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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 [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>

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 Assembly [\[SCA-Assembly\]](#) specification, this specification
41 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>*
    <!-- 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.jms/@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. The interaction specified outside of all
178 operation applies to all the operations defined
- 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
- 210
- 211
- 212
- 213
- ***/binding.jca/inboundInteraction/listener*** type specifies the listener interface supported by this group of interactions.
If the ***inboundInteraction/listener*** element is not specified, the SCA runtime MUST interpret it as a listener implementing `javax.resource.cci.MessageListener` interface from the JCA specification [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].

220 **Extensibility** - the JCA Bindings provide an extensibility mechanism that allows further customization of
221 the bindings with the vendor specific attributes or elements using extensibility element in the schema as
222 follows:

- 223
- 224
- `<anyAttribute namespace="##any" processContents="lax" />`
 - `<any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>`

225 **3 Policy**

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

228

4 Operation Selectors and Wire Formats

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

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

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

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

245

5 Binding Properties

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

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

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

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

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

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

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

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

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

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

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

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

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

304 6 Examples

305 6.1 Minimal JCA Binding

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

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

314 6.2 Existing resources

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

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

338 6.3 Resource Creation

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

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

```
353         </outboundConnection>
354     </binding.jca>
355 </reference>
```

356 6.4 Existing Resources specified in the definition file

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

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

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

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

385

386

7 Conformance

387 Any SCA runtime that claims to support this binding MUST abide by the requirements of this specification
388 [BJC70001].

389 The XML schema available at the namespace URI, defined by this specification, is considered to be
390 authoritative and takes precedence over the XML Schema defined in the appendix of this document.

391 Within this specification, the following conformance targets are used:

- 392 • XML document elements and attributes, including binding.jms and its children, and bindingType
- 393 • The SCA runtime – this refers to the implementation that provides the functionality to support the SCA
394 specifications, including that specific to the JCA binding as well as other SCA capabilities
- 395 • JCA objects, including ConnectionFactories and ActivationSpecs
- 396 • WSDL documents

A. JCA Binding Schema

```

398 <?xml version="1.0" encoding="UTF-8"?>
399 <!-- Copyright(C) OASIS(R) 2005,2009. All Rights Reserved.
400      OASIS trademark, IPR and other policies apply. -->
401 <schema xmlns="http://www.w3.org/2001/XMLSchema"
402       targetNamespace=" http://docs.oasis-open.org/ns/opencsa/sca/200903"
403       xmlns:sca=" http://docs.oasis-open.org/ns/opencsa/sca/200903"
404       elementFormDefault="qualified">
405
406   <include schemaLocation="sca-core-1.1-cd03.xsd" />
407
408   <complexType name="JCABinding">
409     <complexContent>
410       <extension base="sca:Binding">
411         <sequence>
412           <element name="outboundConnection"
413            type="sca:JCAOutboundConnection" minOccurs="0" />
414           <element name="inboundConnection"
415            type="sca:JCAInboundConnection" minOccurs="0" />
416           <element name="outboundInteraction"
417            type="sca:JCAOutboundInteraction" minOccurs="0" />
418           <element name="inboundInteraction"
419            type="sca:JCAInboundInteraction" minOccurs="0" />
420           <element name="property" type="sca:Property" minOccurs="0"
421            maxOccurs="unbounded" />
422           <any namespace="##other" processContents="lax" minOccurs="0"
423            maxOccurs="unbounded" />
424         </sequence>
425         <attribute name="connectionInfo" type="anyURI" use="optional" />
426         <attribute name="initialContextFactory" type="anyURI"
427            use="optional"/>
428         <attribute name="jndiURL" type="anyURI" use="optional"/>
429         <anyAttribute namespace="##any" processContents="lax" />
430       </extension>
431     </complexContent>
432   </complexType>
433
434   <simpleType name="JCACreateResource">
435     <restriction base="string">
436       <enumeration value="always" />
437       <enumeration value="never" />
438       <enumeration value="ifNotExist" />
439     </restriction>
440   </simpleType>
441   <simpleType name="ResAuth">
442     <restriction base="string">
443       <enumeration value="container" />
444       <enumeration value="application" />
445     </restriction>
446   </simpleType>
447   <complexType name="JCAOutboundConnection">
448     <sequence>
449       <element name="resourceAdapter" type="sca:ResourceAdapter"
450        minOccurs="0" />
451       <element name="connection" type="sca:Connection" />
452       <element name="resAuth" type="sca:ResAuth" minOccurs="0" />
453       <any namespace="##other" processContents="lax" minOccurs="0"
454        maxOccurs="unbounded" />
455     </sequence>
456     <attribute name="managed" type="boolean" use="optional"

```

```

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

```

```

521     <attribute name="create" type="sca:JCACreateResource" use="optional"
522             default="ifNotExist"/>
523     <anyAttribute namespace="##any" processContents="lax" />
524 </complexType>
525 <complexType name="Operation">
526     <sequence>
527         <element name="interactionSpec" type="sca:InteractionSpec"
528                 minOccurs="0" />
529         <any namespace="##other" processContents="lax" minOccurs="0"
530             maxOccurs="unbounded" />
531     </sequence>
532     <attribute name="name" type="NMTOKEN" use="required" />
533     <anyAttribute namespace="##any" processContents="lax" />
534 </complexType>
535 <complexType name="InboundOperation">
536     <sequence>
537         <any namespace="##other" processContents="lax" minOccurs="0"
538             maxOccurs="unbounded" />
539     </sequence>
540     <attribute name="name" type="NMTOKEN" use="required" />
541     <attribute name="nativeOperation" type="string" use="required" />
542     <anyAttribute namespace="##any" processContents="lax" />
543 </complexType>
544 <complexType name="ConnectionSpec">
545     <sequence>
546         <element name="property" type="sca:Property" minOccurs="0"
547                 maxOccurs="unbounded" />
548         <any namespace="##other" processContents="lax" minOccurs="0"
549             maxOccurs="unbounded" />
550     </sequence>
551     <attribute name="type" type="NMTOKEN" use="required" />
552     <anyAttribute namespace="##any" processContents="lax" />
553 </complexType>
554 <complexType name="InteractionSpec">
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="##any" processContents="lax" />
563 </complexType>
564
565     <element name="binding.jca" type="sca:JCABinding"
566             substitutionGroup="sca:binding" />
567 </schema>

```

B. Conformance Items

569 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
[BJC70001]	Any SCA runtime that claims to support this binding MUST abide by the requirements of this specification

570

C. Java EE Connector Architecture

571

C.1 Introduction

572

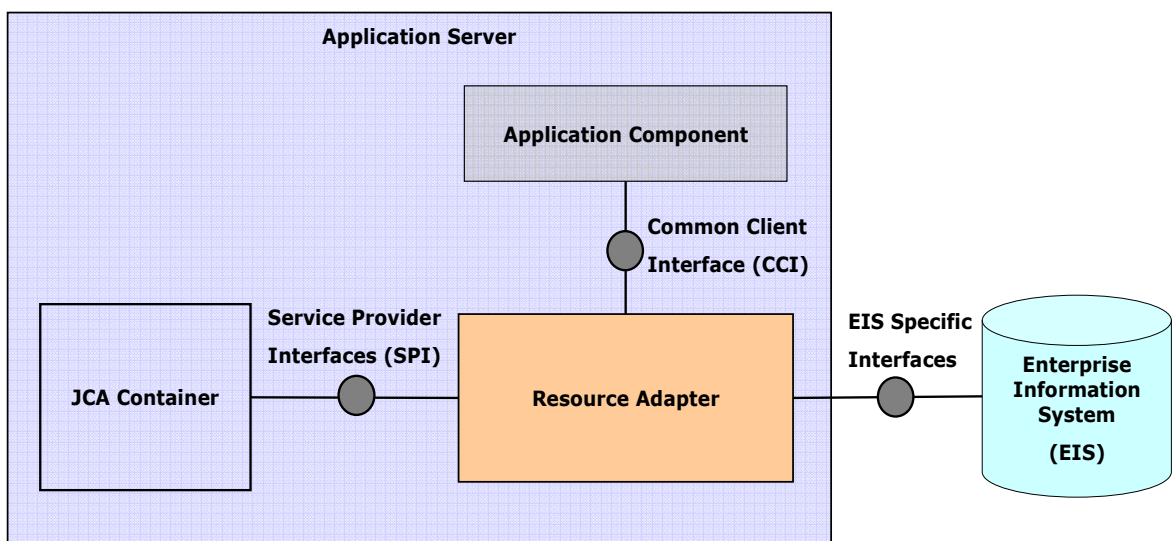
The connector architecture specification defines set of contracts that allow interoperability of the resource adapters and application server environments. The specification also defines set of client interfaces that can be optionally supported by the adapter and allow the use of adapter functionality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

573

574

575

576



577

578

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.

579

580

581

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

582

583

- 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.

584

585

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

586

587

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

588

589

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

590

591

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

592

593

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

594

595

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.

596

597

598

599 C.2 Selected JCA CCI Interfaces

600 Record

```
601     public interface javax.resource.cci.Record
602         extends java.lang.Cloneable, java.io.Serializable {
603
604     public String getRecordName();
605         public void setRecordName(String name);
606     public void setRecordShortDescription(String description);
607     public String getRecordShortDescription();
608         public boolean equals(Object other);
609         public int hashCode();
610         public Object clone() throws CloneNotSupportedException;
611     }
```

612

613 Interaction

614

```
615     public interface javax.resource.cci.Interaction {
616
617         public Connection getConnection();
618         public void close() throws ResourceException;
619         public boolean execute(InteractionSpec ispec,
620             Record input, Record output) throws ResourceException;
621         public Record execute(InteractionSpec ispec,
622             Record input) throws ResourceException;
623
624     }
```

625 MessageListener

626

```
627     interface javax.resource.cci.MessageListener {
628
629         Record onMessage(Record inputData) throws ResourceException;
630     }
```

631

632

633 **D. Acknowledgements**

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

636 **Participants:**

637 [Participant Name, Affiliation | Individual Member]

638 [Participant Name, Affiliation | Individual Member]

639

640 **E. Non-Normative Text**

641

F. Revision History

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

643

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

644