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# Service Component Architecture JCA Binding Specification Version 1.1

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**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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# 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 [RFC Keywords \[RFC2119\]](#).

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

<b>Prefix</b>	<b>Namespace</b>	<b>Notes</b>
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]** J2EE 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 \[SCA-Assembly\]](#), this  
41 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">*
    </resourceAdapter?
    <connection name="NMTOKEN"? type="NMTOKEN" create="string"?>
      <property name="NMTOKEN" type="NMTOKEN">*
    </connection>
    <resAuth>container|application</resAuth?
  </outboundConnection?
  <inboundConnection>
    <resourceAdapter name="NMTOKEN"? type="NMTOKEN">
      <property name="NMTOKEN" type="NMTOKEN">*
    </resourceAdapter>
    <activationSpec name="NMTOKEN"? type="NMTOKEN" create="string"?>
      <property name="NMTOKEN" type="NMTOKEN">*
    </activationSpec>
  </inboundConnection?

  <outboundInteraction>
    <connectionSpec type="NMTOKEN">
      <property name="NMTOKEN" type="NMTOKEN">*
    </connectionSpec?
    <interactionSpec type="NMTOKEN">
      <property name="NMTOKEN" type="NMTOKEN">*
    </interactionSpec?
    <operation name="NMTOKEN">
      <interactionSpec type="NMTOKEN"?>
        <property name="NMTOKEN" type="NMTOKEN">*
      </interactionSpec?
    </operation>*
  </outboundInteraction?
  <inboundInteraction>
    <listener type="NMTOKEN"?>
    <inboundOperation name="NMTOKEN" nativeOperation="NMTOKEN">*
  </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 allow the EIS system to connect to the SCA system by defining the JNDI lookup name of the ActivationSpec, for example @uri="java:comp/env/eis/TRAN\_EIS".

- 107 The **@uri** attribute, the **@connectionInfo** attribute and the **inboundConnection** or  
 108 **outboundConnection** elements are mutually exclusive and the SCA runtime MUST raise an  
 109 error if more than one is present [BJC20001].
- 110 • **/binding.jca/@connectionInfo** identifies the jca.binding element present in the definitions  
 111 document and whose child or children (one or more of inboundConnection, outboundConnection,  
 112 inboundInteraction, outboundInteraction) are used to define characteristics of connection and  
 113 interaction characteristics for this binding.
  - 114 • **/binding.jca/@initialContextFactory** – the name of the JNDI initial context factory.  
 115 The **@initialContextFactory** attribute MUST NOT be specified if the **@uri** attribute is not present  
 116 [BJC20002].
  - 117 • **/binding.jca/@jndiURL** – the URL for the JNDI provider.  
 118 The **@jndiURL** attribute MUST NOT be specified if the **@uri** attribute is not present [BJC20003].
  - 119 • **/binding.jca/@name** - as defined in the [SCA Assembly Specification \[SCA-Assembly\]](#).
  - 120 • **/binding.jca/@requires** - as defined in the [SCA Assembly Specification \[SCA-Assembly\]](#).
  - 121 • **/binding.jca/@policySets** - as defined in the [SCA Assembly Specification \[SCA-Assembly\]](#).
  - 122 • **/binding.jca/outboundConnection** defines the outbound connection characteristics.  
 123 The **outboundConnection** element MUST NOT be specified for services [BJC20004].
  - 124 • **/binding.jca/outboundConnection/@managed** attribute that determines whether the interaction  
 125 with the EIS system is to be performed in the managed or non-managed mode. If the value is true  
 126 (default), the JNDI name is used to obtain connection to the EIS and use adapter in the managed  
 127 mode. If the value is false, the connection information is used to invoke adapter in the non-  
 128 managed mode i.e. by creating instance of the ManagedConnectionFactory and using it to create  
 129 Connection. For the full description of the managed and non-managed mode refer to section 6.9  
 130 of the [JCA 1.5 specification \[JCA15\]](#).
  - 131 • **/binding.jca/outboundConnection/resourceAdapter** – specifies name, type and properties of  
 132 the Resource Adapter Java bean.  
 133 The SCA runtime MAY restrict valid properties of the outbound connection's Resource Adapter  
 134 Java bean depending on the deployment platform [BJC20005].  
 135 The **outboundConnection/resourceAdapter** element MUST NOT be specified when the  
 136 **@managed** attribute value is "false" [BJC20006].
  - 137 • **/binding.jca/outboundConnection/resourceAdapter/@type** – the fully qualified name of the  
 138 class implementing the JCA ResourceAdapter interface
  - 139 • **/binding.jca/outboundConnection/resourceAdapter/@name** – the optional name that uniquely  
 140 identifies the existing instance of the resource adapter.
  - 141 • **/binding.jca/outboundConnection/resourceAdapter/property** element contains the subset of  
 142 the properties of the Resource Adapter Java Bean that need to be set in order to access specified  
 143 EIS service. The full list of Resource Adapter properties can be obtained by introspecting the  
 144 Java Bean.
  - 145 • **/binding.jca/outboundConnection/connection** element specifies the properties of the  
 146 connection factory used to create connections to the service endpoint.
  - 147 • **/binding.jca/outboundConnection/connection/@type** – the fully qualified name of the class  
 148 implementing the JCA ManagedConnectionFactory interface
  - 149 • **/binding.jca/outboundConnection/connection/@name** – if the **@create** attribute is "never",  
 150 the name uniquely identifies an existing instance of the managed connection factory.  
 151 If the **connection/@create** attribute is "always", the **@name** value MUST be unique within the  
 152 domain [BJC20007].
  - 153 • **/binding.jca/outboundConnection/connection/property** element contains the subset of the  
 154 properties of the Managed Connection Factory Java Bean that need to be set in order to access  
 155 specified EIS service. The full list of Managed Connection Factory properties can be obtained by  
 156 introspecting the Java Bean.



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

207 a listener implementing `javax.resource.cci.MessageListener` interface from the JCA specification  
208 [BJC20016].

- 209 • ***/binding.jca/inboundInteraction/inboundOperation*** element that maps the name of the EIS  
210 event received by ResourceAdapter to the name of the operation of the Service.
- 211 • ***/binding.jca/wireFormat*** – identifies the wire format used by requests and responses sent or  
212 received by this binding as defined in the [SCA Assembly Specification \[SCA-Assembly\]](#).
- 213 • ***/binding.jca/operationSelector*** – identifies the operation selector used when receiving requests  
214 for a service as defined in the [SCA Assembly Specification \[SCA-Assembly\]](#).

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

## 216 2.1 Extensibility

217 The JCA Binding allows further customization of the binding element and its subelements with vendor  
218 specific attributes or elements. This is done by providing extension points in the schema; refer to  
219 Appendix A, “JCA XML Binding Schema: `sca-binding-jca.xsd`” for the locations of these extension points.

---

220 **3 Policy**

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

223

---

## 4 Operation Selectors and Wire Formats

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

229 The process of identifying the operation to be invoked is **operation selection**; the information that  
230 describes the contents of messages is a **wire format**. The binding element as described in the [SCA  
231 Assembly Specification \[SCA-Assembly\]](#) provides the means to identify specific operation selection via  
232 the **operationSelector** element and the format of messages received and to be sent using the  
233 **wireFormat** element.

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

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

240

## 5 Binding Properties

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

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

```
247 <reference name="EISHelloWorldReference">  
248   <binding.jca connectionInfo="JCA_Services">  
249     </binding.jca>  
250 </reference>
```

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

```
252 <definitions targetNamespace="http://acme.com"  
253   xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200903">  
254   <binding.jca name="JCA_Services">  
255     <outboundInteraction >  
256       <connectionSpec name="FAConnectionSpec">  
257         <property name="group">GROUP1</property>  
258         <property name="userid">SYSAD</property>  
259         <property name="password">SYSAD</property>  
260       </connectionSpec>  
261       ...  
262     </outboundInteraction>  
263   </binding.jca>  
264 </definitions>
```

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

```
269 <outboundInteraction >  
270   <connectionSpec  
271     name="connector.file.outbound.FAConnectionSpec">  
272     <property name="group">GROUP1</property>  
273     <property name="userid">SYSAD</property>  
274     <property name="password" source="$password"/>  
275   </connectionSpec>  
276 </outboundInteraction>
```

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

```
278 <reference name="JCAHelloWorldReference">  
279   <binding.jca connectionInfo="JCA_Services">  
280     <property name="password">SYSAD</property>  
281   </binding.jca>  
282 </reference>
```

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

```
285 <composite xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200903"  
286   name="EISHelloworld">  
287   <reference name="EISHelloWorldReference">  
288     <binding.jca connectionInfo="JCA_Services">  
289       <property name="userid" source="$UID"/>  
290     </binding.jca>  
291   </reference>
```

291  
292  
293  
294  
295  
296

```
</binding.jca>  
</reference>  
  
<property name="UID">SYSAD</property>  
</composite>
```

297  
298

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

299

## 6 Examples

300

### 6.1 Minimal JCA Binding

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

```
305 <!-- JCA reference, connection is configured in JNDI context -->  
306 <reference name="EISHelloWorldReference">  
307   <binding.jca uri="java:comp/env/eis/EISMCF"/>  
308 </reference>
```

309

### 6.2 Existing resources

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

```
313 <reference name="EISHelloWorldReference">  
314   <binding.jca uri="java:comp/env/eis/EISMCF">  
315     <outboundInteraction>  
316  
317       <connectionSpec name="FAConnectionSpec">  
318         <property name="userid">SYSAD</property>  
319       </connectionSpec>  
320       <interactionSpec name="FAInteractionSpec">  
321       </interactionSpec>  
322  
323       <operation name="hello">  
324         <interactionSpec>  
325           <property name="dir">temp</property>  
326           <property name="fileMode">read</property>  
327         </interactionSpec>  
328       </operation>  
329     </outboundInteraction>  
330   </binding.jca>  
331 </reference>
```

333

### 6.3 Resource Creation

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

```
336 <reference name="JCAHelloWorldReference">  
337   <binding.jca>  
338     <outboundConnection managed="true">  
339       <resourceAdapter  
340         name="connector.file.FAResourceAdapter">  
341         <property name="logDrive">D</property>  
342       </resourceAdapter>  
343       <connection name="FAManagedConnectionFactory"  
344         create="always">  
345         <property name="host">localhost</property>  
346         <property name="drive">C</property>  
347       </connection>  
348     </outboundConnection>
```

349  
350

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

## 351 6.4 Existing Resources specified in the definition file

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

354  
355  
356  
357  
358  
359  
360  
361  
362  
363  
364  
365  
366  
367  
368

```
<definitions targetNamespace="http://acme.com"  
  xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200903">  
  
  <binding.jca name="JCA_Inbound">  
    <inboundConnection>  
      <resourceAdapter name="FAResourceAdapter">  
        <property name="logDrive">D</property>  
      </resourceAdapter>  
      <activationSpec name="FAActivationSpec">  
        <property name="directory_type">temp</property>  
        <property name="drive">C</property>  
      </activationSpec>  
    </inboundConnection>  
  </binding.jca>  
</definitions>
```

369 The service with the JCA Bindings uses the connectionInfo attribute to identify the resources in the  
370 definition file

371  
372  
373  
374  
375  
376  
377  
378  
379

```
<service name="JCAHelloWorldService">  
  <binding.jca connectionInfo=" JCA_Inbound ">  
    <inboundInteraction>  
      <listener>MyInboundListener</listener>  
      <inboundOperation name="hello" nativeOperation="TXPN"/>  
      <inboundOperation name="bye" nativeOperation="ETXPRN"/>  
    </inboundInteraction>  
  </binding.jca>  
</service>
```

380



---

## 381 7 Conformance

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

- 385 a) SCA JCA Binding XML Document
- 386 b) SCA Runtime

### 387 7.1 SCA JCA Binding XML Document

388 An SCA JCA Binding XML document is an SCA Composite Document, an SCA Definitions Document or  
389 an SCA ComponentType Document, as defined by the [SCA Assembly specification Section 13.1 \[SCA-](#)  
390 [Assembly\]](#), that uses the ***binding.jca*** element.

391 An SCA JCA Binding XML document MUST be a conformant SCA Composite Document, SCA Definitions  
392 Document or a SCA ComponentType Document, as defined by the [SCA Assembly Specification \[SCA-](#)  
393 [Assembly\]](#), and MUST comply with all statements in Appendix B: "Conformance Items" related to elements  
394 and attributes in an SCA JCA Binding XML document, notably all "MUST" statements have to be  
395 implemented.

### 396 7.2 SCA Runtime

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

- 399 1. The implementation MUST comply with all statements in Appendix B: "Conformance Items"  
400 related to an SCA Runtime, notably all "MUST" statements have to be implemented
- 401 2. The implementation MUST conform to the [SCA Assembly Model Specification Version 1.1 \[SCA-](#)  
402 [Assembly\]](#), and to the [SCA Policy Framework Version 1.1 \[SCA-Policy\]](#)
- 403 3. The implementation MUST reject an SCA JCA Binding XML Document that is not conformant per  
404 Section 7.1

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

```

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

```

```

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

```

```

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

```

## B. Conformance Items

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

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

580

## C. Java EE Connector Architecture

581

### C.1 Introduction

582

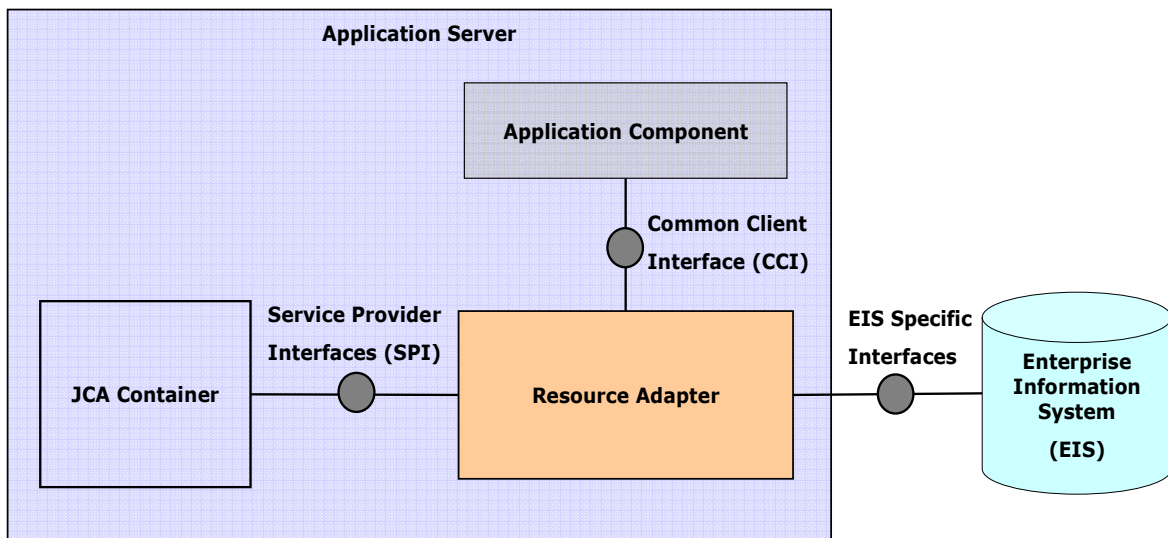
The connector architecture specification defines set of contracts that allow interoperability of the resource adapters and application server environments. The specification also defines set of client interfaces that can be optionally supported by the adapter and allow the use of adapter functionality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

583

584

585

586



587

588

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.

589

590

591

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

592

593

- 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.

594

595

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

596

597

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

598

599

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

600

601

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

602

603

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

604

605

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.

606

607

608

## 609 C.2 Selected JCA CCI Interfaces

### 610 Record

```
611     public interface javax.resource.cci.Record
612         extends java.lang.Cloneable, java.io.Serializable {
613
614     public String getRecordName();
615         public void setRecordName(String name);
616     public void setRecordShortDescription(String description);
617     public String getRecordShortDescription();
618         public boolean equals(Object other);
619         public int hashCode();
620         public Object clone() throws CloneNotSupportedException;
621     }
```

622

### 623 Interaction

624

```
625     public interface javax.resource.cci.Interaction {
626
627         public Connection getConnection();
628         public void close() throws ResourceException;
629         public boolean execute(InteractionSpec ispec,
630             Record input, Record output) throws ResourceException;
631         public Record execute(InteractionSpec ispec,
632             Record input) throws ResourceException;
633
634     }
```

### 635 MessageListener

636

```
637     interface javax.resource.cci.MessageListener {
638
639         Record onMessage(Record inputData) throws ResourceException;
640     }
```

641

642

643

## D. Acknowledgements

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

646 **Participants:**

<b>Participant Name</b>	<b>Affiliation</b>
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647

## E. Revision History

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

649

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
cd02-rev4	2009-06-24	Simon Holdsworth	Updates to resolve following issues BINDINGS-78 Renamed document to old form Editorial fixes around external references; changed all links to hyperlinks

cd02-rev5	2009-06-24	Simon Holdsworth	Fixed broken cross-reference
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650