType name="timeoutType">
    <xs:sequence>
        <xs:element name="blocking-timeout-millis" type="xs:nonNegativeInteger" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The blocking-timeout-millis element indicates the maximum time in
                        milliseconds to block while waiting for a connection before throwing an exception.
                        Note that this blocks only while waiting for a permit for a connection, and
                        will never throw an exception if creating a new connection takes an inordinately
                        long time. The default is 30000 (30 seconds).
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="idle-timeout-minutes" type="xs:nonNegativeInteger" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The idle-timeout-minutes elements indicates the maximum time in minutes
                        a connection may be idle before being closed. The actual maximum time depends
                        also on the IdleRemover scan time, which is 1/2 the smallest idle-timeout-minutes
                        of any pool.
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>

        <xs:element name="allocation-
retry" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The allocation retry element indicates the number of times that allocating
                        a connection should be tried before throwing an exception. The default is
                        0.
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>

        <xs:element name="allocation-retry-wait-
millis" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The allocation retry wait millis element indicates the time in milliseconds

```

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        to wait between retrying to allocate a connection. The default is 5000 (5 seconds).
    ]]>
    </xs:documentation>
</xs:annotation>
</xs:element>

<xs:element name="xa-resource-
timeout" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Passed to XAResource.setTransactionTimeout(). Default is zero which does not
                invoke the setter.
                Specified in seconds - e.g. 5 minutes
                <xa-resource-timeout>300</xa-resource-timeout>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="validationType">
    <xs:sequence>
        <xs:element name="background-validation" type="xs:boolean" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        An element to specify that connections should be validated on a background
                        thread versus being validated prior to use
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="background-validation-millis" type="xs:nonNegativeInteger" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The background-validation-millis element specifies the amount of
                        time, in millis, that background validation will run.
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="use-fast-fail" type="xs:boolean" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        Whether fail a connection allocation on the first connection if it
                        is invalid (true) or keep trying until the pool is exhausted of all potential
                        connections (false). Default is false. e.g. <use-fast-fail>true</use-fast-fail>
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>

<xs:complexType name="connection-definitionsType">
    <xs:sequence>

```



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        <xs:element name="connection-definition" type="connection-
definitionType" minOccurs="1" maxOccurs="unbounded">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[
                Specifies a connection definition
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="connection-definitionType">
    <xs:sequence>
        <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[
                        The config-property specifies managed connection factory configuration properties.
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:choice>
            <xs:element name="pool" type="poolType" minOccurs="0" maxOccurs="1">
                <xs:annotation>
                    <xs:documentation>
                        <![CDATA[
                            Specifies pooling settings
                        ]]>
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="xa-pool" type="xa-poolType" minOccurs="0" maxOccurs="1">
                <xs:annotation>
                    <xs:documentation>
                        <![CDATA[
                            Specifies xa-pooling settings
                        ]]>
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
        </xs:choice>
        <xs:element name="security" type="securityType" minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[
                        Specifies security settings
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="timeout" type="timeoutType" minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[
                        Specifies timeout settings

```

```

    ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validation" type="validationType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies validation settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="recovery" type="recoverType" minOccurs="0" maxOccurs="1"></xs:element>
</xs:sequence>
<xs:attribute name="use-ccm" type="xs:boolean" default="true" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Enable cached connection manager
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="sharable" type="xs:boolean" default="true" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Defines the connections as sharable which allows lazy association to be enabled
        if supported
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="enlistment" type="xs:boolean" default="true" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Defines if lazy enlistment should be used if supported by the resource adapter
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attributeGroup ref="common-attribute"></xs:attributeGroup>
</xs:complexType>

<xs:complexType name="poolType">
  <xs:sequence>
    <xs:element name="min-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The min-pool-size element indicates the minimum number of connections
            a pool should hold. This default to 0. Ex: <min-pool-size>1</min-pool-size>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="initial-pool-size" type="xs:nonNegativeInteger" minOccurs="0">

```

```

<xs:annotation>
  <xs:documentation>
    <![CDATA[[
      The initial-pool-size element indicates the initial number of connections
      a pool should hold. This default to 0. Ex: <initial-pool-size>1</initial-pool-size>
    ]]>
  </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="max-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The max-pool-size element indicates the maximum number of connections
        for a pool. No more than max-pool-size connections will be created in each sub-pool.
        This defaults to 20.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="prefill" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Whether to attempt to prefill the connection pool.
        Default is false. e.g. <prefill>false</prefill>.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="use-strict-min" type="xs:boolean" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies if the min-pool-size should be considered strictly.
        Default false
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="flush-strategy" type="xs:token" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies how the pool should be flush in case of an error.
        Valid values are: FailingConnectionOnly (default), InvalidIdleConnections,
        IdleConnections, Gracefully, EntirePool,
        AllInvalidIdleConnections, AllIdleConnections, AllGracefully,
        AllConnections
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="capacity" type="capacityType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the capacity policies for the pool
      ]]>
    </xs:documentation>
  </xs:annotation>

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        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="xa-poolType">
  <xs:complexContent>
    <xs:extension base="poolType">
      <xs:sequence>
        <xs:element name="is-same-rm-override" type="xs:boolean" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[
                The is-same-rm-override element allows one to unconditionally
                set whether the javax.transaction.xa.XAResource.isSameRM(XAResource) returns
                true or false. Ex: <is-same-rm-override>true</is-same-rm-override>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="interleaving" type="boolean-presenceType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[
                An element to enable interleaving for XA connection factories
                Ex: <interleaving/>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="no-tx-separate-pools" type="boolean-presenceType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[
                Oracle does not like XA connections getting used both inside and outside
                a JTA transaction.
                To workaround the problem you can create separate sub-pools for the
                different contexts
                using <no-tx-separate-pools/>
                Ex: <no-tx-separate-pools/>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="pad-xid" type="xs:boolean" default="false" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[
                Should the Xid be padded
                Ex: <pad-xid>true</pad-xid>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="wrap-xa-resource" type="xs:boolean" default="true" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[

```

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        Should the XAResource instances be wrapped in a org.jboss.tm.XAResourceWrapper
        instance
        Ex: <wrap-xa-resource>true</wrap-xa-resource>
    ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>

<xs:complexType name="securityType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="application" type="boolean-presenceType" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Indicates that app supplied parameters (such as from getConnection(user, pw))
              are used to distinguish connections in the pool.
              Ex:
              <application/>
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Indicates Subject (from security domain) are used to distinguish connections
in the pool.

              The content of the security-domain is the name of the JAAS security manager
that will handle
              authentication. This name correlates to the JAAS login-config.xml descriptor
              application-policy/name attribute.
              Ex:
              <security-domain>HsqlDbRealm</security-domain>
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="security-domain-and-
application" type="xs:token" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Indicates that either app supplied parameters (such as from
              getConnection(user, pw)) or Subject (from security domain) are used to
              distinguish connections in the pool. The content of the
              security-domain is the name of the JAAS security manager that will handle
              authentication. This name correlates to the JAAS login-config.xml descriptor
              application-policy/name attribute.

              Ex:
              <security-domain-and-application>HsqlDbRealm</security-domain-and-application>
            ]]>
          </xs:documentation>

```

```
</xs:annotation>
</xs:element>
</xs:choice>
</xs:sequence>
</xs:complexType>

<xs:complexType name="admin-objectsType">
  <xs:sequence>
    <xs:element name="admin-object" type="admin-
objectType" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the setup for an admin object
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="bean-validation-groupsType">
  <xs:sequence>
    <xs:element name="bean-validation-
group" type="xs:token" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the fully qualified class name for a bean validation group that
            should be used for validation
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="recoverType">
  <xs:sequence>
    <xs:element name="recover-credential" type="credentialType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the security options used when creating a connection during recovery.
            Note: if this credential are not specified the security credential are used
for recover too
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="recover-plugin" type="extensionType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the extension plugin used in spi (core.spi.xa)
            which can be implemented by various plugins to provide better feedback to
the XA recovery system.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

```

    </xs:annotation>
  </xs:element>
</xs:sequence>
<xs:attribute name="no-recovery" type="xs:boolean" default="false" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify if the xa-datasource should be excluded from recovery.
        Default false.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="extensionType">
  <xs:sequence>
    <xs:element name="config-property" type="config-propertyType"></xs:element>
  </xs:sequence>
  <xs:attribute name="class-name" type="xs:token" use="required"></xs:attribute>
</xs:complexType>
<xs:complexType name="credentialType">
  <xs:sequence>
    <xs:element name="user-name" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the username used when creating a new connection.
            Ex: <user-name>sa</user-name>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="password" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the password used when creating a new connection.
            Ex: <password>sa-pass</password>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Indicates Subject (from security domain) are used to distinguish connections
            in the pool.

            The content of the security-domain is the name of the JAAS security manager
            that will handle
            authentication. This name correlates to the JAAS login-config.xml descriptor
            application-policy/name attribute.
            Ex:
            <security-domain>HsqlDbRealm</security-domain>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>

```

```

</xs:complexType>

<xs:complexType name="workmanagerType">
  <xs:sequence>
    <xs:element name="security" type="workmanagerSecurityType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines the security model used by the WorkManager instance
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityType">
  <xs:sequence>
    <xs:element name="mapping-required" type="xs:boolean" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines if a mapping is required for security credentials. A value of false means
            "Case 1" as defined in section 16.4.3, and a value of true means "Case 2" as
            defined in section 16.4.4.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="domain" type="xs:token" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines the name of the security domain that should be used
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="default-principal" type="xs:token" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines a default principal name that should be added to the used Subject instance
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="default-
groups" type="workmanagerSecurityGroupsType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines a default groups that should be added to the used Subject instance
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```



```

<xs:element name="mappings" type="workmanagerSecurityMappingsType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Defines the mappings that should be applied for Case 2
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityGroupsType">
  <xs:sequence>
    <xs:element name="group" type="xs:token" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The name of the group
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityMappingsType">
  <xs:sequence>

<xs:element name="users" type="workmanagerSecurityMappingsUsersType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The mappings for the users
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>

<xs:element name="groups" type="workmanagerSecurityMappingsGroupsType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The mappings for the groups
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityMappingsUsersType">
  <xs:sequence>

<xs:element name="map" type="workmanagerSecurityMappingType" minOccurs="1" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[

```

```
        A user mapping
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityMappingsGroupsType">
  <xs:sequence>

<xs:element name="map" type="workmanagerSecurityMappingType" minOccurs="1" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        A group mapping
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityMappingType">
  <xs:sequence>
</xs:sequence>
<xs:attribute name="from" type="xs:token" use="required">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify the original value
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="to" type="xs:token" use="required">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify the mapped value
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>

<xs:complexType name="capacityType">
  <xs:sequence>
    <xs:element name="incrementer" type="extensionType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines the policy for incrementing connections in the pool
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="decrementer" type="extensionType" minOccurs="0">
      <xs:annotation>
```

```

        <xs:documentation>
            <![CDATA[[
                Defines the policy for decrementing connections in the pool
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:element name="ironjacamar" type="ironjacamarType">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the fully qualified class name for a bean validation group that
                should be used for validation
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:schema>

```

A.7. Resource adapters 1.0

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified"
    targetNamespace="http://www.ironjacamar.org/doc/schema" xmlns="http://
www.ironjacamar.org/doc/schema">

    <xs:complexType name="boolean-presenceType"></xs:complexType>

    <xs:complexType name="config-propertyType" mixed="true">
        <xs:annotation>
            <xs:documentation>
                <![CDATA[[
                    Specifies an override for a config-property element in ra.xml or a @ConfigProperty
                ]]>
            </xs:documentation>
        </xs:annotation>
        <xs:simpleContent>
            <xs:extension base="xs:token">
                <xs:attribute use="required" name="name" type="xs:token">
                    <xs:annotation>
                        <xs:documentation>
                            <![CDATA[[
                                Specifies the name of the config-property
                            ]]>
                        </xs:documentation>
                    </xs:annotation>
                </xs:attribute>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>

```

```

</xs:complexType>

<xs:complexType name="resource-adapterType">
  <xs:sequence>
    <xs:element name="archive" type="xs:token" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the resource adapter archive to be activated
            E.g. <archive>myra.rar</archive>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="bean-validation-groups" type="bean-validation-
groupsType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies bean validation group that should be used
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="bootstrap-context" type="xs:token" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the unique name of the bootstrap context that should be used
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The config-property specifies resource adapter configuration properties.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="transaction-support" type="transaction-supportType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the transaction support level of the resource adapter
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="connection-definitions" type="connection-
definitionsType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the connection definitions
          ]]>

```

```

        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="admin-objects" type="admin-objectsType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the administration objects
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:simpleType name="transaction-supportType">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Define the type of transaction supported by this resource adapter.
        Valid values are: NoTransaction, LocalTransaction, XATransaction
      ]]>
    </xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:token">
    <xs:enumeration value="NoTransaction" />
    <xs:enumeration value="LocalTransaction" />
    <xs:enumeration value="XATransaction" />
  </xs:restriction>
</xs:simpleType>

<xs:attributeGroup name="common-attribute">
  <xs:attribute name="class-name" type="xs:token" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the the fully qualified class name of a managed connection factory
          or admin object
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="jndi-name" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the JNDI name
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

  <xs:attribute name="enabled" type="xs:boolean" default="true" form="unqualified" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Should the object in question be activated
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

```

```

    </xs:annotation>
  </xs:attribute>
  <xs:attribute default="true" name="use-java-context" type="xs:boolean">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies if a java:/ JNDI context should be used
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="pool-name" type="xs:token" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the pool name for the object
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:attributeGroup>

<xs:complexType name="admin-objectType">
  <xs:sequence>
    <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The config-property specifies administration object configuration properties.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attributeGroup ref="common-attribute"></xs:attributeGroup>
</xs:complexType>

<xs:complexType name="timeoutType">
  <xs:sequence>
    <xs:element name="blocking-timeout-millis" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The blocking-timeout-millis element indicates the maximum time in
            milliseconds to block while waiting for a connection before throwing an exception.
            Note that this blocks only while waiting for a permit for a connection, and
            will never throw an exception if creating a new connection takes an inordinately
            long time. The default is 30000 (30 seconds).
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="idle-timeout-minutes" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The idle-timeout-minutes elements indicates the maximum time in minutes
            a connection may be idle before being closed. The actual maximum time depends

```

```

        also on the IdleRemover scan time, which is 1/2 the smallest idle-timeout-minutes
        of any pool.
    ]]>
</xs:documentation>
</xs:annotation>
</xs:element>

<xs:element name="allocation-
retry" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
<xs:annotation>
<xs:documentation>
<![CDATA[[
    The allocation retry element indicates the number of times that allocating
    a connection should be tried before throwing an exception. The default is
    0.
    ]]>
</xs:documentation>
</xs:annotation>
</xs:element>

<xs:element name="allocation-retry-wait-
millis" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
<xs:annotation>
<xs:documentation>
<![CDATA[[
    The allocation retry wait millis element indicates the time in milliseconds
    to wait between retrying to allocate a connection. The default is 5000 (5
    seconds).
    ]]>
</xs:documentation>
</xs:annotation>
</xs:element>

<xs:element name="xa-resource-
timeout" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
<xs:annotation>
<xs:documentation>
<![CDATA[[
    Passed to XAResource.setTransactionTimeout(). Default is zero which does not
    invoke the setter.
    Specified in seconds - e.g. 5 minutes
    <xa-resource-timeout>300</xa-resource-timeout>
    ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="validationType">
<xs:sequence>
<xs:element name="background-validation" type="xs:boolean" minOccurs="0">
<xs:annotation>
<xs:documentation>
<![CDATA[[
    An element to specify that connections should be validated on a background
    thread versus being validated prior to use
    ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="background-validation-millis" type="xs:nonNegativeInteger" minOccurs="0">

```

```
<xs:annotation>
  <xs:documentation>
    <![CDATA[[
      The background-validation-millis element specifies the amount of
      time, in millis, that background validation will run.
    ]]>
  </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="use-fast-fail" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Whether fail a connection allocation on the first connection if it
        is invalid (true) or keep trying until the pool is exhausted of all potential
        connections (false) default false. e.g. <use-fast-fail>true</use-fast-fail>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:element name="resource-adapters" type="resource-adaptersType">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies activation of resource adapters
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>

<xs:complexType name="resource-adaptersType">
  <xs:sequence>
    <xs:element name="resource-adapter" type="resource-
adapterType" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies activation of a resource adapter
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="connection-definitionsType">
  <xs:sequence>
    <xs:element name="connection-definition" type="connection-
definitionType" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies a connection definition
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```



```

    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="connection-definitionType">
  <xs:sequence>
    <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The config-property specifies managed connection factory configuration properties.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:choice>
      <xs:element name="pool" type="poolType" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies pooling settings
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="xa-pool" type="xa-poolType" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies xa-pooling settings
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:choice>
    <xs:element name="security" type="securityType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies security settings
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="timeout" type="timeoutType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies timeout settings
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="validation" type="validationType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies validation settings

```

```

    ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="recovery" type="recoverType" minOccurs="0" maxOccurs="1"></xs:element>
</xs:sequence>
<xs:attribute name="use-ccm" type="xs:boolean" default="true" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Enable cached connection manager
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attributeGroup ref="common-attribute"></xs:attributeGroup>
</xs:complexType>

<xs:complexType name="poolType">
  <xs:sequence>
    <xs:element name="min-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The min-pool-size element indicates the minimum number of connections
            a pool should hold. This default to 0. Ex: <min-pool-size>1</min-pool-size>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="max-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The max-pool-size element indicates the maximum number of connections
            for a pool. No more than max-pool-size connections will be created in each sub-pool.
            This defaults to 20.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="prefill" type="xs:boolean" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Whether to attempt to prefill the connection pool. Default is false.
            e.g. <prefill>>false</prefill>.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="use-strict-min" type="xs:boolean" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Define if the min-pool-size should be considered strictly.
            Default false
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```

    </xs:annotation>
  </xs:element>
  <xs:element name="flush-strategy" type="xs:token" minOccurs="0" maxOccurs="1">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies how the pool should be flush in case of an error.
          Valid values are: FailingConnectionOnly (default), IdleConnections, EntirePool
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="xa-poolType">
  <xs:complexContent>
    <xs:extension base="poolType">
      <xs:sequence>
        <xs:element name="is-same-rm-override" type="xs:boolean" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                The is-same-rm-override element allows one to unconditionally
                set whether the javax.transaction.xa.XAResource.isSameRM(XAResource) returns
                true or false. Ex: <is-same-rm-override>true</is-same-rm-override>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="interleaving" type="boolean-presenceType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                An element to enable interleaving for XA connection factories
                Ex: <interleaving/>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="no-tx-separate-pools" type="boolean-presenceType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Oracle does not like XA connections getting used both inside and outside
                a JTA transaction.

                To workaround the problem you can create separate sub-pools for the
                different contexts
                using <no-tx-separate-pools/>
                Ex: <no-tx-separate-pools/>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="pad-xid" type="xs:boolean" default="false" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Should the Xid be padded

```

```

        Ex: <pad-xid>true</pad-xid>
    ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="wrap-xa-resource" type="xs:boolean" default="true" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Should the XAResource instances be wrapped in a org.jboss.tm.XAResourceWrapper
                instance
                Ex: <wrap-xa-resource>true</wrap-xa-resource>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>

<xs:complexType name="securityType">
    <xs:sequence>
        <xs:choice>
            <xs:element name="application" type="boolean-presenceType" minOccurs="0" maxOccurs="1">
                <xs:annotation>
                    <xs:documentation>
                        <![CDATA[[
                            Indicates that app supplied parameters (such as from getConnection(user, pw))
                            are used to distinguish connections in the pool.
                            Ex:
                            <application/>
                        ]]>
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
                <xs:annotation>
                    <xs:documentation>
                        <![CDATA[[
                            Indicates Subject (from security domain) are used to distinguish connections
                            in the pool.

                            The content of the security-domain is the name of the JAAS security manager
                            that will handle
                            authentication. This name correlates to the JAAS login-config.xml descriptor
                            application-policy/name attribute.
                            Ex:
                            <security-domain>HsqlDbRealm</security-domain>
                        ]]>
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="security-domain-and-
application" type="xs:token" minOccurs="0" maxOccurs="1">
                <xs:annotation>
                    <xs:documentation>
                        <![CDATA[[
                            Indicates that either app supplied parameters (such as from
                            getConnection(user, pw)) or Subject (from security domain) are used to

```

distinguish connections in the pool. The content of the security-domain is the name of the JAAS security manager that will handle authentication. This name correlates to the JAAS login-config.xml descriptor application-policy/name attribute.

Ex:

```

    <security-domain-and-application>HsqlDbRealm</security-domain-and-application>
  ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:choice>
</xs:sequence>
</xs:complexType>

<xs:complexType name="admin-objectsType">
  <xs:sequence>
    <xs:element name="admin-object" type="admin-
objectType" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the setup for an admin object
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="bean-validation-groupsType">
  <xs:sequence>
    <xs:element name="bean-validation-
group" type="xs:token" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the fully qualified class name for a bean validation group that
            should be used for validation
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="recoverType">
  <xs:sequence>
    <xs:element name="recover-credential" type="credentialType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the security options used when creating a connection during recovery.
            Note: if this credential are not specified the security credential are used
            for recover too
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="recover-plugin" type="extensionType" minOccurs="0" maxOccurs="1">

```

```
<xs:annotation>
  <xs:documentation>
    <![CDATA[[
      Specifies the extension plugin used in spi (core.spi.xa)
      which can be implemented by various plugins to provide better feedback to
the XA recovery system.
    ]]>
  </xs:documentation>
</xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="no-recovery" type="xs:boolean" default="false" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify if the xa-datasource should be excluded from recovery.
        Default false.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="extensionType">
  <xs:sequence>
    <xs:element name="config-property" type="config-propertyType"/></xs:element>
  </xs:sequence>
  <xs:attribute name="class-name" type="xs:token" use="required"/></xs:attribute>
</xs:complexType>
<xs:complexType name="credentialType">
  <xs:sequence>
    <xs:element name="user-name" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the username used when creating a new connection.
            Ex: <user-name>sa</user-name>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="password" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the password used when creating a new connection.
            Ex: <password>sa-pass</password>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Indicates Subject (from security domain) are used to distinguish connections
in the pool.

            The content of the security-domain is the name of the JAAS security manager
that will handle
            authentication. This name correlates to the JAAS login-config.xml descriptor
```

```

        application-policy/name attribute.
        Ex:
        <security-domain>HsqlDbRealm</security-domain>
    ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

</xs:schema>

```

A.8. Resource adapters 1.1

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified"
    targetNamespace="http://www.ironjacamar.org/doc/schema" xmlns="http://
www.ironjacamar.org/doc/schema">

  <xs:complexType name="boolean-presenceType"></xs:complexType>

  <xs:complexType name="config-propertyType" mixed="true">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies an override for a config-property element in ra.xml or a @ConfigProperty
        ]]>
      </xs:documentation>
    </xs:annotation>
    <xs:simpleContent>
      <xs:extension base="xs:token">
        <xs:attribute use="required" name="name" type="xs:token">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Specifies the name of the config-property
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:attribute>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>

  <xs:complexType name="resource-adapterType">
    <xs:sequence>
      <xs:element name="archive" type="xs:token" minOccurs="1" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies the resource adapter archive to be activated
              E.g. <archive>myra.rar</archive>
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>

```

```

        </xs:documentation>
    </xs:annotation>
</xs:element>

    <xs:element name="bean-validation-groups" type="bean-validation-
groupsType" minOccurs="0" maxOccurs="1">
    <xs:annotation>
    <xs:documentation>
    <![CDATA[[
        Specifies bean validation group that should be used
    ]]>
    </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="bootstrap-context" type="xs:token" minOccurs="0" maxOccurs="1">
    <xs:annotation>
    <xs:documentation>
    <![CDATA[[
        Specifies the unique name of the bootstrap context that should be used
    ]]>
    </xs:documentation>
    </xs:annotation>
</xs:element>

    <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
    <xs:annotation>
    <xs:documentation>
    <![CDATA[[
        The config-property specifies resource adapter configuration properties.
    ]]>
    </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="transaction-support" type="transaction-supportType" minOccurs="0">
    <xs:annotation>
    <xs:documentation>
    <![CDATA[[
        Specifies the transaction support level of the resource adapter
    ]]>
    </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="workmanager" type="workmanagerType" minOccurs="0">
    <xs:annotation>
    <xs:documentation>
    <![CDATA[[
        Specifies the settings for the WorkManager used by this resource adapter
    ]]>
    </xs:documentation>
    </xs:annotation>
</xs:element>

    <xs:element name="connection-definitions" type="connection-
definitionsType" minOccurs="0" maxOccurs="1">
    <xs:annotation>
    <xs:documentation>
    <![CDATA[[
        Specifies the connection definitions
    ]]>
    </xs:documentation>
    </xs:annotation>

```



```

</xs:element>
<xs:element name="admin-objects" type="admin-objectsType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the administration objects
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="id" type="xs:token" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        An unique identifier for the resource adapter
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>

<xs:simpleType name="transaction-supportType">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Define the type of transaction supported by this resource adapter.
        Valid values are: NoTransaction, LocalTransaction, XATransaction
      ]]>
    </xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:token">
    <xs:enumeration value="NoTransaction" />
    <xs:enumeration value="LocalTransaction" />
    <xs:enumeration value="XATransaction" />
  </xs:restriction>
</xs:simpleType>

<xs:attributeGroup name="common-attribute">
  <xs:attribute name="class-name" type="xs:token" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the the fully qualified class name of a managed connection factory
          or admin object
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="jndi-name" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the JNDI name
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

```

```

<xs:attribute name="enabled" type="xs:boolean" default="true" form="unqualified" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Should the object in question be activated
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute default="true" name="use-java-context" type="xs:boolean">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies if a java:/ JNDI context should be used
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="pool-name" type="xs:token" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the pool name for the object
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:attributeGroup>

<xs:complexType name="admin-objectType">
  <xs:sequence>
    <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The config-property specifies administration object configuration properties.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attributeGroup ref="common-attribute"></xs:attributeGroup>
</xs:complexType>

<xs:complexType name="timeoutType">
  <xs:sequence>
    <xs:element name="blocking-timeout-millis" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The blocking-timeout-millis element indicates the maximum time in
            milliseconds to block while waiting for a connection before throwing an exception.
            Note that this blocks only while waiting for a permit for a connection, and
            will never throw an exception if creating a new connection takes an inordinately
            long time. The default is 30000 (30 seconds).
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```

    </xs:annotation>
  </xs:element>
  <xs:element name="idle-timeout-minutes" type="xs:nonNegativeInteger" minOccurs="0">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          The idle-timeout-minutes elements indicates the maximum time in minutes
          a connection may be idle before being closed. The actual maximum time depends
          also on the IdleRemover scan time, which is 1/2 the smallest idle-timeout-minutes
          of any pool.
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>

      <xs:element name="allocation-
retry" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          The allocation retry element indicates the number of times that allocating
          a connection should be tried before throwing an exception. The default is
          0.
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>

      <xs:element name="allocation-retry-wait-
millis" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          The allocation retry wait millis element indicates the time in milliseconds
          to wait between retrying to allocate a connection. The default is 5000 (5
          seconds).
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>

      <xs:element name="xa-resource-
timeout" type="xs:nonNegativeInteger" minOccurs="0" maxOccurs="1">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Passed to XAResource.setTransactionTimeout(). Default is zero which does not
          invoke the setter.
          Specified in seconds - e.g. 5 minutes
          <xa-resource-timeout>300</xa-resource-timeout>
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="validationType">
  <xs:sequence>
    <xs:element name="background-validation" type="xs:boolean" minOccurs="0">
      <xs:annotation>
        <xs:documentation>

```

```

        <![CDATA[[
            An element to specify that connections should be validated on a background
            thread versus being validated prior to use
        ]]>
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="background-validation-millis" type="xs:nonNegativeInteger" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                The background-validation-millis element specifies the amount of
                time, in millis, that background validation will run.
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="use-fast-fail" type="xs:boolean" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Whether fail a connection allocation on the first connection if it
                is invalid (true) or keep trying until the pool is exhausted of all potential
                connections (false) default false. e.g. <use-fast-fail>true</use-fast-fail>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:element name="resource-adapters" type="resource-adaptersType">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies activation of resource adapters
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>

<xs:complexType name="resource-adaptersType">
    <xs:sequence>
        <xs:element name="resource-adapter" type="resource-
adapterType" minOccurs="1" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        Specifies activation of a resource adapter
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>

<xs:complexType name="connection-definitionsType">
    <xs:sequence>

```

```

        <xs:element name="connection-definition" type="connection-
definitionType" minOccurs="1" maxOccurs="unbounded">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[
                Specifies a connection definition
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="connection-definitionType">
    <xs:sequence>
        <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[
                        The config-property specifies managed connection factory configuration properties.
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:choice>
            <xs:element name="pool" type="poolType" minOccurs="0" maxOccurs="1">
                <xs:annotation>
                    <xs:documentation>
                        <![CDATA[
                            Specifies pooling settings
                        ]]>
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="xa-pool" type="xa-poolType" minOccurs="0" maxOccurs="1">
                <xs:annotation>
                    <xs:documentation>
                        <![CDATA[
                            Specifies xa-pooling settings
                        ]]>
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
        </xs:choice>
        <xs:element name="security" type="securityType" minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[
                        Specifies security settings
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="timeout" type="timeoutType" minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[
                        Specifies timeout settings
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>

```

```

    ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validation" type="validationType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies validation settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="recovery" type="recoverType" minOccurs="0" maxOccurs="1"></xs:element>
</xs:sequence>
<xs:attribute name="use-ccm" type="xs:boolean" default="true" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Enable cached connection manager
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="sharable" type="xs:boolean" default="true" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Defines the connections as sharable which allows lazy association to be enabled
        if supported
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="enlistment" type="xs:boolean" default="true" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Defines if lazy enlistment should be used if supported by the resource adapter
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attributeGroup ref="common-attribute"></xs:attributeGroup>
</xs:complexType>

<xs:complexType name="poolType">
  <xs:sequence>
    <xs:element name="min-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The min-pool-size element indicates the minimum number of connections
            a pool should hold. This default to 0. Ex: <min-pool-size>1</min-pool-size>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="initial-pool-size" type="xs:nonNegativeInteger" minOccurs="0">

```

```

<xs:annotation>
  <xs:documentation>
    <![CDATA[[
      The initial-pool-size element indicates the initial number of connections
      a pool should hold. This default to 0. Ex: <initial-pool-size>1</initial-pool-size>
    ]]>
  </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="max-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The max-pool-size element indicates the maximum number of connections
        for a pool. No more than max-pool-size connections will be created in each sub-pool.
        This defaults to 20.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="prefill" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Whether to attempt to prefill the connection pool. Default is false.
        e.g. <prefill>>false</prefill>.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="use-strict-min" type="xs:boolean" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Define if the min-pool-size should be considered strictly.
        Default false
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="flush-strategy" type="xs:token" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies how the pool should be flush in case of an error.
        Valid values are: FailingConnectionOnly (default), InvalidIdleConnections,
        IdleConnections, Gracefully, EntirePool,
        AllInvalidIdleConnections, AllIdleConnections, AllGracefully,
        AllConnections
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="capacity" type="capacityType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the capacity policies for the pool
      ]]>
    </xs:documentation>
  </xs:annotation>

```

```

    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="xa-poolType">
  <xs:complexContent>
    <xs:extension base="poolType">
      <xs:sequence>
        <xs:element name="is-same-rm-override" type="xs:boolean" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                The is-same-rm-override element allows one to unconditionally
                set whether the javax.transaction.xa.XAResource.isSameRM(XAResource) returns
                true or false. Ex: <is-same-rm-override>true</is-same-rm-override>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="interleaving" type="boolean-presenceType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                An element to enable interleaving for XA connection factories
                Ex: <interleaving/>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="no-tx-separate-pools" type="boolean-presenceType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Oracle does not like XA connections getting used both inside and outside
                a JTA transaction.
                To workaround the problem you can create separate sub-pools for the
                different contexts
                using <no-tx-separate-pools/>
                Ex: <no-tx-separate-pools/>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="pad-xid" type="xs:boolean" default="false" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Should the Xid be padded
                Ex: <pad-xid>true</pad-xid>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="wrap-xa-resource" type="xs:boolean" default="true" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[

```



```

        Should the XAResource instances be wrapped in a org.jboss.tm.XAResourceWrapper
        instance
        Ex: <wrap-xa-resource>true</wrap-xa-resource>
    ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>

<xs:complexType name="securityType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="application" type="boolean-presenceType" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Indicates that app supplied parameters (such as from getConnection(user, pw))
              are used to distinguish connections in the pool.
              Ex:
              <application/>
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Indicates Subject (from security domain) are used to distinguish connections
              in the pool.

              The content of the security-domain is the name of the JAAS security manager
              that will handle
              authentication. This name correlates to the JAAS login-config.xml descriptor
              application-policy/name attribute.
              Ex:
              <security-domain>HsqlDbRealm</security-domain>
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="security-domain-and-
application" type="xs:token" minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Indicates that either app supplied parameters (such as from
              getConnection(user, pw)) or Subject (from security domain) are used to
              distinguish connections in the pool. The content of the
              security-domain is the name of the JAAS security manager that will handle
              authentication. This name correlates to the JAAS login-config.xml descriptor
              application-policy/name attribute.

              Ex:
              <security-domain-and-application>HsqlDbRealm</security-domain-and-application>
            ]]>
          </xs:documentation>

```

```

        </xs:annotation>
      </xs:element>
    </xs:choice>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="admin-objectsType">
  <xs:sequence>
    <xs:element name="admin-object" type="admin-
objectType" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the setup for an admin object
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="bean-validation-groupsType">
  <xs:sequence>
    <xs:element name="bean-validation-
group" type="xs:token" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the fully qualified class name for a bean validation group that
            should be used for validation
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="recoverType">
  <xs:sequence>
    <xs:element name="recover-credential" type="credentialType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the security options used when creating a connection during recovery.
            Note: if this credential are not specified the security credential are used
            for recover too
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="recover-plugin" type="extensionType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the extension plugin used in spi (core.spi.xa)
            which can be implemented by various plugins to provide better feedback to
            the XA recovery system.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```

    </xs:element>
  </xs:sequence>
  <xs:attribute name="no-recovery" type="xs:boolean" default="false" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specify if the xa-datasource should be excluded from recovery.
          Default false.
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="extensionType">
  <xs:sequence>
    <xs:element name="config-property" type="config-propertyType"></xs:element>
  </xs:sequence>
  <xs:attribute name="class-name" type="xs:token" use="required"></xs:attribute>
</xs:complexType>
<xs:complexType name="credentialType">
  <xs:sequence>
    <xs:element name="user-name" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the username used when creating a new connection.
            Ex: <user-name>sa</user-name>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="password" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the password used when creating a new connection.
            Ex: <password>sa-pass</password>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Indicates Subject (from security domain) are used to distinguish connections
            in the pool.

            The content of the security-domain is the name of the JAAS security manager
            that will handle
            authentication. This name correlates to the JAAS login-config.xml descriptor
            application-policy/name attribute.
            Ex:
            <security-domain>HsqlDbRealm</security-domain>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```

<xs:complexType name="workmanagerType">
  <xs:sequence>
    <xs:element name="security" type="workmanagerSecurityType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines the security model used by the WorkManager instance
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityType">
  <xs:sequence>
    <xs:element name="mapping-required" type="xs:boolean" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines if a mapping is required for security credentials. A value of false means
            "Case 1" as defined in section 16.4.3, and a value of true means "Case 2" as
            defined in section 16.4.4.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="domain" type="xs:token" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines the name of the security domain that should be used
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="default-principal" type="xs:token" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines a default principal name that should be added to the used Subject instance
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="default-
groups" type="workmanagerSecurityGroupsType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines a default groups that should be added to the used Subject instance
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="mappings" type="workmanagerSecurityMappingsType" minOccurs="0" maxOccurs="1">
      <xs:annotation>

```

```

        <xs:documentation>
          <![CDATA[[
            Defines the mappings that should be applied for Case 2
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityGroupsType">
  <xs:sequence>
    <xs:element name="group" type="xs:token" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The name of the group
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityMappingsType">
  <xs:sequence>

    <xs:element name="users" type="workmanagerSecurityMappingsUsersType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The mappings for the users
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>

    <xs:element name="groups" type="workmanagerSecurityMappingsGroupsType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The mappings for the groups
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityMappingsUsersType">
  <xs:sequence>

    <xs:element name="map" type="workmanagerSecurityMappingType" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            A user mapping
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```
</xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityMappingsGroupsType">
  <xs:sequence>

<xs:element name="map" type="workmanagerSecurityMappingType" minOccurs="1" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        A group mapping
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="workmanagerSecurityMappingType">
  <xs:sequence>
</xs:sequence>
  <xs:attribute name="from" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specify the original value
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="to" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specify the mapped value
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>

<xs:complexType name="capacityType">
  <xs:sequence>
    <xs:element name="incrementer" type="extensionType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines the policy for incrementing connections in the pool
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="decrementer" type="extensionType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Defines the policy for decrementing connections in the pool
```

```

    ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

</xs:schema>

```

A.9. Datasources 1.0

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified"
  targetNamespace="http://www.ironjacamar.org/doc/schema"
  xmlns="http://www.ironjacamar.org/doc/schema">

  <xs:element name="datasources" type="datasourcesType">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          The datasources element is the root of the JDBC datasource configuration
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:complexType name="datasourcesType">
    <xs:sequence>
      <xs:choice minOccurs="0" maxOccurs="unbounded">
        <xs:element name="datasource" type="datasourceType">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Specifies a non-XA datasource, using local transactions
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="xa-datasource" type="xa-datasourceType">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Specifies a XA datasource
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:choice>
      <xs:element name="drivers" type="driversType" maxOccurs="1" minOccurs="0"></xs:element>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="datasourceType" mixed="false">
    <xs:sequence>

```

```

<xs:element name="connection-url" type="xs:token">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The JDBC driver connection URL Ex: <connection-url>jdbc:hsqldb:hsq1://localhost:1701</
connection-url>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="driver-class" type="xs:token" maxOccurs="1" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The fully qualified name of the JDBC driver class Ex: <driver-
class>org.hsqldb.jdbcDriver</driver-class>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The fully qualified name of the JDBC datasource class Ex: <datasource-
class>org.h2.jdbcx.JdbcDataSource</datasource-class>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="driver" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        An unique reference to the classloader module which contains the JDBC driver
        The accepted format is driverName#majorVersion.minorVersion
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
  <xs:element name="connection-property" type="connection-
propertyType" minOccurs="0" maxOccurs="unbounded">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          The connection-property element allows you to pass in arbitrary connection
          properties to the Driver.connect(url, props) method. Each connection-property
          specifies a string name/value pair with the property name coming from the
          name attribute and the value coming from the element content. Ex:
          <connection-property name="char.encoding">UTF-8</connection-property>
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="new-connection-sql" type="xs:string" minOccurs="0">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specify an SQL statement to execute whenever a connection is added

```



```

        to the connection pool.
    ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="transaction-isolation" type="transaction-isolationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Set java.sql.Connection transaction isolation level to use. The constants
        defined by transaction-isolation-values are the possible transaction isolation
        levels and include: TRANSACTION_READ_UNCOMMITTED TRANSACTION_READ_COMMITTED
        TRANSACTION_REPEATABLE_READ TRANSACTION_SERIALIZABLE TRANSACTION_NONE
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="url-delimiter" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the delimiter for URLs in connection-url for HA datasources
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="url-selector-strategy-class-name" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        A class that implements org.jboss.jca.adapters.jdbc.URLSelectorStrategy
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="pool" type="poolType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the pooling settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="security" type="dsSecurityType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the security settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validation" type="validationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the validation settings
      ]]>
    </xs:documentation>
  </xs:annotation>

```

```

        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="timeout" type="timeoutType" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the time out settings
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="statement" type="statementType" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the statement settings
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="jta" type="xs:boolean" default="true" use="optional">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Enable JTA integration
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attributeGroup ref="common-datasourceAttributes" />
</xs:complexType>
<xs:complexType name="xa-datasourceType">
    <xs:sequence>
        <xs:element name="xa-datasource-property" type="xa-datasource-
propertyType" minOccurs="1" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        Specifies a property to assign to the XADataSource implementation class.
                        Each property is identified by the name attribute and the property value
                        is given by the xa-datasource-property element content. The property is mapped
                        onto the XADataSource implementation by looking for a JavaBeans style getter
                        method for the property name. If found, the value of the property is set
                        using the JavaBeans setter with the element text translated to the true property
                        type using the java.beans.PropertyEditor for the type. Ex:
                        <xa-datasource-property name="IfxWAITTIME">10</xa-datasource-property>
                        <xa-datasource-property name="IfxIFXHOST">myhost.mydomain.com</xa-datasource-
property>
                        <xa-datasource-property name="PortNumber">1557</xa-datasource-property>
                        <xa-datasource-property name="DatabaseName">mydb</xa-datasource-property>
                        <xa-datasource-property name="ServerName">myserver</xa-datasource-property>
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="xa-datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
            <xs:annotation>

```

```

<xs:documentation>
  <![CDATA[[
    The fully qualified name of the javax.sql.XADataSource implementation
    class. Ex: <xa-datasource-class>oracle.jdbc.xa.client.OracleXADataSource</xa-
datasource-class>
  ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="driver" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        An unique reference to the classloader module which contains the JDBC driver
        The accepted format is driverName#majorVersion.minorVersion
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="url-delimiter" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the delimiter for URLs in the connection url for HA datasources
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="url-selector-strategy-class-name" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        A class that implements org.jboss.jca.adapters.jdbc.URLSelectorStrategy
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="new-connection-sql" type="xs:string" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies an SQL statement to execute whenever a connection is added
        to the connection pool.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="transaction-isolation" type="transaction-isolationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Set java.sql.Connection transaction isolation level to use. The constants
        defined by transaction-isolation-values are the possible transaction isolation
        levels and include: TRANSACTION_READ_UNCOMMITTED TRANSACTION_READ_COMMITTED
        TRANSACTION_REPEATABLE_READ TRANSACTION_SERIALIZABLE TRANSACTION_NONE
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>

```

```
<xs:element name="xa-pool" type="xa-poolType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the pooling settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="security" type="dsSecurityType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the security settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validation" type="validationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the validation settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="timeout" type="timeoutType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the time out settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="statement" type="statementType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the statement settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="recovery" type="recoverType" minOccurs="0" maxOccurs="1"></xs:element>
</xs:sequence>
<xs:attributeGroup ref="common-datasourceAttributes" />
</xs:complexType>
<xs:complexType name="boolean-presenceType" />
<xs:attributeGroup name="common-datasourceAttributes">
  <xs:attribute name="jndi-name" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the JNDI name for the datasource
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

```

```

</xs:attribute>
<xs:attribute name="pool-name" type="xs:token" use="required">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the pool name for the datasource used for management
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>

<xs:attribute name="enabled" type="xs:boolean" default="true" form="unqualified" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies if the datasource should be enabled
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute default="true" name="use-java-context" type="xs:boolean">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Setting this to false will bind the DataSource into global JNDI
        Ex: use-java-context="true"
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute default="false" name="spy" type="xs:boolean">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Enable spy functionality on the JDBC layer - e.g. log all JDBC traffic to the datasource.
        Remember to enable the logging category (org.jboss.jdbc) too.
        Ex: spy="true"
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute default="true" name="use-ccm" type="xs:boolean">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Enable the use of a cached connection manager
        Ex: use-ccm="true"
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:attributeGroup>
<xs:simpleType name="transaction-isolationType">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Define constants used as the possible transaction isolation levels in transaction-
isolation

```

```

        type. Include: TRANSACTION_READ_UNCOMMITTED, TRANSACTION_READ_COMMITTED,
TRANSACTION_REPEATABLE_READ,
        TRANSACTION_SERIALIZABLE, TRANSACTION_NONE
    ]]>
    </xs:documentation>
</xs:annotation>
<xs:restriction base="xs:token">
    <xs:enumeration value="TRANSACTION_READ_UNCOMMITTED" />
    <xs:enumeration value="TRANSACTION_READ_COMMITTED" />
    <xs:enumeration value="TRANSACTION_REPEATABLE_READ" />
    <xs:enumeration value="TRANSACTION_SERIALIZABLE" />
    <xs:enumeration value="TRANSACTION_NONE" />
</xs:restriction>
</xs:simpleType>
<xs:complexType name="xa-datasource-propertyType" mixed="true">
    <xs:attribute name="name" use="required" type="xs:token" />
</xs:complexType>
<xs:complexType name="connection-propertyType" mixed="true">
    <xs:attribute name="name" use="required" type="xs:token" />
</xs:complexType>
<xs:complexType name="validationType">
    <xs:sequence>
        <xs:element name="valid-connection-checker" type="extensionType" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        An org.jboss.jca.adapters.jdbc.ValidConnectionChecker that provides
                        a SQLException isValidConnection(Connection e) method to validate is a connection
                        is valid. An exception means the connection is destroyed. This overrides
                        the check-valid-connection-sql when present. Ex:
                                                                    <valid-connection-checker      class-
name="org.jboss.jca.adapters.jdbc.vendor.OracleValidConnectionChecker"/>
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>

        <xs:element name="check-valid-connection-sql" type="xs:string" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        Specify an SQL statement to check validity of a pool connection. This
                        may be called when managed connection is taken from pool for use.
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="validate-on-match" type="xs:boolean" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The validate-on-match element indicates whether or not connection
                        level validation should be done when a connection factory attempts to match
                        a managed connection for a given set. This is typically exclusive to the
                        use of background validation
                    ]]>
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>

```

```

<xs:element name="background-validation" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        An element to specify that connections should be validated on a background
        thread versus being validated prior to use
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="background-validation-millis" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The background-validation-millis element specifies the amount of
        time, in millis, that background validation will run.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="use-fast-fail" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Whether fail a connection allocation on the first connection if it
        is invalid (true) or keep trying until the pool is exhausted of all potential
        connections (false) default false. e.g. <use-fast-fail>true</use-fast-fail>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element minOccurs="0" name="stale-connection-checker" type="extensionType">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        An org.jboss.jca.adapters.jdbc.StaleConnectionChecker that provides
        a boolean isStaleConnection(SQLException e) method which if it returns
        true will wrap the exception in an
        org.jboss.jca.adapters.jdbc.StaleConnectionException
        which is a subclass of SQLException. Ex:
        <stale-connection-checker class-
name="org.jboss.jca.adapters.jdbc.vendor.OracleStaleConnectionChecker"/>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="exception-sorter" type="extensionType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        An org.jboss.jca.adapters.jdbc.ExceptionSorter that provides a
        boolean isExceptionFatal(SQLException e) method to validate is an exception
        should be broadcast to all javax.resource.spi.ConnectionEventListener as
        a connectionErrorOccurred message. Ex:
        <exception-sorter class-
name="org.jboss.jca.adapters.jdbc.vendor.OracleExceptionSorter"/>
      ]]>
    </xs:documentation>
  </xs:annotation>

```

```

    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="timeoutType">
  <xs:sequence>
    <xs:element name="blocking-timeout-millis" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The blocking-timeout-millis element indicates the maximum time in
            milliseconds to block while waiting for a connection before throwing an exception.
            Note that this blocks only while waiting for a permit for a connection, and
            will never throw an exception if creating a new connection takes an inordinately
            long time. The default is 30000 (30 seconds).
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="idle-timeout-minutes" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The idle-timeout-minutes elements indicates the maximum time in minutes
            a connection may be idle before being closed. The actual maximum time depends
            also on the IdleRemover scan time, which is 1/2 the smallest idle-timeout-minutes
            of any pool.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="set-tx-query-timeout" type="boolean-presenceType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Whether to set the query timeout based on the time remaining until
            transaction timeout, any configured query timeout will be used if there is
            no transaction. The default is false. e.g. <set-tx-query-timeout/>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="query-timeout" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Any configured query timeout in seconds The default is no timeout
            e.g. 5 minutes <query-timeout>300</query-timeout>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="use-try-lock" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Any configured timeout for internal locks on the resource adapter
            objects in seconds The default is a 60 second timeout e.g. 5 minutes <use-
            try-lock>300</use-try-lock>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```



```

    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="allocation-retry" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The allocation retry element indicates the number of times that allocating
        a connection should be tried before throwing an exception. The default is 0.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="allocation-retry-wait-millis" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The allocation retry wait millis element indicates the time in milliseconds
        to wait between retrying to allocate a connection. The default is 5000 (5 seconds).
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="xa-resource-timeout" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Passed to XAResource.setTimeout() Default is zero which
        does not invoke the setter. In seconds e.g. 5 minutes <xa-resource-timeout>300</
xa-resource-timeout>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:simpleType name="track-statementsType">
  <xs:restriction base="xs:token">
    <xs:enumeration value="true" />
    <xs:enumeration value="false" />
    <xs:enumeration value="nowarn" />
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="statementType">
  <xs:sequence>
    <xs:element name="track-statements" type="track-statementsType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Whether to check for unclosed statements when a connection is returned
            to the pool and result sets are closed when a statement is closed/return
            to the prepared statement cache. valid values are: false - do not track statements
            and results true - track statements and result sets and warn when they are
            not closed nowarn - track statements but do no warn about them being unclosed
            (the default) e.g. <track-statements>nowarn</track-statements>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>

```

```

<xs:element name="prepared-statement-cache-
size" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The number of prepared statements per connection in an LRU cache
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="share-prepared-statements" type="boolean-presenceType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Whether to share prepare statements, i.e. whether asking for same
        statement twice without closing uses the same underlying prepared statement.
        The default is false. e.g. <share-prepared-statements/>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="poolType">
  <xs:sequence>
    <xs:element name="min-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The min-pool-size element indicates the minimum number of connections
            a pool should hold. This default to 0. Ex: <min-pool-size>1</min-pool-size>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="max-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The max-pool-size element indicates the maximum number of connections
            for a pool. No more connections will be created in each sub-pool.
            This defaults to 20.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="prefill" type="xs:boolean" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Whether to attempt to prefill the connection pool. Empty element denotes
            a true value. e.g. <prefill>true</prefill>.
            Default is false
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="use-strict-min" type="xs:boolean" minOccurs="0" maxOccurs="1">
      <xs:annotation>

```

```

<xs:documentation>
  <![CDATA[[
    Define if the min-pool-size should be considered strictly.
    Default false
  ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="flush-strategy" type="xs:token" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies how the pool should be flush in case of an error.
        Valid values are: FailingConnectionOnly (default), IdleConnections, EntirePool
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="xa-poolType">
  <xs:complexContent>
    <xs:extension base="poolType">
      <xs:sequence>
        <xs:element name="is-same-rm-override" type="xs:boolean" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                The is-same-rm-override element allows one to unconditionally
                set whether the javax.transaction.xa.XAResource.isSameRM(XAResource) returns
                true or false. Ex: <is-same-rm-override>true</is-same-rm-override>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="interleaving" type="boolean-presenceType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                An element to enable interleaving for XA connection factories
                Ex: <interleaving/>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="no-tx-separate-pools" type="boolean-presenceType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Oracle does not like XA connections getting used both inside and outside
                a JTA transaction.
                To workaround the problem you can create separate sub-pools for the
                different contexts
                using <no-tx-separate-pools/>
                Ex: <no-tx-separate-pools/>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>

```

```

<xs:element name="pad-xid" type="xs:boolean" default="false" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Should the Xid be padded
        Ex: <pad-xid>true</pad-xid>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="wrap-xa-resource" type="xs:boolean" default="true" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Should the XAResource instances be wrapped in a org.jboss.tm.XAResourceWrapper
        instance
        Ex: <wrap-xa-resource>true</wrap-xa-resource>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType name="dsSecurityType">
  <xs:sequence>
    <xs:element name="user-name" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the username used when creating a new connection.
            Ex: <user-name>sa</user-name>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="password" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the password used when creating a new connection.
            Ex: <password>sa-pass</password>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Indicates Subject (from security domain) are used to distinguish connections
            in the pool.

            The content of the security-domain is the name of the JAAS security manager
            that will handle
            authentication. This name correlates to the JAAS login-config.xml descriptor
            application-policy/name attribute.
            Ex:
            <security-domain>HsqlDbRealm</security-domain>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```

]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="reauth-plugin" type="extensionType" minOccurs="0" maxOccurs="1"></
xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="extensionType">
  <xs:sequence>
    <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded"></xs:element>
  </xs:sequence>
  <xs:attribute name="class-name" type="xs:token" use="required"></xs:attribute>
</xs:complexType>

<xs:complexType name="config-propertyType" mixed="true">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies a Java bean property value
      ]]>
    </xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:token">
      <xs:attribute use="required" name="name" type="xs:token">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies the name of the config-property
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="recoverType">
  <xs:sequence>
    <xs:element name="recover-credential" type="dsSecurityType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the security options used when creating a connection during recovery.
            Note: if this credential are not specified the security credential are used
for recover too
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="recover-plugin" type="extensionType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the extension plugin used in spi (core.spi.xa)
            which can be implemented by various plugins to provide better feedback to
the XA recovery system.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```

    ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="no-recovery" type="xs:boolean" default="false" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify if the xa-datasource should be excluded from recovery.
        Default false.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>

<xs:complexType name="driverType">
  <xs:sequence>
    <xs:element name="driver-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the JDBC driver class Ex: <driver-
            class>org.hsqldb.jdbcDriver</driver-class>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the javax.sql.DataSource implementation
            class.
          ]]>
        </xs:documentation>
      </xs:annotation></xs:element>
    <xs:element name="xa-datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the javax.sql.XADataSource implementation
            class. Ex: <xa-datasource-class>oracle.jdbc.xa.client.OracleXADataSource</xa-
            datasource-class>
          ]]>
        </xs:documentation>
      </xs:annotation></xs:element>
    </xs:sequence>
    <xs:attribute name="name" type="xs:token" use="required">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the symbolic name of this driver used to reference this driver
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="module" type="xs:token" use="optional">

```

```

<xs:annotation>
  <xs:documentation>
    <![CDATA[[
      Specifies the name of AS7 module providing this driver.
      Thios tag is not used in IronJacamar standalone container.
    ]]>
  </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="major-version" type="xs:int" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the major version of this driver. If the major and minor version is
        obmitted the first availabe
        Driver in module will be used.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="minor-verion" type="xs:int" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the minor version of this driver. If the major and minor version is
        obmitted the first availabe
        Driver in module will be used.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>

<xs:complexType name="driversType">
  <xs:sequence>
    <xs:element name="driver" type="driverType" maxOccurs="unbounded" minOccurs="1"></
xs:element>
  </xs:sequence>
</xs:complexType>
</xs:schema>

```

A.10. Datasources 1.1

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified"
  targetNamespace="http://www.ironjacamar.org/doc/schema"
  xmlns="http://www.ironjacamar.org/doc/schema">

  <xs:element name="datasources" type="datasourcesType">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[

```

```

    The datasources element is the root of the JDBC datasource configuration
  ]]>
  </xs:documentation>
</xs:annotation>
</xs:element>
<xs:complexType name="datasourcesType">
  <xs:sequence>
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element name="datasource" type="datasourceType">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies a non-XA datasource, using local transactions
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="xa-datasource" type="xa-datasourceType">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies a XA datasource
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:choice>
    <xs:element name="drivers" type="driversType" maxOccurs="1" minOccurs="0"></xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="datasourceType" mixed="false">
  <xs:sequence>
    <xs:element name="connection-url" type="xs:token">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The JDBC driver connection URL Ex: <connection-url>jdbc:hsqldb:hsqldb://localhost:1701</
connection-url>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="driver-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the JDBC driver class Ex: <driver-
class>org.hsqldb.jdbcDriver</driver-class>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the JDBC datasource class Ex: <datasource-
class>org.h2.jdbcx.JdbcDataSource</datasource-class>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```



```

    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="driver" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        An unique reference to the classloader module which contains the JDBC driver
        The accepted format is driverName#majorVersion.minorVersion
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>

    <xs:element name="connection-property" type="connection-
propertyType" minOccurs="0" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The connection-property element allows you to pass in arbitrary connection
        properties to the Driver.connect(url, props) method. Each connection-property
        specifies a string name/value pair with the property name coming from the
        name attribute and the value coming from the element content. Ex:
        <connection-property name="char.encoding">UTF-8</connection-property>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="new-connection-sql" type="xs:string" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify an SQL statement to execute whenever a connection is added
        to the connection pool.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="transaction-isolation" type="transaction-isolationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Set java.sql.Connection transaction isolation level to use. The constants
        defined by transaction-isolation-values are the possible transaction isolation
        levels and include: TRANSACTION_READ_UNCOMMITTED TRANSACTION_READ_COMMITTED
        TRANSACTION_REPEATABLE_READ TRANSACTION_SERIALIZABLE TRANSACTION_NONE
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="url-delimiter" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the delimiter for URLs in connection-url for HA datasources
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="url-selector-strategy-class-name" type="xs:token" minOccurs="0">

```

```
<xs:annotation>
  <xs:documentation>
    <![CDATA[[
      A class that implements org.jboss.jca.adapters.jdbc.URLSelectorStrategy
    ]]>
  </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="pool" type="poolType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the pooling settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="security" type="dsSecurityType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the security settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validation" type="validationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the validation settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="timeout" type="timeoutType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the time out settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="statement" type="statementType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the statement settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="jta" type="xs:boolean" default="true" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Enable JTA integration
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:element>
```

```

]]>
</xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attributeGroup ref="common-datasourceAttributes" />
</xs:complexType>
<xs:complexType name="xa-datasourceType">
  <xs:sequence>
    <xs:element name="xa-datasource-property" type="xa-datasource-
propertyType" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies a property to assign to the XADataSource implementation class.
            Each property is identified by the name attribute and the property value
            is given by the xa-datasource-property element content. The property is mapped
            onto the XADataSource implementation by looking for a JavaBeans style getter
            method for the property name. If found, the value of the property is set
            using the JavaBeans setter with the element text translated to the true property
            type using the java.beans.PropertyEditor for the type. Ex:
            <xa-datasource-property name="IfxWAITTIME">10</xa-datasource-property>
            <xa-datasource-property name="IfxIFXHOST">myhost.mydomain.com</xa-datasource-
property>
            <xa-datasource-property name="PortNumber">1557</xa-datasource-property>
            <xa-datasource-property name="DatabaseName">mydb</xa-datasource-property>
            <xa-datasource-property name="ServerName">myserver</xa-datasource-property>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="xa-datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the javax.sql.XADataSource implementation
            class. Ex: <xa-datasource-class>oracle.jdbc.xa.client.OracleXADataSource</xa-
datasource-class>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="driver" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            An unique reference to the classloader module which contains the JDBC driver
            The accepted format is driverName#majorVersion.minorVersion
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="url-delimiter" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the delimiter for URLs in the connection url for HA datasources
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```
</xs:element>
<xs:element name="url-selector-strategy-class-name" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        A class that implements org.jboss.jca.adapters.jdbc.URLSelectorStrategy
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="new-connection-sql" type="xs:string" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies an SQL statement to execute whenever a connection is added
        to the connection pool.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="transaction-isolation" type="transaction-isolationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Set java.sql.Connection transaction isolation level to use. The constants
        defined by transaction-isolation-values are the possible transaction isolation
        levels and include: TRANSACTION_READ_UNCOMMITTED TRANSACTION_READ_COMMITTED
        TRANSACTION_REPEATABLE_READ TRANSACTION_SERIALIZABLE TRANSACTION_NONE
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="xa-pool" type="xa-poolType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the pooling settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="security" type="dsSecurityType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the security settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validation" type="validationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the validation settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
```

```

<xs:element name="timeout" type="timeoutType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the time out settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="statement" type="statementType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the statement settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="recovery" type="recoverType" minOccurs="0" maxOccurs="1"></xs:element>
</xs:sequence>
<xs:attributeGroup ref="common-datasourceAttributes" />
</xs:complexType>
<xs:complexType name="boolean-presenceType" />
<xs:attributeGroup name="common-datasourceAttributes">
  <xs:attribute name="jndi-name" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the JNDI name for the datasource
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="pool-name" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the pool name for the datasource used for management
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="enabled" type="xs:boolean" default="true" form="unqualified" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies if the datasource should be enabled
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute default="true" name="use-java-context" type="xs:boolean">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Setting this to false will bind the DataSource into global JNDI
          Ex: use-java-context="true"
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

```

```

    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute default="false" name="spy" type="xs:boolean">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Enable spy functionality on the JDBC layer - e.g. log all JDBC traffic to the datasource.
        Remember to enable the logging category (org.jboss.jdbc) too.
        Ex: spy="true"
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute default="true" name="use-ccm" type="xs:boolean">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Enable the use of a cached connection manager
        Ex: use-ccm="true"
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:attributeGroup>
<xs:simpleType name="transaction-isolationType">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Define constants used as the possible transaction isolation levels in transaction-
isolation
        type. Include: TRANSACTION_READ_UNCOMMITTED, TRANSACTION_READ_COMMITTED,
TRANSACTION_REPEATABLE_READ,
        TRANSACTION_SERIALIZABLE, TRANSACTION_NONE
      ]]>
    </xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:token">
    <xs:enumeration value="TRANSACTION_READ_UNCOMMITTED" />
    <xs:enumeration value="TRANSACTION_READ_COMMITTED" />
    <xs:enumeration value="TRANSACTION_REPEATABLE_READ" />
    <xs:enumeration value="TRANSACTION_SERIALIZABLE" />
    <xs:enumeration value="TRANSACTION_NONE" />
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="xa-datasource-propertyType" mixed="true">
  <xs:attribute name="name" use="required" type="xs:token" />
</xs:complexType>
<xs:complexType name="connection-propertyType" mixed="true">
  <xs:attribute name="name" use="required" type="xs:token" />
</xs:complexType>
<xs:complexType name="validationType">
  <xs:sequence>
    <xs:element name="valid-connection-checker" type="extensionType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            An org.jboss.jca.adapters.jdbc.ValidConnectionChecker that provides
            a SQLException isValidConnection(Connection e) method to validate is a connection
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```

        is valid. An exception means the connection is destroyed. This overrides
        the check-valid-connection-sql when present. Ex:
                                <valid-connection-checker      class-
name="org.jboss.jca.adapters.jdbc.vendor.OracleValidConnectionChecker"/>
    ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>

<xs:element name="check-valid-connection-sql" type="xs:string" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify an SQL statement to check validity of a pool connection. This
        may be called when managed connection is taken from pool for use.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validate-on-match" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The validate-on-match element indicates whether or not connection
        level validation should be done when a connection factory attempts to match
        a managed connection for a given set. This is typically exclusive to the
        use of background validation
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="background-validation" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        An element to specify that connections should be validated on a background
        thread versus being validated prior to use
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="background-validation-millis" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The background-validation-millis element specifies the amount of
        time, in millis, that background validation will run.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="use-fast-fail" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Whether fail a connection allocation on the first connection if it
        is invalid (true) or keep trying until the pool is exhausted of all potential
        connections (false) default false. e.g. <use-fast-fail>true</use-fast-fail>
      ]]>
    </xs:documentation>
  </xs:annotation>

```

```

        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element minOccurs="0" name="stale-connection-checker" type="extensionType">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                An org.jboss.jca.adapters.jdbc.StaleConnectionChecker that provides
                a boolean isStaleConnection(SQLException e) method which if it returns
                true will wrap the exception in an
                org.jboss.jca.adapters.jdbc.StaleConnectionException
                which is a subclass of SQLException. Ex:
                <stale-connection-checker class-
name="org.jboss.jca.adapters.jdbc.vendor.OracleStaleConnectionChecker"/>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="exception-sorter" type="extensionType" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                An org.jboss.jca.adapters.jdbc.ExceptionSorter that provides a
                boolean isExceptionFatal(SQLException e) method to validate is an exception
                should be broadcast to all javax.resource.spi.ConnectionEventListener as
                a connectionErrorOccurred message. Ex:
                <exception-sorter class-
name="org.jboss.jca.adapters.jdbc.vendor.OracleExceptionSorter"/>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="timeoutType">
    <xs:sequence>
        <xs:element name="blocking-timeout-millis" type="xs:nonNegativeInteger" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The blocking-timeout-millis element indicates the maximum time in
                        milliseconds to block while waiting for a connection before throwing an exception.
                        Note that this blocks only while waiting for a permit for a connection, and
                        will never throw an exception if creating a new connection takes an inordinately
                        long time. The default is 30000 (30 seconds).
                    ]]>
                </xs:documentation>
            </xs:annotation>
</xs:element>
<xs:element name="idle-timeout-minutes" type="xs:nonNegativeInteger" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        The idle-timeout-minutes elements indicates the maximum time in minutes
                        a connection may be idle before being closed. The actual maximum time depends
                        also on the IdleRemover scan time, which is 1/2 the smallest idle-timeout-minutes
                        of any pool.
                    ]]>
                </xs:documentation>
            </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

```



```

    </xs:annotation>
  </xs:element>
  <xs:element name="set-tx-query-timeout" type="boolean-presenceType" minOccurs="0">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Whether to set the query timeout based on the time remaining until
          transaction timeout, any configured query timeout will be used if there is
          no transaction. The default is false. e.g. <set-tx-query-timeout/>
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="query-timeout" type="xs:nonNegativeInteger" minOccurs="0">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Any configured query timeout in seconds The default is no timeout
          e.g. 5 minutes <query-timeout>300</query-timeout>
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="use-try-lock" type="xs:nonNegativeInteger" minOccurs="0">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Any configured timeout for internal locks on the resource adapter
          objects in seconds The default is a 60 second timeout e.g. 5 minutes <use-
          try-lock>300</use-try-lock>
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="allocation-retry" type="xs:nonNegativeInteger" minOccurs="0">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          The allocation retry element indicates the number of times that allocating
          a connection should be tried before throwing an exception. The default is 0.
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="allocation-retry-wait-millis" type="xs:nonNegativeInteger" minOccurs="0">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          The allocation retry wait millis element indicates the time in milliseconds
          to wait between retrying to allocate a connection. The default is 5000 (5 seconds).
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="xa-resource-timeout" type="xs:token" minOccurs="0">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Passed to XAResource.setTimeout() Default is zero which

```

```

        does not invoke the setter. In seconds e.g. 5 minutes <xa-resource-timeout>300</
xa-resource-timeout>
    ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:simpleType name="track-statementsType">
  <xs:restriction base="xs:token">
    <xs:enumeration value="true" />
    <xs:enumeration value="false" />
    <xs:enumeration value="nowarn" />
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="statementType">
  <xs:sequence>
    <xs:element name="track-statements" type="track-statementsType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Whether to check for unclosed statements when a connection is returned
            to the pool and result sets are closed when a statement is closed/return
            to the prepared statement cache. valid values are: false - do not track statements
            and results true - track statements and result sets and warn when they are
            not closed nowarn - track statements but do no warn about them being unclosed
            (the default) e.g. <track-statements>nowarn</track-statements>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="prepared-statement-cache-
size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The number of prepared statements per connection in an LRU cache
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="share-prepared-statements" type="boolean-presenceType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Whether to share prepare statements, i.e. whether asking for same
            statement twice without closing uses the same underlying prepared statement.
            The default is false. e.g. <share-prepared-statements/>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="poolType">
  <xs:sequence>
    <xs:element name="min-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>

```

```

    <![CDATA[[
      The min-pool-size element indicates the minimum number of connections
      a pool should hold. This default to 0. Ex: <min-pool-size>1</min-pool-size>
    ]]>
  </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="max-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The max-pool-size element indicates the maximum number of connections
        for a pool. No more connections will be created in each sub-pool.
        This defaults to 20.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="prefill" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Whether to attempt to prefill the connection pool. Empty element denotes
        a true value. e.g. <prefill>true</prefill>.
        Default is false
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="use-strict-min" type="xs:boolean" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Define if the min-pool-size should be considered strictly.
        Default false
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="flush-strategy" type="xs:token" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies how the pool should be flush in case of an error.
        Valid values are: FailingConnectionOnly (default), IdleConnections, EntirePool
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="allow-multiple-users" type="boolean-
presenceType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies if multiple users will access the datasource through the getConnection(user,
        password)
        method and hence if the internal pool type should account for that
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>

```

```

    </xs:annotation>
  </xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="xa-poolType">
  <xs:complexContent>
    <xs:extension base="poolType">
      <xs:sequence>
        <xs:element name="is-same-rm-override" type="xs:boolean" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                The is-same-rm-override element allows one to unconditionally
                set whether the javax.transaction.xa.XAResource.isSameRM(XAResource) returns
                true or false. Ex: <is-same-rm-override>true</is-same-rm-override>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="interleaving" type="boolean-presenceType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                An element to enable interleaving for XA connection factories
                Ex: <interleaving/>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="no-tx-separate-pools" type="boolean-presenceType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Oracle does not like XA connections getting used both inside and outside
                a JTA transaction.
                To workaround the problem you can create separate sub-pools for the
                different contexts
                using <no-tx-separate-pools/>
                Ex: <no-tx-separate-pools/>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="pad-xid" type="xs:boolean" default="false" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Should the Xid be padded
                Ex: <pad-xid>true</pad-xid>
              ]]>
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="wrap-xa-resource" type="xs:boolean" default="true" minOccurs="0">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Should the XAResource instances be wrapped in a org.jboss.tm.XAResourceWrapper
                instance
            
```

```

        Ex: <wrap-xa-resource>true</wrap-xa-resource>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType name="dsSecurityType">
  <xs:sequence>
    <xs:element name="user-name" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the username used when creating a new connection.
            Ex: <user-name>sa</user-name>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="password" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the password used when creating a new connection.
            Ex: <password>sa-pass</password>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Indicates Subject (from security domain) are used to distinguish connections
            in the pool.

            The content of the security-domain is the name of the JAAS security manager
            that will handle
            authentication. This name correlates to the JAAS login-config.xml descriptor
            application-policy/name attribute.
            Ex:
            <security-domain>HsqlDbRealm</security-domain>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="reauth-plugin" type="extensionType" minOccurs="0" maxOccurs="1"></
xs:element>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="extensionType">
  <xs:sequence>
    <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded"></xs:element>
  </xs:sequence>
  <xs:attribute name="class-name" type="xs:token" use="required"></xs:attribute>
</xs:complexType>

```

```

<xs:complexType name="config-propertyType" mixed="true">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies a Java bean property value
      ]]>
    </xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:token">
      <xs:attribute use="required" name="name" type="xs:token">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies the name of the config-property
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="recoverType">
  <xs:sequence>
    <xs:element name="recover-credential" type="dsSecurityType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the security options used when creating a connection during recovery.
            Note: if this credential are not specified the security credential are used
for recover too
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="recover-plugin" type="extensionType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the extension plugin used in spi (core.spi.xa)
            which can be implemented by various plugins to provide better feedback to
the XA recovery system.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="no-recovery" type="xs:boolean" default="false" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specify if the xa-datasource should be excluded from recovery.
          Default false.
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>

```

```

<xs:complexType name="driverType">
  <xs:sequence>
    <xs:element name="driver-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the JDBC driver class Ex: <driver-
class>org.hsqldb.jdbcDriver</driver-class>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the javax.sql.DataSource implementation
            class.
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="xa-datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the javax.sql.XADataSource implementation
            class. Ex: <xa-datasource-class>oracle.jdbc.xa.client.OracleXADataSource</xa-
datasource-class>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="name" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the symbolic name of this driver used to reference this driver
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="module" type="xs:token" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the name of AS7 module providing this driver.
          Thios tag is not used in IronJacamar standalone container.
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="major-version" type="xs:int" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the major version of this driver. If the major and minor version is
          obmitted the fist availabe
          Driver in module will be used.
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

```

```
    ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="minor-verion" type="xs:int" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the minor version of this driver. If the major and minor version is
        obmitted the fist availabe
        Driver in module will be used.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>

<xs:complexType name="driversType">
  <xs:sequence>
    <xs:element name="driver" type="driverType" maxOccurs="unbounded" minOccurs="1"></
xs:element>
  </xs:sequence>
</xs:complexType>
</xs:schema>
```

A.11. Datasources 1.2

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified"
  targetNamespace="http://www.ironjacamar.org/doc/schema"
  xmlns="http://www.ironjacamar.org/doc/schema">

  <xs:element name="datasources" type="datasourcesType">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          The datasources element is the root of the JDBC datasource configuration
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:complexType name="datasourcesType">
    <xs:sequence>
      <xs:choice minOccurs="0" maxOccurs="unbounded">
        <xs:element name="datasource" type="datasourceType">
          <xs:annotation>
            <xs:documentation>
              <![CDATA[[
                Specifies a non-XA datasource, using local transactions
              ]]>
            </xs:documentation>
          </xs:annotation>
```



```

</xs:element>
<xs:element name="xa-datasource" type="xa-datasourceType">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies a XA datasource
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:choice>
<xs:element name="drivers" type="driversType" maxOccurs="1" minOccurs="0"></xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="datasourceType" mixed="false">
  <xs:sequence>
    <xs:element name="connection-url" type="xs:token">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The JDBC driver connection URL Ex: <connection-url>jdbc:hsqldb:hsqldb://localhost:1701</
connection-url>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="driver-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the JDBC driver class Ex: <driver-
class>org.hsqldb.jdbcDriver</driver-class>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The fully qualified name of the JDBC datasource class Ex: <datasource-
class>org.h2.jdbcx.JdbcDataSource</datasource-class>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="driver" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            An unique reference to the classloader module which contains the JDBC driver
            The accepted format is driverName#majorVersion.minorVersion
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="connection-property" type="connection-
propertyType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>

```

```

<xs:documentation>
  <![CDATA[[
    The connection-property element allows you to pass in arbitrary connection
    properties to the Driver.connect(url, props) method. Each connection-property
    specifies a string name/value pair with the property name coming from the
    name attribute and the value coming from the element content. Ex:
    <connection-property name="char.encoding">UTF-8</connection-property>
  ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="new-connection-sql" type="xs:string" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify an SQL statement to execute whenever a connection is added
        to the connection pool.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="transaction-isolation" type="transaction-isolationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Set java.sql.Connection transaction isolation level to use. The constants
        defined by transaction-isolation-values are the possible transaction isolation
        levels and include: TRANSACTION_READ_UNCOMMITTED TRANSACTION_READ_COMMITTED
        TRANSACTION_REPEATABLE_READ TRANSACTION_SERIALIZABLE TRANSACTION_NONE
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="url-delimiter" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the delimiter for URLs in connection-url for HA datasources
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="url-selector-strategy-class-name" type="xs:token" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        A class that implements org.jboss.jca.adapters.jdbc.URLSelectorStrategy
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="pool" type="poolType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the pooling settings
      ]]>
    </xs:documentation>
  </xs:annotation>

```

```

</xs:element>
<xs:element name="security" type="dsSecurityType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the security settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validation" type="validationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the validation settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="timeout" type="timeoutType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the time out settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="statement" type="statementType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the statement settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="jta" type="xs:boolean" default="true" use="optional">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Enable JTA integration
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attributeGroup ref="common-datasourceAttributes" />
</xs:complexType>
<xs:complexType name="xa-datasourceType">
  <xs:sequence>
    <xs:element name="xa-datasource-property" type="xa-datasource-
propertyType" minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies a property to assign to the XADataSource implementation class.
            Each property is identified by the name attribute and the property value
            is given by the xa-datasource-property element content. The property is mapped

```

```

        onto the XADataSource implementation by looking for a JavaBeans style getter
        method for the property name. If found, the value of the property is set
        using the JavaBeans setter with the element text translated to the true property
        type using the java.beans.PropertyEditor for the type. Ex:
        <xa-datasource-property name="IfxWAITTIME">10</xa-datasource-property>
        <xa-datasource-property name="IfxIFXHOST">myhost.mydomain.com</xa-datasource-
property>

        <xa-datasource-property name="PortNumber">1557</xa-datasource-property>
        <xa-datasource-property name="DatabaseName">mydb</xa-datasource-property>
        <xa-datasource-property name="ServerName">myserver</xa-datasource-property>
    ]]>
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="xa-datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                The fully qualified name of the javax.sql.XADataSource implementation
                class. Ex: <xa-datasource-class>oracle.jdbc.xa.client.OracleXADataSource</xa-
datasource-class>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="driver" type="xs:token" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                An unique reference to the classloader module which contains the JDBC driver
                The accepted format is driverName#majorVersion.minorVersion
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="url-delimiter" type="xs:token" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the delimiter for URLs in the connection url for HA datasources
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="url-property" type="xs:token" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the property for the URL property in the xa-datasource-property values
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="url-selector-strategy-class-name" type="xs:token" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                A class that implements org.jboss.jca.adapters.jdbc.URLSelectorStrategy
            ]]>

```

```

    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="new-connection-sql" type="xs:string" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies an SQL statement to execute whenever a connection is added
        to the connection pool.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="transaction-isolation" type="transaction-isolationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Set java.sql.Connection transaction isolation level to use. The constants
        defined by transaction-isolation-values are the possible transaction isolation
        levels and include: TRANSACTION_READ_UNCOMMITTED TRANSACTION_READ_COMMITTED
        TRANSACTION_REPEATABLE_READ TRANSACTION_SERIALIZABLE TRANSACTION_NONE
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="xa-pool" type="xa-poolType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the pooling settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="security" type="dsSecurityType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the security settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validation" type="validationType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the validation settings
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="timeout" type="timeoutType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies the time out settings
      ]]>
    </xs:documentation>
  </xs:annotation>

```

```

    </xs:annotation>
  </xs:element>
  <xs:element name="statement" type="statementType" minOccurs="0">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the statement settings
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="recovery" type="recoverType" minOccurs="0" maxOccurs="1"></xs:element>
</xs:sequence>
<xs:attributeGroup ref="common-datasourceAttributes" />
</xs:complexType>
<xs:complexType name="boolean-presenceType" />
<xs:attributeGroup name="common-datasourceAttributes">
  <xs:attribute name="jndi-name" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the JNDI name for the datasource
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="pool-name" type="xs:token" use="required">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies the pool name for the datasource used for management
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

  <xs:attribute name="enabled" type="xs:boolean" default="true" form="unqualified" use="optional">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Specifies if the datasource should be enabled
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute default="true" name="use-java-context" type="xs:boolean">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[
          Setting this to false will bind the DataSource into global JNDI
          Ex: use-java-context="true"
        ]]>
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute default="false" name="spy" type="xs:boolean">
    <xs:annotation>
      <xs:documentation>
        <![CDATA[[

```

```

        Enable spy functionality on the JDBC layer - e.g. log all JDBC traffic to the datasource.
        Remember to enable the logging category (org.jboss.jdbc) too.
        Ex: spy="true"
    ]]>
</xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute default="true" name="use-ccm" type="xs:boolean">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Enable the use of a cached connection manager
                Ex: use-ccm="true"
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:attributeGroup>
<xs:simpleType name="transaction-isolationType">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Define constants used as the possible transaction isolation levels in transaction-
isolation
                type. Include: TRANSACTION_READ_UNCOMMITTED, TRANSACTION_READ_COMMITTED,
TRANSACTION_REPEATABLE_READ,
                TRANSACTION_SERIALIZABLE, TRANSACTION_NONE
            ]]>
        </xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:token">
        <xs:enumeration value="TRANSACTION_READ_UNCOMMITTED" />
        <xs:enumeration value="TRANSACTION_READ_COMMITTED" />
        <xs:enumeration value="TRANSACTION_REPEATABLE_READ" />
        <xs:enumeration value="TRANSACTION_SERIALIZABLE" />
        <xs:enumeration value="TRANSACTION_NONE" />
    </xs:restriction>
</xs:simpleType>
<xs:complexType name="xa-datasource-propertyType" mixed="true">
    <xs:attribute name="name" use="required" type="xs:token" />
</xs:complexType>
<xs:complexType name="connection-propertyType" mixed="true">
    <xs:attribute name="name" use="required" type="xs:token" />
</xs:complexType>
<xs:complexType name="validationType">
    <xs:sequence>
        <xs:element name="valid-connection-checker" type="extensionType" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[
                        An org.jboss.jca.adapters.jdbc.ValidConnectionChecker that provides
                        a SQLException isValidConnection(Connection e) method to validate is a connection
                        is valid. An exception means the connection is destroyed. This overrides
                        the check-valid-connection-sql when present. Ex:
                        <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.vendor.OracleValidConnectionChecker"/>
                    ]]>
                </xs:documentation>
            </xs:annotation>

```

```

</xs:element>

<xs:element name="check-valid-connection-sql" type="xs:string" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specify an SQL statement to check validity of a pool connection. This
        may be called when managed connection is taken from pool for use.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="validate-on-match" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The validate-on-match element indicates whether or not connection
        level validation should be done when a connection factory attempts to match
        a managed connection for a given set. This is typically exclusive to the
        use of background validation
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="background-validation" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        An element to specify that connections should be validated on a background
        thread versus being validated prior to use
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="background-validation-millis" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The background-validation-millis element specifies the amount of
        time, in millis, that background validation will run.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="use-fast-fail" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Whether fail a connection allocation on the first connection if it
        is invalid (true) or keep trying until the pool is exhausted of all potential
        connections (false) default false. e.g. <use-fast-fail>true</use-fast-fail>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element minOccurs="0" name="stale-connection-checker" type="extensionType">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[

```


An org.jboss.jca.adapters.jdbc.StaleConnectionChecker that provides a boolean isStaleConnection(SQLException e) method which if it returns true will wrap the exception in an org.jboss.jca.adapters.jdbc.StaleConnectionException which is a subclass of SQLException. Ex:

```

<stale-connection-checker class-
name="org.jboss.jca.adapters.jdbc.vendor.OracleStaleConnectionChecker"/>
]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="exception-sorter" type="extensionType" minOccurs="0">
<xs:annotation>
<xs:documentation>
<![CDATA[[
An org.jboss.jca.adapters.jdbc.ExceptionSorter that provides a
boolean isExceptionFatal(SQLException e) method to validate is an exception
should be broadcast to all javax.resource.spi.ConnectionEventListener as
a connectionErrorOccurred message. Ex:
<exception-sorter class-
name="org.jboss.jca.adapters.jdbc.vendor.OracleExceptionSorter"/>
]]>
</xs:documentation>
</xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="timeoutType">
<xs:sequence>
<xs:element name="blocking-timeout-millis" type="xs:nonNegativeInteger" minOccurs="0">
<xs:annotation>
<xs:documentation>
<![CDATA[[
The blocking-timeout-millis element indicates the maximum time in
milliseconds to block while waiting for a connection before throwing an exception.
Note that this blocks only while waiting for a permit for a connection, and
will never throw an exception if creating a new connection takes an inordinately
long time. The default is 30000 (30 seconds).
]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="idle-timeout-minutes" type="xs:nonNegativeInteger" minOccurs="0">
<xs:annotation>
<xs:documentation>
<![CDATA[[
The idle-timeout-minutes elements indicates the maximum time in minutes
a connection may be idle before being closed. The actual maximum time depends
also on the IdleRemover scan time, which is 1/2 the smallest idle-timeout-minutes
of any pool.
]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="set-tx-query-timeout" type="boolean-presenceType" minOccurs="0">
<xs:annotation>
<xs:documentation>
<![CDATA[[
Whether to set the query timeout based on the time remaining until

```

```

        transaction timeout, any configured query timeout will be used if there is
        no transaction. The default is false. e.g. <set-tx-query-timeout/>
    ]]>
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="query-timeout" type="xs:nonNegativeInteger" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Any configured query timeout in seconds The default is no timeout
                e.g. 5 minutes <query-timeout>300</query-timeout>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="use-try-lock" type="xs:nonNegativeInteger" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Any configured timeout for internal locks on the resource adapter
                objects in seconds The default is a 60 second timeout e.g. 5 minutes <use-
                try-lock>300</use-try-lock>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="allocation-retry" type="xs:nonNegativeInteger" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                The allocation retry element indicates the number of times that allocating
                a connection should be tried before throwing an exception. The default is 0.
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="allocation-retry-wait-millis" type="xs:nonNegativeInteger" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                The allocation retry wait millis element indicates the time in milliseconds
                to wait between retrying to allocate a connection. The default is 5000 (5 seconds).
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="xa-resource-timeout" type="xs:token" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Passed to XAResource.setTimeout() Default is zero which
                does not invoke the setter. In seconds e.g. 5 minutes <xa-resource-timeout>300</
                xa-resource-timeout>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>

```

```

</xs:complexType>
<xs:simpleType name="track-statementsType">
  <xs:restriction base="xs:token">
    <xs:enumeration value="true" />
    <xs:enumeration value="false" />
    <xs:enumeration value="nowarn" />
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="statementType">
  <xs:sequence>
    <xs:element name="track-statements" type="track-statementsType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Whether to check for unclosed statements when a connection is returned
            to the pool and result sets are closed when a statement is closed/return
            to the prepared statement cache. valid values are: false - do not track statements
            and results true - track statements and result sets and warn when they are
            not closed nowarn - track statements but do no warn about them being unclosed
            (the default) e.g. <track-statements>nowarn</track-statements>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="prepared-statement-cache-
size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The number of prepared statements per connection in an LRU cache
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="share-prepared-statements" type="boolean-presenceType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Whether to share prepare statements, i.e. whether asking for same
            statement twice without closing uses the same underlying prepared statement.
            The default is false. e.g. <share-prepared-statements/>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="poolType">
  <xs:sequence>
    <xs:element name="min-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            The min-pool-size element indicates the minimum number of connections
            a pool should hold. This default to 0. Ex: <min-pool-size>1</min-pool-size>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>

```

```

<xs:element name="initial-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The initial-pool-size element indicates the initial number of connections
        a pool should hold. This default to 0. Ex: <initial-pool-size>1</initial-pool-size>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="max-pool-size" type="xs:nonNegativeInteger" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        The max-pool-size element indicates the maximum number of connections
        for a pool. No more connections will be created in each sub-pool.
        This defaults to 20.
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="prefill" type="xs:boolean" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Whether to attempt to prefill the connection pool. Empty element denotes
        a true value. e.g. <prefill>true</prefill>.
        Default is false
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="use-strict-min" type="xs:boolean" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Define if the min-pool-size should be considered strictly.
        Default false
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="flush-strategy" type="xs:token" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies how the pool should be flush in case of an error.
        Valid values are: FailingConnectionOnly (default), InvalidIdleConnections,
        IdleConnections, Gracefully, EntirePool,
        AllInvalidIdleConnections, AllIdleConnections, AllGracefully,
        AllConnections
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="allow-multiple-users" type="boolean-
presenceType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>

```

```

        <![CDATA[[
            Specifies if multiple users will access the datasource through the getConnection(user,
password)
            method and hence if the internal pool type should account for that
        ]]>
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="capacity" type="capacityType" minOccurs="0" maxOccurs="1">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the capacity policies for the pool
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="connection-listener" type="extensionType" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                An org.jboss.jca.adapters.jdbc.spi.listener.ConnectionListener that provides
                a possible to listen for connection activation and passivation in order to
                perform actions before the connection is returned to the application or returned
                to the pool. Ex:
                <connection-listener class-name="com.acme.jdbc.OracleConnectionListener"/>
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="xa-poolType">
    <xs:complexContent>
        <xs:extension base="poolType">
            <xs:sequence>
                <xs:element name="is-same-rm-override" type="xs:boolean" minOccurs="0">
                    <xs:annotation>
                        <xs:documentation>
                            <![CDATA[[
                                The is-same-rm-override element allows one to unconditionally
                                set whether the javax.transaction.xa.XAResource.isSameRM(XAResource) returns
                                true or false. Ex: <is-same-rm-override>true</is-same-rm-override>
                            ]]>
                        </xs:documentation>
                    </xs:annotation>
                </xs:element>
                <xs:element name="interleaving" type="boolean-presenceType" minOccurs="0">
                    <xs:annotation>
                        <xs:documentation>
                            <![CDATA[[
                                An element to enable interleaving for XA connection factories
                                Ex: <interleaving/>
                            ]]>
                        </xs:documentation>
                    </xs:annotation>
                </xs:element>
                <xs:element name="no-tx-separate-pools" type="boolean-presenceType" minOccurs="0">
                    <xs:annotation>

```

```
<xs:documentation>
  <![CDATA[[
    Oracle does not like XA connections getting used both inside and outside
a JTA transaction.

    To workaround the problem you can create separate sub-pools for the
different contexts

    using <no-tx-separate-pools/>
    Ex: <no-tx-separate-pools/>
  ]]>
</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="pad-xid" type="xs:boolean" default="false" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Should the Xid be padded
        Ex: <pad-xid>true</pad-xid>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="wrap-xa-resource" type="xs:boolean" default="true" minOccurs="0">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Should the XAResource instances be wrapped in a org.jboss.tm.XAResourceWrapper
        instance
        Ex: <wrap-xa-resource>true</wrap-xa-resource>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType name="dsSecurityType">
  <xs:sequence>
    <xs:element name="user-name" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the username used when creating a new connection.
            Ex: <user-name>sa</user-name>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="password" type="xs:token" minOccurs="0">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specify the password used when creating a new connection.
            Ex: <password>sa-pass</password>
          ]]>
        </xs:documentation>
      </xs:annotation>
    </xs:element>
```

```

<xs:element name="security-domain" type="xs:token" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Indicates Subject (from security domain) are used to distinguish connections
        in the pool.

        The content of the security-domain is the name of the JAAS security manager
        that will handle
        authentication. This name correlates to the JAAS login-config.xml descriptor
        application-policy/name attribute.
        Ex:
        <security-domain>HsqlDbRealm</security-domain>
      ]]>
    </xs:documentation>
  </xs:annotation>
</xs:element>

<xs:element name="reauth-plugin" type="extensionType" minOccurs="0" maxOccurs="1"></
xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="extensionType">
  <xs:sequence>
    <xs:element name="config-property" type="config-
propertyType" minOccurs="0" maxOccurs="unbounded"></xs:element>
  </xs:sequence>
  <xs:attribute name="class-name" type="xs:token" use="required"></xs:attribute>
</xs:complexType>

<xs:complexType name="config-propertyType" mixed="true">
  <xs:annotation>
    <xs:documentation>
      <![CDATA[[
        Specifies a Java bean property value
      ]]>
    </xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:token">
      <xs:attribute use="required" name="name" type="xs:token">
        <xs:annotation>
          <xs:documentation>
            <![CDATA[[
              Specifies the name of the config-property
            ]]>
          </xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

<xs:complexType name="recoverType">
  <xs:sequence>
    <xs:element name="recover-credential" type="dsSecurityType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>
          <![CDATA[[
            Specifies the security options used when creating a connection during recovery.

```

```

        Note: if this credential are not specified the security credential are used
for recover too
    ]]>
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="recover-plugin" type="extensionType" minOccurs="0" maxOccurs="1">
    <xs:annotation>
    <xs:documentation>
        <![CDATA[[
            Specifies the extension plugin used in spi (core.spi.xa)
            which can be implemented by various plugins to provide better feedback to
the XA recovery system.
        ]]>
    </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="no-recovery" type="xs:boolean" default="false" use="optional">
    <xs:annotation>
    <xs:documentation>
        <![CDATA[[
            Specify if the xa-datasource should be excluded from recovery.
            Default false.
        ]]>
    </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>

<xs:complexType name="driverType">
    <xs:sequence>
    <xs:element name="driver-class" type="xs:token" maxOccurs="1" minOccurs="0">
    <xs:annotation>
    <xs:documentation>
        <![CDATA[[
            The fully qualifed name of the JDBC driver class Ex: <driver-
class>org.hsqldb.jdbcDriver</driver-class>
        ]]>
    </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
<xs:annotation>
    <xs:documentation>
        <![CDATA[[
            The fully qualified name of the javax.sql.DataSource implementation
            class.
        ]]>
    </xs:documentation>
    </xs:annotation></xs:element>
<xs:element name="xa-datasource-class" type="xs:token" maxOccurs="1" minOccurs="0">
<xs:annotation>
    <xs:documentation>
        <![CDATA[[
            The fully qualified name of the javax.sql.XADataSource implementation
            class. Ex: <xa-datasource-class>oracle.jdbc.xa.client.OracleXADataSource</xa-
datasource-class>
        ]]>
    </xs:documentation>
    </xs:annotation>
    </xs:element>
    </xs:sequence>
</xs:complexType>

```



```

        </xs:documentation>
    </xs:annotation></xs:element>
</xs:sequence>
<xs:attribute name="name" type="xs:token" use="required">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the symbolic name of this driver used to reference this driver
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="module" type="xs:token" use="optional">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the name of AS7 module providing this driver.
                Thios tag is not used in IronJacamar standalone container.
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="major-version" type="xs:int" use="optional">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the major version of this driver. If the major and minor version is
                obmitted the fist availabe
                Driver in module will be used.
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="minor-verion" type="xs:int" use="optional">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[[
                Specifies the minor version of this driver. If the major and minor version is
                obmitted the fist availabe
                Driver in module will be used.
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>

<xs:complexType name="driversType">
    <xs:sequence>
        <xs:element name="driver" type="driverType" maxOccurs="unbounded" minOccurs="1"></
xs:element>
    </xs:sequence>
</xs:complexType>

<xs:complexType name="capacityType">
    <xs:sequence>
        <xs:element name="incrementer" type="extensionType" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    <![CDATA[[

```

```
        Defines the policy for incrementing connections in the pool
    ]]>
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="decrementer" type="extensionType" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            <![CDATA[
                Defines the policy for decrementing connections in the pool
            ]]>
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
</xs:schema>
```

Appendix B. Samples

B.1. HelloWorld example

B.1.1. Introduction

The HelloWorld resource adapter example shows a simple example of how to use and implement the interfaces in the Java EE Connector Architecture specification.

The HelloWorld examples exposes the HelloWorldConnection interface where developers can invoke the exposed methods.

The example shows how to build and test a resource adapter.

B.1.1.1. Setup

The build environment needs various libraries in order to being able to build and test the resource adapter. The setup is done by

```
cd doc/samples/helloworld
cp -R ../../../../lib .
cp ../../../../bin/ironjacamar-sjc.jar lib/
```

B.1.1.2. Building

Building the resource adapter is done by

```
ant
```

B.1.1.3. Testing

Testing the resource adapter is done by

```
ant test
```

B.1.2. HelloWorld Resource Adapter

```
/*
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import java.util.logging.Logger;

import javax.resource.ResourceException;
import javax.resource.spi.ActivationSpec;
import javax.resource.spi.BootstrapContext;
import javax.resource.spi.ConfigProperty;
import javax.resource.spi.Connector;
import javax.resource.spi.ResourceAdapter;
import javax.resource.spi.ResourceAdapterInternalException;
import javax.resource.spi.TransactionSupport;
import javax.resource.spi.endpoint.MessageEndpointFactory;

import javax.transaction.xa.XAResource;

/**
 * HelloWorldResourceAdapter
 *
 * @version $Revision: $
 */
@Connector(
    reauthenticationSupport = false,
    transactionSupport = TransactionSupport.TransactionSupportLevel.NoTransaction)
public class HelloWorldResourceAdapter implements ResourceAdapter
{
    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldResourceAdapter");

    /** Name property */
    @ConfigProperty(defaultValue = "AS 7", supportsDynamicUpdates = true)
    private String name;
```

```
/**
 * Default constructor
 */
public HelloWorldResourceAdapter()
{
}

/**
 * Set name
 * @param name The value
 */
public void setName(String name)
{
    this.name = name;
}

/**
 * Get name
 * @return The value
 */
public String getName()
{
    return name;
}

/**
 * This is called during the activation of a message endpoint.
 *
 * @param endpointFactory A message endpoint factory instance.
 * @param spec An activation spec JavaBean instance.
 * @throws ResourceException generic exception
 */
public void endpointActivation(MessageEndpointFactory endpointFactory,
                               ActivationSpec spec) throws ResourceException
{
}

/**
 * This is called when a message endpoint is deactivated.
 *
 * @param endpointFactory A message endpoint factory instance.
 * @param spec An activation spec JavaBean instance.
 */
public void endpointDeactivation(MessageEndpointFactory endpointFactory,
                                 ActivationSpec spec)
{
}

/**
 * This is called when a resource adapter instance is bootstrapped.
 *
 * @param ctx A bootstrap context containing references
 * @throws ResourceAdapterInternalException indicates bootstrap failure.
 */
public void start(BootstrapContext ctx)
    throws ResourceAdapterInternalException
{
}
```

```
/**
 * This is called when a resource adapter instance is undeployed or
 * during application server shutdown.
 */
public void stop()
{
}

/**
 * This method is called by the application server during crash recovery.
 *
 * @param specs an array of ActivationSpec JavaBeans
 * @throws ResourceException generic exception
 * @return an array of XAResource objects
 */
public XAResource[] getXAResources(ActivationSpec[] specs)
    throws ResourceException
{
    return null;
}

/**
 * Returns a hash code value for the object.
 * @return A hash code value for this object.
 */
@Override
public int hashCode()
{
    int result = 17;
    if (name != null)
        result += 31 * result + 7 * name.hashCode();
    else
        result += 31 * result + 7;
    return result;
}

/**
 * Indicates whether some other object is equal to this one.
 * @param other The reference object with which to compare.
 * @return true If this object is the same as the obj argument, false otherwise.
 */
@Override
public boolean equals(Object other)
{
    if (other == null)
        return false;
    if (other == this)
        return true;
    if (!(other instanceof HelloWorldResourceAdapter))
        return false;
    HelloWorldResourceAdapter obj = (HelloWorldResourceAdapter)other;
    boolean result = true;
    if (result)
    {
        if (name == null)
            result = obj.getName() == null;
        else
            result = name.equals(obj.getName());
    }
}
```

```

        return result;
    }
}

```

B.1.3. HelloWorld Managed Connection Factory

```

/*
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 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import java.io.PrintWriter;
import java.util.Iterator;
import java.util.Set;
import java.util.logging.Logger;

import javax.resource.ResourceException;
import javax.resource.spi.ConnectionDefinition;
import javax.resource.spi.ConnectionManager;
import javax.resource.spi.ConnectionRequestInfo;
import javax.resource.spi.ManagedConnection;
import javax.resource.spi.ManagedConnectionFactory;
import javax.resource.spi.ResourceAdapter;
import javax.resource.spi.ResourceAdapterAssociation;

import javax.security.auth.Subject;

/**
 * HelloWorldManagedConnectionFactory
 *
 * @version $Revision: $
 */
@ConnectionDefinition(connectionFactory = HelloWorldConnectionFactory.class,
    connectionFactoryImpl = HelloWorldConnectionFactoryImpl.class,
    connection = HelloWorldConnection.class,

```

```
connectionImpl = HelloWorldConnectionImpl.class)
public class HelloWorldManagedConnectionFactory
    implements ManagedConnectionFactory, ResourceAdapterAssociation
{

    /** The serialVersionUID */
    private static final long serialVersionUID = 1L;

    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldManagedConnectionFactory");

    /** The resource adapter */
    private ResourceAdapter ra;

    /** The logwriter */
    private PrintWriter logwriter;

    /**
     * Default constructor
     */
    public HelloWorldManagedConnectionFactory()
    {
        this.ra = null;
        this.logwriter = null;
    }

    /**
     * Creates a Connection Factory instance.
     *
     * @return EIS-specific Connection Factory instance or
     *         javax.resource.cci.ConnectionFactory instance
     * @throws ResourceException Generic exception
     */
    public Object createConnectionFactory() throws ResourceException
    {
        throw new ResourceException("This resource adapter doesn't support non-managed
environments");
    }

    /**
     * Creates a Connection Factory instance.
     *
     * @param cxManager ConnectionManager to be associated with created EIS
     *         connection factory instance
     * @return EIS-specific Connection Factory instance or
     *         javax.resource.cci.ConnectionFactory instance
     * @throws ResourceException Generic exception
     */
    public Object createConnectionFactory(ConnectionManager cxManager) throws ResourceException
    {
        return new HelloWorldConnectionFactoryImpl(this, cxManager);
    }

    /**
     * Creates a new physical connection to the underlying EIS resource manager.
     *
     * @param subject Caller's security information
     * @param cxRequestInfo Additional resource adapter specific connection
     *         request information
     */
}
```



```

* @throws ResourceException generic exception
* @return ManagedConnection instance
*/
public ManagedConnection createManagedConnection(Subject subject,
                                                ConnectionRequestInfo cxRequestInfo)
    throws ResourceException
{
    return new HelloWorldManagedConnection(this);
}

/**
 * Returns a matched connection from the candidate set of connections.
 *
 * @param connectionSet Candidate connection set
 * @param subject Caller's security information
 * @param cxRequestInfo Additional resource adapter specific connection request information
 * @throws ResourceException generic exception
 * @return ManagedConnection if resource adapter finds an acceptable match otherwise null
 */
public ManagedConnection matchManagedConnections(Set connectionSet,
                                                Subject subject, ConnectionRequestInfo cxRequestInfo)
    throws ResourceException
{
    ManagedConnection result = null;

    Iterator it = connectionSet.iterator();
    while (result == null && it.hasNext())
    {
        ManagedConnection mc = (ManagedConnection)it.next();
        if (mc instanceof HelloWorldManagedConnection)
        {
            HelloWorldManagedConnection hwmc = (HelloWorldManagedConnection)mc;
            result = hwmc;
        }
    }

    return result;
}

/**
 * Get the log writer for this ManagedConnectionFactory instance.
 *
 * @return PrintWriter
 * @throws ResourceException generic exception
 */
public PrintWriter getLogWriter() throws ResourceException
{
    return logwriter;
}

/**
 * Set the log writer for this ManagedConnectionFactory instance.
 *
 * @param out PrintWriter - an out stream for error logging and tracing
 * @throws ResourceException generic exception
 */
public void setLogWriter(PrintWriter out) throws ResourceException
{
    logwriter = out;
}

```

```
}

/**
 * Get the resource adapter
 *
 * @return The handle
 */
public ResourceAdapter getResourceAdapter()
{
    return ra;
}

/**
 * Set the resource adapter
 *
 * @param ra The handle
 */
public void setResourceAdapter(ResourceAdapter ra)
{
    this.ra = ra;
}

/**
 * Returns a hash code value for the object.
 * @return A hash code value for this object.
 */
@Override
public int hashCode()
{
    int result = 17;
    return result;
}

/**
 * Indicates whether some other object is equal to this one.
 * @param other The reference object with which to compare.
 * @return true If this object is the same as the obj argument, false otherwise.
 */
@Override
public boolean equals(Object other)
{
    if (other == null)
        return false;
    if (other == this)
        return true;
    if (!(other instanceof HelloWorldManagedConnectionFactory))
        return false;
    HelloWorldManagedConnectionFactory obj = (HelloWorldManagedConnectionFactory)other;
    boolean result = true;
    return result;
}

}
```

B.1.4. HelloWorld Managed Connection

```

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 *
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import java.io.PrintWriter;
import java.util.ArrayList;
import java.util.List;
import java.util.logging.Logger;

import javax.resource.NotSupportedException;
import javax.resource.ResourceException;
import javax.resource.spi.ConnectionEvent;
import javax.resource.spi.ConnectionEventListener;
import javax.resource.spi.ConnectionRequestInfo;
import javax.resource.spi.LocalTransaction;
import javax.resource.spi.ManagedConnection;
import javax.resource.spi.ManagedConnectionMetaData;

import javax.security.auth.Subject;
import javax.transaction.xa.XAResource;

/**
 * HelloWorldManagedConnection
 *
 * @version $Revision: $
 */
public class HelloWorldManagedConnection implements ManagedConnection
{
    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldManagedConnection");

    /** MCF */
    private HelloWorldManagedConnectionFactory mcf;

    /** Log writer */

```

```
private PrintWriter logWriter;

/** Listeners */
private List<ConnectionEventListener> listeners;

/** Connection */
private Object connection;

/**
 * default constructor
 * @param mcf mcf
 */
public HelloWorldManagedConnection(HelloWorldManagedConnectionFactory mcf)
{
    this.mcf = mcf;
    this.logWriter = null;
    this.listeners = new ArrayList<ConnectionEventListener>(1);
    this.connection = null;
}

/**
 * Creates a new connection handle for the underlying physical connection
 * represented by the ManagedConnection instance.
 *
 * @param subject Security context as JAAS subject
 * @param cxRequestInfo ConnectionRequestInfo instance
 * @return generic Object instance representing the connection handle.
 * @throws ResourceException generic exception if operation fails
 */
public Object getConnection(Subject subject,
                           ConnectionRequestInfo cxRequestInfo)
    throws ResourceException
{
    connection = new HelloWorldConnectionImpl(this, mcf);

    return connection;
}

/**
 * Used by the container to change the association of an
 * application-level connection handle with a ManagedConnection instance.
 *
 * @param connection Application-level connection handle
 * @throws ResourceException generic exception if operation fails
 */
public void associateConnection(Object connection) throws ResourceException
{
    this.connection = connection;
}

/**
 * Application server calls this method to force any cleanup on
 * the ManagedConnection instance.
 *
 * @throws ResourceException generic exception if operation fails
 */
public void cleanup() throws ResourceException
{
}
```

```
/**
 * Destroys the physical connection to the underlying resource manager.
 *
 * @throws ResourceException generic exception if operation fails
 */
public void destroy() throws ResourceException
{
    this.connection = null;
}

/**
 * Adds a connection event listener to the ManagedConnection instance.
 *
 * @param listener A new ConnectionEventListener to be registered
 */
public void addConnectionEventListener(ConnectionEventListener listener)
{
    if (listener == null)
        throw new IllegalArgumentException("Listener is null");

    listeners.add(listener);
}

/**
 * Removes an already registered connection event listener
 * from the ManagedConnection instance.
 *
 * @param listener Already registered connection event listener to be removed
 */
public void removeConnectionEventListener(ConnectionEventListener listener)
{
    if (listener == null)
        throw new IllegalArgumentException("Listener is null");

    listeners.remove(listener);
}

/**
 * Gets the log writer for this ManagedConnection instance.
 *
 * @return Character ourput stream associated with this
 *         Managed-Connection instance
 * @throws ResourceException generic exception if operation fails
 */
public PrintWriter getLogWriter() throws ResourceException
{
    return logWriter;
}

/**
 * Sets the log writer for this ManagedConnection instance.
 *
 * @param out Character Output stream to be associated
 * @throws ResourceException generic exception if operation fails
 */
public void setLogWriter(PrintWriter out) throws ResourceException
{
    this.logWriter = out;
}
```

```
}

/**
 * Returns an <code>javax.resource.spi.LocalTransaction</code> instance.
 *
 * @return LocalTransaction instance
 * @throws ResourceException generic exception if operation fails
 */
public LocalTransaction getLocalTransaction() throws ResourceException
{
    throw new NotSupportedException("LocalTransaction not supported");
}

/**
 * Returns an <code>javax.transaction.xa.XAResource</code> instance.
 *
 * @return XAResource instance
 * @throws ResourceException generic exception if operation fails
 */
public XAResource getXAResource() throws ResourceException
{
    throw new NotSupportedException("GetXAResource not supported");
}

/**
 * Gets the metadata information for this connection's underlying
 * EIS resource manager instance.
 *
 * @return ManagedConnectionMetaData instance
 * @throws ResourceException generic exception if operation fails
 */
public ManagedConnectionMetaData getMetaData() throws ResourceException
{
    return new HelloWorldManagedConnectionMetaData();
}

/**
 * Call helloWorld
 * @param name String name
 * @return String helloworld
 */
String helloWorld(String name)
{
    return "Hello World, " + name + " !";
}

/**
 * Close handle
 * @param handle The handle
 */
void closeHandle(HelloWorldConnection handle)
{
    ConnectionEvent event = new ConnectionEvent(this, ConnectionEvent.CONNECTION_CLOSED);
    event.setConnectionHandle(handle);

    for (ConnectionEventListener cel : listeners)
    {
        cel.connectionClosed(event);
    }
}
```

```
}
}
```

B.1.5. HelloWorld Connection Factory

```
/*
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import java.io.Serializable;

import javax.resource.Referenceable;
import javax.resource.ResourceException;

/**
 * HelloWorldConnectionFactory
 *
 * @version $Revision: $
 */
public interface HelloWorldConnectionFactory extends Serializable, Referenceable
{
    /**
     * Get connection from factory
     *
     * @return HelloWorldConnection instance
     * @exception ResourceException Thrown if a connection can't be obtained
     */
    public HelloWorldConnection getConnection() throws ResourceException;
}
```

B.1.6. HelloWorld Connection Factory Implementation

```
/*
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import javax.naming.NamingException;
import javax.naming.Reference;

import javax.resource.ResourceException;
import javax.resource.spi.ConnectionManager;

/**
 * HelloWorldConnectionFactoryImpl
 *
 * @version $Revision: $
 */
public class HelloWorldConnectionFactoryImpl implements HelloWorldConnectionFactory
{
    /** The serialVersionUID */
    private static final long serialVersionUID = 1L;

    private Reference reference;

    private HelloWorldManagedConnectionFactory mcf;
    private ConnectionManager connectionManager;

    /**
     * Default constructor
     * @param mcf ManagedConnectionFactory
     * @param cxManager ConnectionManager
     */
    public HelloWorldConnectionFactoryImpl(HelloWorldManagedConnectionFactory mcf,
                                           ConnectionManager cxManager)
    {
        this.mcf = mcf;
        this.connectionManager = cxManager;
    }
}
```



```

    }

    /**
     * Get connection from factory
     *
     * @return HelloWorldConnection instance
     * @exception ResourceException Thrown if a connection can't be obtained
     */
    @Override
    public HelloWorldConnection getConnection() throws ResourceException
    {
        return (HelloWorldConnection)connectionManager.allocateConnection(mcf, null);
    }

    /**
     * Get the Reference instance.
     *
     * @return Reference instance
     * @exception NamingException Thrown if a reference can't be obtained
     */
    @Override
    public Reference getReference() throws NamingException
    {
        return reference;
    }

    /**
     * Set the Reference instance.
     *
     * @param reference A Reference instance
     */
    @Override
    public void setReference(Reference reference)
    {
        this.reference = reference;
    }
}

```

B.1.7. HelloWorld Connection

```

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 * but WITHOUT ANY WARRANTY; without even the implied warranty of

```

```
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* Lesser General Public License for more details.
*
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* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

/**
 * HelloWorldConnection
 *
 * @version $Revision: $
 */
public interface HelloWorldConnection
{
    /**
     * HelloWorld
     * @return String
     */
    public String helloWorld();

    /**
     * HelloWorld
     * @param name A name
     * @return String
     */
    public String helloWorld(String name);

    /**
     * Close
     */
    public void close();
}
```

B.1.8. HelloWorld Connection Implementation

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * distribution for a full listing of individual contributors.
 *
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 *
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 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 */
```

```

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* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

import java.util.logging.Logger;

/**
 * HelloWorldConnectionImpl
 *
 * @version $Revision: $
 */
public class HelloWorldConnectionImpl implements HelloWorldConnection
{
    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldConnectionImpl");

    /** ManagedConnection */
    private HelloWorldManagedConnection mc;

    /** ManagedConnectionFactory */
    private HelloWorldManagedConnectionFactory mcf;

    /**
     * Default constructor
     * @param mc HelloWorldManagedConnection
     * @param mcf HelloWorldManagedConnectionFactory
     */
    public HelloWorldConnectionImpl(HelloWorldManagedConnection mc,
                                     HelloWorldManagedConnectionFactory mcf)
    {
        this.mc = mc;
        this.mcf = mcf;
    }

    /**
     * Call helloWorld
     * @return String helloworld
     */
    public String helloWorld()
    {
        return helloWorld(((HelloWorldResourceAdapter)mcf.getResourceAdapter()).getName());
    }

    /**
     * Call helloWorld
     * @param name String name
     * @return String helloworld
     */
    public String helloWorld(String name)
    {
        return mc.helloWorld(name);
    }

    /**
     * Close

```

```
    */  
    public void close()  
    {  
        mc.closeHandle(this);  
    }  
}
```

B.1.9. HelloWorld Managed Connection MetaData

```
/*  
 * IronJacamar, a Java EE Connector Architecture implementation  
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 * distribution for a full listing of individual contributors.  
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 * the License, or (at your option) any later version.  
 *  
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 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU  
 * Lesser General Public License for more details.  
 *  
 * You should have received a copy of the GNU Lesser General Public  
 * License along with this software; if not, write to the Free  
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA  
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.  
 */  
package org.jboss.jca.samples.helloworld;  
  
import javax.resource.ResourceException;  
  
import javax.resource.spi.ManagedConnectionMetaData;  
  
/**  
 * HelloWorldManagedConnectionMetaData  
 *  
 * @version $Revision: $  
 */  
public class HelloWorldManagedConnectionMetaData implements ManagedConnectionMetaData  
{  
    /**  
     * Default constructor  
     */  
    public HelloWorldManagedConnectionMetaData()  
    {  
    }  
  
    /**  
     * Returns Product name of the underlying EIS instance connected  
     * through the ManagedConnection.  
     */  
}
```

```

*
* @return Product name of the EIS instance
* @throws ResourceException Thrown if an error occurs
*/
@Override
public String getEISProductName() throws ResourceException
{
    return "HelloWorld Resource Adapter";
}

/**
 * Returns Product version of the underlying EIS instance connected
 * through the ManagedConnection.
 *
 * @return Product version of the EIS instance
 * @throws ResourceException Thrown if an error occurs
 */
@Override
public String getEISProductVersion() throws ResourceException
{
    return "1.0";
}

/**
 * Returns maximum limit on number of active concurrent connections
 *
 * @return Maximum limit for number of active concurrent connections
 * @throws ResourceException Thrown if an error occurs
 */
@Override
public int getMaxConnections() throws ResourceException
{
    return 0;
}

/**
 * Returns name of the user associated with the ManagedConnection instance
 *
 * @return Name of the user
 * @throws ResourceException Thrown if an error occurs
 */
@Override
public String getUserUserName() throws ResourceException
{
    return null;
}
}

```

B.1.10. HelloWorld ironjacamar.xml

```

<?xml version="1.0" encoding="UTF-8"?>
<ironjacamar>
  <connection-definitions>

```

```
<connection-definition
  class-name="org.jboss.jca.samples.helloworld.HelloWorldManagedConnectionFactory"
  jndi-name="java:/eis/HelloWorld"/>
</connection-definitions>
</ironjacamar>
```

B.1.11. HelloWorld Connection Test Case

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
 * Copyright 2010, Red Hat Inc, and individual contributors
 * as indicated by the @author tags. See the copyright.txt file in the
 * distribution for a full listing of individual contributors.
 *
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 * under the terms of the GNU Lesser General Public License as
 * published by the Free Software Foundation; either version 2.1 of
 * the License, or (at your option) any later version.
 *
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 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 *
 * You should have received a copy of the GNU Lesser General Public
 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import java.util.UUID;
import java.util.logging.Logger;

import javax.annotation.Resource;

import org.jboss.arquillian.container.test.api.Deployment;
import org.jboss.arquillian.junit.Arquillian;

import org.jboss.shrinkwrap.api.ShrinkWrap;
import org.jboss.shrinkwrap.api.spec.JavaArchive;
import org.jboss.shrinkwrap.api.spec.ResourceAdapterArchive;

import org.junit.Test;
import org.junit.runner.RunWith;
import static org.junit.Assert.*;

/**
 * ConnectorTestCase
 *
 * @version $Revision: $
 */
```

```

@RunWith(Arquillian.class)
public class ConnectorTestCase
{
    private static Logger log = Logger.getLogger("ConnectorTestCase");

    private static String deploymentName = "ConnectorTestCase";

    /**
     * Define the deployment
     *
     * @return The deployment archive
     */
    @Deployment
    public static ResourceAdapterArchive createDeployment()
    {
        ResourceAdapterArchive raa =
            ShrinkWrap.create(ResourceAdapterArchive.class, deploymentName + ".rar");
        JavaArchive ja = ShrinkWrap.create(JavaArchive.class,
            UUID.randomUUID().toString() + ".jar");
        ja.addClasses(HelloWorldResourceAdapter.class,
            HelloWorldManagedConnectionFactory.class,
            HelloWorldManagedConnection.class,
            HelloWorldManagedConnectionMetaData.class,
            HelloWorldConnectionFactory.class,
            HelloWorldConnectionFactoryImpl.class,
            HelloWorldConnection.class,
            HelloWorldConnectionImpl.class);
        raa.addAsLibrary(ja);
        raa.addAsManifestResource("META-INF/ironjacamar.xml", "ironjacamar.xml");

        return raa;
    }

    /** resource */
    @Resource(mappedName = "java:/eis/HelloWorld")
    private HelloWorldConnectionFactory connectionFactory;

    /**
     * Test helloWorld
     *
     * @exception Throwable Thrown if case of an error
     */
    @Test
    public void testHelloWorldNoArgs() throws Throwable
    {
        assertNotNull(connectionFactory);
        HelloWorldConnection connection = connectionFactory.getConnection();
        assertNotNull(connection);
        String result = connection.helloWorld();
        connection.close();
    }

    /**
     * Test helloWorld
     *
     * @exception Throwable Thrown if case of an error
     */
    @Test
    public void testHelloWorldNameString() throws Throwable

```

```
{
    assertNotNull(connectionFactory);
    HelloWorldConnection connection = connectionFactory.getConnection();
    assertNotNull(connection);
    String result = connection.helloWorld(null);
    connection.close();
}
}
```

B.1.12. HelloWorld Ant build.xml

```
<!--
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * distribution for a full listing of individual contributors.
 *
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 * published by the Free Software Foundation; either version 2.1 of
 * the License, or (at your option) any later version.
 *
 * This software is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 *
 * You should have received a copy of the GNU Lesser General Public
 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
-->

<project name="helloworld" basedir="." default="rar">

    <!-- =====
    Properties
    ===== -->
    <property name="build.dir" value="${basedir}/build" />
    <property name="target.dir" value="${basedir}/target" />
    <property name="lib.dir" value="${basedir}/lib" />

    <property name="javac.debug" value="on" />
    <property name="javac.deprecation" value="on" />
    <property name="javac.optimize" value="off" />
    <property name="javac.encoding" value="utf-8" />

    <property name="junit.printsummary" value="yes" />
    <property name="junit.haltonerror" value="no" />
    <property name="junit.haltonfailure" value="no" />
    <property name="junit.fork" value="yes" />

```



```

<property name="junit.timeout" value="60000" />
<property name="junit.jvm" value="" />
<property name="junit.jvm.options" value="-Xms128m -Xmx512m -XX:MaxPermSize=256m" />
<property name="junit.batchtest.haltonerror" value="no" />
<property name="junit.batchtest.haltonfailure" value="no" />
<property name="junit.batchtest.fork" value="yes" />

<path id="lib.path.id">
  <fileset dir="{lib.dir}">
    <include name="**/*.jar"/>
  </fileset>
</path>

<path id="test.lib.path.id">
  <fileset dir="{lib.dir}">
    <include name="**/*.jar"/>
  </fileset>
  <fileset dir="{build.dir}">
    <include name="**/*.jar"/>
  </fileset>
</path>

<!-- =====
      Target: init
      ===== -->
<target name="init">
  <mkdir dir="{lib.dir}" />
</target>

<!-- =====
      Target: compile
      ===== -->
<target name="compile" depends="init">
  <mkdir dir="{build.dir}" />

  <javac srcdir="{basedir}/src/main/java"
        destdir="{build.dir}"
        classpathref="lib.path.id"
        debug="{javac.debug}"
        deprecation="{javac.deprecation}"
        encoding="{javac.encoding}"
        optimize="{javac.optimize}" />
</javac>
</target>

<!-- =====
      Target: rar
      ===== -->
<target name="rar" depends="compile">
  <mkdir dir="{target.dir}" />
  <mkdir dir="{basedir}/src/main/resources" />
  <jar destfile="{build.dir}/helloworld.jar"
      basedir="{build.dir}"
      includes="**/*.class" />
  <jar destfile="{target.dir}/helloworld.rar">
    <fileset dir="{basedir}/src/main/resources" includes="META-INF/*" />
    <fileset dir="{build.dir}" includes="**/*.jar" />
  </jar>
</target>

```

```
<!-- =====
Target: prepare-test
===== -->
<target name="prepare-test" depends="init">
  <mkdir dir="${build.dir}/test" />

  <javac srcdir="src/test"
        destdir="${build.dir}/test"
        classpathref="test.lib.path.id"
        debug="${javac.debug}"
        deprecation="${javac.deprecation}"
        encoding="${javac.encoding}"
        optimize="${javac.optimize}">
    <compilerarg value="-Xlint"/>
  </javac>

  <copy todir="${build.dir}/test">
    <fileset dir="src/main/resources"/>
    <fileset dir="src/test/resources"/>
  </copy>
</target>

<!-- =====
Target: test
===== -->
<target name="test" depends="rar, prepare-test">
  <mkdir dir="${basedir}/reports"/>

  <junit dir="src/test"
        printsummary="${junit.printsummary}"
        haltonerror="${junit.haltonerror}"
        haltonfailure="${junit.haltonfailure}"
        fork="${junit.fork}"
        timeout="${junit.timeout}">

    <jvmarg line="${junit.jvm.options}"/>
    <sysproperty key="archives.dir" value="${target.dir}"/>
    <sysproperty key="reports.dir" value="${basedir}/reports"/>
    <sysproperty key="java.util.logging.manager" value="org.jboss.logmanager.LogManager"/>
    <sysproperty key="log4j.defaultInitOverride" value="true"/>
    <sysproperty key="org.jboss.logging.Logger.pluginClass"
                  value="org.jboss.logging.logmanager.LoggerPluginImpl"/>
    <sysproperty key="test.dir" value="${build.dir}/test"/>
    <sysproperty key="xb.builder.useUnorderedSequence" value="true"/>

    <classpath>
      <fileset dir="${lib.dir}" includes="**/*.jar" />
      <fileset dir="${build.dir}" includes="*.jar" />
      <pathelement location="${build.dir}/test"/>
    </classpath>

    <formatter type="plain"/>
    <formatter type="xml"/>

    <batchtest todir="${basedir}/reports"
              haltonerror="${junit.batchtest.haltonerror}"
              haltonfailure="${junit.batchtest.haltonfailure}"
```

```

        fork="${junit.batchtest.fork}">

        <fileset dir="${build.dir}/test">
            <include name="**/*TestCase.class"/>
        </fileset>
    </batchtest>

</junit>

</target>

<!-- =====
Target: docs
===== -->
<target name="docs" depends="compile">
    <mkdir dir="${target.dir}/docs"/>
    <javadoc packagenames=""
            sourcepath="src/main/java"
            destdir="${target.dir}/docs"
            classpathref="lib.path.id">
    </javadoc>
</target>

<!-- =====
Target: clean
===== -->
<target name="clean">
    <delete>
        <fileset dir="${basedir}" defaultexcludes="no">
            <include name="**/*~"/>
            <include name="**/*.bak"/>
        </fileset>
    </delete>
    <delete dir="${build.dir}"/>
    <delete dir="${target.dir}"/>
    <delete dir="${basedir}/reports"/>
</target>

<!-- =====
Target: dist-clean
===== -->
<target name="dist-clean" depends="init,clean">
    <delete includeemptydirs="true">
        <fileset dir="${lib.dir}" includes="**/*"/>
    </delete>
</target>

</project>

```

B.2. HelloWorld/Native example

B.2.1. Introduction

The HelloWorld/Native resource adapter sample shows a simple example of how to use and implement the interfaces in the Java EE Connector Architecture specification which calls a native library.

The HelloWorld/Native sample exposes the HelloWorldConnection interface where developers can invoke the exposed methods.

The sample shows how to build and test a resource adapter.

B.2.1.1. Setup

The build environment needs various libraries in order to being able to build and test the resource adapter. The setup is done by

```
cd doc/samples/helloworld-native
cp -R ../../../../lib .
cp ../../../../bin/ironjacamar-sjc.jar lib/
```

B.2.1.2. Building

Building the resource adapter is done by

```
ant native
cmake .
make
ant rar
```

B.2.1.3. Testing

Testing the resource adapter is done by

```
ant test
```

B.2.2. HelloWorld/Native Resource Adapter

```

/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * Lesser General Public License for more details.
 *
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import java.util.logging.Logger;

import javax.resource.ResourceException;
import javax.resource.spi.ActivationSpec;
import javax.resource.spi.BootstrapContext;
import javax.resource.spi.ConfigProperty;
import javax.resource.spi.Connector;
import javax.resource.spi.ResourceAdapter;
import javax.resource.spi.ResourceAdapterInternalException;
import javax.resource.spi.TransactionSupport;
import javax.resource.spi.endpoint.MessageEndpointFactory;

import javax.transaction.xa.XAResource;

/**
 * HelloWorldResourceAdapter
 *
 * @version $Revision: $
 */
@Connector(
    reauthenticationSupport = false,
    transactionSupport = TransactionSupport.TransactionSupportLevel.NoTransaction)
public class HelloWorldResourceAdapter implements ResourceAdapter
{
    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldResourceAdapter");

    /** Name property */
    @ConfigProperty(defaultValue = "AS 7", supportsDynamicUpdates = true)
    private String name;

```

```
/**
 * Default constructor
 */
public HelloWorldResourceAdapter()
{
}

/**
 * Set name
 * @param name The value
 */
public void setName(String name)
{
    this.name = name;
}

/**
 * Get name
 * @return The value
 */
public String getName()
{
    return name;
}

/**
 * This is called during the activation of a message endpoint.
 *
 * @param endpointFactory A message endpoint factory instance.
 * @param spec An activation spec JavaBean instance.
 * @throws ResourceException generic exception
 */
public void endpointActivation(MessageEndpointFactory endpointFactory,
                             ActivationSpec spec) throws ResourceException
{
}

/**
 * This is called when a message endpoint is deactivated.
 *
 * @param endpointFactory A message endpoint factory instance.
 * @param spec An activation spec JavaBean instance.
 */
public void endpointDeactivation(MessageEndpointFactory endpointFactory,
                                ActivationSpec spec)
{
}

/**
 * This is called when a resource adapter instance is bootstrapped.
 *
 * @param ctx A bootstrap context containing references
 * @throws ResourceAdapterInternalException indicates bootstrap failure.
 */
public void start(BootstrapContext ctx)
    throws ResourceAdapterInternalException
{
}
```

```

/**
 * This is called when a resource adapter instance is undeployed or
 * during application server shutdown.
 */
public void stop()
{
}

/**
 * This method is called by the application server during crash recovery.
 *
 * @param specs an array of ActivationSpec JavaBeans
 * @throws ResourceException generic exception
 * @return an array of XAResource objects
 */
public XAResource[] getXAResources(ActivationSpec[] specs)
    throws ResourceException
{
    return null;
}

/**
 * Returns a hash code value for the object.
 * @return A hash code value for this object.
 */
@Override
public int hashCode()
{
    int result = 17;
    if (name != null)
        result += 31 * result + 7 * name.hashCode();
    else
        result += 31 * result + 7;
    return result;
}

/**
 * Indicates whether some other object is equal to this one.
 * @param other The reference object with which to compare.
 * @return true If this object is the same as the obj argument, false otherwise.
 */
@Override
public boolean equals(Object other)
{
    if (other == null)
        return false;
    if (other == this)
        return true;
    if (!(other instanceof HelloWorldResourceAdapter))
        return false;
    HelloWorldResourceAdapter obj = (HelloWorldResourceAdapter)other;
    boolean result = true;
    if (result)
    {
        if (name == null)
            result = obj.getName() == null;
        else
            result = name.equals(obj.getName());
    }
}

```

```
        return result;
    }
}
```

B.2.3. HelloWorld/Native Managed Connection Factory

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * distribution for a full listing of individual contributors.
 *
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 * published by the Free Software Foundation; either version 2.1 of
 * the License, or (at your option) any later version.
 *
 * This software is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 *
 * You should have received a copy of the GNU Lesser General Public
 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import java.io.PrintWriter;
import java.util.Iterator;
import java.util.Set;
import java.util.logging.Logger;

import javax.resource.ResourceException;
import javax.resource.spi.ConnectionDefinition;
import javax.resource.spi.ConnectionManager;
import javax.resource.spi.ConnectionRequestInfo;
import javax.resource.spi.ManagedConnection;
import javax.resource.spi.ManagedConnectionFactory;
import javax.resource.spi.ResourceAdapter;
import javax.resource.spi.ResourceAdapterAssociation;

import javax.security.auth.Subject;

/**
 * HelloWorldManagedConnectionFactory
 *
 * @version $Revision: $
 */
@ConnectionDefinition(connectionFactory = HelloWorldConnectionFactory.class,
    connectionFactoryImpl = HelloWorldConnectionFactoryImpl.class,
    connection = HelloWorldConnection.class,
```



```

        connectionImpl = HelloWorldConnectionImpl.class)
public class HelloWorldManagedConnectionFactory
    implements ManagedConnectionFactory, ResourceAdapterAssociation
{

    /** The serialVersionUID */
    private static final long serialVersionUID = 1L;

    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldManagedConnectionFactory");

    /** The resource adapter */
    private ResourceAdapter ra;

    /** The logwriter */
    private PrintWriter logwriter;

    /**
     * Default constructor
     */
    public HelloWorldManagedConnectionFactory()
    {
        this.ra = null;
        this.logwriter = null;
    }

    /**
     * Creates a Connection Factory instance.
     *
     * @return EIS-specific Connection Factory instance or
     *         javax.resource.cci.ConnectionFactory instance
     * @throws ResourceException Generic exception
     */
    public Object createConnectionFactory() throws ResourceException
    {
        throw new ResourceException("This resource adapter doesn't support non-managed
environments");
    }

    /**
     * Creates a Connection Factory instance.
     *
     * @param cxManager ConnectionManager to be associated with created EIS
     *         connection factory instance
     * @return EIS-specific Connection Factory instance or
     *         javax.resource.cci.ConnectionFactory instance
     * @throws ResourceException Generic exception
     */
    public Object createConnectionFactory(ConnectionManager cxManager) throws ResourceException
    {
        return new HelloWorldConnectionFactoryImpl(this, cxManager);
    }

    /**
     * Creates a new physical connection to the underlying EIS resource manager.
     *
     * @param subject Caller's security information
     * @param cxRequestInfo Additional resource adapter specific connection
     *         request information

```

```
* @throws ResourceException generic exception
* @return ManagedConnection instance
*/
public ManagedConnection createManagedConnection(Subject subject,
                                                ConnectionRequestInfo cxRequestInfo)
    throws ResourceException
{
    return new HelloWorldManagedConnection(this);
}

/**
 * Returns a matched connection from the candidate set of connections.
 *
 * @param connectionSet Candidate connection set
 * @param subject Caller's security information
 * @param cxRequestInfo Additional resource adapter specific connection request information
 * @throws ResourceException generic exception
 * @return ManagedConnection if resource adapter finds an acceptable match otherwise null
 */
public ManagedConnection matchManagedConnections(Set connectionSet,
                                                Subject subject, ConnectionRequestInfo cxRequestInfo)
    throws ResourceException
{
    ManagedConnection result = null;

    Iterator it = connectionSet.iterator();
    while (result == null && it.hasNext())
    {
        ManagedConnection mc = (ManagedConnection)it.next();
        if (mc instanceof HelloWorldManagedConnection)
        {
            HelloWorldManagedConnection hwmc = (HelloWorldManagedConnection)mc;
            result = hwmc;
        }
    }

    return result;
}

/**
 * Get the log writer for this ManagedConnectionFactory instance.
 *
 * @return PrintWriter
 * @throws ResourceException generic exception
 */
public PrintWriter getLogWriter() throws ResourceException
{
    return logwriter;
}

/**
 * Set the log writer for this ManagedConnectionFactory instance.
 *
 * @param out PrintWriter - an out stream for error logging and tracing
 * @throws ResourceException generic exception
 */
public void setLogWriter(PrintWriter out) throws ResourceException
{
    logwriter = out;
}
```

```
}

/**
 * Get the resource adapter
 *
 * @return The handle
 */
public ResourceAdapter getResourceAdapter()
{
    return ra;
}

/**
 * Set the resource adapter
 *
 * @param ra The handle
 */
public void setResourceAdapter(ResourceAdapter ra)
{
    this.ra = ra;
}

/**
 * Returns a hash code value for the object.
 * @return A hash code value for this object.
 */
@Override
public int hashCode()
{
    int result = 17;
    return result;
}

/**
 * Indicates whether some other object is equal to this one.
 * @param other The reference object with which to compare.
 * @return true If this object is the same as the obj argument, false otherwise.
 */
@Override
public boolean equals(Object other)
{
    if (other == null)
        return false;
    if (other == this)
        return true;
    if (!(other instanceof HelloWorldManagedConnectionFactory))
        return false;
    HelloWorldManagedConnectionFactory obj = (HelloWorldManagedConnectionFactory)other;
    boolean result = true;
    return result;
}
}
```

B.2.4. HelloWorld/Native Managed Connection

```
/*
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import java.io.PrintWriter;
import java.util.ArrayList;
import java.util.List;
import java.util.logging.Logger;

import javax.resource.NotSupportedException;
import javax.resource.ResourceException;
import javax.resource.spi.ConnectionEvent;
import javax.resource.spi.ConnectionEventListener;
import javax.resource.spi.ConnectionRequestInfo;
import javax.resource.spi.LocalTransaction;
import javax.resource.spi.ManagedConnection;
import javax.resource.spi.ManagedConnectionMetaData;

import javax.security.auth.Subject;
import javax.transaction.xa.XAResource;

/**
 * HelloWorldManagedConnection
 *
 * @version $Revision: $
 */
public class HelloWorldManagedConnection implements ManagedConnection
{
    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldManagedConnection");

    /** MCF */
    private HelloWorldManagedConnectionFactory mcf;

    /** Log writer */
}
```

```

private PrintWriter logWriter;

/** Listeners */
private List<ConnectionEventListener> listeners;

/** Connection */
private Object connection;

/**
 * Constructor
 * @param mcf mcf
 */
public HelloWorldManagedConnection(HelloWorldManagedConnectionFactory mcf)
{
    this.mcf = mcf;
    this.logWriter = null;
    this.listeners = new ArrayList<ConnectionEventListener>(1);
    this.connection = null;
}

/**
 * Creates a new connection handle for the underlying physical connection
 * represented by the ManagedConnection instance.
 *
 * @param subject Security context as JAAS subject
 * @param cxRequestInfo ConnectionRequestInfo instance
 * @return generic Object instance representing the connection handle.
 * @throws ResourceException generic exception if operation fails
 */
public Object getConnection(Subject subject,
                           ConnectionRequestInfo cxRequestInfo)
    throws ResourceException
{
    connection = new HelloWorldConnectionImpl(this, mcf);

    return connection;
}

/**
 * Used by the container to change the association of an
 * application-level connection handle with a ManagedConneciton instance.
 *
 * @param connection Application-level connection handle
 * @throws ResourceException generic exception if operation fails
 */
public void associateConnection(Object connection) throws ResourceException
{
    this.connection = connection;
}

/**
 * Application server calls this method to force any cleanup on
 * the ManagedConnection instance.
 *
 * @throws ResourceException generic exception if operation fails
 */
public void cleanup() throws ResourceException
{
}

```

```
/**
 * Destroys the physical connection to the underlying resource manager.
 *
 * @throws ResourceException generic exception if operation fails
 */
public void destroy() throws ResourceException
{
    this.connection = null;
}

/**
 * Adds a connection event listener to the ManagedConnection instance.
 *
 * @param listener A new ConnectionEventListener to be registered
 */
public void addConnectionEventListener(ConnectionEventListener listener)
{
    if (listener == null)
        throw new IllegalArgumentException("Listener is null");

    listeners.add(listener);
}

/**
 * Removes an already registered connection event listener
 * from the ManagedConnection instance.
 *
 * @param listener Already registered connection event listener to be removed
 */
public void removeConnectionEventListener(ConnectionEventListener listener)
{
    if (listener == null)
        throw new IllegalArgumentException("Listener is null");

    listeners.remove(listener);
}

/**
 * Gets the log writer for this ManagedConnection instance.
 *
 * @return Character ourput stream associated with this
 *         Managed-Connection instance
 * @throws ResourceException generic exception if operation fails
 */
public PrintWriter getLogWriter() throws ResourceException
{
    return logWriter;
}

/**
 * Sets the log writer for this ManagedConnection instance.
 *
 * @param out Character Output stream to be associated
 * @throws ResourceException generic exception if operation fails
 */
public void setLogWriter(PrintWriter out) throws ResourceException
{
    this.logWriter = out;
}
```

```

    }

    /**
     * Returns an javax.resource.spi.LocalTransaction instance.
     *
     * @return LocalTransaction instance
     * @throws ResourceException generic exception if operation fails
     */
    public LocalTransaction getLocalTransaction() throws ResourceException
    {
        throw new NotSupportedException("LocalTransaction not supported");
    }

    /**
     * Returns an javax.transaction.xa.XAResource instance.
     *
     * @return XAResource instance
     * @throws ResourceException generic exception if operation fails
     */
    public XAResource getXAResource() throws ResourceException
    {
        throw new NotSupportedException("GetXAResource not supported");
    }

    /**
     * Gets the metadata information for this connection's underlying
     * EIS resource manager instance.
     *
     * @return ManagedConnectionMetaData instance
     * @throws ResourceException generic exception if operation fails
     */
    public ManagedConnectionMetaData getMetaData() throws ResourceException
    {
        return new HelloWorldManagedConnectionMetaData();
    }

    /**
     * Call helloWorld
     * @param name String name
     * @return String helloworld
     */
    public native String helloWorld(String name);

    /**
     * Close handle
     * @param handle The handle
     */
    void closeHandle(HelloWorldConnection handle)
    {
        ConnectionEvent event = new ConnectionEvent(this, ConnectionEvent.CONNECTION_CLOSED);
        event.setConnectionHandle(handle);

        for (ConnectionEventListener cel : listeners)
        {
            cel.connectionClosed(event);
        }
    }
}

```

B.2.5. HelloWorld/Native Connection Factory

```
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import java.io.Serializable;

import javax.resource.Referenceable;
import javax.resource.ResourceException;

/**
 * HelloWorldConnectionFactory
 *
 * @version $Revision: $
 */
public interface HelloWorldConnectionFactory extends Serializable, Referenceable
{
    /**
     * Get connection from factory
     *
     * @return HelloWorldConnection instance
     * @exception ResourceException Thrown if a connection can't be obtained
     */
    public HelloWorldConnection getConnection() throws ResourceException;
}
```


B.2.6. HelloWorld/Native Connection Factory Implementation

```

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 *
 * You should have received a copy of the GNU Lesser General Public
 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import javax.naming.NamingException;
import javax.naming.Reference;

import javax.resource.ResourceException;
import javax.resource.spi.ConnectionManager;

/**
 * HelloWorldConnectionFactoryImpl
 *
 * @version $Revision: $
 */
public class HelloWorldConnectionFactoryImpl implements HelloWorldConnectionFactory
{
    /** The serialVersionUID */
    private static final long serialVersionUID = 1L;

    private Reference reference;

    private HelloWorldManagedConnectionFactory mcf;
    private ConnectionManager connectionManager;

    /**
     * Default constructor
     * @param mcf ManagedConnectionFactory
     * @param cxManager ConnectionManager
     */
    public HelloWorldConnectionFactoryImpl(HelloWorldManagedConnectionFactory mcf,
                                           ConnectionManager cxManager)
    {
        this.mcf = mcf;
        this.connectionManager = cxManager;
    }

```

```
}

/**
 * Get connection from factory
 *
 * @return HelloWorldConnection instance
 * @exception ResourceException Thrown if a connection can't be obtained
 */
@Override
public HelloWorldConnection getConnection() throws ResourceException
{
    return (HelloWorldConnection)connectionManager.allocateConnection(mcf, null);
}

/**
 * Get the Reference instance.
 *
 * @return Reference instance
 * @exception NamingException Thrown if a reference can't be obtained
 */
@Override
public Reference getReference() throws NamingException
{
    return reference;
}

/**
 * Set the Reference instance.
 *
 * @param reference A Reference instance
 */
@Override
public void setReference(Reference reference)
{
    this.reference = reference;
}
}
```

B.2.7. HelloWorld/Native Connection

```
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```

```

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* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

/**
 * HelloWorldConnection
 *
 * @version $Revision: $
 */
public interface HelloWorldConnection
{
    /**
     * HelloWorld
     * @return String
     */
    public String helloWorld();

    /**
     * HelloWorld
     * @param name A name
     * @return String
     */
    public String helloWorld(String name);

    /**
     * Close
     */
    public void close();
}

```

B.2.8. HelloWorld/Native Connection Implementation

```

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```

```
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* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

import java.util.logging.Logger;

/**
 * HelloWorldConnectionImpl
 *
 * @version $Revision: $
 */
public class HelloWorldConnectionImpl implements HelloWorldConnection
{
    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldConnectionImpl");

    /** ManagedConnection */
    private HelloWorldManagedConnection mc;

    /** ManagedConnectionFactory */
    private HelloWorldManagedConnectionFactory mcf;

    /**
     * Default constructor
     * @param mc HelloWorldManagedConnection
     * @param mcf HelloWorldManagedConnectionFactory
     */
    public HelloWorldConnectionImpl(HelloWorldManagedConnection mc,
                                     HelloWorldManagedConnectionFactory mcf)
    {
        this.mc = mc;
        this.mcf = mcf;
    }

    /**
     * Call helloWorld
     * @return String helloworld
     */
    public String helloWorld()
    {
        return helloWorld(((HelloWorldResourceAdapter)mcf.getResourceAdapter()).getName());
    }

    /**
     * Call helloWorld
     * @param name String name
     * @return String helloworld
     */
    public String helloWorld(String name)
    {
        return mc.helloWorld(name);
    }

    /**
     * Close

```

```

    */
    public void close()
    {
        mc.closeHandle(this);
    }
}

```

B.2.9. HelloWorld/Native Managed Connection MetaData

```

/*
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import javax.resource.ResourceException;

import javax.resource.spi.ManagedConnectionMetaData;

/**
 * HelloWorldManagedConnectionMetaData
 *
 * @version $Revision: $
 */
public class HelloWorldManagedConnectionMetaData implements ManagedConnectionMetaData
{
    /**
     * Default constructor
     */
    public HelloWorldManagedConnectionMetaData()
    {
    }

    /**
     * Returns Product name of the underlying EIS instance connected
     * through the ManagedConnection.

```

```
*
* @return Product name of the EIS instance
* @throws ResourceException Thrown if an error occurs
*/
@Override
public String getEISProductName() throws ResourceException
{
    return "HelloWorld Resource Adapter";
}

/**
* Returns Product version of the underlying EIS instance connected
* through the ManagedConnection.
*
* @return Product version of the EIS instance
* @throws ResourceException Thrown if an error occurs
*/
@Override
public String getEISProductVersion() throws ResourceException
{
    return "1.0";
}

/**
* Returns maximum limit on number of active concurrent connections
*
* @return Maximum limit for number of active concurrent connections
* @throws ResourceException Thrown if an error occurs
*/
@Override
public int getMaxConnections() throws ResourceException
{
    return 0;
}

/**
* Returns name of the user associated with the ManagedConnection instance
*
* @return Name of the user
* @throws ResourceException Thrown if an error occurs
*/
@Override
public String getUserUserName() throws ResourceException
{
    return null;
}
}
```

B.2.10. HelloWorld/Native ironjacamar.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<ironjacamar>
  <connection-definitions>
```

```

<connection-definition
  class-name="org.jboss.jca.samples.helloworld.HelloWorldManagedConnectionFactory"
  jndi-name="java:/eis/HelloWorld"/>
</connection-definitions>
</ironjacamar>

```

B.2.11. HelloWorld/Native C

```

#include <jni.h>
#include <string.h>
#include <stdlib.h>
#include "build/c/HelloWorld.h"

/*
 * Class:      org.jboss.jca.samples.helloworld.HelloWorldManagedConnection
 * Method:     helloWorld
 * Signature:  (Ljava/lang/String;)Ljava/lang/String;
 */
JNIEXPORT jstring JNICALL
Java_org.jboss.jca.samples.helloworld.HelloWorldManagedConnection_helloWorld(JNIEnv *env,
    jobject o, jstring s)
{
    int length = 0;

    if (s != NULL)
        length = (*env)->GetStringLength(env, s);

    char *buf = (char*)malloc(16 + length);

    strcpy(buf, "Hello world, ");

    if (s != NULL)
        strcat(buf, (*env)->GetStringUTFChars(env, s, 0));

    strcat(buf, " !");

    jstring result = (*env)->NewStringUTF(env, buf);

    free(buf);

    return result;
}

```

B.2.12. HelloWorld/Native Connection Test Case

```

/*
 * IronJacamar, a Java EE Connector Architecture implementation

```

```
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* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

import java.io.File;
import java.util.UUID;
import java.util.logging.Logger;

import javax.annotation.Resource;

import org.jboss.arquillian.container.test.api.Deployment;
import org.jboss.arquillian.junit.Arquillian;

import org.jboss.shrinkwrap.api.ShrinkWrap;
import org.jboss.shrinkwrap.api.spec.JavaArchive;
import org.jboss.shrinkwrap.api.spec.ResourceAdapterArchive;

import org.junit.Test;
import org.junit.runner.RunWith;
import static org.junit.Assert.*;

/**
 * Test case for the HelloWorld/Native resource adapter
 */
@RunWith(Arquillian.class)
public class ConnectorTestCase
{
    private static Logger log = Logger.getLogger("ConnectorTestCase");

    /**
     * Define the deployment
     *
     * @return The deployment archive
     */
    @Deployment
    public static ResourceAdapterArchive createDeployment()
    {
        String deploymentName = "ConnectorTestCase.rar";

        ResourceAdapterArchive raa =
            ShrinkWrap.create(ResourceAdapterArchive.class, deploymentName);
        JavaArchive ja = ShrinkWrap.create(JavaArchive.class,
```



```

        UUID.randomUUID().toString() + ".jar");
    ja.addClasses(HelloWorldResourceAdapter.class,
        HelloWorldManagedConnectionFactory.class,
        HelloWorldManagedConnection.class,
        HelloWorldManagedConnectionMetaData.class,
        HelloWorldConnectionFactory.class,
        HelloWorldConnectionFactoryImpl.class,
        HelloWorldConnection.class,
        HelloWorldConnectionImpl.class);
    raa.addAsLibrary(ja);
    raa.addAsManifestResource("META-INF/ironjacamar.xml", "ironjacamar.xml");

    String rootPath =
        System.getProperty("test.dir") + File.separator + ".." + File.separator;

    File root = new File(rootPath);
    for (File f : root.listFiles())
    {
        if (f.getName().contains("HelloWorld"))
            raa.addAsLibrary(f);
    }

    log.info(raa.toString(true));

    return raa;
}

/** Resource */
@Resource(mappedName = "java:/eis/HelloWorld")
private HelloWorldConnectionFactory connectionFactory;

/**
 * Test helloWorld
 *
 * @exception Throwable Thrown if case of an error
 */
@Test
public void testHelloWorldNoArgs() throws Throwable
{
    assertNotNull(connectionFactory);
    HelloWorldConnection connection = connectionFactory.getConnection();
    assertNotNull(connection);
    String result = connection.helloWorld();
    assertNotNull(result);
    connection.close();
}

/**
 * Test helloWorld
 *
 * @exception Throwable Thrown if case of an error
 */
@Test
public void testHelloWorldNameString() throws Throwable
{
    assertNotNull(connectionFactory);
    HelloWorldConnection connection = connectionFactory.getConnection();
    assertNotNull(connection);
    String result = connection.helloWorld(null);

```

```
        assertNotNull(result);
        connection.close();
    }
}
```

B.2.13. HelloWorld/Native Ant build.xml

```
<!--
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 *
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
-->

<project name="helloworld-native" basedir="." default="rar">

    <!-- =====
        Properties
        ===== -->
    <property name="build.dir" value="${basedir}/build" />
    <property name="target.dir" value="${basedir}/target" />
    <property name="lib.dir" value="${basedir}/lib" />

    <property name="javac.debug" value="on" />
    <property name="javac.deprecation" value="on" />
    <property name="javac.optimize" value="off" />
    <property name="javac.encoding" value="utf-8" />

    <property name="junit.printsummary" value="yes" />
    <property name="junit.halt.onerror" value="no" />
    <property name="junit.halt.onfailure" value="no" />
    <property name="junit.fork" value="yes" />
    <property name="junit.timeout" value="60000" />
    <property name="junit.jvm" value="" />
    <property name="junit.jvm.options" value="-Xms128m -Xmx512m -XX:MaxPermSize=256m" />
    <property name="junit.batchtest.halt.onerror" value="no" />
```

```

<property name="junit.batchtest.haltonfailure" value="no" />
<property name="junit.batchtest.fork" value="yes" />

<path id="lib.path.id">
  <fileset dir="{lib.dir}">
    <include name="**/*.jar"/>
  </fileset>
</path>

<path id="native.path.id">
  <fileset dir="{lib.dir}">
    <include name="**/*.jar"/>
  </fileset>
  <pathelement path="{build.dir}"/>
</path>

<path id="test.lib.path.id">
  <fileset dir="{lib.dir}">
    <include name="**/*.jar"/>
  </fileset>
  <fileset dir="{build.dir}">
    <include name="**/*.jar"/>
  </fileset>
</path>

<!-- =====
      Target: init
      ===== -->
<target name="init">
  <mkdir dir="{build.dir}" />
  <mkdir dir="{build.dir}/c" />
  <mkdir dir="{lib.dir}" />
</target>

<!-- =====
      Target: compile
      ===== -->
<target name="compile" depends="init">
  <javac srcdir="{basedir}/src/main/java"
        destdir="{build.dir}"
        classpathref="lib.path.id"
        debug="{javac.debug}"
        deprecation="{javac.deprecation}"
        encoding="{javac.encoding}"
        optimize="{javac.optimize}">
  </javac>
</target>

<!-- =====
      Target: native
      ===== -->
<target name="native" depends="compile">
  <javah class="org.jboss.jca.samples.helloworld.HelloWorldManagedConnection"
        outputFile="{build.dir}/c/HelloWorld.h"
        force="true"
        classpathref="native.path.id">
  </javah>
</target>

```

```
<!-- =====
      Target: rar
      ===== -->
<target name="rar">
  <mkdir dir="${target.dir}" />
  <mkdir dir="${basedir}/src/main/resources" />
  <jar destfile="${build.dir}/helloworld.jar"
      basedir="${build.dir}"
      includes="**/*.class"/>
  <jar destfile="${target.dir}/helloworld.rar">
    <fileset dir="${basedir}/src/main/resources" includes="META-INF/*"/>
    <fileset dir="${build.dir}" includes="*.jar"/>
    <fileset dir="${build.dir}" includes="*.so"/>
    <fileset dir="${build.dir}" includes="*.a"/>
    <fileset dir="${build.dir}" includes="*.dll"/>
  </jar>
</target>

<!-- =====
      Target: prepare-test
      ===== -->
<target name="prepare-test" depends="init">
  <mkdir dir="${build.dir}/test" />

  <javac srcdir="src/test"
        destdir="${build.dir}/test"
        classpathref="test.lib.path.id"
        debug="${javac.debug}"
        deprecation="${javac.deprecation}"
        encoding="${javac.encoding}"
        optimize="${javac.optimize}">
    <compilerarg value="-Xlint"/>
  </javac>

  <copy todir="${build.dir}/test">
    <fileset dir="src/main/resources"/>
    <fileset dir="src/test/resources"/>
  </copy>
</target>

<!-- =====
      Target: test
      ===== -->
<target name="test" depends="rar, prepare-test">
  <mkdir dir="${basedir}/reports"/>

  <junit dir="src/test"
        printsummary="${junit.printsummary}"
        haltonerror="${junit.haltonerror}"
        haltonfailure="${junit.haltonfailure}"
        fork="${junit.fork}"
        timeout="${junit.timeout}">

    <jvmarg line="${junit.jvm.options}"/>
    <sysproperty key="archives.dir" value="${target.dir}"/>
    <sysproperty key="reports.dir" value="${basedir}/reports"/>
    <sysproperty key="java.util.logging.manager" value="org.jboss.logmanager.LogManager"/>
    <sysproperty key="log4j.defaultInitOverride" value="true"/>
    <sysproperty key="org.jboss.logging.Logger.pluginClass"
```

```

        value="org.jboss.logging.logmanager.LoggerPluginImpl"/>
<sysproperty key="test.dir" value="${build.dir}/test"/>
<sysproperty key="xb.builder.useUnorderedSequence" value="true"/>

<classpath>
    <fileset dir="${lib.dir}" includes="**/*.jar" />
    <fileset dir="${build.dir}" includes="*.jar" />
    <pathelement location="${build.dir}/test"/>
</classpath>

<formatter type="plain"/>
<formatter type="xml"/>

<batchtest todir="${basedir}/reports"
           haltonerror="${junit.batchtest.haltonerror}"
           haltonfailure="${junit.batchtest.haltonfailure}"
           fork="${junit.batchtest.fork}">

    <fileset dir="${build.dir}/test">
        <include name="**/*TestCase.class"/>
    </fileset>
</batchtest>

</junit>

</target>

<!-- =====
Target: docs
===== -->
<target name="docs" depends="compile">
    <mkdir dir="${target.dir}/docs"/>
    <javadoc packagenames=""
            sourcepath="src/main/java"
            destdir="${target.dir}/docs"
            classpathref="lib.path.id">
    </javadoc>
</target>

<!-- =====
Target: clean
===== -->
<target name="clean">
    <delete>
        <fileset dir="${basedir}" defaultexcludes="no">
            <include name="**/*~"/>
            <include name="**/*.bak"/>
        </fileset>
    </delete>
    <delete dir="${build.dir}"/>
    <delete dir="${target.dir}"/>
    <delete dir="${basedir}/reports"/>

    <!-- cmake environment -->
    <delete file="${basedir}/Makefile"/>
    <delete file="${basedir}/cmake_install.cmake"/>
    <delete dir="${basedir}/CMakeFiles"/>
    <delete file="${basedir}/CMakeCache.txt"/>
</target>

```

```
<!-- =====
      Target: dist-clean
      ===== -->
<target name="dist-clean" depends="init,clean">
  <delete includeemptydirs="true">
    <fileset dir="${lib.dir}" includes="**/*"/>
  </delete>
</target>

</project>
```

B.2.14. HelloWorld/Native cmake

```
PROJECT(helloworld-native)

CMAKE_MINIMUM_REQUIRED (VERSION 2.8)
SET(CMAKE_VERBOSE_MAKEFILE 1)

SET(LIBRARY_OUTPUT_PATH build)
SET(BUILD_SHARED_LIBS ON)
SET(CMAKE_INCLUDE_CURRENT_DIR ON)

FIND_PACKAGE(Java COMPONENTS Development)
FIND_PACKAGE(JNI)

INCLUDE_DIRECTORIES(${JAVA_INCLUDE_PATH})
INCLUDE_DIRECTORIES(${JAVA_INCLUDE_PATH2})

ADD_LIBRARY(HelloWorld helloworld.c)
```

B.3. HelloWorld/Lazy example

B.3.1. Introduction

The HelloWorld/Lazy resource adapter example shows a simple example of how to use and implement the interfaces in the Java EE Connector Architecture specification which takes advantage of the lazy association mechanism to reestablish the relationship between the logical (HelloWorldConnectionImpl) and the physical connection (HelloWorldManagedConnection).

The HelloWorld/Lazy sample exposes the HelloWorldConnection interface where developers can invoke the exposed methods.

The sample shows how to build and test a resource adapter.

B.3.1.1. Setup

The build environment needs various libraries in order to being able to build and test the resource adapter. The setup is done by

```
cd doc/samples/helloworld-lazy
cp -R ../../../../lib .
cp ../../../../bin/ironjacamar-sjc.jar lib/
```

B.3.1.2. Building

Building the resource adapter is done by

```
ant rar
```

B.3.1.3. Testing

Testing the resource adapter is done by

```
ant test
```

B.3.2. HelloWorld/Lazy Resource Adapter

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 *
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```

```
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* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

import java.util.logging.Logger;

import javax.resource.ResourceException;
import javax.resource.spi.ActivationSpec;
import javax.resource.spi.BootstrapContext;
import javax.resource.spi.ConfigProperty;
import javax.resource.spi.Connector;
import javax.resource.spi.ResourceAdapter;
import javax.resource.spi.ResourceAdapterInternalException;
import javax.resource.spi.TransactionSupport;
import javax.resource.spi.endpoint.MessageEndpointFactory;

import javax.transaction.xa.XAResource;

/**
 * HelloWorldResourceAdapter
 *
 * @version $Revision: $
 */
@Connector(
    reauthenticationSupport = false,
    transactionSupport = TransactionSupport.TransactionSupportLevel.NoTransaction)
public class HelloWorldResourceAdapter implements ResourceAdapter
{
    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldResourceAdapter");

    /** Name property */
    @ConfigProperty(defaultValue = "AS 7", supportsDynamicUpdates = true)
    private String name;

    /**
     * Default constructor
     */
    public HelloWorldResourceAdapter()
    {
    }

    /**
     * Set name
     * @param name The value
     */
    public void setName(String name)
    {
        this.name = name;
    }

    /**
     * Get name
     * @return The value
     */
    public String getName()
    {
    }
}
```



```
        return name;
    }

    /**
     * This is called during the activation of a message endpoint.
     *
     * @param endpointFactory A message endpoint factory instance.
     * @param spec An activation spec JavaBean instance.
     * @throws ResourceException generic exception
     */
    public void endpointActivation(MessageEndpointFactory endpointFactory,
                                   ActivationSpec spec) throws ResourceException
    {
    }

    /**
     * This is called when a message endpoint is deactivated.
     *
     * @param endpointFactory A message endpoint factory instance.
     * @param spec An activation spec JavaBean instance.
     */
    public void endpointDeactivation(MessageEndpointFactory endpointFactory,
                                      ActivationSpec spec)
    {
    }

    /**
     * This is called when a resource adapter instance is bootstrapped.
     *
     * @param ctx A bootstrap context containing references
     * @throws ResourceAdapterInternalException indicates bootstrap failure.
     */
    public void start(BootstrapContext ctx)
        throws ResourceAdapterInternalException
    {
    }

    /**
     * This is called when a resource adapter instance is undeployed or
     * during application server shutdown.
     */
    public void stop()
    {
    }

    /**
     * This method is called by the application server during crash recovery.
     *
     * @param specs an array of ActivationSpec JavaBeans
     * @throws ResourceException generic exception
     * @return an array of XAResource objects
     */
    public XAResource[] getXAResources(ActivationSpec[] specs)
        throws ResourceException
    {
        return null;
    }

    /**
```

```
* Returns a hash code value for the object.
* @return A hash code value for this object.
*/
@Override
public int hashCode()
{
    int result = 17;
    if (name != null)
        result += 31 * result + 7 * name.hashCode();
    else
        result += 31 * result + 7;
    return result;
}

/**
* Indicates whether some other object is equal to this one.
* @param other The reference object with which to compare.
* @return true If this object is the same as the obj argument, false otherwise.
*/
@Override
public boolean equals(Object other)
{
    if (other == null)
        return false;
    if (other == this)
        return true;
    if (!(other instanceof HelloWorldResourceAdapter))
        return false;
    HelloWorldResourceAdapter obj = (HelloWorldResourceAdapter)other;
    boolean result = true;
    if (result)
    {
        if (name == null)
            result = obj.getName() == null;
        else
            result = name.equals(obj.getName());
    }
    return result;
}
}
```

B.3.3. HelloWorld/Lazy Managed Connection Factory

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * the License, or (at your option) any later version.
 */
```

```

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*
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* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

import java.io.PrintWriter;
import java.util.Iterator;
import java.util.Set;
import java.util.logging.Logger;

import javax.resource.ResourceException;
import javax.resource.spi.ConnectionDefinition;
import javax.resource.spi.ConnectionManager;
import javax.resource.spi.ConnectionRequestInfo;
import javax.resource.spi.ManagedConnection;
import javax.resource.spi.ManagedConnectionFactory;
import javax.resource.spi.ResourceAdapter;
import javax.resource.spi.ResourceAdapterAssociation;

import javax.security.auth.Subject;

/**
 * HelloWorldManagedConnectionFactory
 *
 * @version $Revision: $
 */
@ConnectionDefinition(connectionFactory = HelloWorldConnectionFactory.class,
    connectionFactoryImpl = HelloWorldConnectionFactoryImpl.class,
    connection = HelloWorldConnection.class,
    connectionImpl = HelloWorldConnectionImpl.class)
public class HelloWorldManagedConnectionFactory
    implements ManagedConnectionFactory, ResourceAdapterAssociation
{

    /** The serialVersionUID */
    private static final long serialVersionUID = 1L;

    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldManagedConnectionFactory");

    /** The resource adapter */
    private ResourceAdapter ra;

    /** The connection manager */
    private ConnectionManager cm;

    /** The logwriter */
    private PrintWriter logwriter;

    /**
     * Default constructor

```

```
    */
    public HelloWorldManagedConnectionFactory()
    {
        this.ra = null;
        this.cm = null;
        this.logwriter = null;
    }

    /**
     * Creates a Connection Factory instance.
     *
     * @return EIS-specific Connection Factory instance or
     *         javax.resource.cci.ConnectionFactory instance
     * @throws ResourceException Generic exception
     */
    public Object createConnectionFactory() throws ResourceException
    {
        throw new ResourceException("This resource adapter doesn't support non-managed environments");
    }

    /**
     * Creates a Connection Factory instance.
     *
     * @param cxManager ConnectionManager to be associated with created EIS
     *         connection factory instance
     * @return EIS-specific Connection Factory instance or
     *         javax.resource.cci.ConnectionFactory instance
     * @throws ResourceException Generic exception
     */
    public Object createConnectionFactory(ConnectionManager cxManager) throws ResourceException
    {
        this.cm = cxManager;

        return new HelloWorldConnectionFactoryImpl(this, cxManager);
    }

    /**
     * Creates a new physical connection to the underlying EIS resource manager.
     *
     * @param subject Caller's security information
     * @param cxRequestInfo Additional resource adapter specific connection
     *         request information
     * @throws ResourceException generic exception
     * @return ManagedConnection instance
     */
    public ManagedConnection createManagedConnection(Subject subject,
                                                    ConnectionRequestInfo cxRequestInfo)
        throws ResourceException
    {
        return new HelloWorldManagedConnection(cm, this);
    }

    /**
     * Returns a matched connection from the candidate set of connections.
     *
     * @param connectionSet Candidate connection set
     * @param subject Caller's security information
     * @param cxRequestInfo Additional resource adapter specific connection request information

```

```

* @throws ResourceException generic exception
* @return ManagedConnection if resource adapter finds an acceptable match otherwise null
*/
public ManagedConnection matchManagedConnections(Set connectionSet,
                                                Subject subject, ConnectionRequestInfo cxRequestInfo)
    throws ResourceException
{
    Iterator it = connectionSet.iterator();
    while (it.hasNext())
    {
        ManagedConnection mc = (ManagedConnection)it.next();
        if (mc instanceof HelloWorldManagedConnection)
        {
            return (HelloWorldManagedConnection)mc;
        }
    }

    return null;
}

/**
 * Get the log writer for this ManagedConnectionFactory instance.
 *
 * @return PrintWriter
 * @throws ResourceException generic exception
 */
public PrintWriter getLogWriter() throws ResourceException
{
    return logwriter;
}

/**
 * Set the log writer for this ManagedConnectionFactory instance.
 *
 * @param out PrintWriter - an out stream for error logging and tracing
 * @throws ResourceException generic exception
 */
public void setLogWriter(PrintWriter out) throws ResourceException
{
    logwriter = out;
}

/**
 * Get the resource adapter
 *
 * @return The handle
 */
public ResourceAdapter getResourceAdapter()
{
    return ra;
}

/**
 * Set the resource adapter
 *
 * @param ra The handle
 */
public void setResourceAdapter(ResourceAdapter ra)
{

```

```
        this.ra = ra;
    }

    /**
     * Returns a hash code value for the object.
     * @return A hash code value for this object.
     */
    @Override
    public int hashCode()
    {
        int result = 17;
        return result;
    }

    /**
     * Indicates whether some other object is equal to this one.
     * @param other The reference object with which to compare.
     * @return true If this object is the same as the obj argument, false otherwise.
     */
    @Override
    public boolean equals(Object other)
    {
        if (other == null)
            return false;
        if (other == this)
            return true;
        if (!(other instanceof HelloWorldManagedConnectionFactory))
            return false;
        HelloWorldManagedConnectionFactory obj = (HelloWorldManagedConnectionFactory)other;
        boolean result = true;
        return result;
    }
}
```

B.3.4. HelloWorld/Lazy Managed Connection

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 *
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 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 */
```

```

*
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* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

import java.io.PrintWriter;
import java.util.ArrayList;
import java.util.Collections;
import java.util.List;
import java.util.logging.Logger;

import javax.resource.NotSupportedException;
import javax.resource.ResourceException;
import javax.resource.spi.ConnectionEvent;
import javax.resource.spi.ConnectionEventListener;
import javax.resource.spi.ConnectionManager;
import javax.resource.spi.ConnectionRequestInfo;
import javax.resource.spi.DissociatableManagedConnection;
import javax.resource.spi.LocalTransaction;
import javax.resource.spi.ManagedConnection;
import javax.resource.spi.ManagedConnectionMetaData;

import javax.security.auth.Subject;
import javax.transaction.xa.XAResource;

/**
 * HelloWorldManagedConnection
 *
 * @version $Revision: $
 */
public class HelloWorldManagedConnection implements ManagedConnection,
                                                    DissociatableManagedConnection
{
    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldManagedConnection");

    /** Connection manager */
    private ConnectionManager cm;

    /** MCF */
    private HelloWorldManagedConnectionFactory mcf;

    /** Log writer */
    private PrintWriter logWriter;

    /** Listeners */
    private List<ConnectionEventListener> listeners;

    /** Connection */
    private HelloWorldConnectionImpl connection;

    /**
     * Constructor
     * @param cm The connection manager
     * @param mcf The managed connection factory
     */

```

```
public HelloWorldManagedConnection(ConnectionManager cm,
                                   HelloWorldManagedConnectionFactory mcf)
{
    this.cm = cm;
    this.mcf = mcf;
    this.logWriter = null;
    this.listeners = Collections.synchronizedList(new ArrayList<ConnectionEventListener>(1));
    this.connection = null;
}

/**
 * Creates a new connection handle for the underlying physical connection
 * represented by the ManagedConnection instance.
 *
 * @param subject Security context as JAAS subject
 * @param cxRequestInfo ConnectionRequestInfo instance
 * @return generic Object instance representing the connection handle.
 * @throws ResourceException generic exception if operation fails
 */
public Object getConnection(Subject subject,
                            ConnectionRequestInfo cxRequestInfo)
    throws ResourceException
{
    if (connection != null)
    {
        connection.setManagedConnection(null);
    }

    connection = new HelloWorldConnectionImpl(this, mcf, cm, cxRequestInfo);

    return connection;
}

/**
 * Used by the container to change the association of an
 * application-level connection handle with a ManagedConneciton instance.
 *
 * @param connection Application-level connection handle
 * @throws ResourceException generic exception if operation fails
 */
public void associateConnection(Object connection) throws ResourceException
{
    if (connection == null)
        throw new ResourceException("Null connection handle");

    if (!(connection instanceof HelloWorldConnectionImpl))
        throw new ResourceException("Wrong connection handle");

    if (this.connection != null)
    {
        this.connection.setManagedConnection(null);
    }

    this.connection = (HelloWorldConnectionImpl)connection;
    this.connection.setManagedConnection(this);
}

/**
 * This method is called by an application server (that is capable of lazy
```



```

* connection association optimization) in order to dissociate a ManagedConnection
* instance from all of its connection handles.
* @exception ResourceException Thrown if an error occurs
*/
public void dissociateConnections() throws ResourceException
{
    if (connection != null)
    {
        connection.setManagedConnection(null);
        connection = null;
    }
}

/**
 * Application server calls this method to force any cleanup on
 * the ManagedConnection instance.
 *
 * @throws ResourceException generic exception if operation fails
 */
public void cleanup() throws ResourceException
{
    if (connection != null)
    {
        connection.setManagedConnection(null);
        connection = null;
    }
}

/**
 * Destroys the physical connection to the underlying resource manager.
 *
 * @throws ResourceException generic exception if operation fails
 */
public void destroy() throws ResourceException
{
    if (connection != null)
    {
        connection.setManagedConnection(null);
        connection = null;
    }
}

/**
 * Adds a connection event listener to the ManagedConnection instance.
 *
 * @param listener A new ConnectionEventListener to be registered
 */
public void addConnectionEventListener(ConnectionEventListener listener)
{
    if (listener == null)
        throw new IllegalArgumentException("Listener is null");

    listeners.add(listener);
}

/**
 * Removes an already registered connection event listener
 * from the ManagedConnection instance.
 *

```

```
* @param listener Already registered connection event listener to be removed
*/
public void removeConnectionEventListener(ConnectionEventListener listener)
{
    if (listener == null)
        throw new IllegalArgumentException("Listener is null");

    listeners.remove(listener);
}

/**
* Gets the log writer for this ManagedConnection instance.
*
* @return Character ourput stream associated with this
*      Managed-Connection instance
* @throws ResourceException generic exception if operation fails
*/
public PrintWriter getLogWriter() throws ResourceException
{
    return logWriter;
}

/**
* Sets the log writer for this ManagedConnection instance.
*
* @param out Character Output stream to be associated
* @throws ResourceException generic exception if operation fails
*/
public void setLogWriter(PrintWriter out) throws ResourceException
{
    this.logWriter = out;
}

/**
* Returns an <code>javax.resource.spi.LocalTransaction</code> instance.
*
* @return LocalTransaction instance
* @throws ResourceException generic exception if operation fails
*/
public LocalTransaction getLocalTransaction() throws ResourceException
{
    throw new NotSupportedException("LocalTransaction not supported");
}

/**
* Returns an <code>javax.transaction.xa.XAResource</code> instance.
*
* @return XAResource instance
* @throws ResourceException generic exception if operation fails
*/
public XAResource getXAResource() throws ResourceException
{
    throw new NotSupportedException("GetXAResource not supported");
}

/**
* Gets the metadata information for this connection's underlying
* EIS resource manager instance.
*
```

```

    * @return ManagedConnectionMetaData instance
    * @throws ResourceException generic exception if operation fails
    */
    public ManagedConnectionMetaData getMetaData() throws ResourceException
    {
        return new HelloWorldManagedConnectionMetaData();
    }

    /**
     * Call helloWorld
     * @param name String name
     * @return String helloworld
     */
    String helloWorld(String name)
    {
        return "Hello World, " + name + " !";
    }

    /**
     * Close handle
     * @param handle The handle
     */
    void closeHandle(HelloWorldConnection handle)
    {
        ConnectionEvent event = new ConnectionEvent(this, ConnectionEvent.CONNECTION_CLOSED);
        event.setConnectionHandle(handle);

        for (ConnectionEventListener cel : listeners)
        {
            cel.connectionClosed(event);
        }
    }
}

```

B.3.5. HelloWorld/Lazy Connection Factory

```

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```

```
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* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

import java.io.Serializable;

import javax.resource.Referenceable;
import javax.resource.ResourceException;

/**
 * HelloWorldConnectionFactory
 *
 * @version $Revision: $
 */
public interface HelloWorldConnectionFactory extends Serializable, Referenceable
{
    /**
     * Get connection from factory
     *
     * @return HelloWorldConnection instance
     * @exception ResourceException Thrown if a connection can't be obtained
     */
    public HelloWorldConnection getConnection() throws ResourceException;
}
```

B.3.6. HelloWorld/Lazy Connection Factory Implementation

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;
```

```

import javax.naming.NamingException;
import javax.naming.Reference;

import javax.resource.ResourceException;
import javax.resource.spi.ConnectionManager;

/**
 * HelloWorldConnectionFactoryImpl
 *
 * @version $Revision: $
 */
public class HelloWorldConnectionFactoryImpl implements HelloWorldConnectionFactory
{
    /** The serialVersionUID */
    private static final long serialVersionUID = 1L;

    private Reference reference;

    private HelloWorldManagedConnectionFactory mcf;
    private ConnectionManager connectionManager;

    /**
     * Default constructor
     * @param mcf ManagedConnectionFactory
     * @param cxManager ConnectionManager
     */
    public HelloWorldConnectionFactoryImpl(HelloWorldManagedConnectionFactory mcf,
                                           ConnectionManager cxManager)
    {
        this.mcf = mcf;
        this.connectionManager = cxManager;
    }

    /**
     * Get connection from factory
     *
     * @return HelloWorldConnection instance
     * @exception ResourceException Thrown if a connection can't be obtained
     */
    @Override
    public HelloWorldConnection getConnection() throws ResourceException
    {
        return (HelloWorldConnection)connectionManager.allocateConnection(mcf, null);
    }

    /**
     * Get the Reference instance.
     *
     * @return Reference instance
     * @exception NamingException Thrown if a reference can't be obtained
     */
    @Override
    public Reference getReference() throws NamingException
    {
        return reference;
    }

    /**
     * Set the Reference instance.

```

```
    *  
    * @param reference A Reference instance  
    */  
    @Override  
    public void setReference(Reference reference)  
    {  
        this.reference = reference;  
    }  
}
```

B.3.7. HelloWorld/Lazy Connection

```
/*  
 * IronJacamar, a Java EE Connector Architecture implementation  
 * Copyright 2012, Red Hat Inc, and individual contributors  
 * as indicated by the @author tags. See the copyright.txt file in the  
 * distribution for a full listing of individual contributors.  
 *  
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 *  
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 * Lesser General Public License for more details.  
 *  
 * You should have received a copy of the GNU Lesser General Public  
 * License along with this software; if not, write to the Free  
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA  
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.  
 */  
package org.jboss.jca.samples.helloworld;  
  
/**  
 * HelloWorldConnection  
 *  
 * @version $Revision: $  
 */  
public interface HelloWorldConnection  
{  
    /**  
     * HelloWorld  
     * @return String  
     */  
    public String helloWorld();  
  
    /**  
     * HelloWorld  
     * @param name A name  
     * @return String  
     */  
}
```

```
public String helloWorld(String name);

/**
 * Close
 */
public void close();
}
```

B.3.8. HelloWorld/Lazy Connection Implementation

```
/*
 * IronJacamar, a Java EE Connector Architecture implementation
 * Copyright 2012, Red Hat Inc, and individual contributors
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 * distribution for a full listing of individual contributors.
 *
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 * published by the Free Software Foundation; either version 2.1 of
 * the License, or (at your option) any later version.
 *
 * This software is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 *
 * You should have received a copy of the GNU Lesser General Public
 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
package org.jboss.jca.samples.helloworld;

import java.util.logging.Logger;

import javax.resource.spi.ConnectionManager;
import javax.resource.spi.ConnectionRequestInfo;
import javax.resource.spi.LazyAssociatableConnectionManager;

/**
 * HelloWorldConnectionImpl
 */
@version $Revision: $
/**
public class HelloWorldConnectionImpl implements HelloWorldConnection
{
    /** The logger */
    private static Logger log = Logger.getLogger("HelloWorldConnectionImpl");

    /** Connection Manager */
    private ConnectionManager cm;

    /** ManagedConnection */
```

```
private HelloWorldManagedConnection mc;

/** ManagedConnectionFactory */
private HelloWorldManagedConnectionFactory mcf;

/** ConnectionRequestInfo */
private ConnectionRequestInfo cri;

/**
 * Default constructor
 * @param mc HelloWorldManagedConnection
 * @param mcf HelloWorldManagedConnectionFactory
 * @param cm The connection manager
 * @param cri The connection request info
 */
public HelloWorldConnectionImpl(HelloWorldManagedConnection mc,
                                HelloWorldManagedConnectionFactory mcf,
                                ConnectionManager cm,
                                ConnectionRequestInfo cri)
{
    this.mc = mc;
    this.mcf = mcf;
    this.cm = cm;
    this.cri = cri;
}

/**
 * Call helloWorld
 * @return String helloworld
 */
public String helloWorld()
{
    return helloWorld(((HelloWorldResourceAdapter)mcf.getResourceAdapter()).getName());
}

/**
 * Call helloWorld
 * @param name String name
 * @return String helloworld
 */
public String helloWorld(String name)
{
    if (mc == null)
        associate();

    return mc.helloWorld(name);
}

/**
 * Close
 */
public void close()
{
    if (mc != null)
    {
        mc.closeHandle(this);
    }
    else
    {

```



```

        if (cm instanceof LazyAssociatableConnectionManager)
        {
            LazyAssociatableConnectionManager lacm = (LazyAssociatableConnectionManager)cm;
            lacm.inactiveConnectionClosed(this, mcf);
        }
    }

    /**
     * Set the managed connection
     * @param mc The managed connection
     */
    void setManagedConnection(HelloWorldManagedConnection mc)
    {
        this.mc = mc;
    }

    /**
     * Associate
     */
    private void associate()
    {
        if (cm instanceof LazyAssociatableConnectionManager)
        {
            try
            {
                LazyAssociatableConnectionManager lacm = (LazyAssociatableConnectionManager)cm;
                lacm.associateConnection(this, mcf, cri);
            }
            catch (Throwable t)
            {
                log.severe("Associate" + t.getMessage());
            }
        }
    }
}

```

B.3.9. HelloWorld/Lazy Managed Connection MetaData

```

/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * distribution for a full listing of individual contributors.
 *
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 *
 * This software is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU

```

```
* Lesser General Public License for more details.
*
* You should have received a copy of the GNU Lesser General Public
* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

import javax.resource.ResourceException;

import javax.resource.spi.ManagedConnectionMetaData;

/**
 * HelloWorldManagedConnectionMetaData
 *
 * @version $Revision: $
 */
public class HelloWorldManagedConnectionMetaData implements ManagedConnectionMetaData
{
    /**
     * Default constructor
     */
    public HelloWorldManagedConnectionMetaData()
    {
    }

    /**
     * Returns Product name of the underlying EIS instance connected
     * through the ManagedConnection.
     *
     * @return Product name of the EIS instance
     * @throws ResourceException Thrown if an error occurs
     */
    @Override
    public String getEISProductName() throws ResourceException
    {
        return "HelloWorld Resource Adapter";
    }

    /**
     * Returns Product version of the underlying EIS instance connected
     * through the ManagedConnection.
     *
     * @return Product version of the EIS instance
     * @throws ResourceException Thrown if an error occurs
     */
    @Override
    public String getEISProductVersion() throws ResourceException
    {
        return "1.0";
    }

    /**
     * Returns maximum limit on number of active concurrent connections
     *
     * @return Maximum limit for number of active concurrent connections
     * @throws ResourceException Thrown if an error occurs
     */
}
```

```

@Override
public int getMaxConnections() throws ResourceException
{
    return 0;
}

/**
 * Returns name of the user associated with the ManagedConnection instance
 *
 * @return Name of the user
 * @throws ResourceException Thrown if an error occurs
 */
@Override
public String getUserName() throws ResourceException
{
    return null;
}
}

```

B.3.10. HelloWorld/Lazy ironjacamar.xml

```

<?xml version="1.0" encoding="UTF-8"?>
<ironjacamar>
  <connection-definitions>
    <connection-definition
      class-name="org.jboss.jca.samples.helloworld.HelloWorldManagedConnectionFactory"
      jndi-name="java:/eis/HelloWorld">
      <pool>
        <min-pool-size>0</min-pool-size>
        <max-pool-size>1</max-pool-size>
      </pool>
    </connection-definition>
  </connection-definitions>
</ironjacamar>

```

B.3.11. HelloWorld/Lazy Connection Test Case

```

/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * distribution for a full listing of individual contributors.
 *
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 * under the terms of the GNU Lesser General Public License as
 * published by the Free Software Foundation; either version 2.1 of
 * the License, or (at your option) any later version.

```

```
*
* This software is distributed in the hope that it will be useful,
* but WITHOUT ANY WARRANTY; without even the implied warranty of
* MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
* Lesser General Public License for more details.
*
* You should have received a copy of the GNU Lesser General Public
* License along with this software; if not, write to the Free
* Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
* 02110-1301 USA, or see the FSF site: http://www.fsf.org.
*/
package org.jboss.jca.samples.helloworld;

import java.util.UUID;
import java.util.logging.Logger;

import javax.annotation.Resource;

import org.jboss.arquillian.container.test.api.Deployment;
import org.jboss.arquillian.junit.Arquillian;

import org.jboss.shrinkwrap.api.ShrinkWrap;
import org.jboss.shrinkwrap.api.spec.JavaArchive;
import org.jboss.shrinkwrap.api.spec.ResourceAdapterArchive;

import org.junit.Test;
import org.junit.runner.RunWith;
import static org.junit.Assert.*;

/**
 * ConnectorTestCase
 *
 * @version $Revision: $
 */
@RunWith(Arquillian.class)
public class ConnectorTestCase
{
    private static Logger log = Logger.getLogger("ConnectorTestCase");

    private static String deploymentName = "ConnectorTestCase";

    /**
     * Define the deployment
     *
     * @return The deployment archive
     */
    @Deployment
    public static ResourceAdapterArchive createDeployment()
    {
        ResourceAdapterArchive raa =
            ShrinkWrap.create(ResourceAdapterArchive.class, deploymentName + ".rar");
        JavaArchive ja = ShrinkWrap.create(JavaArchive.class,
            UUID.randomUUID().toString() + ".jar");
        ja.addClasses>HelloWorldResourceAdapter.class,
            HelloWorldManagedConnectionFactory.class,
            HelloWorldManagedConnection.class,
            HelloWorldManagedConnectionMetaData.class,
            HelloWorldConnectionFactory.class,
```

```

        HelloWorldConnectionFactoryImpl.class,
        HelloWorldConnection.class,
        HelloWorldConnectionImpl.class);
    raa.addAsLibrary(ja);
    raa.addAsManifestResource("META-INF/ironjacamar.xml", "ironjacamar.xml");

    return raa;
}

/** resource */
@Resource(mappedName = "java:/eis/HelloWorld")
private HelloWorldConnectionFactory connectionFactory;

/**
 * Test helloWorld
 *
 * @exception Throwable Thrown if case of an error
 */
@Test
public void testHelloWorldNoArgs() throws Throwable
{
    assertNotNull(connectionFactory);
    HelloWorldConnection connection = connectionFactory.getConnection();
    assertNotNull(connection);
    String result = connection.helloWorld();
    connection.close();
}

/**
 * Test helloWorld
 *
 * @exception Throwable Thrown if case of an error
 */
@Test
public void testHelloWorldNameString() throws Throwable
{
    assertNotNull(connectionFactory);
    HelloWorldConnection connection = connectionFactory.getConnection();
    assertNotNull(connection);
    String result = connection.helloWorld(null);
    connection.close();
}

/**
 * Test helloWorld with two connections
 *
 * max-pool-size is 1, so once getConnection() is called
 * the second time, the managed connection for connection1
 * is dissociated.
 *
 * @exception Throwable Thrown if case of an error
 */
@Test
public void testHelloWorldTwoConnections() throws Throwable
{
    assertNotNull(connectionFactory);

    HelloWorldConnection connection1 = connectionFactory.getConnection();
    assertNotNull(connection1);

```

```
String result1 = connection1.helloWorld(null);
assertNotNull(result1);

HelloWorldConnection connection2 = connectionFactory.getConnection();
assertNotNull(connection2);
String result2 = connection2.helloWorld(null);
assertNotNull(result2);

connection1.close();
connection2.close();
}
}
```

B.3.12. HelloWorld/Lazy Ant build.xml

```
<!--
/*
 * IronJacamar, a Java EE Connector Architecture implementation
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 * distribution for a full listing of individual contributors.
 *
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 * the License, or (at your option) any later version.
 *
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 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 *
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 * License along with this software; if not, write to the Free
 * Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA
 * 02110-1301 USA, or see the FSF site: http://www.fsf.org.
 */
-->

<project name="helloworld-lazy" basedir="." default="rar">

    <!-- =====
    Properties
    ===== -->

    <property name="build.dir" value="${basedir}/build" />
    <property name="target.dir" value="${basedir}/target" />
    <property name="lib.dir" value="${basedir}/lib" />

    <property name="javac.debug" value="on" />
    <property name="javac.deprecation" value="on" />
    <property name="javac.optimize" value="off" />
    <property name="javac.encoding" value="utf-8" />
```

```

<property name="junit.printsummary" value="yes" />
<property name="junit.haltsonerror" value="no" />
<property name="junit.haltsonfailure" value="no" />
<property name="junit.fork" value="yes" />
<property name="junit.timeout" value="60000" />
<property name="junit.jvm" value="" />
<property name="junit.jvm.options" value="-Xms128m -Xmx512m -XX:MaxPermSize=256m" />
<property name="junit.batchtest.haltsonerror" value="no" />
<property name="junit.batchtest.haltsonfailure" value="no" />
<property name="junit.batchtest.fork" value="yes" />

<path id="lib.path.id">
  <fileset dir="{lib.dir}">
    <include name="**/*.jar"/>
  </fileset>
</path>

<path id="test.lib.path.id">
  <fileset dir="{lib.dir}">
    <include name="**/*.jar"/>
  </fileset>
  <fileset dir="{build.dir}">
    <include name="**/*.jar"/>
  </fileset>
</path>

<!-- =====
      Target: init
      ===== -->
<target name="init">
  <mkdir dir="{lib.dir}" />
</target>

<!-- =====
      Target: compile
      ===== -->
<target name="compile" depends="init">
  <mkdir dir="{build.dir}" />

  <javac srcdir="{basedir}/src/main/java"
    destdir="{build.dir}"
    classpathref="lib.path.id"
    debug="{javac.debug}"
    deprecation="{javac.deprecation}"
    encoding="{javac.encoding}"
    optimize="{javac.optimize}">
  </javac>
</target>

<!-- =====
      Target: rar
      ===== -->
<target name="rar" depends="compile">
  <mkdir dir="{target.dir}" />
  <mkdir dir="{basedir}/src/main/resources" />
  <jar destfile="{build.dir}/helloworld.jar"
    basedir="{build.dir}"
    includes="**/*.class"/>
  <jar destfile="{target.dir}/helloworld.rar">

```

```

    <fileset dir="${basedir}/src/main/resources" includes="META-INF/*" />
    <fileset dir="${build.dir}" includes="**/*.jar" />
  </jar>
</target>

<!-- =====
      Target: prepare-test
      ===== -->
<target name="prepare-test" depends="init">
  <mkdir dir="${build.dir}/test" />

  <javac srcdir="src/test"
        destdir="${build.dir}/test"
        classpathref="test.lib.path.id"
        debug="${javac.debug}"
        deprecation="${javac.deprecation}"
        encoding="${javac.encoding}"
        optimize="${javac.optimize}"
        <compilerarg value="-Xlint" />
  </javac>

  <copy todir="${build.dir}/test">
    <fileset dir="src/main/resources" />
    <fileset dir="src/test/resources" />
  </copy>
</target>

<!-- =====
      Target: test
      ===== -->
<target name="test" depends="rar, prepare-test">
  <mkdir dir="${basedir}/reports" />

  <junit dir="src/test"
        printsummary="${junit.printsummary}"
        haltonerror="${junit.haltonerror}"
        haltonfailure="${junit.haltonfailure}"
        fork="${junit.fork}"
        timeout="${junit.timeout}">

    <jvmarg line="${junit.jvm.options}" />
    <sysproperty key="archives.dir" value="${target.dir}" />
    <sysproperty key="reports.dir" value="${basedir}/reports" />
    <sysproperty key="java.util.logging.manager" value="org.jboss.logmanager.LogManager" />
    <sysproperty key="log4j.defaultInitOverride" value="true" />
    <sysproperty key="org.jboss.logging.Logger.pluginClass"
                  value="org.jboss.logging.logmanager.LoggerPluginImpl" />
    <sysproperty key="test.dir" value="${build.dir}/test" />
    <sysproperty key="xb.builder.useUnorderedSequence" value="true" />

    <classpath>
      <fileset dir="${lib.dir}" includes="**/*.jar" />
      <fileset dir="${build.dir}" includes="*.jar" />
      <pathelement location="${build.dir}/test" />
    </classpath>

    <formatter type="plain" />
    <formatter type="xml" />
  </junit>
</target>

```



```

        <batchtest todir="${basedir}/reports"
                  haltonerror="${junit.batchtest.haltonerror}"
                  haltonfailure="${junit.batchtest.haltonfailure}"
                  fork="${junit.batchtest.fork}">

            <fileset dir="${build.dir}/test">
                <include name="**/*TestCase.class"/>
            </fileset>
        </batchtest>

    </junit>

</target>

<!-- =====
      Target: docs
      ===== -->
<target name="docs" depends="compile">
    <mkdir dir="${target.dir}/docs"/>
    <javadoc packagenames=""
             sourcepath="src/main/java"
             destdir="${target.dir}/docs"
             classpathref="lib.path.id">
    </javadoc>
</target>

<!-- =====
      Target: clean
      ===== -->
<target name="clean">
    <delete>
        <fileset dir="${basedir}" defaultexcludes="no">
            <include name="**/*~"/>
            <include name="**/*.bak"/>
        </fileset>
    </delete>
    <delete dir="${build.dir}"/>
    <delete dir="${target.dir}"/>
    <delete dir="${basedir}/reports"/>
</target>

<!-- =====
      Target: dist-clean
      ===== -->
<target name="dist-clean" depends="init,clean">
    <delete includeemptydirs="true">
        <fileset dir="${lib.dir}" includes="**/*"/>
    </delete>
</target>

</project>

```

Appendix C. Datasources

The datasource schema can found at http://www.ironjacamar.org/schema/datasources_1_0.xsd.

C.1. PosgreSQL

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
             xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <datasource jndi-name="java:/PostgresDS" pool-name="PostgresDS">
    <connection-url>jdbc:postgresql://[servername]:[port]/[database name]</connection-url>
    <driver-class>org.postgresql.Driver</driver-class>
    <security>
      <user-name>x</user-name>
      <password>y</password>
    </security>
    <validation>
      <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.postgres.PostgreSQLValidConnectionChecker"></
valid-connection-checker>
      <exception-sorter class-
name="org.jboss.jca.adapters.jdbc.extensions.postgres.PostgreSQLExceptionSorter"></exception-
sorter>
    </validation>
  </datasource>
</datasources>
```

C.2. PosgreSQL XA

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
             xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <xa-datasource jndi-name="java:/PostgresDS" pool-name="PostgresDS">
    <xa-datasource-property name="ServerName">server_name</xa-datasource-property>
    <xa-datasource-property name="PortNumber">5432</xa-datasource-property>
    <xa-datasource-property name="DatabaseName">database_name</xa-datasource-property>
    <xa-datasource-class>org.postgresql.xa.PGXADatasource</xa-datasource-class>
    <security>
      <user-name>x</user-name>
      <password>y</password>
    </security>
  </xa-datasource>
</datasources>
```

```
<validation>
    <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.postgres.PostgreSQLValidConnectionChecker"></
valid-connection-checker>
    <exception-sorter class-
name="org.jboss.jca.adapters.jdbc.extensions.postgres.PostgreSQLExceptionSorter"></exception-
sorter>
</validation>
</xa-datasource>

</datasources>
```

C.3. MySQL

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <datasource jndi-name="java:/MySqlDS" pool-name="MySqlDS">
    <connection-url>jdbc:mysql://mysql-hostname:3306/jbossdb</connection-url>
    <driver-class>com.mysql.jdbc.Driver</driver-class>
    <security>
      <user-name>x</user-name>
      <password>y</password>
    </security>
    <validation>
      <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.mysql.MySQLValidConnectionChecker"></valid-
connection-checker>
      <exception-sorter class-
name="org.jboss.jca.adapters.jdbc.extensions.mysql.MySQLExceptionSorter"></exception-sorter>
    </validation>
  </datasource>

</datasources>
```

C.4. MySQL XA

```
<?xml version="1.0" encoding="UTF-8"?>

<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <xa-datasource jndi-name="java:/MysqlXADS" pool-name="MysqlXADS">
```

```

<xa-datasource-property name="ServerName">server_name</xa-datasource-property>
<xa-datasource-property name="DatabaseName">database_name</xa-datasource-property>
<xa-datasource-class>com.mysql.jdbc.jdbc2.optional.MysqlXADataSource</xa-datasource-class>
<security>
  <user-name>x</user-name>
  <password>y</password>
</security>
<validation>
  <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.mysql.MySQLValidConnectionChecker"></valid-
connection-checker>
  <exception-sorter class-
name="org.jboss.jca.adapters.jdbc.extensions.mysql.MySQLExceptionSorter"></exception-sorter>
</validation>
</xa-datasource>
</datasources>

```

C.5. H2

```

<?xml version="1.0" encoding="UTF-8"?>

<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <datasource jndi-name="java:/H2DS" pool-name="H2DS">
    <connection-url>jdbc:h2:mem:test;DB_CLOSE_DELAY=-1</connection-url>
    <driver-class>org.h2.Driver</driver-class>
    <security>
      <user-name>sa</user-name>
      <password>sa</password>
    </security>
  </datasource>

</datasources>

```

C.6. H2 XA

```

<?xml version="1.0" encoding="UTF-8"?>

<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <xa-datasource jndi-name="java:/H2XADS" pool-name="H2XADS">

```

```
<xa-datasource-class>org.h2.jdbcx.JdbcDataSource</xa-datasource-class>
<xa-datasource-property name="URL">jdbc:h2:mem:test</xa-datasource-property>
<security>
  <!-- Have to defined as a primary property - otherwise it won't work -->
  <user-name>sa</user-name>
  <!-- Have to defined as a primary property - otherwise it won't work -->
  <password>sa</password>
</security>
</xa-datasource>

</datasources>
```

C.7. Derby

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <datasource jndi-name="java:/DerbyDS" pool-name="DerbyDS">
    <connection-url>jdbc:derby:${ironjacamar.home}${/}data${/}derby${/}localDB;create=true</
connection-url>
    <driver-class>org.apache.derby.jdbc.EmbeddedDriver</driver-class>
    <security>
      <user-name>sa</user-name>
      <password></password>
    </security>
  </datasource>

</datasources>
```

C.8. Derby XA

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <xa-datasource jndi-name="java:/XADerbyDS" pool-name="XADerbyDS">
    <xa-datasource-property name="DatabaseName">derby/default</xa-datasource-property>
    <xa-datasource-property name="CreateDatabase">create</xa-datasource-property>
    <xa-datasource-class>org.apache.derby.jdbc.EmbeddedXADataSource</xa-datasource-class>

    <xa-pool>
      <is-same-rm-override>>false</is-same-rm-override>
    </xa-pool>
  </xa-datasource>

</datasources>
```

```

        <!-- Uncomment to enable interleaving <interleaving/> -->
    </xa-pool>
    <security>
        <user-name>sa</user-name>
        <password></password>
    </security>
</xa-datasource>

</datasources>

```

C.9. Oracle

```

<?xml version="1.0" encoding="UTF-8"?>
<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
              xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">
    <datasource jndi-name="java:/OracleDS" pool-name="OracleDS">
        <!--
            Here are a couple of the possible OCI configurations. For more information,
            see http://otn.oracle.com/docs/products/oracle9i/doc\_library/release2/java.920/a96654/toc.htm
            <connection-url>jdbc:oracle:oci:@youroracle-tns-name</connection-url> or
            <connection-url>jdbc:oracle:oci:@(description=(address=(host=youroraclehost)(protocol=tcp)
(port=1521))(connect_data=(SERVICE_NAME=yourservicename)))</connection-url>
            Clearly, its better to have TNS set up properly.
        -->
        <connection-url>jdbc:oracle:thin:@youroraclehost:1521:yoursid</connection-url>
        <!-- you don't need this but it helps DBAs identify the application associated with a
connection -->
        <connection-property name="v$session.program">IronJacamar</connection-property>
        <driver-class>oracle.jdbc.driver.OracleDriver</driver-class>
        <security>
            <user-name>x</user-name>
            <password>y</password>
        </security>
        <validation>
            <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.oracle.OracleValidConnectionChecker"></valid-
connection-checker>
            <stale-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.oracle.OracleStaleConnectionChecker"></stale-
connection-checker>
            <exception-sorter class-
name="org.jboss.jca.adapters.jdbc.extensions.oracle.OracleExceptionSorter"></exception-sorter>
        </validation>
    </datasource>
</datasources>

```

C.10. Oracle XA

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- ATTENTION: DO NOT FORGET TO SET Pad=true IN transaction.xml -->
<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
              xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <xa-datasource jndi-name="java:/XAOracleDS" pool-name="XAOracleDS">
    <xa-datasource-property name="URL">jdbc:oracle:oci8:@tc</xa-datasource-property>
    <!-- you don't need this but it helps DBAs identify the application associated with a
connection -->
    <xa-datasource-property name="connectionProperties">v$session.program=IronJacamar</xa-
datasource-property>
    <xa-datasource-class>oracle.jdbc.xa.client.OracleXADataSource</xa-datasource-class>
    <xa-pool>
      <is-same-rm-override>false</is-same-rm-override>
      <!-- Uncomment to enable interleaving <interleaving/> -->
      <no-tx-separate-pools />
    </xa-pool>
    <security>
      <user-name>x</user-name>
      <password>y</password>
    </security>
    <validation>
      <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.oracle.OracleValidConnectionChecker"></valid-
connection-checker>
      <stale-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.oracle.OracleStaleConnectionChecker"></stale-
connection-checker>
      <exception-sorter class-
name="org.jboss.jca.adapters.jdbc.extensions.oracle.OracleExceptionSorter"></exception-sorter>
    </validation>
  </xa-datasource>
</datasources>
```

C.11. Microsoft SQLServer

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
              xsi:noNamespaceSchemaLocation="http://www.ironjacamar.orgd/schema/
atasources_1_0.xsd">

  <datasource jndi-name="java:/MSSQLDS" pool-name="MSSQLDS">
    <connection-url>jdbc:microsoft:sqlserver://localhost:1433;DatabaseName=MyDatabase</
connection-url>
    <driver-class>com.microsoft.sqlserver.jdbc.SQLServerDriver</driver-class>
```



```

<security>
  <user-name>x</user-name>
  <password>y</password>
</security>
<validation>
  <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.mssql.MSSQLValidConnectionChecker"></valid-
connection-checker>
</validation>
</datasource>

</datasources>

```

C.12. Microsoft SQLServer XA

```

<?xml version="1.0" encoding="UTF-8"?>

<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
             xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <xa-datasource jndi-name="java:/MSSQLXADS" pool-name="MSSQLXADS">
    <xa-datasource-property name="ServerName">myserver</xa-datasource-property>
    <xa-datasource-property name="DatabaseName">mydatabase</xa-datasource-property>
    <xa-datasource-property name="SelectMethod">cursor</xa-datasource-property>
    <xa-datasource-class>com.microsoft.sqlserver.jdbc.SQLServerXADataSource</xa-datasource-
class>
    <xa-pool>
      <is-same-rm-override>false</is-same-rm-override>
      <!-- Uncomment to enable interleaving <interleaving/> -->
    </xa-pool>
    <security>
      <user-name>x</user-name>
      <password>y</password>
    </security>
    <validation>
      <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.mssql.MSSQLValidConnectionChecker"></valid-
connection-checker>
    </validation>
  </xa-datasource>

</datasources>

```

C.13. IBM DB2

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
              xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/schema/
datasources_1_0.xsd">

  <datasource jndi-name="java:/DB2DS" pool-name="DB2DS">
    <!--
      DB2 Universal Driver Note connection URL is in form of
      jdbc:db2://host:port:dbname

      Default port for Type 4 driver is 50000

      Note, host and port must be specified if using Type 4 driver. And be forewarned, no native
      XA support is provided with Type 4; you must set a DB property calling for Type 2 to get XA

      <driver-class>com.ibm.db2.jcc.DB2Driver</driver-class>
      <connection-url>jdbc:db2://[hostname]:[port]/databasename"</connection-url>

      Please see http://www-128.ibm.com/developerworks/db2/library/techarticle/dm-0512kokkat/
      or the DB2 JDBC application developers manual.
    -->
    <connection-url>jdbc:db2:yourdatabase</connection-url>
    <driver-class>COM.ibm.db2.jdbc.app.DB2Driver</driver-class>
    <security>
      <user-name>x</user-name>
      <password>y</password>
    </security>
    <validation>
      <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.db2.DB2ValidConnectionChecker"></valid-
connection-checker>
      <stale-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.db2.DB2StaleConnectionChecker"></stale-
connection-checker>
      <exception-sorter class-
name="org.jboss.jca.adapters.jdbc.extensions.db2.DB2ExceptionSorter"></exception-sorter>
    </validation>
  </datasource>
</datasources>
```

C.14. IBM DB2 XA

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
              xsi:noNamespaceSchemaLocation="http://www.ironjacamar.org/doc/schema/
datasources_1_0.xsd">

  <xa-datasource jndi-name="java:/DB2XADS" pool-name="DB2XADS">
    <xa-datasource-property name="DatabaseName">your_database_name</xa-datasource-property>
    <xa-datasource-class>COM.ibm.db2.jdbc.DB2XADataSource</xa-datasource-class>
    <xa-pool>
      <is-same-rm-override>false</is-same-rm-override>
    </xa-pool>
  </xa-datasource>
</datasources>
```

```
<!-- Uncomment to enable interleaving <interleaving/> -->
</xa-pool>
<security>
  <user-name>x</user-name>
  <password>y</password>
</security>
<validation>
  <valid-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.db2.DB2ValidConnectionChecker"></valid-
connection-checker>
  <stale-connection-checker class-
name="org.jboss.jca.adapters.jdbc.extensions.db2.DB2StaleConnectionChecker"></stale-
connection-checker>
  <exception-sorter class-
name="org.jboss.jca.adapters.jdbc.extensions.db2.DB2ExceptionSorter"></exception-sorter>
</validation>
<recovery>
  <recover-plugin class-name="org.jboss.jca.core.recovery.ConfigurableRecoveryPlugin">
    <config-property name="EnableIsValid">false</config-property>
    <config-property name="IsValidOverride">false</config-property>
    <config-property name="EnableClose">false</config-property>
  </recover-plugin>
</recovery>
</xa-datasource>

</datasources>
```

Appendix D. Logging codes

D.1. Core: 000000 - 009999

Table D.1. Logging codes for core

Code	Level	Description
100	INFO	Closing a connection for you. Please close them yourself
102	INFO	Throwable trying to close a connection for you, please close it yourself
103	INFO	Could not find a close method on alleged connection object. Please close your own connections
151	EXCEPTION	Some connections were not closed, see the log for the allocation stacktraces
152	EXCEPTION	Trying to return an unknown connection
201	ERROR	SecurityContext setup failed
202	ERROR	SecurityContext setup failed since CallbackSecurity was null
251	EXCEPTION	SecurityContext setup failed
252	EXCEPTION	SecurityContext setup failed since CallbackSecurity was null
253	EXCEPTION	Work is null
254	EXCEPTION	StartTimeout is negative
255	EXCEPTION	Interrupted while requesting permit
256	EXCEPTION	Work execution context must be null because work instance implements WorkContextProviderStartTimeout is negative
257	EXCEPTION	Run method is synchronized
258	EXCEPTION	Release method is synchronized
259	EXCEPTION	Unsupported WorkContext class
260	EXCEPTION	Duplicate TransactionWorkContext class
261	EXCEPTION	Duplicate SecurityWorkContext class
262	EXCEPTION	Duplicate HintWorkContext class
263	EXCEPTION	WorkManager is shutting down
264	EXCEPTION	SecurityContext setup failed since CallbackSecurity::Domain was empty
265	EXCEPTION	ResourceAdapterAssociation failed
266	EXCEPTION	Invalid number of parameters
301	INFO	Registered a null handle for managed connection

Appendix D. Logging codes

Code	Level	Description
302	INFO	Unregistered handle that was not registered
303	INFO	Unregistered a null handle for managed connection
305	WARN	Connection error occurred
306	WARN	Unknown connection error occurred
307	WARN	Notified of error on a different managed connection
311	INFO	Throwable from unregister connection
312	ERROR	Error while closing connection handle
313	ERROR	There is something wrong with the pooling
351	EXCEPTION	Not correct type
352	EXCEPTION	Failure to delist resource
353	EXCEPTION	Error in delist
354	EXCEPTION	Unfinished local transaction - error getting local transaction
355	EXCEPTION	Unfinished local transaction but managed connection does not provide a local transaction
356	EXCEPTION	Failed to enlist
357	EXCEPTION	Error in dissociate
401	WARN	Error during tidy up connection
402	WARN	ResourceException in returning connection
403	WARN	Reconnecting a connection handle that still has a managed connection
404	WARN	Unchecked throwable in managedConnectionDisconnected()
405	WARN	Multiple LocalTransaction connection listeners enlisted
451	EXCEPTION	The connection manager is shutdown
452	EXCEPTION	Method getManagedConnection retry wait was interrupted
453	EXCEPTION	Unable to get managed connection
454	EXCEPTION	You are trying to use a connection factory that has been shut down: ManagedConnectionFactory is null
455	EXCEPTION	Wrong ManagedConnectionFactory sent to allocateConnection
456	EXCEPTION	Unchecked throwable in ManagedConnection.getConnection()
457	EXCEPTION	Unchecked throwable in managedConnectionReconnected()
458	EXCEPTION	This method is not supported
459	EXCEPTION	Transaction is not active
460	EXCEPTION	Error checking for a transaction
461	EXCEPTION	Could not enlist in transaction on entering meta-aware object

Code	Level	Description
462	EXCEPTION	Could not delist resource, probably a transaction rollback
463	EXCEPTION	Unable to set XAResource transaction timeout
464	EXCEPTION	Unable to find connection listener
465	EXCEPTION	Connection is null
466	EXCEPTION	Enlistment not enabled
467	EXCEPTION	Managed connection not lazy enlistable
468	EXCEPTION	Connection listener already enlisted
469	EXCEPTION	Error during enlistment
501	WARN	Thread is not the enlisting thread
502	WARN	Transaction error in beforeCompletion
503	WARN	Transaction error in afterCompletion
504	WARN	Transaction not found
601	INFO	ConnectionValidator has been interrupted
602	WARN	ConnectionValidator ignored unexpected runtime exception
603	WARN	ConnectionValidator ignored unexpected error
604	WARN	Throwable while attempting to get a new connection
605	WARN	Destroying connection that could not be successfully matched
606	WARN	Throwable while trying to match managed connection, destroying connection
607	WARN	ResourceException cleaning up managed connection
608	WARN	Destroying returned connection, maximum pool size exceeded
609	WARN	Attempt to return connection twice
610	WARN	Unable to fill pool
611	WARN	Warning: Background validation was specified with a non compliant ManagedConnectionFactory interface
612	WARN	Destroying connection that could not be successfully matched
613	WARN	Throwable while trying to match managed connection, destroying connection
614	ERROR	Exception during createSubject()
615	WARN	Destroying active connection in pool
616	ERROR	Leak detected in pool
617	WARN	Invalid incrementer capacity policy
618	WARN	Invalid decrementer capacity policy
619	WARN	Invalid capacity property

Appendix D. Logging codes

Code	Level	Description
651	EXCEPTION	Unable to get managed connection pool
652	EXCEPTION	Unable to obtain lock
653	EXCEPTION	The pool has been shutdown
654	EXCEPTION	Interrupted while requesting connection
655	EXCEPTION	No managed connections available within configured blocking timeout
656	EXCEPTION	This should never happen
657	EXCEPTION	Interrupted while requesting permit
658	EXCEPTION	Unexpected throwable while trying to create a connection
659	EXCEPTION	Unable to get connection listener
701	WARN	Exception during unbind
751	EXCEPTION	Deployment failed
851	EXCEPTION	Resource adapter instance not active
852	EXCEPTION	Validation exception
853	EXCEPTION	The activation spec class is no longer available
854	EXCEPTION	The resource adapter is no longer available
855	EXCEPTION	Key isn't registered
856	EXCEPTION	Unable to lookup resource adapter in MDR
901	WARN	Error during connection close
902	ERROR	Error during inflow crash recovery
903	ERROR	Error creating Subject for crash recovery
904	WARN	No security domain defined for crash recovery
905	WARN	Subject for crash recovery was null
906	ERROR	Error during crash recovery
951	EXCEPTION	Error during connection close
1001	WARN	No users.properties were found
1002	ERROR	Error while loading users.properties
1003	WARN	No roles.properties were found
1004	ERROR	Error while loading roles.properties
1005	WARN	No callback.properties were found
1006	ERROR	Error while loading callback.properties
1011	WARN	Prepare called on a local tx. Use of local transactions on a JTA transaction with more than one branch may result in inconsistent data in some cases of failure
1151	EXCEPTION	Trying to start a new transaction when old is not complete

Code	Level	Description
1152	EXCEPTION	Trying to start a new transaction with wrong flags
1153	EXCEPTION	Error trying to start local transaction
1154	EXCEPTION	Throwable trying to start local transaction
1155	EXCEPTION	Wrong xid in commit
1156	EXCEPTION	Could not commit local transaction
1157	EXCEPTION	Forget not supported in local transaction
1158	EXCEPTION	No recovery for LocalTransaction only resource manager
1159	EXCEPTION	Wrong xid in rollback
1160	EXCEPTION	Could not rollback local transaction

D.2. Common: 010000 - 019999

Table D.2. Logging codes for common

Code	Level	Description
10001	ERROR	Parsing error of ra.xml file
10002	ERROR	Parsing error of ironjacamar.xml file
10003	ERROR	No @Connector was found and no definition in the ra.xml metadata either
10004	ERROR	More than one @Connector was found but the correct one wasn't defined in the ra.xml metadata
10051	EXCEPTION	AnnotationRepository reference is null
10052	EXCEPTION	No @Connector defined
10053	EXCEPTION	More than @Connector defined
10054	EXCEPTION	More than one @ConnectionDefinitions defined
10055	EXCEPTION	Unknown annotation
10056	EXCEPTION	Element isn't a valid boolean
10057	EXCEPTION	Attribute isn't a valid boolean
10058	EXCEPTION	Element isn't a valid number
10059	EXCEPTION	Invalid flush strategy
10060	EXCEPTION	Unexpected end tag
10061	EXCEPTION	Unexpected element
10062	EXCEPTION	Reached end of xml document unexpectedly
10063	EXCEPTION	Mandatory class-name attribute missing
10064	EXCEPTION	Unexpected attribute
10065	EXCEPTION	Missing mandatory jndi-name attribute

Code	Level	Description
10066	EXCEPTION	You cannot define more than one pool or xa-pool in same connection-definition
10067	EXCEPTION	Element cannot be set without an xa-pool
10068	EXCEPTION	Missing required attribute
10069	EXCEPTION	Missing required element
10070	EXCEPTION	Invalid negative value
10071	EXCEPTION	Tag is not valid
10072	EXCEPTION	Tag cannot be undefined
10073	EXCEPTION	Invalid <security> configuration
10074	EXCEPTION	The resource adapter metadata must be defined
10075	EXCEPTION	The resource adapter metadata must contain either an outbound or inbound configuration
10076	EXCEPTION	Tag must be defined
10077	EXCEPTION	Wrong annotation type

D.3. Deployers: 020000 - 029999

Table D.3. Logging codes for deployers

Code	Level	Description
20001	INFO	Required license terms
20002	INFO	Deployed
20003	WARN	Failure during validation report generation
20004	WARN	Only one connection definition found with a mismatch in class-name
20005	WARN	Only one admin object found with a mismatch in class-name
20006	ERROR	ConnectionFactory is null
20007	ERROR	Exception during createSubject()
20008	WARN	Invalid config property
20009	WARN	Invalid connection definition
20010	ERROR	Connection definition with missing class-name
20011	ERROR	Admin object with missing class-name
20012	WARN	Admin object not bound
20013	WARN	Connection factory not bound
20014	INFO	Admin object not spec compliant
20015	INFO	Connection factory not spec compliant
20016	WARN	Missing <recovery> element. XA recovery disabled

Code	Level	Description
20017	WARN	Invalid archive
20051	EXCEPTION	Unable to start
20052	EXCEPTION	Unable to associate
20053	EXCEPTION	ManagedConnectionFactory must be defined in class-name
20054	EXCEPTION	AdminObject must be defined in class-name
20055	EXCEPTION	Failed to bind admin object
20056	EXCEPTION	Deployment failed
20057	EXCEPTION	Invalid ManagedConnectionFactory class
20058	EXCEPTION	Invalid ActivationSpec class
20059	EXCEPTION	Invalid ResourceAdapter class
20060	EXCEPTION	Unable to inject
20061	EXCEPTION	Invalid required work context
20062	EXCEPTION	Invalid connection factory interface
20063	EXCEPTION	Invalid connection factory implementation
20064	EXCEPTION	Invalid connection interface
20065	EXCEPTION	Invalid connection implementation
20066	EXCEPTION	Connection factory implementation doesn't implement interface
20067	EXCEPTION	Connection implementation doesn't implement interface

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All licenses can be found in the `doc/licenses` directory.

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Version 2.1, February 1999

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(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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