



# Service Component Architecture EJB Session Bean Binding Specification Version 1.1

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- Service Component Architecture EJB Session Bean Binding Specification Version 1.00, February 22 2007

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- Service Component Architecture Assembly Model Specification Version 1.1
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**Abstract:**

This document explains the SCA EJB session bean binding. It describes how to integrate a previously deployed session bean into an SCA assembly, and how to expose SCA services to clients which use the EJB programming model.

**Status:**

This document was last revised or approved by the OASIS Service Component Architecture / J (SCA-J) TC on the above date. The level of approval is also listed above. Check the "Latest Version" or "Latest Approved Version" location noted above for possible later revisions of this document.

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# 1 Introduction

EJB session beans are a common technology used to implement business services. The ability to integrate SCA with session bean based services is useful because it preserves the investment incurred during the creation of those business services, while enabling the enterprise to embrace the newer SCA technology in incremental steps. The simplest form of integration is to simply enable SCA components to invoke session beans as SCA services. There is also a need to expose SCA services such that they are consumable by programmers skilled in the EJB programming model. This enables existing session bean assets to be enhanced to exploit newly deployed SCA services without the EJB programmers having to learn a new programming model.

This document explains the EJB SCA binding. This proposal describes how to integrate a previously deployed stateless session bean into an SCA assembly, and how to expose SCA services to clients which use the EJB programming model.

The EJB Session Bean binding enables:

- SCA developers to treat previously deployed stateless session beans as SCA services, by wiring them into an SCA assembly (SCA reference).
- SCA service deployers to expose a SCA service as a stateless session bean for consumption by Java EE applications.

Stateful session beans are out of scope for this specification. The terms 'session bean' and 'stateless session bean' are interchangeable for the purpose of this specification.

The use of EJBs and EJB modules as SCA component implementations is beyond the scope of this specification and is described in [the Java EE integration specification \[SCAJEE\]](#). The following diagram [Figure 11-2](#) [Figure 1-1](#) [Figure 1-1](#) shows the use of the EJB SCA binding on both SCA services and references.

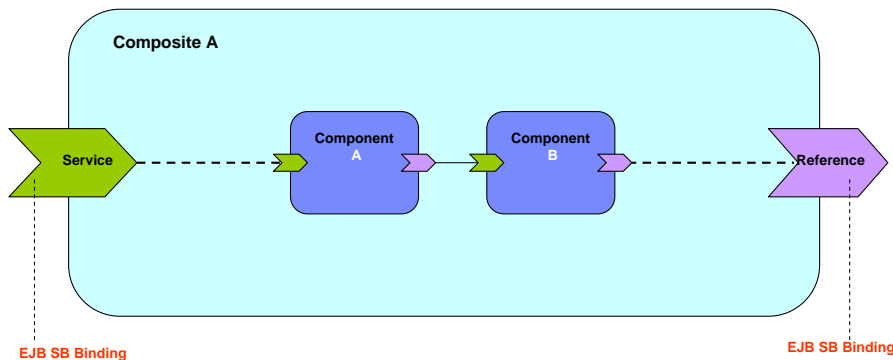


Figure 11-24: EJB Binding used on SCA Services and References

## 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 [\[RFC2119\]](#).

32 **1.2 Normative References**

33 **[RFC2119]** S. Bradner, *Key words for use in RFCs to Indicate Requirement Levels*,  
34 <http://www.ietf.org/rfc/rfc2119.txt>, IETF RFC 2119, March 1997.

35 **[SCAJEE]** SCA Java EE Implementation Specification,  
36 <http://www.osoa.org/display/Main/Service+Component+Architecture+Specifications>  
37

38 **[EJB]** Enterprise JavaBeans Specification,  
39 <http://java.sun.com/products/ejb/docs.html>

40 **[CORBA]** CORBA Naming Service Specification,  
41 <http://www.omg.org/docs/formal/04-10-03.pdf>

42 **[ASSEMBLY]** [OASIS Committee Draft 05](#), "SCA Assembly Model Specification Version 1.1",  
43 "[January 2010](#)."  
44 [http://docs.oasis-open.org/opencsa/sca-assembly/sca-assembly-1.1-spec-  
45 ed03cd05.pdf](http://docs.oasis-open.org/opencsa/sca-assembly/sca-assembly-1.1-spec-ed03cd05.pdf)

46 **[JAVACAA]** [OASIS Committee Draft 04](#), "Service Component Architecture SCA-J Common  
47 Annotations and APIs Specification Version 1.1",  
48 "[February 2010](#)."  
49 <http://docs.oasis-open.org/opencsa/sca-j/sca-javacaa-1.1-spec-ed03cd04.pdf>

50 **[POLICY]** [OASIS Committee Draft 02](#), "SCA Policy Framework Specification Version 1.1",  
51 "[February 2009](#)"  
52 <http://docs.oasis-open.org/opencsa/sca-policy/sca-policy-1.1-spec-cd02.pdf>

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54 ~~**1.3 Non-Normative References**~~

55 ~~TBD~~ ~~TBD~~

## 2 Session bean binding schema

The EJB session bean binding element is defined by the following pseudo-schema in [Snippet 2-1](#)

```
<binding.ejb homeInterface="NCName"?
  ejb-link-name="string"?
  ejb-version="EJB2 or EJB3"?
  name="NCName"?
  policySets="sca:listOfQNames"?
  requires="sca:listOfQNames"?
  uri="anyURI"?>
  <wireFormat ... />?
  <operationSelector ... />?
</binding.ejb>
```

[Snippet 2-1: binding.ejb Pseudo-schema](#)

- **/binding.ejb/@homeInterface : NCName (0..1)** - The homeInterface attribute of the EJB binding is the session bean's home interface, and is used when exposing SCA services as EJB 2.x session beans. For <binding.ejb>, if @ejb-version="EJB2", then @homeInterface MUST be specified and MUST have a value that is the fully qualified package name of the Java interface class of the EJB's home interface. [BSB20001]
- **/binding.ejb/@ejb-link-name : string (0..1)** - The ejb-link-name attribute provides a means for integrating EJB reference resolution with SCA. When used on a binding for an SCA reference, it allows a SCA client to bind to an EJB that is packaged in the same Java EE EAR file as the SCA client. When used on an SCA service binding, it exposes an <ejb-link/> target for Java EE clients that want to use Java EE assembly to wire to the SCA service. -This attribute is functionally equivalent to using the <ejb-link/> subelement of the <ejb-ref/> element in an EJB deployment descriptor. The value of this attribute is supplied by an application assembler, and is in the form as specified by the Java EE specification [SCAJEE] (i.e. <jar-name>#<ejb-name>).  
When <binding.ejb/> applies to an SCA reference, if @ejb-link-name attribute is specified it MUST contain the value of an <ejb-link/> target packaged within the same Java EE EAR file as the SCA component containing the SCA reference. When <binding.ejb/> applies to an SCA reference, if @ejb-link-name attribute is specified it MUST contain the value of an <ejb-link/> target packaged within the same Java EE EAR file as the SCA component containing the SCA reference. When <binding.ejb/> applies to an SCA service, if @ejb-link-name attribute is specified, it MUST contain a value in the form "<jar-name>#<ejb-name>" which MUST be unique amongst the <ejb-link/> targets contained within the same Java EE EAR file as the SCA component containing the SCA service. When <binding.ejb/> applies to an SCA service, if @ejb-link-name attribute is specified, it MUST contain a value in the form "<jar-name>#<ejb-name>" which MUST be unique amongst the

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105 | `<ejb-link/>` targets contained within the same Java EE EAR file as the SCA component containing the  
106 | SCA service. [BSB20003]

107 |

- 108 • **`/binding.ejb/@ejb-version` : *VersionValue (0..1)*** – The `ejb-version` attribute is used to indicate the  
109 | EJB client view exposed by the EJB binding when used on an SCA service. This attribute has no  
110 | meaning when used on an SCA reference. The value 'EJB2' indicates the desire to expose an EJB  
111 | 2.x client view. The value 'EJB3' indicates the desire to expose an EJB 3.0 client view. The default  
112 | value is 'EJB3'. **When `<binding.ejb/>` applies to an SCA service and the `@ejb-version`  
113 | attribute is set to 'EJB2', the SCA Runtime MUST support invocation of the SCA service  
114 | using the EJB 2.x client view as specified in the Java EE specification [SCAJEE]. When  
115 | `<binding.ejb/>` applies to an SCA service and the `@ejb-version` attribute is set to 'EJB2',  
116 | the SCA Runtime MUST support invocation of the SCA service using the EJB 2.x client  
117 | view as specified in the Java EE specification [SCAJEE]. When `<binding.ejb/>` applies to an  
118 | SCA service and the `@ejb-version` attribute is set to 'EJB2', the SCA Runtime MUST support  
119 | invocation of the SCA service using the EJB 2.x client view as specified in the Java EE specification  
120 | [SCAJEE]. [BSB20004] **When `<binding.ejb/>` applies to an SCA service and the `@ejb-`  
121 | `version` attribute is set to 'EJB3', the SCA Runtime MUST support invocation of the SCA  
122 | service using the EJB 3.x client view as specified in the Java EE specification  
123 | [SCAJEE]. When `<binding.ejb/>` applies to an SCA service and the `@ejb-version` attribute  
124 | is set to 'EJB3', the SCA Runtime MUST support invocation of the SCA service using the  
125 | EJB 3.x client view as specified in the Java EE specification [SCAJEE]. When `<binding.ejb/>`  
126 | applies to an SCA service and the `@ejb-version` attribute is set to 'EJB3', the SCA Runtime MUST  
127 | support invocation of the SCA service using the EJB 3.x client view as specified in the Java EE  
128 | specification [SCAJEE]. [BSB20005]****

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- 130 • **`/binding.ejb/@name` : *NCName (0..1)*** – As defined in the SCA Assembly Specification [ASSEMBLY]

131 |

- 132 • **`/binding.ejb/@requires` : *QName (0..1)*** – A list of policy intents as defined in the SCA Policy  
133 | Framework Specification [POLICY]

134 |

- 135 • **`/binding.ejb/@policySets` : *QName (0..1)*** – A list of policy sets as defined in the SCA Policy  
136 | Framework Specification [POLICY]

137 |

138 The base SCA binding schema provides an attribute called `uri`, that is used to denote the URI of an  
139 | endpoint. In the context of the SCA EJB binding, the `uri` attribute is defined as follows:

140 |

- 141 • **`/binding.ejb/@uri` : *anyURI (0..1)*** – Specifies the URI of a session bean endpoint. For EJB 2.x, this  
142 | is the endpoint of the session home. For EJB 3.x, this is the endpoint of the session bean. **The value  
143 | of the `@uri` attribute MUST take the form of an Object URL as specified in the CORBA Services  
144 | specification [CORBA]. [BSB20006]** This is a standard URI form for referring to remotable CORBA  
145 | objects. Briefly, the corbaname URI format looks like this:  
146 | – corbaname:iiop:<hostName>:<port>/<key string>#<path to home>

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148 Typically, a corbaname URI doesn't include all these components. The following example shows a  
149 | corbaname URI that uses the default ORB configuration to find an EJB home at `ejb/MyHome` in the  
150 | JNDI directory:

151 |

- 152 | – corbaname:rir:#ejb/MyHome

153 |



154 Other forms of URI specification are admissible when interoperability is of no concern.

155

- 156 • **/binding.ejb/wireFormat** – As defined in the SCA Assembly Specification [ASSEMBLY]. This  
157 specification does not define any new wireFormat elements.
- 158 • **/binding.ejb/operationSelector** – As defined in the SCA Assembly Specification [ASSEMBLY]. This  
159 specification does not define any new operationSelector elements.

160 ~~When <binding.ejb/> applies to an SCA reference, the @uri and @ejb-link-name attributes~~  
161 ~~MUST NOT be specified together in the same binding configuration.~~~~When <binding.ejb/>~~  
162 ~~applies to an SCA reference, the @uri and @ejb link name attributes MUST NOT be~~  
163 ~~specified together in the same binding configuration.~~~~When <binding.ejb/> applies to an SCA~~  
164 ~~reference, the @uri and @ejb-link-name attributes MUST NOT be specified together in the same binding~~  
165 ~~configuration. [BSB20007]~~

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166 ~~The <binding.ejb/> element MUST conform to the XML schema defined in the sca-binding-~~  
167 ~~ejb.xsd.~~~~The <binding.ejb/> element MUST conform to the XML schema defined in the sca-~~  
168 ~~binding-ejb.xsd.~~~~The <binding.ejb/> element MUST conform to the XML schema defined in the sca-~~  
169 ~~binding-ejb.xsd. [BSB20008]~~

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170 ~~The implementation MUST reject a SCA Session Bean Binding XML Document that is not~~  
171 ~~conformant per Section 9.1.~~~~The implementation MUST reject a SCA Session Bean Binding~~  
172 ~~XML Document that is not conformant per Section 9.1.~~~~The implementation MUST reject a SCA~~  
173 ~~Session Bean Binding XML Document that is not conformant per Section 9.1. [BSB20009]~~

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## 174 2.1 Additional binding configuration data

175 SCA runtime implementations can provide additional metadata that is associated with an EJB binding.  
176 This is done by providing extension points in the schema; refer to Appendix B: EJB Binding Schema for  
177 the locations of these extension points.

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## 3 Interface Mapping

When used with the EJB binding, an SCA runtime MUST ensure that an SCA service or reference interface is compatible with a session bean interface, according to the rules defined in the section "Compatibility of Interfaces used for SCA Services & References with EJB Session Bean Interfaces". When used with the EJB binding, an SCA runtime MUST ensure that an SCA service or reference interface is compatible with a session bean interface, according to the rules defined in the section "Compatibility of Interfaces used for SCA Services & References with EJB Session Bean Interfaces". When used with the EJB binding, an SCA runtime MUST ensure that an SCA service or reference interface is compatible with a session bean interface, according to the rules defined in the section "Compatibility of Interfaces used for SCA Services & References with EJB Session Bean Interfaces". [BSB30001]

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### 3.1 Compatibility of Interfaces used for SCA Services & References with EJB Session Bean Interfaces

This section defines the compatibility of the interface used by an SCA reference with the interface provided by an EJB, when the SCA reference is wired to the EJB. It also defines the compatibility of the interface used by an EJB reference with the interface of an SCA service when the EJB reference is wired to the SCA service.

If an SCA reference is wired to an EJB remote session bean interface, the SCA reference interface is compatible if it is remotable.

If an SCA reference is wired to an EJB local session bean interface, the SCA reference interface is compatible if it is local.

The interface used by an SCA reference which is wired to a session bean is a compatible subset [ASSEMBLY] of the interface used by the session bean. In particular, the interface used by the SCA reference can omit any methods inherited from EJBObject or EJBLocalObject that appear in the session bean interface.

The interface used by an SCA service which is wired to by an EJB reference is a compatible superset [ASSEMBLY] of the interface used by the EJB reference. In particular, the interface used by the SCA service can omit any methods inherited from EJBObject or EJBLocalObject that appear in the EJB reference interface.

Compatibility for an individual method is defined by the SCA Assembly Model Specification [ASSEMBLY], and can be stated simply as compatibility of the signature. That is, the method name, input types, output types, and faults are identical.

The interface used by an SCA service or reference can be an SCA business interface or an EJB 3.0 remote or local interface.

### 3.2 EJBObject and EJBLocalObject Interfaces

The interfaces exposed from EJB 2.X beans inherit from either EJBObject or EJBLocalObject. EJBObject and EJBLocalObject contain methods directed toward the management of bean instances, meaning that the exposed 2.X interfaces mix business and infrastructure methods in a way that makes them poorly suited for use as an SCA business interface. However, EJB 2.X beans developed using the "Business Interface Pattern" will already have an interface that is a suitable SCA business interface. An EJB 2.x session bean interface itself MUST NOT be used as the interface of an SCA reference. An EJB

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223 | ~~2.x session bean interface itself MUST NOT be used as the interface of an SCA reference. An~~  
224 | ~~EJB 2.x session bean interface itself MUST NOT be used as the interface of an SCA reference.~~  
225 | [BSB30002]  
226 | ~~Section 6.1~~Section 6.1 describes the behavior associated with each inherited method when  
227 | <binding.ejb/> is used on an SCA service.  
228 |

## 229 4 SCA Reference Binding

230 When used on an SCA reference, the EJB binding specifies the means for connecting an SCA  
231 component to a previously deployed or co-deployed session bean.

232 The SCA reference interface used with the EJB binding can be either a remote or local interface. SCA  
233 deployment logic and the binding implementation will introspect the SCA reference interface class to  
234 determine whether it is local or remote. If an SCA component needs to access both the local and remote  
235 interface of a session bean, then this can be modeled in SCA assembly through two SCA references, one  
236 with a local interface and one with a remote interface.

237

238 [The following example Snippet 2-1 Snippet 2-1 Snippet 2-1](#) shows a reference binding using a corbaname  
239 URI:

240

```
241 <reference name="CandidateCheck">  
242   <interface.java interface="com.app.jobbank.CandidateCheck"/>  
243   <binding.ejb uri="corbaname:rir:#ejb/CandidateCheckHome"/>  
244 </reference >
```

245 [Snippet 4-1: Reference Using a Corbaname URI](#)

246

247 The specific `uri` would be supplied prior to the completion of deployment.

248 [The following example Snippet 4-2 Snippet 4-2 Snippet 4-2](#) is a reference binding using an ejb-link.

249

```
250 <reference name="CandidateCheck">  
251   <interface.java interface="com.app.jobbank.CandidateChk"/>  
252   <binding.ejb ejb-link-name="candidateEJB.jar#CandidateChk"/>  
253 </reference >
```

254 [Snippet 4-2: Reference Using an EJB-link](#)

### 255 4.1 Exception Handling

256 Exception handling for interactions with session beans has been specified in chapter 14 of the EJB 3  
257 specification [EJB] and in Chapter 18 of the EJB 2.1 specification [EJB]. [The EJB \[EJB\] specifications](#)  
258 [define non-business exceptions that can be thrown to the EJB client. When <binding.ejb/>](#)  
259 [applies to an SCA reference, the SCA Runtime MUST wrap non-business exceptions in a](#)  
260 [ServiceRuntimeException that is thrown to the client \[JAVACAA\].The EJB \[EJB\] specifications](#)  
261 [define non-business exceptions that can be thrown to the EJB client. When <binding.ejb/>](#)  
262 [applies to an SCA reference, the SCA Runtime MUST wrap non-business exceptions in a](#)  
263 [ServiceRuntimeException that is thrown to the client \[JAVACAA\].The EJB \[EJB\] specifications](#)  
264 [define non-business exceptions that can be thrown to the EJB client. When <binding.ejb/> applies to an](#)  
265 [SCA reference, the SCA Runtime MUST wrap non-business exceptions in a ServiceRuntimeException](#)  
266 [that is thrown to the client \[JAVACAA\]. \[BSB40001\]](#)

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267

---

## 5 Packaging

268

There is no requirement to package the session bean home interface or client stubs with an SCA component that uses the Session bean binding. The EJB Session Bean binding implementation can dynamically lookup, create and invoke the bean without the usual EJB client classes.

269

270

## 271 6 SCA Service Binding

272 When used on an SCA service, the EJB SCA binding causes the SCA service to be exposed as a  
273 session bean. This enables a client that is using the EJB programming model to call the SCA service  
274 using its native programming model.

275 The `/binding.ejb/@homeInterface` attribute is used to indicate the Session Home interface that an EJB  
276 client will use to bootstrap itself with the SCA service, just as it would with any other session bean. **When**  
277 `<binding.ejb/>` applies to an SCA service, the Java interface class specified on the `@homeInterface`  
278 attribute **MUST** have one and only one create method [EJB]. **When** `<binding.ejb/>` applies to an SCA  
279 service, the Java interface class specified on the `@homeInterface` attribute **MUST** have one and only one  
280 create method [EJB]. **When** `<binding.ejb/>` applies to an SCA service, the Java interface class specified  
281 on the `@homeInterface` attribute **MUST** have one and only one create method [EJB]. [BSB60001]

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282 The following [Snippet 6-1](#) [Snippet 6-1](#) [Snippet 6-1](#) is an example of a service using the EJB binding.

283

```
284 <service name="JobBank">  
285   <interface.java interface="com.app.jobbank.JobBankService"/>  
286   <binding.ejb  
287     uri="corbaname:rir:#ejb/JobBankServiceHome"  
288     homeInterface="com.app.jobbank.JobBankServiceHome"  
289     ejb-link-name="jobbankEJB.jar#JobBankComponent"/>  
290 </service>
```

291 [Snippet 6-1: Service Using an EJB Binding](#)

292

293 A corresponding local home interface `com.app.jobbank.JobBankServiceHome` [looks like this: is shown in](#)  
294 [Snippet 6-2](#) [Snippet 6-2](#) [Snippet 6-2](#).

295

```
296 package com.app.jobbank;  
297  
298 import javax.ejb.CreateException;  
299 import javax.ejb.EJBLocalHome;  
300  
301 public interface JobBankServiceHome extends EJBLocalHome {  
302     JobBankService create() throws CreateException;  
303 }
```

304 [Snippet 6-2: Local Home Interface for Service in Snippet 6-1](#) [Snippet 6-1](#) [Snippet 6-1](#)

305

306 Similarly, the remote home interface can be formulated by extending `javax.ejb.EJBHome` and making  
307 sure to declare a `RemoteException`: [is shown in Snippet 6-3](#) [Snippet 6-3](#) [Snippet 6-3](#)

308

```
309 package com.app.jobbank;  
310  
311 import java.rmi.RemoteException;  
312 import javax.ejb.CreateException;  
313 import javax.ejb.EJBHome;  
314  
315 public interface JobBankServiceHome extends EJBHome {  
316     JobBankService create() throws CreateException, RemoteException;  
317 }
```

318 [Snippet 6-3: Remote Home Interface for Service in Snippet 6-1](#) [Snippet 6-1](#) [Snippet 6-1](#)

319

320 In the corbaname used in this example, the first part of the URI (up to the #) would logically be supplied  
 321 by the target deployment environment. See the SCA Assembly Model Specification [ASSEMBLY] for a  
 322 discussion of base URIs provided by an SCA domain configuration. The remainder of the name would be  
 323 provided prior to completion of deployment. The example above shows the URI that a client would use  
 324 after deployment. Prior to deployment, an assembler or developer can specify only the last portion of the  
 325 URI (i.e. everything following the #).

326 The SCA service interface used with the EJB binding can be either a remote or local interface. SCA  
 327 deployment logic and the binding implementation will introspect the interface class to determine whether it  
 328 is local or remote. If an SCA component needs to be exposed as both a local and remote session bean,  
 329 this can be modeled in SCA through two SCA services, one with the local interface and one with the  
 330 remote interface.

331 When used on an SCA service binding, **ejb-link-name** and **uri** are NOT mutually exclusive. They each  
 332 provide a means for wiring to the SCA service depending on the locality of the client EJB reference. For  
 333 example, an SCA service packaged with an JEE EJB application could be exposed for consumption by  
 334 local EJB clients (using the **ejb-link-name** element) and remote EJB clients (using the **uri**).

335 From the perspective of an EJB client (local and remote), SCA services that are exposed as session  
 336 beans are not distinguishable from ordinary session beans. **When <binding.ejb/> applies to an SCA  
 337 service and @ejb-version is set to 'EJB2', the binding implementation MUST implement the  
 338 methods from the EJBObject or EJBLocalObject interface. When <binding.ejb/> applies to an  
 339 SCA service and @ejb-version is set to 'EJB2', the binding implementation MUST implement  
 340 the methods from the EJBObject or EJBLocalObject interface. When <binding.ejb/> applies to an  
 341 SCA service and @ejb-version is set to 'EJB2', the binding implementation MUST implement the methods  
 342 from the EJBObject or EJBLocalObject interface. [BSB60002]**

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343 Specifically, this means that a local client will be able to reference the SCA service as a session bean  
 344 using **ejb-(local)-ref** declarations in the appropriate locations and by issuing JNDI lookups or relying on  
 345 dependency injection mechanisms. If the SCA service is exposed as EJB 2.x session bean, by virtue of a  
 346 home interface specification, the client needs to be aware of the EJB 2.x home interface contract.

347 Similarly remote EJB clients are expected to be able to consume SCA services that are exposed as  
 348 session beans just as they are able to consume ordinary session beans.

## 349 6.1 Handling methods from EJBObject and EJBLocalObject

350 This section describes the SCA specific behavior of the methods that EJB 2.X service bindings inherit  
 351 from the EJBObject and EJBLocalObject interfaces.

352

Method	Behavior
isIdentical	Tests whether the SCA component, which the binding exposes, is the same instance as the one exposed by the specified object.
getEJBHome getEJBLocalHome	Returns an implementation of the interface specified as <b>/binding.ejb/@homeInterface</b> . The instance can be used to create or remove bean instances.

353 [Table 6-1: Behavior for EJB 2.X Methods](#)

354

355

---

## 7 Callbacks

356 The SCA Assembly Model Specification [ASSEMBLY] defines the callback feature which enables  
357 asynchronous interactions between two SCA components. This specification does not support the  
358 callback feature. However, implementations can choose to support the callback feature, in conjunction  
359 with this binding, by creating extensions to this specification.

360 |



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---

## 8 EJB Session Bean Binding bindingType

The bindingType for the Session Bean binding is defined ~~as follows~~ in [Snippet 8-1](#) ~~Snippet 8-1~~ [Snippet 8-1](#) ~~Snippet 8-1~~ [Snippet 8-1](#):

```
<bindingType type="binding.ejb" alwaysProvides="EJB"/>
```

[Snippet 8-1: Pseudo-schema for EJB bindingType](#)

The EJB intent is defined in the SCA Policy Specification [POLICY] document in the section entitled "Miscellaneous Intents".

---

373 **9 Conformance**

374 The XML schema pointed to by the RDDL document at the namespace URI, defined by this specification,  
375 are considered to be authoritative and take precedence over the XML schema defined in the appendix of  
376 this document.

377 There are two categories of artifacts for which this specification defines conformance:

378 a) SCA EJB Session Bean Binding XML Document

379 b) SCA Runtime

380 **9.1 SCA EJB Session Bean Binding XML Document**

381 An SCA EJB Session Bean Binding XML document is an SCA Composite Document, or an SCA  
382 ComponentType Document, as defined by the SCA Assembly Model Specification [ASSEMBLY], that  
383 uses the <binding.ejb> element.

384 An SCA EJB Session Bean Binding XML document MUST be a conformant SCA Composite Document or  
385 a SCA ComponentType Document, as defined by the SCA Assembly Model Specification [ASSEMBLY],  
386 and MUST comply with all statements in Appendix C: Conformance Items related to elements and  
387 attributes in an SCA EJB Session Bean Binding XML document, notably all "MUST" statements have to  
388 be implemented.

389 **9.2 SCA Runtime**

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

- 392 1. The implementation MUST comply with all statements in Appendix C: Conformance Items related to  
393 an SCA Runtime.
- 394 2. The implementation MUST conform to the SCA Assembly Model Specification Version 1.1  
395 [ASSEMBLY] and to the SCA Policy Framework Version 1.1 [POLICY].
- 396

## A Use cases (non-normative)

The following use cases provide some examples of the usage of the SCA EJB Session Bean binding.

### A.1 Consuming an Existing EJB SOA Service

An SCA service is developed that needs to call a business service which is already deployed and running in a Java EE server. The SCA service will be deployed into an SCA runtime somewhere in the enterprise that is not necessarily a Java EE runtime. The business service was implemented as a session bean. The SCA component defines a SCA reference to the business service, and the deployer attaches an EJB binding to the SCA reference. In this use case, the EJB remote interface is the business interface.

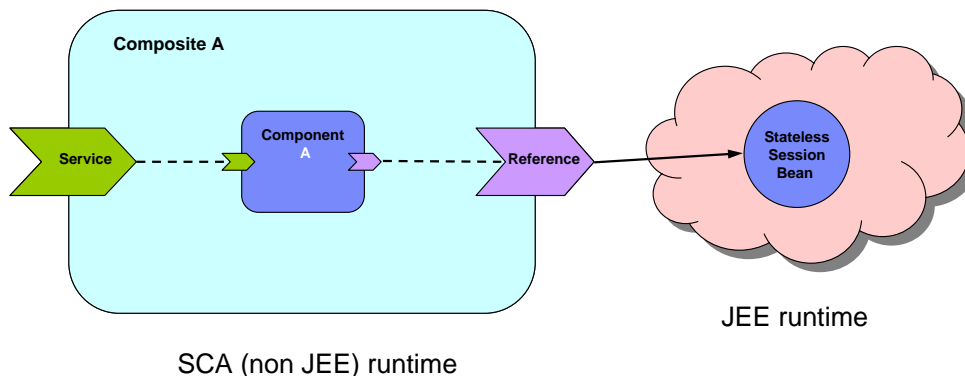


Figure 32A-41: SCA Reference invoking EJB Session Bean

The reference in the deployed `sca.composite` file looks like this: [shown in Snippet A-1 Snippet A-1 Snippet A-1](#).

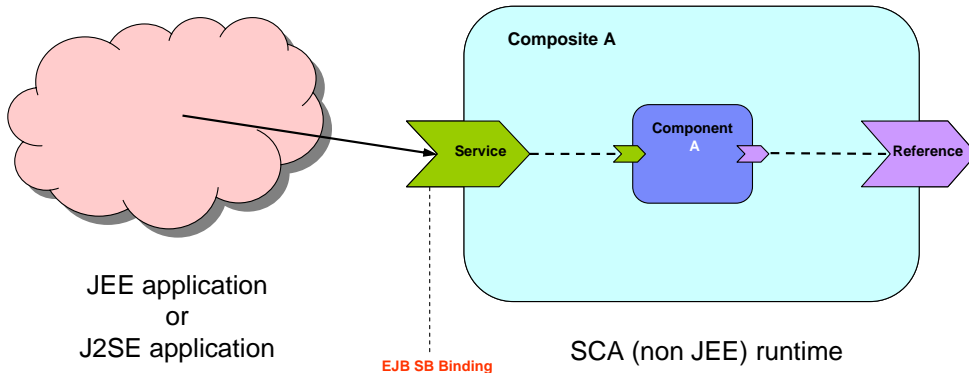
```
<reference name="CandidateCheck">
  <interface.java interface="com.app.jobbank.CandidateChk"/>
  <binding.ejb uri="corbaname:rir:#ejb/CandidateChkHome"/>
</reference >
```

[Snippet A-1: Reference Using binding.ejb](#)

### A.2 Exposing an SCA Service with an EJB SCA Binding

An SCA service is developed that will be called from a Java EE environment. The Java EE programmer doesn't know the SCA programming model and therefore wants to use the Java EE programming model that he knows in order to invoke the SCA service (i.e. `new initialContext()`, `nc.lookup()`, etc.). In this case, the SCA service has to be deployed into a runtime that is capable of supporting the EJB binding. Note that deployment of this SCA service can result in the generation and deployment of a session bean, along with its home interface. This aspect is significantly different from the previous use case.

427



428

429 Figure 53A-62: SCA Service accessed as an EJB Session Bean

430

431 Since the client will use the standard Java EE programming model, the client needs to know the home  
432 interface of the SCA service. The service in the SCA composite file will look like this: is shown in Snippet  
433 A-2 Snippet A-2 Snippet A-2.

434

```

435 <service name="CompanyInfo">
436 <interface.java interface="com.app.jobbank.CompanyInfo"/>
437 <binding.ejb uri="corbaname:rir:#ejb/CompanyInfoHome"
438   homeInterface="com.app.jobbank.CompanyInfoHome"
439   ejb-version="EJB2"/>
440 <reference>CompanyInfoComponent/CompanyInfo</reference>
441 </service>

```

442 Snippet A-2: Service Using binding.ejb

443

444 The client code as per the standard Java EE programming model looks like this: is shown in Snippet  
445 A-3 Snippet A-3 Snippet A-3.

446

```

447 Context initialContext = new InitialContext(env);
448 CompanyInfoHome companyInfoHome= (CompanyInfoHome)
449   initialContext.lookup("corbaname:rir:#ejb/CompanyInfoHome");
450
451 CompanyInfo companyInfo = companyInfoHome.create();
452 companyInfo.getCompanyInfo("ACME Corp");

```

453 Snippet A-3: Client Code for Service in Snippet A-2 Snippet A-2 Snippet A-2

### 454 A.3 Consuming Existing Local EJB SOA Services

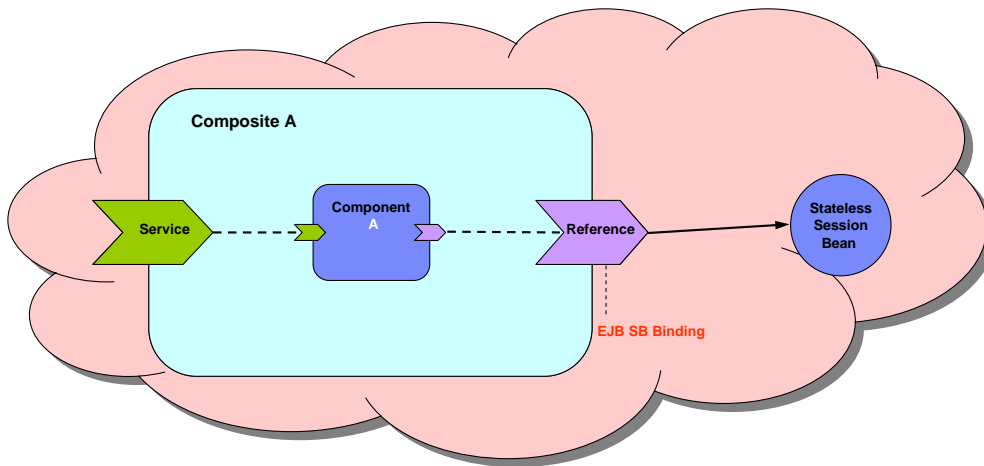
455

456 This use case is similar to the use case in section A.1A-13-1, except that the SCA service is going to be  
457 deployed into a Java EE capable JVM, and it is the same JVM as the EJB service. In this use case, the  
458 EJB's local interface is used as the business interface.

459

460 Note that the SCA client could also use the EJB remote interface. If an SCA component wanted to access

461 both the local and remote interface, then it would declare 2 SCA references (one with the local interface,  
 462 one with the remote interface).  
 463  
 464 |



Hybrid SCA/JEE runtime – all in one JVM

465  
 466 | *Figure 74A-83: SCA reference consuming a Local EJB service*

467 | **The example below**  
 468 | [Snippet A-4](#) [Snippet A-4](#) [Snippet A-4](#) shows the usage of a local interface in the reference definition.

```
469  

  470 | <reference name="CandidateCheck">  

  471 |   <interface.java interface="com.app.jobbank.CandidateCheckLocal"/>  

  472 |   <binding.ejb  

  473 |     uri="corbaname:rir:#ejb/CandidateCheckHome"/>  

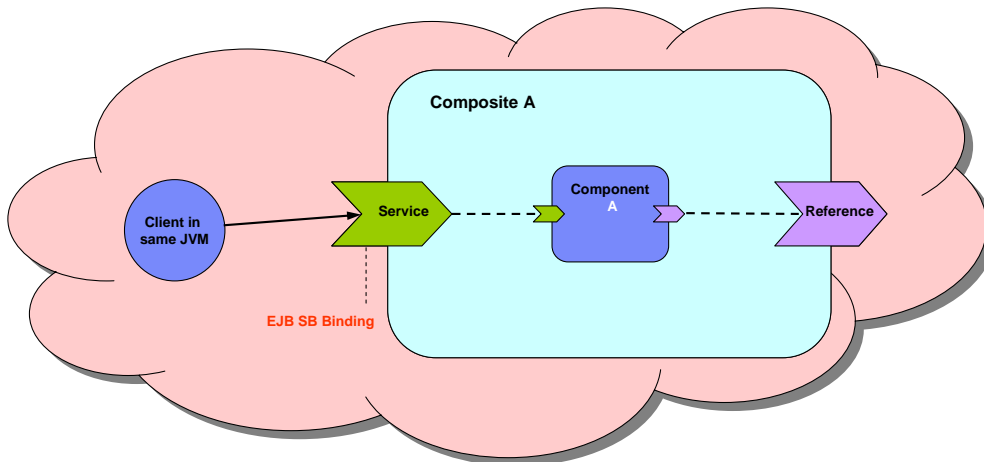
  474 | </reference>
```

475 | [Snippet A-4: Using a Local Interface](#)

#### 476 | **A.4 Exposing an SCA Service with a Local SLSB SCA Binding**

477 | This use case is similar to the use case in section [A.2A.23.2](#), except that the SCA service is going to be  
 478 | deployed into the same JVM as the client. This use case allows for the possibility that the SCA service is  
 479 | exposed as a local EJB interface. Note that deployment of this SCA service will effectively result in the  
 480 | generation and deployment of a session bean with a local interface and a local home interface.

481  
 482  
 483 |



Hybrid SCA/JEE runtime – all in one JVM

484

485 | Figure [95A-104](#): SCA Service exposed as a Local session bean

486

487 | The following [Snippet A-5](#) [Snippet A-5](#) [Snippet A-5](#) is an example:

488

```
489 <service name="CompanyInfo">
490 <interface.java interface="com.app.jobbank.CompanyInfoLocal"/>
491 <binding.ejb uri="corbaname:rir#ejb/CompanyInfoHome"
492     homeInterface="com.app.jobbank.CompanyInfoLocalHome"/>
493 <reference>CompanyInfoComponent/CompanyInfo</reference>
494 </service>
```

495 | [Snippet A-5: A Service Implemented as a Local Session Bean](#)

## 496 A.5 Consuming an EJB Service inside a Java EE EAR file

497 | This use case is similar to sections [A.1A.13.4](#) and [A.3A.33.3](#), except that the SCA service is going to be  
 498 | packaged inside a Java EE EAR file. By packaging it in this way, the SCA reference binding can be  
 499 | configured as if it were an <ejb-ref> with the <ejb-link> subelement.

500 | The following [Snippet A-6](#) [Snippet A-6](#) [Snippet A-6](#) is an example of the SCA reference binding.

501

```
502 <reference name="CandidateCheck">
503 <interface.java interface="com.app.jobbank.CandidateChk"/>
504 <binding.ejb ejb-link-name="candidateEJB.jar#CandidateChk"/>
505 </reference >
```

506

507 | The following [Snippet A-6: Reference Using binding.ejb](#)

508

509 | [Snippet A-7](#) [Snippet A-7](#) [Snippet A-7](#) is an <ejb-ref/> snippet that is functionally equivalent to the SCA  
 510 | reference above.

511

```
512 <ejb-ref>
```

```

513 <ejb-ref-name>CandidateCheck</ejb-ref-name>
514 <ejb-ref-type>Session</ejb-ref-type>
515 <home>com.app.jobbank.CandidateChkHome</home>
516 <remote>com.app.jobbank.CandidateChk</remote>
517 <ejb-link>candidateEJB.jar#CandidateChk</ejb-link>
518 </ejb-ref>

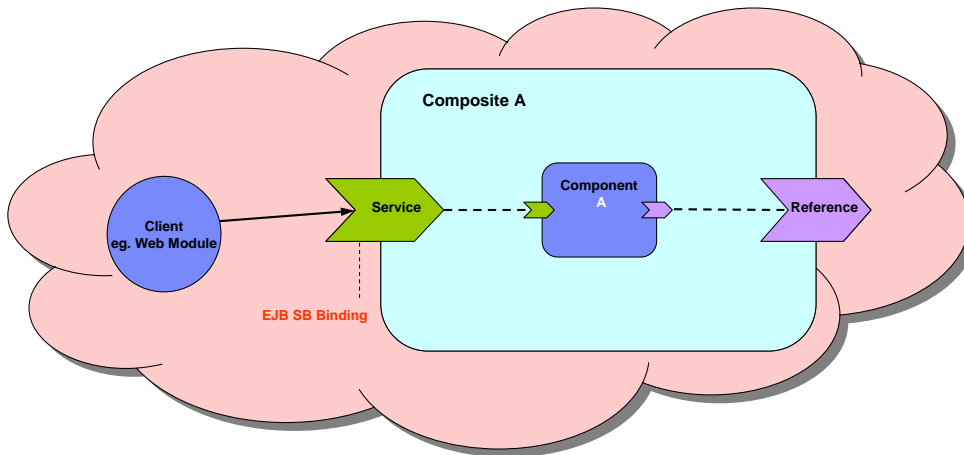
```

519 [Snippet A-7: ejb-ref Equivalent to Reference in Snippet A-6](#)[Snippet A-6](#)[Snippet A-6](#)

## 520 A.6 Exposing an SCA Service inside a Java EE EAR file

521 This use case is similar to sections [A.2A.23.2](#) and [A.4A.43.4](#), except that the SCA service is going to be  
522 deployed inside a Java EE EAR file so that it can be referenced by an EJB client, using the EJB assembly  
523 model.

524  
525



526 Caller and SCA Composite within one EAR file

527 [Figure 116A-125](#): SCA Service with client within one EAR file

528  
529 The following [Snippet A-8](#)[Snippet A-8](#)[Snippet A-8](#) is an example of the SCA service binding.

```

530
531 <service name="CompanyInfo">
532 <interface.java interface="com.app.jobbank.CompanyInfo"/>
533 <binding.ejb
534   homeInterface="com.app.jobbank.CompanyInfoHome"
535   ejb-link-name="companyInfoEJB.jar#CompanyInfoComponent"/>
536 <reference>CompanyInfoComponent/CompanyInfo</reference>
537 </service>

```

538  
539 [The following Snippet A-8: Service Using binding.eib](#)

540  
541 [Snippet A-9](#)[Snippet A-9](#)[Snippet A-9](#) is an example of an EJB deployment descriptor created by the client  
542 that is wired to the SCA Service binding.

543  
544  
545  
546  
547  
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549  
550

```
<ejb-ref>  
<ejb-ref-name>ejb/CompanyInfo</ejb-ref-name>  
<ejb-ref-type>Session</ejb-ref-type>  
<home>com.app.jobbank.CompanyInfoHome</home>  
<remote>com.app.jobbank.CompanyInfo</remote>  
<ejb-link>companyInfoEJB.jar#CompanyInfoComponent</ejb-link>  
</ejb-ref>
```

551 | [Snippet A-9: Deployment Descriptor Wired to Service in Snippet A-8](#)~~Snippet A-8~~~~Snippet A-8~~

552

553 | Note: There is a variant of this use case that needs to be considered. If the SCA service is in the same  
554 | EJB module as the client, then the ejb-link specified by the client does not have to include the EJB  
555 | module jar name.

556 |



557

## B EJB binding schema

```
558 <?xml version="1.0" encoding="UTF-8"?>
559 <!-- Copyright (C) OASIS (R) 2005, 20092010. All Rights Reserved.
560 OASIS trademark, IPR and other policies apply. -->
561 <schema xmlns="http://www.w3.org/2001/XMLSchema"
562 xmlns:sca="http://docs.oasis-open.org/ns/opencsa/sca/200903200912"
563 targetNamespace="http://docs.oasis-
564 open.org/ns/opencsa/sca/200903200912"
565 elementFormDefault="qualified">
566
567 <include schemaLocation="sca-core-1.1-ed03cd05.xsd"/>
568
569 <element name="binding.ejb" type="sca:EJBSessionBeanBinding"
570 substitutionGroup="sca:binding" />
571
572 <simpleType name="VersionValue">
573 <restriction base="string">
574 <enumeration value="EJB2"/>
575 <enumeration value="EJB3"/>
576 </restriction>
577 </simpleType>
578
579 <complexType name="EJBSessionBeanBinding">
580 <complexContent>
581 <extension base="sca:Binding">
582 <sequence>
583 <any namespace="##other" processContents="lax"
584 minOccurs="0" maxOccurs="unbounded"/>
585 </sequence>
586 <attribute name="homeInterface" type="NCName"
587 use="optional"/>
588 <attribute name="ejb-link-name" type="string"
589 use="optional"/>
590 <attribute name="ejb-version" type="sca:VersionValue"
591 use="optional" default="EJB3"/>
592 </extension>
593 </complexContent>
594 </complexType>
595 </schema>
```

596

597  
598  
599

## C Conformance Items

This section contains a list of conformance items for the SCA EJB Session Bean Binding specification.

Conformance ID	Description
[BSB20001]	For <binding.ejb/>, if @ejb-version="EJB2", then @homeInterface MUST be specified and MUST have a value that is the fully qualified package name of the Java interface class of the EJB's home interface.
[BSB20002]	When <binding.ejb/> applies to an SCA reference, if @ejb-link-name attribute is specified it MUST contain the value of an <ejb-link/> target packaged within the same Java EE EAR file as the SCA component containing the SCA reference.
[BSB20003]	When <binding.ejb/> applies to an SCA service, if @ejb-link-name attribute is specified, it MUST contain a value in the form "<jar-name>#<ejb-name>" which MUST be unique amongst the <ejb-link/> targets contained within the same Java EE EAR file as the SCA component containing the SCA service.
[BSB20004]	When <binding.ejb/> applies to an SCA service and the @ejb-version attribute is set to 'EJB2', the SCA Runtime MUST support invocation of the SCA service using the EJB 2.x client view as specified in the Java EE specification [SCAJEE].
[BSB20005]	When <binding.ejb/> applies to an SCA service and the @ejb-version attribute is set to 'EJB3', the SCA Runtime MUST support invocation of the SCA service using the EJB 3.x client view as specified in the Java EE specification [SCAJEE].
[BSB20006]	The value of the @uri attribute MUST take the form of an Object URL as specified in the CORBA Services specification [CORBA].
<del>[BSB20007]</del> <del>[BSB20007]</del>	When <binding.ejb/> applies to an SCA reference, the @uri and @ejb-link-name attributes MUST NOT be specified together in the same binding configuration.
<del>[BSB20008]</del> <del>[BSB20008]</del>	The <binding.ejb/> element MUST conform to the XML schema defined in the sca-binding-ejb.xsd.
<del>[BSB20009]</del> <del>[BSB20009]</del>	The implementation MUST reject a SCA Session Bean Binding XML Document that is not conformant per Section 9.1.
<del>[BSB30001]</del> <del>[BSB30001]</del>	When used with the EJB binding, an SCA runtime MUST ensure that an SCA service or reference interface is compatible with a session bean interface, according to the rules defined in the section "Compatibility of Interfaces used for SCA Services & References with EJB Session Bean Interfaces".
<del>[BSB30002]</del> <del>[BSB30002]</del>	An EJB 2.x session bean interface itself MUST NOT be used as the interface of an SCA reference.
<del>[BSB40001]</del> <del>[BSB40001]</del>	The EJB [EJB] specifications define non-business exceptions that can be thrown to the EJB client. When <binding.ejb/> applies to an SCA reference, the SCA Runtime MUST wrap non-business exceptions in a ServiceRuntimeException that is thrown to the client [JAVACAA].

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[BSB60001]{BSB60001}	When <binding.ejb/> applies to an SCA service, the Java interface class specified on the @homeInterface attribute MUST have one <b>and only one</b> create method [EJB].
[BSB60002]{BSB60002}	When <binding.ejb/> applies to an SCA service and @ejb-version is set to 'EJB2', the binding implementation MUST implement the methods from the EJBObject or EJBLocalObject interface.

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---

602 **D Acknowledgements**

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

605 Participants:

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606

## ~~E.Non-Normative Text~~

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608

## E Revision History

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

610

Revision	Date	Editor	Changes Made
1	2007-09-26	Anish Karmarkar	Applied the OASIS template + related changes to the Submission
2	2007-10-04	David Booz	Issue 5: Ending a conversation should invoke the remove method of EJLObject or EJBLocalObject.
wd02	2007-11-02	David Booz	Applied OSCA Errata
wd03	2009-06-04	David Booz	Editorial upgrade of namespaces, attribute descriptions, etc Applied Issues 86, 140
wd04	2009-07-20	David Booz	Applied 24, 122, 118
wd05	2009-08-14	David Booz	Applied 107, 170
cd01	2009-09-02	David Booz	Creation of CD01

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<a href="#">cd01-rev1</a>	<a href="#">2010-01-18</a>	<a href="#">David Booz</a>	<a href="#">Updated to latest Assembly namespace</a> <a href="#">Applied issues 183, 191</a>
<a href="#">cd01-rev2</a>	<a href="#">2010-01-22</a>	<a href="#">David Booz and Bryan Aupperle</a>	<a href="#">OASIS Formatting, copyright updates</a>
<a href="#">CD02</a>	<a href="#">2010-02-02</a>	<a href="#">David Booz</a>	<a href="#">Editorial updates to produce Committee Draft document</a> <a href="#">All changes accepted</a>

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