



Service Component Architecture JCA Binding Specification Version 1.1

Committee Draft 02 revision 3

19th June, 2009

Specification URIs:

This Version:

<http://docs.oasis-open.org/opencsa/sca-bindings/sca-binding-jca-1.1-spec-cd02-rev3.html>
<http://docs.oasis-open.org/opencsa/sca-bindings/sca-binding-jca-1.1-spec-cd02-rev3.doc>
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(Authoritative)

Previous Version:

<http://docs.oasis-open.org/opencsa/sca-bindings/sca-binding-jca-1.1-spec-cd02.html>
<http://docs.oasis-open.org/opencsa/sca-bindings/sca-binding-jca-1.1-spec-cd02.doc>
<http://docs.oasis-open.org/opencsa/sca-bindings/sca-binding-jca-1.1-spec-cd02.pdf>
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<http://docs.oasis-open.org/opencsa/sca-bindings/sca-binding-jca-1.1-spec.html>
<http://docs.oasis-open.org/opencsa/sca-bindings/sca-binding-jca-1.1-spec.doc>
<http://docs.oasis-open.org/opencsa/sca-bindings/sca-binding-jca-1.1-spec.pdf> (Authoritative)

Latest Approved Version:

Technical Committee:

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Related work:

This specification replaces or supersedes:

- Service Component Architecture JCA Binding Specification Version 1.00 20 September 2007

This specification is related to:

- Service Component Architecture Assembly Model Specification Version 1.1
- Service Component Architecture Policy Framework Specification Version 1.1

Declared XML Namespace(s):

<http://docs.oasis-open.org/ns/opencsa/sca/200903>

Abstract:

This document presents bindings describing access and connectivity to the services provided by the Enterprise Information System (EIS).

This version of the document describes JCA Bindings thus narrowing connectivity down to the connectivity to the EIS system external to the SCA system, based on the Java EE Connector Architecture specification and implemented in Java.

Further specification is necessary to define EIS Bindings between different SCA runtimes within SCA system, for example J2EE and EIS based runtimes.

The binding specified in this document applies to the composite's references and services.

The connection to exchange data with the EIS is characterized by two sets of configuration parameters, the connection and interaction parameters. The former set determines the location of the target system the latter determines characteristics that need to be specified to invoke one specific service available at the endpoint. JCA Binding model captures these parameters as separate sets to allow their reuse and reconfiguration.

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Table of Contents

| | | |
|-----|---|----|
| 1 | Introduction | 5 |
| 1.1 | Terminology | 5 |
| 1.2 | Normative References | 5 |
| 1.3 | Non-Normative References | 5 |
| 1.4 | Naming Conventions | 6 |
| 2 | JCA Binding | 7 |
| 3 | Policy | 11 |
| 4 | Operation Selectors and Wire Formats | 12 |
| 5 | Binding Properties | 13 |
| 6 | Examples | 15 |
| 6.1 | Minimal JCA Binding | 15 |
| 6.2 | Existing resources | 15 |
| 6.3 | Resource Creation | 15 |
| 6.4 | Existing Resources specified in the definition file | 16 |
| 7 | Conformance | 17 |
| 7.1 | SCA JCA Binding XML Document | 17 |
| 7.2 | SCA Runtime | 17 |
| A. | JCA XML Binding Schema: sca-binding-jca.xsd | 18 |
| B. | Conformance Items | 21 |
| C. | Java EE Connector Architecture | 22 |
| C.1 | Introduction | 22 |
| C.2 | Selected JCA CCI Interfaces | 23 |
| D. | Acknowledgements | 24 |
| E. | Revision History | 26 |

1 Introduction

This document presents a binding describing access and connectivity to the services provided by Enterprise Information Systems (EIS). This document focuses on JCA Bindings thus narrowing connectivity down to the connectivity to the EIS system external to the SCA system, based on the J2EE Connector Architecture specification and implemented in Java.

Further specification is necessary to define EIS Bindings between different SCA runtimes within SCA system, for example J2EE and EIS based runtimes.

The JCA Bindings are applicable to the composite's references and services.

The connection to exchange data with the EIS is characterized by two sets of configuration parameters, the connection and interaction parameters. The former set determines the location of the target system the latter determines characteristics that need to be specified to invoke one specific service available at the endpoint. JCA Binding model captures these parameters as separate sets to allow their reuse and reconfiguration.

This binding places no requirement to support bidirectional interfaces, SCA runtimes can implement support for bidirectional interfaces via extensions.

1.1 Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119]

This specification uses predefined namespace prefixes throughout; they are given in the following list. Note that the choice of any namespace prefix is arbitrary and not semantically significant.

Table 1-1 Prefixes and Namespaces used in this specification

| Prefix | Namespace | Notes |
|--------|--|---|
| xs | "http://www.w3.org/2001/XMLSchema" | Defined by XML Schema 1.0 specification |
| sca | "http://docs.oasis-open.org/ns/opencsa/sca/200903" | Defined by the SCA specifications |

1.2 Normative References

- [RFC2119] S. Bradner, *Key words for use in RFCs to Indicate Requirement Levels*, <http://www.ietf.org/rfc/rfc2119.txt>, IETF RFC 2119, March 1997.
- [JCA15] Java Connector Architecture Specification Version 1.5
<http://java.sun.com/j2ee/connector/>
- [WSDL] E. Christensen et al, *Web Service Description Language (WSDL) 1.1*, <http://www.w3.org/TR/2001/NOTE-wsdl-20010315>, W3C Note, March 15 2001.
R. Chinnici et al, *Web Service Description Language (WSDL) Version 2.0 Part 1: Core Language*, <http://www.w3.org/TR/2007/REC-wsdl20-20070626/>, W3C Recommendation, June 26 2007.
- [SCA-Assembly] <http://docs.oasis-open.org/opencsa/sca-assembly/sca-assembly-1.1-spec.html>
- [SCA-Policy] <http://docs.oasis-open.org/opencsa/sca-policy/sca-policy-1.1-spec.pdf>

1.3 Non-Normative References

- TBD TBD

38 1.4 Naming Conventions

39 This specification follows some naming conventions for artifacts defined by the specification. In addition
40 to the conventions defined by section 1.3 of the SCA Assembly Specification [[SCA-Assembly](#)]
41 specification, this specification adds three additional conventions:

- 42 • Where the names of elements and attributes consist partially or wholly of acronyms, the letters of the
43 acronyms use the same case. When the acronym appears at the start of the name of an element or
44 an attribute, or after a period, it is in lower case. If it appears elsewhere in the name of an element or
45 an attribute, it is in upper case. For example, an attribute might be named "uri" or "jndiURL".
- 46 • Where the names of types consist partially or wholly of acronyms, the letters of the acronyms are in
47 all upper case. For example, an XML Schema type might be named "JCABinding" or "MessageID".
- 48 • Values, including local parts of QName values, follow the rules for names of elements and attributes
49 as stated above, with the exception that the letters of acronyms are in all upper case. For example, a
50 value might be "JMSDefault" or "namespaceURI".

2 JCA Binding

The JCA binding element is defined by the following pseudo-schema:

```
<binding.jca connectionInfo="QName"?
  initialContextFactory="xs:anyURI"?
  jndiURL="xs:anyURI"?
  name="NCName"?
  requires="list of xs:QName"?
  policySets="list of xs:QName"?
  uri="xsd:anyURI"?>

  <outboundConnection managed="xs:boolean"?>
    <resourceAdapter name="NMTOKEN" type="NMTOKEN">
      <property name="NMTOKEN" type="NMTOKEN">*</property>
    </resourceAdapter>
    <connection name="NMTOKEN"? type="NMTOKEN" create="string"?>
      <property name="NMTOKEN" type="NMTOKEN">*</property>
    </connection>
    <resAuth>container|application</resAuth>?
    <!-- Vendor specific extensions -->
  </outboundConnection>?

  <inboundConnection>
    <resourceAdapter name="NMTOKEN"? type="NMTOKEN">
      <property name="NMTOKEN" type="NMTOKEN">*</property>
    </resourceAdapter>
    <activationSpec name="NMTOKEN"? type="NMTOKEN" create="string"?>
      <property name="NMTOKEN" type="NMTOKEN">*</property>
    </activationSpec>
    <!-- Vendor specific extensions -->
  </inboundConnection>?

  <outboundInteraction>
    <connectionSpec type="NMTOKEN">
      <property name="NMTOKEN" type="NMTOKEN">*</property>
    </connectionSpec>?
    <interactionSpec type="NMTOKEN">
      <property name="NMTOKEN" type="NMTOKEN">*</property>
    </interactionSpec>?
    <operation name="NMTOKEN">
      <interactionSpec type="NMTOKEN"?>
        <property name="NMTOKEN" type="NMTOKEN">*</property>
      </interactionSpec>?
    </operation>*</operation>?
    <!-- Vendor specific extensions -->
  </outboundInteraction>?

  <inboundInteraction>
    <listener type="NMTOKEN"?>
      <inboundOperation name="NMTOKEN" nativeOperation="NMTOKEN">*</inboundOperation>?
    </listener>
  </inboundInteraction>?

  <wireFormat/>?
  <operationSelector/>?
</binding.jca>
```

The *binding.jca* element has the following attributes:

- */binding.jca/@uri* the binding's @uri attribute allows for the specification of the endpoint. For the reference, it defines the endpoint allowing connecting to the target EIS by providing JNDI name under which the ConnectionFactory is located. For the service, the @uri defines the endpoint to

- 108 allow the EIS system to connect to the SCA system by defining the JNDI lookup name of the
 109 ActivationSpec, for example `@uri="java:comp/env/eis/TRAN_EIS"`.
- 110 The `@uri` attribute, the `@connectionInfo` attribute and the `inboundConnection` or
 111 `outboundConnection` elements are mutually exclusive and the SCA runtime MUST raise an
 112 error if more than one is present [BJC20001].
- 113 • `/binding.jca/@connectionInfo` identifies the `jca.binding` element present in the definitions
 114 document and whose child or children (one or more of `inboundConnection`, `outboundConnection`,
 115 `inboundInteraction`, `outboundInteraction`) are used to define characteristics of connection and
 116 interaction characteristics for this binding.
 - 117 • `/binding.jca/@initialContextFactory` – the name of the JNDI initial context factory.
 118 The `@initialContextFactory` attribute MUST NOT be specified if the `@uri` attribute is not present
 119 [BJC20002].
 - 120 • `/binding.jca/@jndiURL` – the URL for the JNDI provider.
 121 The `@jndiURL` attribute MUST NOT be specified if the `@uri` attribute is not present [BJC20003].
 - 122 • `/binding.jca/@name` - as defined in the SCA Assembly Specification [SCA-Assembly].
 - 123 • `/binding.jca/@requires` - as defined in the SCA Assembly Specification [SCA-Assembly].
 - 124 • `/binding.jca/@policySets` - as defined in the SCA Assembly Specification [SCA-Assembly].
 - 125 • `/binding.jca/outboundConnection` defines the outbound connection characteristics.
 126 The `outboundConnection` element MUST NOT be specified for services [BJC20004].
 - 127 • `/binding.jca/outboundConnection/@managed` attribute that determines whether the interaction
 128 with the EIS system is to be performed in the managed or non-managed mode. If the value is true
 129 (default), the JNDI name is used to obtain connection to the EIS and use adapter in the managed
 130 mode. If the value is false, the connection information is used to invoke adapter in the non-
 131 managed mode i.e. by creating instance of the `ManagedConnectionFactory` and using it to create
 132 `Connection`. For the full description of the managed and non-managed mode refer to section 6.9
 133 of [JCA15]
 - 134 • `/binding.jca/outboundConnection/resourceAdapter` – specifies name, type and properties of
 135 the Resource Adapter Java bean.
 136 The SCA runtime MAY restrict valid properties of the outbound connection's Resource Adapter
 137 Java bean depending on the deployment platform [BJC20005].
 138 The `outboundConnection/resourceAdapter` element MUST NOT be specified when the
 139 `@managed` attribute value is "false" [BJC20006].
 - 140 • `/binding.jca/outboundConnection/resourceAdapter/@type` – the fully qualified name of the
 141 class implementing the JCA `ResourceAdapter` interface
 - 142 • `/binding.jca/outboundConnection/resourceAdapter/@name` – the optional name that uniquely
 143 identifies the existing instance of the resource adapter.
 - 144 • `/binding.jca/outboundConnection/resourceAdapter/property` element contains the subset of
 145 the properties of the Resource Adapter Java Bean that need to be set in order to access specified
 146 EIS service. The full list of Resource Adapter properties can be obtained by introspecting the
 147 Java Bean.
 - 148 • `/binding.jca/outboundConnection/connection` element specifies the properties of the
 149 connection factory used to create connections to the service endpoint.
 - 150 • `/binding.jca/outboundConnection/connection/@type` – the fully qualified name of the class
 151 implementing the JCA `ManagedConnectionFactory` interface
 - 152 • `/binding.jca/outboundConnection/connection/@name` – if the `@create` attribute is "never",
 153 the name uniquely identifies an existing instance of the managed connection factory.
 154 If the `connection/@create` attribute is "always", the `@name` value MUST be unique within the
 155 domain [BJC20007].
 - 156 • `/binding.jca/outboundConnection/connection/property` element contains the subset of the
 157 properties of the Managed Connection Factory Java Bean that need to be set in order to access

158 specified EIS service. The full list of Managed Connection Factory properties can be obtained by
159 introspecting the Java Bean.

- 160 • **/binding.jca/outboundConnection/connection/@create** attribute indicates whether the
161 element containing the attribute should be created when the containing composite is deployed.
162 Valid values are “**always**”, “**never**” and “**ifNotExist**”. The default value is “**ifNotExist**”.
163 The SCA runtime SHOULD raise an error if the **connection/@create** attribute value is “**always**”
164 and the element with the given name already exists [BJC20008].
- 165 • **/binding.jca/outboundConnection/connection/resAuth** element specifies the authentication
166 mechanism used by the resource adapter in the managed environment
- 167 • Vendor specific extensions allow to customize the model to support the specific runtime
168 characteristics, for example pool size or maximum number of connections
- 169 • **/binding.jca/outboundInteraction** defines characteristics of the outbound interaction.
170 The **outboundInteraction** element MUST NOT be specified for services [BJC20009].
- 171 • **/binding.jca/outboundInteraction/connectionSpec** identifies the name of the class
172 implementing javax.resource.cci.ConnectionSpec interface and the set of connectionSpec
173 properties to be specified when creating a connection, a client level connection properties e.g.
174 user name or password. The ConnectionSpec object is used in several patterns that justify its
175 definition in the interaction binding.
- 176 • **/binding.jca/outboundInteraction/interactionSpec** type specifies the name of the class
177 implementing javax.resource.cci.InteractionSpec interface. This **interactionSpec** applies to all
178 operations that do not have one defined via an **operation** element.
- 179 • **/binding.jca/outboundInteraction/operation** element gathers characteristics of one operation of
180 the service, the data bindings of the inbound and outbound arguments as well as interaction type
181 and the properties.
- 182 • **/binding.jca/inboundConnection** defines the inbound connection characteristics.
183 The **inboundConnection** element MUST NOT be specified for references [BJC20010].
- 184 • **/binding.jca/inboundConnection/resourceAdapter** – specifies name, type and properties of
185 the Resource Adapter Java bean.
186 The SCA runtime MAY restrict valid properties of the inbound connection’s Resource Adapter
187 Java bean depending on the deployment platform [BJC20011].
188 The **inboundConnection/resourceAdapter** element MUST NOT be specified when the
189 **@managed** attribute is “**false**” [BJC20012].
- 190 • **/binding.jca/inboundConnection/resourceAdapter/@type** – the fully qualified name of the
191 class implementing the ResourceAdapter interface
- 192 • **/binding.jca/inboundConnection/resourceAdapter/@name** – the optional name that uniquely
193 identifies the existing instance of the resource adapter.
- 194 • **/binding.jca/inboundConnection/activationSpec** element specifies the name of the class
195 implementing javax.resource.spi.ActivationSpec interface and its properties.
- 196 • **/binding.jca/inboundConnection/activationSpec/@type** – the fully qualified name of the class
197 implementing the ActivationSpec interface
- 198 • **/binding.jca/inboundConnection/activationSpec/@name** – if the **@create** attribute is “**never**”,
199 the name uniquely identifies an existing instance of the activation spec.
200 If the **activationSpec/@create** attribute is “**always**”, the **@name** value MUST be unique within
201 domain [BJC20013].
- 202 • **/binding.jca/inboundConnection/activationSpec/@create** attribute indicates whether the
203 element containing the attribute should be created when the containing composite is deployed.
204 Valid values are “**always**”, “**never**” and “**ifNotExist**”. The default value is “**ifNotExist**”.
205 The SCA runtime SHOULD raise an error if the **activationSpec/@create** attribute value is
206 “**always**” and the element with the given name already exists [BJC20014].
- 207 • **/binding.jca/inboundInteraction** defines characteristics of the inbound interaction.
208 The **inboundInteraction** element MUST NOT be specified for references [BJC20015].

- 209
- ***/binding.jca/inboundInteraction/listener*** type specifies the listener interface supported by this group of interactions.
- 210
- 211 If the ***inboundInteraction/listener*** element is not specified, the SCA runtime MUST interpret it as
- 212 a listener implementing `javax.resource.cci.MessageListener` interface from the JCA specification
- 213 [BJC20016].
- ***/binding.jca/inboundInteraction/inboundOperation*** element that maps the name of the EIS event received by ResourceAdapter to the name of the operation of the Service.
 - ***/binding.jca/wireFormat*** – identifies the wire format used by requests and responses sent or received by this binding as defined in the SCA Assembly Specification [SCA-Assembly].
 - ***/binding.jca/operationSelector*** – identifies the operation selector used when receiving requests for a service as defined in the SCA Assembly Specification [SCA-Assembly].
- 214
- 215
- 216
- 217
- 218
- 219

220 The ***binding.jca*** element MUST conform to the XML schema defined in `sca-binding-jca.xsd` [BJC20017].

221 **Extensibility** - the JCA Bindings provide an extensibility mechanism that allows further customization of

222 the bindings with the vendor specific attributes or elements using extensibility element in the schema as

223 follows:

- 224
- `<anyAttribute namespace="##any" processContents="lax" />`
 - `<any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>`
- 225

226 **3 Policy**

227 This JCA Binding specification does not support intents such as `mayProvide` or `alwaysProvides` as JCA
228 Specification does not define generic Resource Adapter characteristics that could be set using intents.

229

4 Operation Selectors and Wire Formats

230 In general JCA resource adapters deal with records. There is not usually a built-in concept of “operation”
231 that corresponds to that defined in a WSDL portType [WSDL]. Records have a format which corresponds
232 in some way to the schema of an input or output message of an operation in the interface of a service or
233 reference, however additional Resource Adapter-specific information is required in order for an SCA
234 runtime to know how to identify the operation and understand the format of records.

235 The process of identifying the operation to be invoked is **operation selection**; the information that
236 describes the contents of messages is a **wire format**. The binding element as described in the SCA
237 Assembly Specification [SCA-Assembly] provides the means to identify specific operation selection via
238 the **operationSelector** element and the format of messages received and to be sent using the
239 **wireFormat** element.

240 This specification does not define default behavior for the operation selection or wire format of a JCA
241 binding. This choice had been made because the implementations of generic Record interfaces that
242 define the data exchanged between JCA adapter and its client are specific to a particular adapter and,
243 unlike JMS, cannot be used in a generic manner.

244 No standard means is provided for linking the **wireFormat** or **operationSelector** elements with the
245 runtime components that implement their behaviour.

246

5 Binding Properties

247 The JCA Binding contains properties necessary to interact with the EIS system, properties that are,
248 however, not related to the service location or type of services available. Such properties ought to be
249 configurable but not require overwriting connection or interaction elements. Examples of such properties
250 are user ID or password.

251 The binding.jca element contains connectionInfo attribute that specifies the name of the binding.jca
252 element in the definition file.

```
253 <reference name="EISHelloWorldReference">  
254 <binding.jca connectionInfo="JCA_Services">  
255 </binding.jca>  
256 </reference>
```

257 This element can contain the interaction properties, for example properties of the connectionSpec.

```
258 <definitions targetNamespace="http://acme.com"  
259 xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200903">  
260 <binding.jca name="JCA_Services">  
261 <outboundInteraction >  
262 <connectionSpec name="FAConnectionSpec">  
263 <property name="group">GROUP1</property>  
264 <property name="userid">SYSAD</property>  
265 <property name="password">SYSAD</property>  
266 </connectionSpec>  
267 ...  
268 </outboundInteraction>  
269 </binding.jca>  
270 </definitions>
```

271 In the example above, the connectionSpec element specifies all the properties it overwrites in place and
272 needs to be updated when there is a need to modify any of the properties. This could be inefficient at
273 times and the method of passing properties from the bindings is defined. To get the value from the
274 bindings, the property specifies the source attribute as follows.

```
275 <outboundInteraction >  
276 <connectionSpec  
277 name="connector.file.outbound.FAConnectionSpec">  
278 <property name="group">GROUP1</property>  
279 <property name="userid">SYSAD</property>  
280 <property name="password" source="$password"/>  
281 </connectionSpec>  
282 </outboundInteraction>
```

283 The property value is the specified in the binding element that refers to the element in the definitions file.

```
284 <reference name="JCAHelloWorldReference">  
285 <binding.jca connectionInfo="JCA_Services">  
286 <property name="password">SYSAD</property>  
287 </binding.jca>  
288 </reference>
```

289 The properties can also be specified by the composite, in that case the reference or service would contain
290 the source attribute pointing to the property of the composite:

```
291 <composite xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200903"  
292 name="EISHelloworld">  
293 <reference name="EISHelloWorldReference">  
294 <binding.jca connectionInfo="JCA_Services">  
295 <property name="userid" source="$UID"/>  
296
```

```
297     </binding.jca>
298     </reference>
299
300     <property name="UID">SYSAD</property>
301 </composite>
```

303 The indirection level of the binding, required even if the property value is specified in the composite
304 prevents introducing hidden dependencies between the composite and definitions file.

305 6 Examples

306 6.1 Minimal JCA Binding

307 The minimal JCA Binding only contains the binding's uri attribute with JNDI name of the connection
308 factory. It allows to obtain the Connection to execute request against EIS using adapter. Since no
309 interaction properties are specified, it is assumed that Resource Adapter accepts the null values for the
310 invocation methods.

```
311 <!-- JCA reference, connection is configured in JNDI context -->  
312 <reference name="EISHelloWorldReference">  
313   <binding.jca uri="java:comp/env/eis/EISMCF"/>  
314 </reference>
```

315 6.2 Existing resources

316 The sample reference with the JCA Binding, the binding's uri attribute specifies the existing resource - the
317 JNDI name under which the connection factory object is located. The interaction properties are specified
318 explicitly in the inlined **outboundInteraction** element.

```
319 <reference name="EISHelloWorldReference">  
320   <binding.jca uri="java:comp/env/eis/EISMCF">  
321     <outboundInteraction>  
322  
323       <connectionSpec name="FAConnectionSpec">  
324         <property name="userid">SYSAD</property>  
325       </connectionSpec>  
326       <interactionSpec name="FAInteractionSpec">  
327       </interactionSpec>  
328  
329       <operation name="hello">  
330         <interactionSpec>  
331           <property name="dir">temp</property>  
332           <property name="fileMode">read</property>  
333         </interactionSpec>  
334       </operation>  
335     </outboundInteraction>  
336   </binding.jca>  
337 </reference>  
338
```

339 6.3 Resource Creation

340 The following sample presents the reference with JCA bindings where the connection resources do not
341 exist and need to be created.

```
342 <reference name="JCAHelloWorldReference">  
343   <binding.jca>  
344     <outboundConnection managed="true">  
345       <resourceAdapter  
346         name="connector.file.FAResourceAdapter">  
347         <property name="logDrive">D</property>  
348       </resourceAdapter>  
349       <connection name="FAManagedConnectionFactory"  
350         create="always">  
351         <property name="host">localhost</property>  
352         <property name="drive">C</property>  
353       </connection>  
354     </outboundConnection>
```

```
355     </binding.jca>
356 </reference>
```

357 6.4 Existing Resources specified in the definition file

358 This sample shows the resources specified in the definitions file and referred to by the binding elements.
359 The definitions file contains the following

```
360 <definitions targetNamespace="http://acme.com"
361             xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200903">
362
363     <binding.jca name="JCA_Inbound">
364         <inboundConnection>
365             <resourceAdapter name="FAResourceAdapter">
366                 <property name="logDrive">D</property>
367             </resourceAdapter>
368             <activationSpec name="FAActivationSpec">
369                 <property name="directory_type">temp</property>
370                 <property name="drive">C</property>
371             </activationSpec>
372         </inboundConnection>
373     </binding.jca>
374 </definitions>
```

375 The service with the JCA Bindings uses the connectionInfo attribute to identify the resources in the
376 definition file

```
377 <service name="JCAHelloWorldService">
378     <binding.jca connectionInfo=" JCA_Inbound ">
379         <inboundInteraction>
380             <listener>MyInboundListener</listener>
381             <inboundOperation name="hello" nativeOperation="TXPN"/>
382             <inboundOperation name="bye" nativeOperation="ETXPRN"/>
383         </inboundInteraction>
384     </binding.jca>
385 </service>
```

386

387 7 Conformance

388 The XML schema pointed to by the RDDL document at the namespace URI, defined by this specification,
389 are considered to be authoritative and take precedence over the XML schema defined in the appendix of
390 this document. There are two categories of artifacts for which this specification defines conformance:

- 391 a) SCA JCA Binding XML Document
- 392 b) SCA Runtime

393 7.1 SCA JCA Binding XML Document

394 An SCA JCA Binding XML document is an SCA Composite Document, an SCA Definitions Document or
395 an SCA ComponentType Document, as defined by the SCA Assembly specification Section 13.1 [SCA-
396 Assembly], that uses the *binding.jca* element.

397 An SCA JCA Binding XML document MUST be a conformant SCA Composite Document, SCA Definitions
398 Document or a SCA ComponentType Document, as defined by the SCA Assembly Specification [SCA-
399 Assembly], and MUST comply with all statements in Appendix B: Conformance Items related to elements
400 and attributes in an SCA JCA Binding XML document, notably all "MUST" statements have to be
401 implemented.

402 7.2 SCA Runtime

403 An implementation that claims to conform to the requirements of an SCA Runtime defined in this
404 specification has to meet the following conditions:

- 405 1. The implementation MUST comply with all statements in Appendix B: Conformance Items related
406 to an SCA Runtime, notably all "MUST" statements have to be implemented
- 407 2. The implementation MUST conform to the SCA Assembly Model Specification Version 1.1 [SCA-
408 Assembly], and to the SCA Policy Framework Version 1.1 [SCA-Policy]
- 409 3. The implementation MUST reject an SCA JCA Binding XML Document that is not conformant per
410 Section 7.1

411

A. JCA XML Binding Schema: sca-binding-jca.xsd

```

413 <?xml version="1.0" encoding="UTF-8"?>
414 <!-- Copyright(C) OASIS(R) 2005,2009. All Rights Reserved.
415      OASIS trademark, IPR and other policies apply. -->
416 <schema xmlns="http://www.w3.org/2001/XMLSchema"
417       targetNamespace=" http://docs.oasis-open.org/ns/opencsa/sca/200903"
418       xmlns:sca=" http://docs.oasis-open.org/ns/opencsa/sca/200903"
419       elementFormDefault="qualified">
420
421   <include schemaLocation="sca-core-1.1-cd03.xsd" />
422
423   <complexType name="JCABinding">
424     <complexContent>
425       <extension base="sca:Binding">
426         <sequence>
427           <element name="outboundConnection"
428             type="sca:JCAOutboundConnection" minOccurs="0" />
429           <element name="inboundConnection"
430             type="sca:JCAInboundConnection" minOccurs="0" />
431           <element name="outboundInteraction"
432             type="sca:JCAOutboundInteraction" minOccurs="0" />
433           <element name="inboundInteraction"
434             type="sca:JCAInboundInteraction" minOccurs="0" />
435           <element name="property" type="sca:Property" minOccurs="0"
436             maxOccurs="unbounded" />
437           <any namespace="##other" processContents="lax" minOccurs="0"
438             maxOccurs="unbounded" />
439         </sequence>
440         <attribute name="connectionInfo" type="anyURI" use="optional" />
441         <attribute name="initialContextFactory" type="anyURI"
442           use="optional"/>
443         <attribute name="jndiURL" type="anyURI" use="optional"/>
444         <anyAttribute namespace="##any" processContents="lax" />
445       </extension>
446     </complexContent>
447   </complexType>
448
449   <simpleType name="JCACreateResource">
450     <restriction base="string">
451       <enumeration value="always" />
452       <enumeration value="never" />
453       <enumeration value="ifNotExist" />
454     </restriction>
455   </simpleType>
456   <simpleType name="ResAuth">
457     <restriction base="string">
458       <enumeration value="container" />
459       <enumeration value="application" />
460     </restriction>
461   </simpleType>
462   <complexType name="JCAOutboundConnection">
463     <sequence>
464       <element name="resourceAdapter" type="sca:ResourceAdapter"
465         minOccurs="0" />
466       <element name="connection" type="sca:Connection" />
467       <element name="resAuth" type="sca:ResAuth" minOccurs="0" />
468       <any namespace="##other" processContents="lax" minOccurs="0"
469         maxOccurs="unbounded" />
470     </sequence>
471     <attribute name="managed" type="boolean" use="optional"
472       default="true" />

```

```

473     <anyAttribute namespace="##any" processContents="lax" />
474 </complexType>
475 <complexType name="JCAInboundConnection">
476   <sequence>
477     <element name="resourceAdapter" type="sca:ResourceAdapter" />
478     <element name="activationSpec" type="sca:ActivationSpec" />
479     <any namespace="##other" processContents="lax" minOccurs="0"
480         maxOccurs="unbounded" />
481   </sequence>
482 </complexType>
483 <complexType name="JCAOutboundInteraction">
484   <sequence>
485     <element name="connectionSpec" type="sca:ConnectionSpec"
486         minOccurs="0" />
487     <element name="interactionSpec" type="sca:InteractionSpec"
488         minOccurs="0" />
489     <element name="operation" type="sca:Operation" minOccurs="0" />
490     <any namespace="##other" processContents="lax" minOccurs="0"
491         maxOccurs="unbounded" />
492   </sequence>
493 </complexType>
494 <complexType name="JCAInboundInteraction">
495   <sequence>
496     <element name="listener" type="string" minOccurs="0" />
497     <element name="inboundOperation" type="sca:InboundOperation"
498         minOccurs="0" maxOccurs="unbounded" />
499     <any namespace="##other" processContents="lax" minOccurs="0"
500         maxOccurs="unbounded" />
501   </sequence>
502 </complexType>
503 <complexType name="ResourceAdapter">
504   <sequence>
505     <element name="property" type="sca:Property" minOccurs="0"
506         maxOccurs="unbounded" />
507     <any namespace="##other" processContents="lax" minOccurs="0"
508         maxOccurs="unbounded" />
509   </sequence>
510   <attribute name="name" type="NMTOKEN" use="optional" />
511   <attribute name="type" type="NMTOKEN" use="required" />
512   <anyAttribute namespace="##any" processContents="lax" />
513 </complexType>
514 <complexType name="Connection">
515   <sequence>
516     <element name="property" type="sca:Property" minOccurs="0"
517         maxOccurs="unbounded" />
518     <any namespace="##other" processContents="lax" minOccurs="0"
519         maxOccurs="unbounded" />
520   </sequence>
521   <attribute name="name" type="NMTOKEN" use="optional" />
522   <attribute name="type" type="NMTOKEN" use="required" />
523   <attribute name="create" type="sca:JCACreateResource" use="optional"
524       default="ifNotExist" />
525   <anyAttribute namespace="##any" processContents="lax" />
526 </complexType>
527 <complexType name="ActivationSpec">
528   <sequence>
529     <element name="property" type="sca:Property" minOccurs="0"
530         maxOccurs="unbounded" />
531     <any namespace="##other" processContents="lax" minOccurs="0"
532         maxOccurs="unbounded" />
533   </sequence>
534   <attribute name="name" type="NMTOKEN" use="optional" />
535   <attribute name="type" type="NMTOKEN" use="required" />
536   <attribute name="create" type="sca:JCACreateResource" use="optional"

```

```

537         default="ifNotExist"/>
538     <anyAttribute namespace="##any" processContents="lax" />
539 </complexType>
540 <complexType name="Operation">
541     <sequence>
542         <element name="interactionSpec" type="sca:InteractionSpec"
543             minOccurs="0" />
544         <any namespace="##other" processContents="lax" minOccurs="0"
545             maxOccurs="unbounded" />
546     </sequence>
547     <attribute name="name" type="NMTOKEN" use="required" />
548     <anyAttribute namespace="##any" processContents="lax" />
549 </complexType>
550 <complexType name="InboundOperation">
551     <sequence>
552         <any namespace="##other" processContents="lax" minOccurs="0"
553             maxOccurs="unbounded" />
554     </sequence>
555     <attribute name="name" type="NMTOKEN" use="required" />
556     <attribute name="nativeOperation" type="string" use="required" />
557     <anyAttribute namespace="##any" processContents="lax" />
558 </complexType>
559 <complexType name="ConnectionSpec">
560     <sequence>
561         <element name="property" type="sca:Property" minOccurs="0"
562             maxOccurs="unbounded" />
563         <any namespace="##other" processContents="lax" minOccurs="0"
564             maxOccurs="unbounded" />
565     </sequence>
566     <attribute name="type" type="NMTOKEN" use="required" />
567     <anyAttribute namespace="##any" processContents="lax" />
568 </complexType>
569 <complexType name="InteractionSpec">
570     <sequence>
571         <element name="property" type="sca:Property" minOccurs="0"
572             maxOccurs="unbounded" />
573         <any namespace="##other" processContents="lax" minOccurs="0"
574             maxOccurs="unbounded" />
575     </sequence>
576     <attribute name="type" type="NMTOKEN" use="required" />
577     <anyAttribute namespace="##any" processContents="lax" />
578 </complexType>
579
580     <element name="binding.jca" type="sca:JCABinding"
581         substitutionGroup="sca:binding" />
582 </schema>

```

B. Conformance Items

584 This section contains a list of conformance items for the SCA JCA Binding specification.

| Conformance ID | Description |
|----------------|---|
| [BJC20001] | The @uri attribute, the @connectionInfo attribute and the inboundConnection or outboundConnection elements are mutually exclusive and the SCA runtime MUST raise an error if more than one is present |
| [BJC20002] | The @initialContextFactory attribute MUST NOT be specified if the @uri attribute is not present |
| [BJC20003] | The @jndiURL attribute MUST NOT be specified if the @uri attribute is not present |
| [BJC20004] | The outboundConnection element MUST NOT be specified for services |
| [BJC20005] | The SCA runtime MAY restrict valid properties of the outbound connection's Resource Adapter Java bean depending on the deployment platform |
| [BJC20006] | The outboundConnection/resourceAdapter element MUST NOT be specified when the @managed attribute value is "false" |
| [BJC20007] | If the connection/@create attribute is "always" , the @name value MUST be unique within the domain |
| [BJC20008] | The SCA runtime SHOULD raise an error if the connection/@create attribute value is "always" and the element with the given name already exists |
| [BJC20009] | The outboundInteraction element MUST NOT be specified for services |
| [BJC20010] | The inboundConnection element MUST NOT be specified for references |
| [BJC20011] | The SCA runtime MAY restrict valid properties of the inbound connection's Resource Adapter Java bean depending on the deployment platform |
| [BJC20012] | The inboundConnection/resourceAdapter element MUST NOT be specified when the @managed attribute is "false" |
| [BJC20013] | If the activationSpec/@create attribute is "always" , the @name value MUST be unique within domain |
| [BJC20014] | The SCA runtime SHOULD raise an error if the activationSpec/@create attribute value is "always" and the element with the given name already exists |
| [BJC20015] | The inboundInteraction element MUST NOT be specified for references |
| [BJC20016] | If the inboundInteraction/listener element is not specified, the SCA runtime MUST interpret it as a listener implementing <code>javax.resource.cci.MessageListener</code> interface from the JCA specification |
| [BJC20017] | The binding.jca element MUST conform to the XML schema defined in <code>sca-binding-jca.xsd</code> |

585

C. Java EE Connector Architecture

586

C.1 Introduction

587

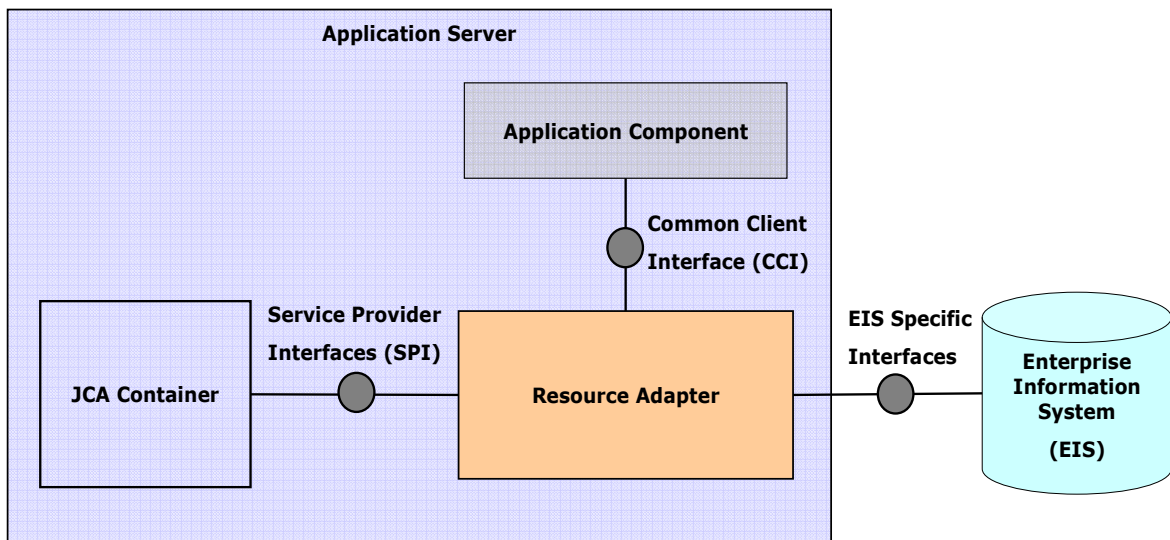
The connector architecture specification defines set of contracts that allow interoperability of the resource adapters and application server environments. The specification also defines set of client interfaces that can be optionally supported by the adapter and allow the use of adapter functionality by the application clients. The following figure illustrates the relationships of these interfaces.

588

589

590

591



592

593

The SPI defines the following management contracts that give adapter consistent view of the infrastructure provided by the server and give sever consistent view of all the adapters thus helping with integration of adapters and servers.

594

595

596

- Lifecycle management allows application server to control the startup of the adapter and notification to allow it to shutdown in an orderly fashion

597

598

- Work management allows the adapter to use the server resources such as threads in an efficient way and allows server to manage system resources appropriately.

599

600

- Connection management lets the server control the pooling, reusing and caching of the physical connections to the EIS system thus allowing for better scalability.

601

602

- Transactions allow the server to control EIS resource managers and provide application clients with the transactional access to external resources.

603

604

- Security contract allow for secure access to the EIS systems with security information configured and provided by the application server

605

606

- Message inflow contract allows Resource Adapter to deliver events initiated by the EIS system to the application component executing on the application server.

607

608

- Transaction inflow contract allow the application server to participate and execute in the context of the transaction initiated by the EIS system.

609

610

The CCI defines set of interfaces to access EIS functionality, through the resource adapter, from the application client. The CCI also provides access to some of the SPIs for transactions and security management to allow for executions of clients running in the non-managed mode, without the presence of the Application Server.

611

612

613

614 C.2 Selected JCA CCI Interfaces

615 Record

```
616 public interface javax.resource.cci.Record
617     extends java.lang.Cloneable, java.io.Serializable {
618
619 public String getRecordName();
620     public void setRecordName(String name);
621 public void setRecordShortDescription(String description);
622 public String getRecordShortDescription();
623     public boolean equals(Object other);
624     public int hashCode();
625     public Object clone() throws CloneNotSupportedException;
626 }
```

627

628 Interaction

629

```
630 public interface javax.resource.cci.Interaction {
631
632     public Connection getConnection();
633     public void close() throws ResourceException;
634     public boolean execute(InteractionSpec ispec,
635         Record input, Record output) throws ResourceException;
636     public Record execute(InteractionSpec ispec,
637         Record input) throws ResourceException;
638
639 }
```

640 MessageListener

641

```
642 interface javax.resource.cci.MessageListener {
643
644     Record onMessage(Record inputData) throws ResourceException;
645 }
```

646

647

648

D. Acknowledgements

649 The following individuals have participated in the creation of this specification and are gratefully
650 acknowledged:

651 **Participants:**

| Participant Name | Affiliation |
|------------------------|-----------------------------|
| Bryan Aupperle | IBM |
| Ron Barack | SAP AG |
| Michael Beisiegel | IBM |
| Henning Blohm | SAP AG |
| David Booz | IBM |
| Martin Chapman | Oracle Corporation |
| Jean-Sebastien Delfino | IBM |
| Laurent Domenech | TIBCO Software Inc. |
| Jacques Durand | Fujitsu Limited |
| Mike Edwards | IBM |
| Billy Feng | Primeton Technologies, Inc. |
| Nimish Hathalia | TIBCO Software Inc. |
| Simon Holdsworth | IBM |
| Eric Johnson | Software Inc. |
| Uday Joshi | Oracle Corporation |
| Khanderao Kand | Oracle Corporation |
| Anish Karmarkar | Oracle Corporation |
| Nickolaos Kavantzias | Oracle Corporation |
| Mark Little | Red Hat |
| Ashok Malhotra | Oracle Corporation |
| Jim Marino | Individual |
| Jeff Mischkinsky | Oracle Corporation |
| Dale Moberg | Axway Software |
| Simon Nash | Individual |
| Sanjay Patil | SAP AG |
| Plamen Pavlov | SAP AG |
| Peter Peshev | SAP AG |
| Piotr Przybylski | IBM |
| Luciano Resende | IBM |
| Tom Rutt | Fujitsu Limited |
| Vladimir Savchenko | SAP AG |
| Scott Vorthmann | TIBCO Software Inc. |
| Tim Watson | Oracle Corporation |
| Owen Williams | Avaya, Inc. |

653

E. Revision History

654 [optional; should not be included in OASIS Standards]

655

| Revision | Date | Editor | Changes Made |
|-----------|------------|------------------|--|
| 1 | 2008-01-16 | Anish Karmarkar | Applied the OASIS template + related changes to the Submission |
| 2 | 2008-08-06 | Piotr Przybylski | Updates for consistency with JMS Binding and to resolve the following: BINDINGS-13 BINDINGS-14 BINDINGS-28 BINDINGS-30 BINDINGS-32 BINDINGS-38 |
| cd01-rev1 | 2008-10-16 | Simon Holdsworth | Updates to resolve following issues: BINDINGS-41 |
| cd01-rev2 | 2008-10-20 | Piotr Przybylski | Update for RFC2119 conformance Updated to resolve following issues: BINDINGS-53 |
| cd02 | 2009-02-16 | Simon Holdsworth | Renamed and applied editorial issues |
| cd02-rev1 | 2009-05-22 | Simon Holdsworth | Updates to resolve issue BINDINGS-63 (conformance statement numbering) Updated assembly namespace to 200903 |
| cd02-rev2 | 2009-05-22 | Simon Holdsworth | Updates to resolve following issues: BINDINGS-22 BINDINGS-45 BINDINGS-58 BINDINGS-69 Fixed errors in schema |
| cd02-rev3 | 2009-06-19 | Simon Holdsworth | Updates to resolve following issues: BINDINGS-75 Added acknowledgements |

656