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OASIS Service Component Architecture / Bindings (SCA-Bindings) TC

Chair(s):

Simon Holdsworth, IBM

Editor(s):

Simon Holdsworth, IBM

Khanderao Kand, Oracle

Anish Karmarkar, Oracle

Sanjay Patil, SAP

Piotr Przybylski, IBM

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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 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 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.

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]

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.

1.3 Non-Normative References

- TBD TBD

31 2 Operation Selection and Data Binding

32 The operation selection is a process used to identify the operation of the service that should be invoked.
33 The data binding is a process of data conversion between EIS and runtime formats.

34
35 This specification does not define default behavior for the operation selection nor data binding. This
36 choice had been made because the interfaces describing data exchanged between JCA adapter and its
37 client are specific to a particular adapter and, unlike JMS, cannot be used in a generic manner.

38
39 The JCA Binding implementation however, **MUST** use or provide the operation selection and data binding
40 functionality. To support multiple adapters in a generic fashion, the binding **MUST** expose a mechanism
41 for selecting or specifying the implementations of data bindings or operation selector. This protocol **MUST**
42 be followed by this functionality providers. This can be achieved in a variety of ways, for example by
43 providing the metadata information or specific pluggability points. This document does not specify such
44 mechanism, it is left to the binding implementation.

45
46
47

48

3 JCA Binding

49 The JCA binding element is defined by the following schema:

```

50 <binding.jca connectionInfo="QName"?
51     initialContextFactory="xs:anyURI"?
52     jndiURL="xs:anyURI"?
53     name="NCName"?
54     requires="listofQName"?
55     uri="xsd:anyURI"?
56
57     <jca.outbound.connection managed="xs:boolean" ?>
58         <resourceAdapter name="NMTOKEN" type="NMTOKEN">
59             <property name="NMTOKEN" type="NMTOKEN">*
60         </resourceAdapter?
61         <connection name="NMTOKEN"? type="NMTOKEN" create="string"?>
62             <property name="NMTOKEN" type="NMTOKEN">*
63         </connection>
64         <resAuth>Container|Application</resAuth?
65         <!-- Vendor specific extensions -->
66     </jca.outbound.connection?
67     <jca.inbound.connection>
68         <resourceAdapter name="NMTOKEN"? type="NMTOKEN">
69             <property name="NMTOKEN" type="NMTOKEN">*
70         </resourceAdapter>
71         <activationSpec name="NMTOKEN"? type="NMTOKEN" create="string"?>
72             <property name="NMTOKEN" type="NMTOKEN">*
73         </activationSpec>
74         <!-- Vendor specific extensions -->
75     </jca.inbound.connection?
76
77     <jca.outbound.interaction>
78         <connectionSpec type="NMTOKEN">
79             <property name="NMTOKEN" type="NMTOKEN">*
80         </connectionSpec?
81         <interactionSpec type="NMTOKEN">
82             <property name="NMTOKEN" type="NMTOKEN">*
83         </interactionSpec?
84         <operation name="NMTOKEN">
85             <interactionSpec type="NMTOKEN"?>
86                 <property name="NMTOKEN" type="NMTOKEN">*
87             </interactionSpec?
88         </operation>*
89         <!-- Vendor specific extensions -->
90     </jca.outbound.interaction?
91     <jca.inbound.interaction>
92         <listener type="NMTOKEN" />?
93         <inboundOperation name="NMTOKEN" nativeOperation="NMTOKEN">*
94         </inboundOperation>
95     </jca.inbound.interaction?
96 </binding.jca>

```

97

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

99

- */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

100

101

102 under which the ConnectionFactory is located. For the service, the uri defines the endpoint to
 103 allow the EIS system to connect to the SCA system by defining the JNDI lookup name of the
 104 ActivationSpec, for example `uri="java:comp/env/eis/TRAN_EIS"`. The the binding's uri attribute is
 105 mutually exclusive with the connectionInfo element as well as `jca.inbound.connection` or
 106 `jca.outbound.connection` elements

- 107 • **`/binding.jca/@connectionInfo`** identifies the `jca.binding` element present in the definitions
 108 document and whose child or children (one or more of `jca.inbound.connection`,
 109 `jca.outbound.connection`, `jca.inbound.interaction`, `jca.outbound.interaction`) are used to define
 110 characteristics of connection and interaction characteristics for this binding.
- 111 • **`/binding.jca/@initialContextFactory`** – the name of the JNDI initial context factory.
- 112 • **`/binding.jca/@jndiURL`** – the URL for the JNDI provider.
- 113 • **`/binding.jca/@name`** - as defined in the SCA Assembly specification in Section 9, "Binding"
- 114 • **`/binding.jca/@requires`** - as defined in the SCA Assembly specification in Section 9, "Binding"
- 115 • **`/binding.jca/jca.outbound.connection`** defines the outbound connection characteristics, MUST
 116 NOT be specified for services
- 117 • **`/binding.jca/jca.outbound.connection/@managed`** attribute that determines whether the
 118 interaction with the EIS system should be performed in the managed or non-managed mode. If
 119 the value is true (default), the JNDI name is used to obtain connection to the EIS and use adapter
 120 in the managed mode. If the value is false, the connection information is used to invoke adapter
 121 in the non-managed mode i.e. by creating instance of the ManagedConnectionFactory and using
 122 it to create Connection. For the full description of the managed and non-managed mode refer to
 123 section 6.9 of [JCA15]
- 124 • **`/binding.jca/jca.outbound.connection/resourceAdapter`** – specifies name, type and properties
 125 of the Resource Adapter Java bean. There may be a restriction, depending on the deployment
 126 platform, about specifying properties of the RA Java Bean. This element is only valid in the
 127 managed mode.
- 128 • **`/binding.jca/jca.outbound.connection/resourceAdapter/@type`** – the fully qualified name of
 129 the class implementing the JCA ResourceAdapter interface
- 130 • **`/binding.jca/jca.outbound.connection/resourceAdapter/@name`** – the optional name that
 131 uniquely identifies the existing instance of the resource adapter.
- 132 • **`/binding.jca/jca.outbound.connection/resourceAdapter/property`** element contains the subset
 133 of the properties of the Resource Adapter Java Bean that need to be set in order to access
 134 specified EIS service. The full list of Resource Adapter properties can be obtained by
 135 introspecting the Java Bean.
- 136 • **`/binding.jca/jca.outbound.connection/connection`** element specifies the properties of the
 137 connection factory used to create connections to the required service endpoint.
- 138 • **`/binding.jca/jca.outbound.connection/connection/@type`** – the fully qualified name of the
 139 class implementing the JCA ManagedConnectionFactory interface
- 140 • **`/binding.jca/jca.outbound.connection/connection/@name`** – if the create attribute is never, the
 141 name uniquely identifies existing instance of the managed connection factory. If create attribute is
 142 always, the name MUST be unique within domain.
- 143 • **`/binding.jca/jca.outbound.connection/connection/property`** element contains the subset of the
 144 properties of the Managed Connectoin Factory Java Bean that need to be set in order to access
 145 specified EIS service. The full list of Managed Connectoin Factory properties can be obtained by
 146 introspecting the Java Bean.
- 147 • **`/binding.jca/jca.outbound.connection/connection/@create`** attribute indicates whether the
 148 element containing the attribute should be created when the containing composite is deployed.
 149 Valid values are "always", "never" and "ifnotexist". The default value is "ifnotexist". It is an error if
 150 the attribute value is "always" and the element with the given name already exists.
- 151 • **`/binding.jca/jca.outbound.connection/connection/resAuth`** element specifies the
 152 authentication mechanism used by the resource adapter in the managed environment
- 153 • Vendor specific extensions allow to customize the model to support the specific runtime
 154 characteristics, for example pool size or maximum number of connections

- 155 • ***/binding.jca/jca.outbound.interaction*** defines characteristics of the outbound interaction, MUST
- 156 NOT be specified for the services
- 157 • ***/binding.jca/jca.outbound.interaction/connectionSpec*** identifies the name of the class
- 158 implementing javax.resource.cci.ConnectionSpec interface and the set of connectionSpec
- 159 properties to be specified when creating a connection, a client level connection properties e.g.
- 160 user name or password. The ConnectionSpec object is used in several patterns that justify its
- 161 definition in the interaction binding.
- 162 • ***/binding.jca/jca.outbound.interaction/interactionSpec*** type specifies the name of the class
- 163 implementing javax.resource.cci.InteractionSpec interface. The interaction specified outside of all
- 164 operation applies to all the operations defined
- 165 • ***/binding.jca/jca.outbound.interaction/operation*** element gathers characteristics of one
- 166 operation of the service, the data bindings of the inbound and outbound arguments as well as
- 167 interaction type and the properties.
- 168 • ***/binding.jca/jca.inbound.connection*** defines the inbound connection characteristics, MUST
- 169 NOT be specified for the references
- 170 • ***/binding.jca/jca.inbound.connection/resourceAdapter*** – specifies name, type and properties
- 171 of the Resource Adapter Java bean. There may be a restriction, depending on the deployment
- 172 platform, about specifying properties of the RA Java Bean. This element is only valid in the
- 173 managed mode.
- 174 • ***/binding.jca/jca.inbound.connection/resourceAdapter@type*** – the fully qualified name of the
- 175 class implementing the ResourceAdapter interface
- 176 • ***/binding.jca/jca.inbound.connection/resourceAdapter/@name*** – the optional name that
- 177 uniquely identifies the existing instance of the resource adapter.
- 178 • ***/binding.jca/jca.inbound.connection/activationSpec*** element specifies the name of the class
- 179 implementing javax.resource.spi.ActivationSpec interface and its properties.
- 180 • ***/binding.jca/jca.inbound.connection/activationSpec/@type*** – the fully qualified name of the
- 181 class implementing the ActivationSpec interface
- 182 • ***/binding.jca/jca.inbound.connection/activationSpec/@name*** – if the create attribute is never,
- 183 the name uniquely identifies existing instance of the activation spec. If create attribute is always,
- 184 the name MUST be unique within domain.
- 185 • ***/binding.jca/jca.inbound.connection/activationSpec/@create*** attribute indicates whether the
- 186 element containing the attribute should be created when the containing composite is deployed.
- 187 Valid values are “always”, “never” and “ifnotexist”. The default value is “ifnotexist”. It is an error if
- 188 the attribute value is “always” and the element with the given name already exists.
- 189 • ***/binding.jca/jca.inbound.interaction*** defines characteristics of the inbound interaction, MUST
- 190 NOT be specified for the references
- 191 • ***/binding.jca/jca.inbound.interaction/listener*** type specifies the listener interface supported by
- 192 this group of interactions. If the listener is not specified, it is assumed to be a listener
- 193 implementing javax.resource.cci.MessageListener interface from the JCA specification
- 194 • ***/binding.jca/jca.inbound.interaction/inboundOperation*** element maps the name of the EIS
- 195 event received by ResourceAdapter to the name of the operation of the Service.

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

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

198 follows:

- 199 • `<anyAttribute namespace="##any" processContents="lax" />`
- 200 • `<any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>`

201

4 Binding Properties

202 The JCA Binding may contain properties necessary to interact with the EIS system, properties that are,
203 however, not related to the service location or type of services available. Such properties SHOULD be
204 configurable but SHOULD NOT require overwriting connection or interaction elements. Examples of such
205 properties are user ID or password.

206 The binding.jca contains connectionInfo element that specifies the name of the binding.jca element in the
207 definition file.

208

```
209 <reference name="EISHelloWorldReference">  
210   <binding.jca uri=" java:comp/env/eis/EISMCF"  
211     connectionInfo="JCA_Services">  
212     </binding.jca>  
213 </reference>
```

214

215 This element may contain the interaction properties, for example properties of the connectionSpec.

```
216 <definitions targetNamespace="http://acme.com"  
217   xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200712">  
218   <binding.jca name="JCA_Services">  
219     <jca.outbound.interaction >  
220       <connectionSpec name="FAConnectionSpec">  
221         <property name="group">GROUP1</property>  
222         <property name="userid">SYSAD</property>  
223         <property name="password">SYSAD</property>  
224       </connectionSpec>  
225       ...  
226     </jca.outbound.interaction>  
227   </binding.jca>  
228 </definitions>
```

229

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

234

```
235 <jca.outbound.interaction >  
236   <connectionSpec  
237     name="connector.file.outbound.FAConnectionSpec">  
238     <property name="group">GROUP1</property>  
239     <property name="userid">SYSAD</property>  
240     <property name="password" source="$password"/>  
241   </connectionSpec>  
242 </jca.outbound.interaction>
```

243

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

245

```
246 <reference name="JCAHelloWorldReference">  
247   <binding.jca uri=" java:comp/env/eis/MCF "  
248     connectionInfo="JCA_Services">  
249     <property name="password">SYSAD</property>  
250   </binding.jca>  
251 </reference>
```

252

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

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```
<composite xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200712
  name="EISHelloworld">

  <reference name="EISHelloWorldReference">
    <binding.jca uri=" java:comp/env/eis/EISMCF"
      connectionInfo="JCA_Services">
      <property name="userid" source="$UID"/>
    </binding.jca>
  </reference>

  <property name="UID">SYSAD</property>
</composite>
```

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.

272

5 Additional Binding Configuration Data

273

274

275

SCA runtime implementations may provide additional configuration that is associated with a JCA Binding, for example to overwrite binding properties like user name or password. The specification of such configuration is SCA runtime-specific and is outside of the scope of this document.

276

6 Examples

277

6.1 Minimal JCA Binding

278

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

279

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288

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

289

6.2 Existing resources

290

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

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```
<reference name="EISHelloWorldReference">
  <binding.jca uri="java:comp/env/eis/EISMCF">
    <jca.outbound.interaction>

      <connectionSpec name="FAConnectionSpec">
        <property name="userid">SYSAD</property>
      </connectionSpec>
      <interactionSpec name="FAInteractionSpec">
      </interactionSpec>

      <operation name="hello">
        <interactionSpec>
          <property name="dir">temp</property>
          <property name="fileMode">read</property>
        </interactionSpec>
      </operation>

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

315

6.3 Resource Creation

316

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

317

318

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320

321

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323

324

```
<reference name="JCAHelloWorldReference">
  <binding.jca>
    <jca.outbound.connection managed="true">
      <resourceAdapter
        name="connector.file.FAResourceAdapter">
        <property name="logDrive">D</property>
      </resourceAdapter>
```

```

325         <connection name="FAManagedConnectionFactory"
326             create="always">
327             <property name="host">localhost</property>
328             <property name="drive">C</property>
329         </connection>
330     </jca.outbound.connection>
331 </binding.jca>
332 </reference>

```

333

334 6.4 Existing Resources specified in the definition file

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

```

337 <definitions targetNamespace="http://acme.com"
338             xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200712">
339
340     <binding.jca name="JCA_Inbound">
341         <jca.inbound.connection>
342             <resourceAdapter name="FAResourceAdapter">
343                 <property name="logDrive">D</property>
344             </resourceAdapter>
345             <activationSpec name="FAActivationSpec">
346                 <property name="directory_type">temp</property>
347                 <property name="drive">C</property>
348             </activationSpec>
349         </jca.inbound.connection>
350     </binding.jca>
351 </definitions>

```

352

353 The service with the JCA Bindings uses the connectionInfo attribute to identify the resources in the
354 definition file

```

355 <service name="JCAHelloWorldService">
356     <binding.jca connectionInfo=" JCA_Inbound ">
357         <jca.inbound.interaction>
358             <listener>MyInboundListener</listener>
359             <inboundOperation name="hello" nativeOperation="TXPN"/>
360             <inboundOperation name="bye" nativeOperation="ETXPRN"/>
361         </jca.inbound.interaction>
362     </binding.jca>
363 </service>

```

364

365 7 Conformance

366 Any SCA runtime that claims to support this binding MUST abide by the requirements of this specification.

367

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

370

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

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

A. JCA Binding Schema

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```

<?xml version="1.0" encoding="UTF-8"?>
<!-- (c) Copyright OASIS 2007, 2008 -->
<schema xmlns="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://docs.oasis-open.org/ns/opencsa/sca/200712"
  xmlns:sca="http://docs.oasis-open.org/ns/opencsa/sca/200712"
  elementFormDefault="qualified">
  <include schemaLocation="sca-core.xsd" />
  <complexType name="JCABinding">
    <complexContent>
      <extension base="sca:Binding">
        <sequence>
          <element name="jca.outbound.connection"
            type="sca:JCAOutboundConnection"
            minOccurs="0" />
          <element name="jca.inbound.connection"
            type="sca:JCAInboundConnection"
            minOccurs="0" />
          <element name="jca.outbound.interaction"
            type="sca:JCAOutboundInteraction"
            minOccurs="0" />
          <element name="jca.inbound.interaction"
            type="sca:JCAInboundInteraction"
            minOccurs="0" />
          <element name="property" type="sca:Property" minOccurs="0"
            maxOccurs="unbounded" />
          <any namespace="##other" processContents="lax" minOccurs="0"
            maxOccurs="unbounded" />
        </sequence>
        <attribute name="connectionInfo" type="anyURI" use="optional" />
        <attribute name="initialContextFactory"
          type="anyURI" use="optional"/>
        <attribute name="jndiURL" type="anyURI" use="optional"/>
        <anyAttribute namespace="##any" processContents="lax" />
      </extension>
    </complexContent>
  </complexType>
  <simpleType name="CreateResource">
    <restriction base="string">
      <enumeration value="always" />
      <enumeration value="never" />
      <enumeration value="ifnotexist" />
    </restriction>
  </simpleType>
  <simpleType name="ResAuth">
    <restriction base="string">
      <enumeration value="Container" />
      <enumeration value="Application" />
    </restriction>
  </simpleType>
  <complexType name="JCAOutboundConnection">
    <sequence>
      <element name="resourceAdapter" type="sca:ResourceAdapter"

```



```

431         minOccurs="0" />
432         <element name="connection" type="sca:Connection" />
433         <element name="resAuth" type="sca:ResAuth" minOccurs="0" />
434         <any namespace="##other"
435             processContents="lax" minOccurs="0"
436             maxOccurs="unbounded" />
437     </sequence>
438     <attribute name="managed" type="boolean" use="optional"
439         default="true" />
440     <anyAttribute namespace="##any" processContents="lax" />
441 </complexType>
442 <complexType name="JCAInboundConnection">
443     <sequence>
444         <element name="resourceAdapter" type="sca:ResourceAdapter" />
445         <element name="activationSpec" type="sca:ActivationSpec" />
446         <any namespace="##other" processContents="lax" minOccurs="0"
447             maxOccurs="unbounded" />
448     </sequence>
449 </complexType>
450 <complexType name="JCAOutboundInteraction">
451     <sequence>
452         <element name="connectionSpec" type="sca:ConnectionSpec"
453             minOccurs="0" />
454         <element name="interactionSpec" type="sca:InteractionSpec"
455             minOccurs="0" />
456         <element name="operation" type="sca:Operation" minOccurs="0" />
457         <any namespace="##other" processContents="lax" minOccurs="0"
458             maxOccurs="unbounded" />
459     </sequence>
460 </complexType>
461 <complexType name="JCAInboundInteraction">
462     <sequence>
463         <element name="listener" type="string" minOccurs="0" />
464         <element name="inboundOperation" type="sca:InboundOperation"
465             minOccurs="0" maxOccurs="unbounded" />
466         <any namespace="##other" processContents="lax" minOccurs="0"
467             maxOccurs="unbounded" />
468     </sequence>
469 </complexType>
470 <complexType name="ResourceAdapter">
471     <sequence>
472         <element name="property" type="sca:Property" minOccurs="0"
473             maxOccurs="unbounded" />
474         <any namespace="##other" processContents="lax" minOccurs="0"
475             maxOccurs="unbounded" />
476     </sequence>
477     <attribute name="name" type="NMTOKEN" use="optional" />
478     <attribute name="type" type="NMTOKEN" use="required" />
479     <anyAttribute namespace="##any" processContents="lax" />
480 </complexType>
481 <complexType name="Connection">
482     <sequence>
483         <element name="property" type="sca:Property" minOccurs="0"
484             maxOccurs="unbounded" />
485         <any namespace="##other" processContents="lax" minOccurs="0"
486             maxOccurs="unbounded" />
487     </sequence>
488     <attribute name="name" type="NMTOKEN" use="optional" />

```

```

489     <attribute name="type" type="NMTOKEN" use="required" />
490     <attribute name="create" type="sca:CreateResource" use="optional"
491         default="ifnotexist" />
492     <anyAttribute namespace="##any" processContents="lax" />
493 </complexType>
494 <complexType name="ActivationSpec">
495     <sequence>
496         <element name="property" type="sca:Property" minOccurs="0"
497             maxOccurs="unbounded" />
498         <any namespace="##other" processContents="lax" minOccurs="0"
499             maxOccurs="unbounded" />
500     </sequence>
501     <attribute name="name" type="NMTOKEN" use="optional" />
502     <attribute name="type" type="NMTOKEN" use="required" />
503     <attribute name="create" type="sca:CreateResource" use="optional"
504         default="ifnotexist" />
505     <anyAttribute namespace="##any" processContents="lax" />
506 </complexType>
507 <complexType name="Operation">
508     <sequence>
509         <element name="interactionSpec" type="sca:InteractionSpec"
510             minOccurs="0" />
511         <any namespace="##other" processContents="lax" minOccurs="0"
512             maxOccurs="unbounded" />
513     </sequence>
514     <attribute name="name" type="NMTOKEN" use="required" />
515     <anyAttribute namespace="##any" processContents="lax" />
516 </complexType>
517 <complexType name="InboundOperation">
518     <sequence>
519         <any namespace="##other" processContents="lax" minOccurs="0"
520             maxOccurs="unbounded" />
521     </sequence>
522     <attribute name="name" type="NMTOKEN" use="required" />
523     <attribute name="nativeOperation" type="string" use="required" />
524     <anyAttribute namespace="##any" processContents="lax" />
525 </complexType>
526 <complexType name="ConnectionSpec">
527     <sequence>
528         <element name="property" type="sca:Property" minOccurs="0"
529             maxOccurs="unbounded" />
530         <any namespace="##other" processContents="lax" minOccurs="0"
531             maxOccurs="unbounded" />
532     </sequence>
533     <attribute name="type" type="NMTOKEN" use="required" />
534     <anyAttribute namespace="##any" processContents="lax" />
535 </complexType>
536 <complexType name="InteractionSpec">
537     <sequence>
538         <element name="property" type="sca:Property" minOccurs="0"
539             maxOccurs="unbounded" />
540         <any namespace="##other" processContents="lax" minOccurs="0"
541             maxOccurs="unbounded" />
542     </sequence>
543     <attribute name="type" type="NMTOKEN" use="required" />
544     <anyAttribute namespace="##any" processContents="lax" />
545 </complexType>
546 <element name="binding.jca" type="sca:JCABinding"

```

547
548

```
substitutionGroup="sca:binding" />  
</schema>
```

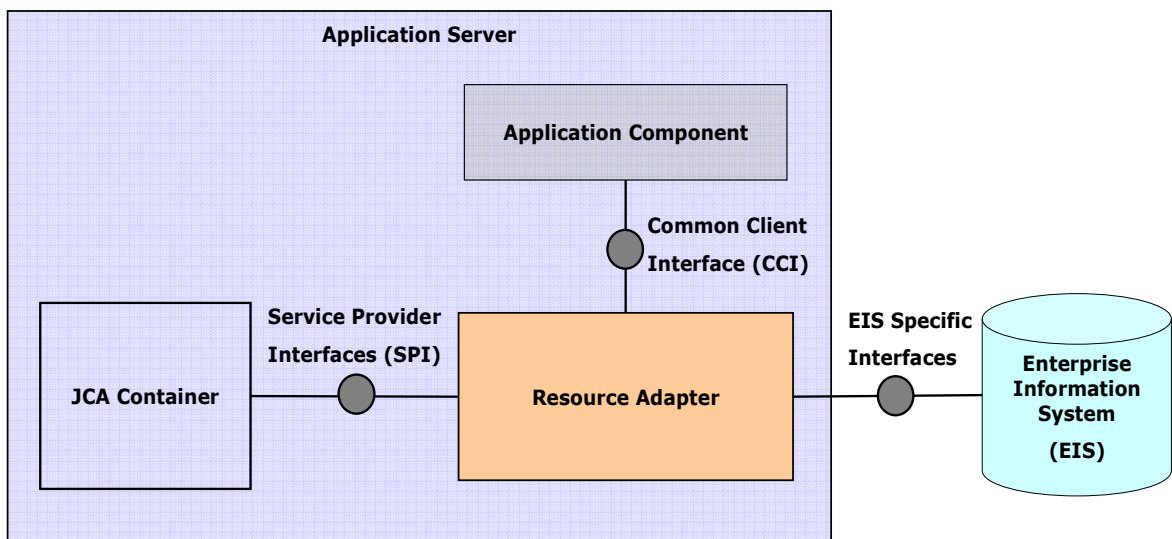
549

B. Java EE Connector Architecture

550

B.1 Introduction

551 The connector architecture specification defines set of contracts that allow interoperability of the resource
552 adapters and application server environments. The specification also defines set of client interfaces that
553 can be optionally supported by the adapter and allow the use of adapter functionality by the application
554 clients. The following figure illustrates the relationships of these interfaces.
555



556

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

560

- 561 • Lifecycle management allows application server to control the startup of the adapter and notification to allow it to shutdown in an orderly fashion
- 562 • 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.
- 563 • Connection management lets the server control the pooling, reusing and caching of the physical connections to the EIS system thus allowing for better scalability.
- 564 • Transactions allow the server to control EIS resource managers and provide application clients with the transactional access to external resources.
- 565 • Security contract allow for secure access to the EIS systems with security information configured and provided by the application server
- 566 • Message inflow contract allows Resource Adapter to deliver events initiated by the EIS system to the application component executing on the application server.
- 567 • Transaction inflow contract allow the application server to participate and execute in the context of the transaction initiated by the EIS system.

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

578

B.2 Selected JCA CCI Interfaces

579

Record

```
580 public interface javax.resource.cci.Record
581     extends java.lang.Cloneable, java.io.Serializable {
582
583 public String getRecordName();
584     public void setRecordName(String name);
585 public void setRecordShortDescription(String description);
586 public String getRecordShortDescription();
587     public boolean equals(Object other);
588     public int hashCode();
589     public Object clone() throws CloneNotSupportedException;
590 }
```

591

592 **Interaction**

593

```
594 public interface javax.resource.cci.Interaction {
595
596     public Connection getConnection();
597     public void close() throws ResourceException;
598     public boolean execute(InteractionSpec ispec,
599         Record input, Record output) throws ResourceException;
600     public Record execute(InteractionSpec ispec,
601         Record input) throws ResourceException;
602
603 }
```

604 **MessageListener**

605

```
606 interface javax.resource.cci.MessageListener {
607
608     Record onMessage(Record inputData) throws ResourceException;
609 }
```

610

611

612 **C. Acknowledgements**

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

615 **Participants:**

616 [Participant Name, Affiliation | Individual Member]

617 [Participant Name, Affiliation | Individual Member]

618

D. Non-Normative Text

620

E. Revision History

621

[optional; should not be included in OASIS Standards]

622

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: BINDING-13 BINDING-14 BINDING-28 BINDING-30 BINDING-32 BINDING-38

623