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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]

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/200712"	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.

1.3 Non-Normative References

- TBD TBD

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2 Operation Selection and Data Binding

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

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

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

3 JCA Binding

The JCA binding element is defined by the following schema:

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

  <jca.outbound.connection 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?>
    <!-- Vendor specific extensions -->
  </jca.outbound.connection?>
  <jca.inbound.connection>
    <resourceAdapter name="NMTOKEN"? type="NMTOKEN">
      <property name="NMTOKEN" type="NMTOKEN">*
    </resourceAdapter>
    <activationSpec name="NMTOKEN"? type="NMTOKEN" create="string"?>
      <property name="NMTOKEN" type="NMTOKEN">*
    </activationSpec>
    <!-- Vendor specific extensions -->
  </jca.inbound.connection?>

  <jca.outbound.interaction>
    <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>*
    <!-- Vendor specific extensions -->
  </jca.outbound.interaction?>
  <jca.inbound.interaction>
    <listener type="NMTOKEN" />?
    <inboundOperation name="NMTOKEN" nativeOperation="NMTOKEN">*
    </inboundOperation>
  </jca.inbound.interaction?>
</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

- 106 under which the ConnectionFactory is located. For the service, the uri defines the endpoint to
107 allow the EIS system to connect to the SCA system by defining the JNDI lookup name of the
108 ActivationSpec, for example `uri="java:comp/env/eis/TRAN_EIS"`. The the binding's uri attribute is
109 mutually exclusive with the connectionInfo element as well as `jca.inbound.connection` or
110 `jca.outbound.connection` elements and the SCA runtime MUST produce an error if both are
111 present
- 112 • **`/binding.jca/@connectionInfo`** identifies the `jca.binding` element present in the definitions
113 document and whose child or children (one or more of `jca.inbound.connection`,
114 `jca.outbound.connection`, `jca.inbound.interaction`, `jca.outbound.interaction`) are used to define
115 characteristics of connection and interaction characteristics for this binding.
 - 116 • **`/binding.jca/@initialContextFactory`** – the name of the JNDI initial context factory, MUST NOT
117 be specified if the uri element is not present
 - 118 • **`/binding.jca/@jndiURL`** – the URL for the JNDI provider, MUST NOT be specified if the uri
119 element is not present.
 - 120 • **`/binding.jca/@name`** - as defined in the SCA Assembly specification in Section 9, "Binding"
 - 121 • **`/binding.jca/@requires`** - as defined in the SCA Assembly specification in Section 9, "Binding"
 - 122 • **`/binding.jca/jca.outbound.connection`** defines the outbound connection characteristics, MUST
123 NOT be specified for services
 - 124 • **`/binding.jca/jca.outbound.connection/@managed`** attribute that determines whether the
125 interaction with the EIS system is to be performed in the managed or non-managed mode. If the
126 value is true (default), the JNDI name is used to obtain connection to the EIS and use adapter in
127 the managed mode. If the value is false, the connection information is used to invoke adapter in
128 the non-managed mode i.e. by creating instance of the ManagedConnectionFactory and using it
129 to create Connection. For the full description of the managed and non-managed mode refer to
130 section 6.9 of [JCA15]
 - 131 • **`/binding.jca/jca.outbound.connection/resourceAdapter`** – specifies name, type and properties
132 of the Resource Adapter Java bean. The SCA runtime MAY restrict valid properties of the Java
133 Bean depending on the deployment platform. This element MUST NOT be specified in the non
134 managed mode.
 - 135 • **`/binding.jca/jca.outbound.connection/resourceAdapter/@type`** – the fully qualified name of
136 the class implementing the JCA ResourceAdapter interface
 - 137 • **`/binding.jca/jca.outbound.connection/resourceAdapter/@name`** – the optional name that
138 uniquely identifies the existing instance of the resource adapter.
 - 139 • **`/binding.jca/jca.outbound.connection/resourceAdapter/property`** element contains the subset
140 of the properties of the Resource Adapter Java Bean that need to be set in order to access
141 specified EIS service. The full list of Resource Adapter properties SHOULD be determined by
142 introspecting the Java Bean.
 - 143 • **`/binding.jca/jca.outbound.connection/connection`** element specifies the properties of the
144 connection factory used to create connections to the service endpoint.
 - 145 • **`/binding.jca/jca.outbound.connection/connection/@type`** – the fully qualified name of the
146 class implementing the JCA ManagedConnectionFactory interface
 - 147 • **`/binding.jca/jca.outbound.connection/connection/@name`** – if the create attribute is "*never*",
148 the name uniquely identifies existing instance of the managed connection factory. If create
149 attribute is "*always*", the name MUST be unique within domain.
 - 150 • **`/binding.jca/jca.outbound.connection/connection/property`** element contains the subset of the
151 properties of the Managed Connectoin Factory Java Bean that need to be set in order to access
152 specified EIS service. The full list of Managed Connectoin Factory properties SHOULD be
153 determined by introspecting the Java Bean.
 - 154 • **`/binding.jca/jca.outbound.connection/connection/@create`** attribute indicates whether the
155 element containing the attribute should be created when the containing composite is deployed.
156 Valid values are "*always*", "*never*" and "*ifnotexist*". The default value is "*ifnotexist*". is the SCA
157 runtime SHOULD consider it as an error if the attribute value is "*always*" and the element with the
158 given name already exists.

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

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

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

206 follows:

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

209 4 Binding Properties

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

214 The binding.jca contains connectionInfo element that specifies the name of the binding.jca element in the
215 definition file.

```
217 <reference name="EISHelloWorldReference">
218   <binding.jca uri=" java:comp/env/eis/EISMCF"
219     connectionInfo="JCA_Services">
220     </binding.jca>
221 </reference>
```

222
223 This element may contain the interaction properties, for example properties of the connectionSpec.

```
224 <definitions targetNamespace="http://acme.com"
225   xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200712">
226   <binding.jca name="JCA_Services">
227     <jca.outbound.interaction >
228       <connectionSpec name="FAConnectionSpec">
229         <property name="group">GROUP1</property>
230         <property name="userid">SYSAD</property>
231         <property name="password">SYSAD</property>
232       </connectionSpec>
233       ...
234     </jca.outbound.interaction>
235   </binding.jca>
236 </definitions>
```

237
238 In the example above, the connectionSpec element specifies all the properties it overwrites in place and
239 needs to be updated when there is a need to modify any of the properties. This could be inefficient at
240 times and the method of passing properties from the bindings is defined. To get the value from the
241 bindings, the property specifies the source attribute as follows.

```
243 <jca.outbound.interaction >
244   <connectionSpec
245     name="connector.file.outbound.FAConnectionSpec">
246     <property name="group">GROUP1</property>
247     <property name="userid">SYSAD</property>
248     <property name="password" source="$password"/>
249   </connectionSpec>
250 </jca.outbound.interaction>
```

251
252 The property value is the specified in the binding element that refers to the element in the definitions file.

```
254 <reference name="JCAHelloWorldReference">
255   <binding.jca uri=" java:comp/env/eis/MCF "
256     connectionInfo="JCA_Services">
257     <property name="password">SYSAD</property>
258   </binding.jca>
259 </reference>
```

260
261 The properties can also be specified by the composite, in that case the reference or service would contain
262 the source attribute pointing to the property of the composite:

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```
<composite xmlns="http://docs.oasis-pen.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.

280

5 Additional Binding Configuration Data

281

SCA runtime implementations MAY provide additional configuration that is associated with a JCA Binding,

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for example to overwrite binding properties like user name or password. The specification of such

283

configuration is SCA runtime-specific and is outside of the scope of this document.

284

6 Examples

285

6.1 Minimal JCA Binding

286

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.

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295

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

296

297

6.2 Existing resources

298

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>
```

322

323

6.3 Resource Creation

324

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

325

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331

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

```

333         <connection name="FAManagedConnectionFactory"
334             create="always">
335             <property name="host">localhost</property>
336             <property name="drive">C</property>
337         </connection>
338     </jca.outbound.connection>
339 </binding.jca>
340 </reference>

```

341

342 6.4 Existing Resources specified in the definition file

343 This sample shows the resources specified in the definitions file and referred to by the binding elements.

344 The definitions file contains the following

```

345 <definitions targetNamespace="http://acme.com"
346             xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200712">
347
348     <binding.jca name="JCA_Inbound">
349         <jca.inbound.connection>
350             <resourceAdapter name="FAResourceAdapter">
351                 <property name="logDrive">D</property>
352             </resourceAdapter>
353             <activationSpec name="FAActivationSpec">
354                 <property name="directory_type">temp</property>
355                 <property name="drive">C</property>
356             </activationSpec>
357         </jca.inbound.connection>
358     </binding.jca>
359 </definitions>

```

360

361 The service with the JCA Bindings uses the connectionInfo attribute to identify the resources in the
362 definition file

```

363 <service name="JCAHelloWorldService">
364     <binding.jca connectionInfo=" JCA_Inbound ">
365         <jca.inbound.interaction>
366             <listener>MyInboundListener</listener>
367             <inboundOperation name="hello" nativeOperation="TXPN"/>
368             <inboundOperation name="bye" nativeOperation="ETXPRN"/>
369         </jca.inbound.interaction>
370     </binding.jca>
371 </service>

```

372

373 7 Conformance

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

375

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

378

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

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

385

A. JCA Binding Schema

386

```

387 <?xml version="1.0" encoding="UTF-8"?>
388 <!-- (c) Copyright OASIS 2007, 2008 -->
389 <schema xmlns="http://www.w3.org/2001/XMLSchema"
390   targetNamespace="http://docs.oasis-open.org/ns/opencsa/sca/200712"
391   xmlns:sca="http://docs.oasis-open.org/ns/opencsa/sca/200712"
392   elementFormDefault="qualified">
393   <include schemaLocation="sca-core.xsd" />
394   <complexType name="JCABinding">
395     <complexContent>
396       <extension base="sca:Binding">
397         <sequence>
398           <element name="jca.outbound.connection"
399             type="sca:JCAOutboundConnection"
400             minOccurs="0" />
401           <element name="jca.inbound.connection"
402             type="sca:JCAInboundConnection"
403             minOccurs="0" />
404           <element name="jca.outbound.interaction"
405             type="sca:JCAOutboundInteraction"
406             minOccurs="0" />
407           <element name="jca.inbound.interaction"
408             type="sca:JCAInboundInteraction"
409             minOccurs="0" />
410           <element name="property" type="sca:Property" minOccurs="0"
411             maxOccurs="unbounded" />
412           <any namespace="##other" processContents="lax" minOccurs="0"
413             maxOccurs="unbounded" />
414         </sequence>
415         <attribute name="connectionInfo" type="anyURI" use="optional" />
416         <attribute name="initialContextFactory"
417           type="anyURI" use="optional"/>
418         <attribute name="jndiURL" type="anyURI" use="optional"/>
419         <anyAttribute namespace="##any" processContents="lax" />
420       </extension>
421     </complexContent>
422   </complexType>
423   <simpleType name="CreateResource">
424     <restriction base="string">
425       <enumeration value="always" />
426       <enumeration value="never" />
427       <enumeration value="ifnotexist" />
428     </restriction>
429   </simpleType>
430   <simpleType name="ResAuth">
431     <restriction base="string">
432       <enumeration value="Container" />
433       <enumeration value="Application" />
434     </restriction>
435   </simpleType>
436   <complexType name="JCAOutboundConnection">
437     <sequence>
438       <element name="resourceAdapter" type="sca:ResourceAdapter"

```



```

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

```

```

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

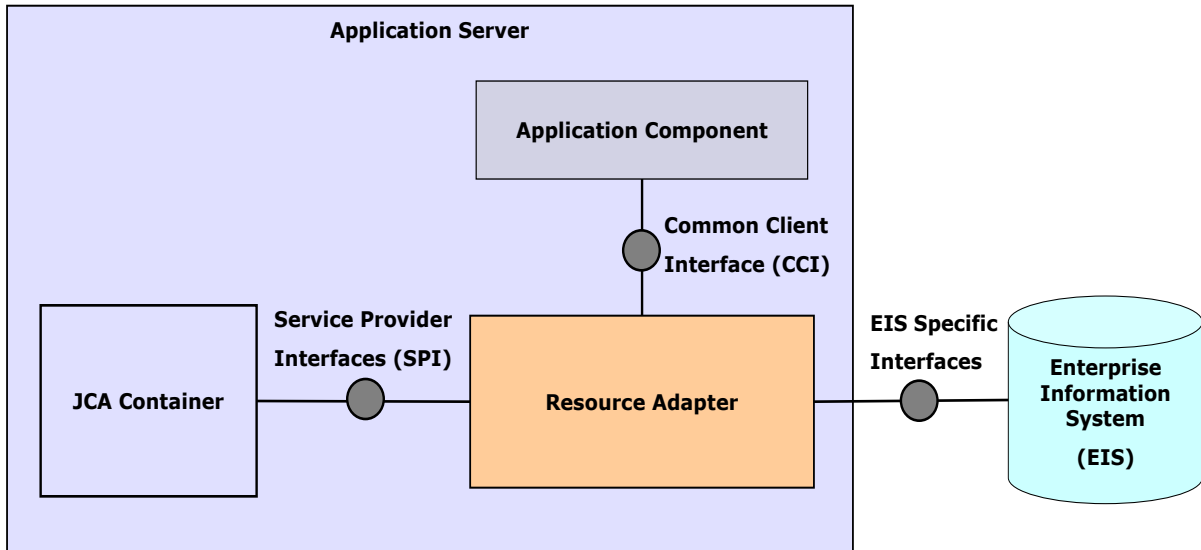
```

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

557 B. Java EE Connector Architecture

558 B.1 Introduction

559 The connector architecture specification defines set of contracts that allow interoperability of the resource
560 adapters and application server environments. The specification also defines set of client interfaces that
561 can be optionally supported by the adapter and allow the use of adapter functionality by the application
562 clients. The following figure illustrates the relationships of these interfaces.
563



564
565 The SPI defines the following management contracts that give adapter consistent view of the
566 infrastructure provided by the server and give sever consistent view of all the adapters thus helping with
567 integration of adapters and servers.

- 568 • Lifecycle management allows application server to control the startup of the adapter and
569 notification to allow it to shutdown in an orderly fashion
- 570 • Work management allows the adapter to use the server resources such as threads in an efficient
571 way and allows server to manage system resources appropriately.
- 572 • Connection management lets the server control the pooling, reusing and caching of the physical
573 connections to the EIS system thus allowing for better scalability.
- 574 • Transactions allow the server to control EIS resource managers and provide application clients
575 with the transactional access to external resources.
- 576 • Security contract allow for secure access to the EIS systems with security information configured
577 and provided by the application server
- 578 • Message inflow contract allows Resource Adapter to deliver events initiated by the EIS system to
579 the application component executing on the application server.
- 580 • Transaction inflow contract allow the application server to participate and execute in the context
581 of the transaction initiated by the EIS system.

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

586 B.2 Selected JCA CCI Interfaces

587 Record

```
588     public interface javax.resource.cci.Record
589         extends java.lang.Cloneable, java.io.Serializable {
590
591     public String getRecordName();
592         public void setRecordName(String name);
593     public void setRecordShortDescription(String description);
594     public String getRecordShortDescription();
595         public boolean equals(Object other);
596         public int hashCode();
597         public Object clone() throws CloneNotSupportedException;
598     }
```

599

600 **Interaction**

```
601
602     public interface javax.resource.cci.Interaction {
603
604         public Connection getConnection();
605         public void close() throws ResourceException;
606         public boolean execute(InteractionSpec ispec,
607             Record input, Record output) throws ResourceException;
608         public Record execute(InteractionSpec ispec,
609             Record input) throws ResourceException;
610
611     }
```

612 **MessageListener**

```
613
614     interface javax.resource.cci.MessageListener {
615
616         Record onMessage(Record inputData) throws ResourceException;
617     }
```

618

619

620 **C. Acknowledgements**

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

623 **Participants:**

624 [Participant Name, Affiliation | Individual Member]

625 [Participant Name, Affiliation | Individual Member]

626

D. Non-Normative Text

628

E. Revision History

629

[optional; should not be included in OASIS Standards]

630

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
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

631