



BEA WebLogic Enterprise

EJB XML Reference

WebLogic Enterprise 5.0
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EJB XML Reference

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About This Document

This document provides XML reference information for configuring EJB applications that run under WebLogic Enterprise (WLE).

This document covers the following topics:

- Chapter 1, “EJB Deployment Descriptor Reference,” describes the XML DTD for the EJB deployment descriptor as specified in Sun Microsystem’s *Enterprise JavaBeans Specification 1.1* (Public Release 2, dated October 18, 1999).
- Chapter 2, “WebLogic EJB Extensions Reference,” describes the WLE XML extensions for EJB applications. WLE extends the ability to configure EJBs by providing additional, optional XML elements that can be associated with EJBs. The *Enterprise JavaBeans Specification 1.1* mandates that these extensions must be specified in a separate file (`weblogic-ejb-extensions.xml`).

What You Need to Know

This document is intended for Bean Providers, Application Assemblers, and Deployers who need to review or change the configuration for EJBs in EJB applications. It assumes that you are knowledgeable about EJB programming and familiar with Sun Microsystem’s *Enterprise JavaBeans Specification 1.1*.

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Related Information

For more information about CORBA, Java 2 Enterprise Edition (J2EE), BEA TUXEDO, distributed object computing, transaction processing, C++ programming, and Java programming, see the *WLE Bibliography* in the WebLogic Enterprise online documentation.

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- Your company name and company address
- Your machine type and authorization codes
- The name and version of the product you are using
- A description of the problem and the content of pertinent error messages

Documentation Conventions

The following documentation conventions are used throughout this document.

Convention	Item
boldface text	Indicates terms defined in the glossary.
Ctrl+Tab	Indicates that you must press two or more keys simultaneously.

Convention	Item
<i>italics</i>	Indicates emphasis or book titles.
monospace text	Indicates code samples, commands and their options, data structures and their members, data types, directories, and file names and their extensions. Monospace text also indicates text that you must enter from the keyboard. <i>Examples:</i> #include <iostream.h> void main () the pointer psz chmod u+w * \tux\data\ap .doc tux.doc BITMAP float
monospace boldface text	Identifies significant words in code. <i>Example:</i> void commit ()
<i>monospace italic text</i>	Identifies variables in code. <i>Example:</i> String <i>expr</i>
UPPERCASE TEXT	Indicates device names, environment variables, and logical operators. <i>Examples:</i> LPT1 SIGNON OR
{ }	Indicates a set of choices in a syntax line. The braces themselves should never be typed.
[]	Indicates optional items in a syntax line. The brackets themselves should never be typed. <i>Example:</i> buildobjclient [-v] [-o name] [-f <i>file-list</i>]... [-l <i>file-list</i>]...

Convention	Item
	Separates mutually exclusive choices in a syntax line. The symbol itself should never be typed.
...	<p>Indicates one of the following in a command line:</p> <ul style="list-style-type: none">■ That an argument can be repeated several times in a command line■ That the statement omits additional optional arguments■ That you can enter additional parameters, values, or other information <p>The ellipsis itself should never be typed.</p> <p><i>Example:</i></p> <pre>buildobjclient [-v] [-o name] [-f file-list]... [-l file-list]...</pre>
. . . .	<p>Indicates the omission of items from a code example or from a syntax line.</p> <p>The vertical ellipsis itself should never be typed.</p>



1 EJB Deployment Descriptor Reference

This section describes the XML DTD for the EJB deployment descriptor as specified in Sun Microsystems's *Enterprise JavaBeans Specification 1.1* (Public Release 2, dated October 18, 1999). This topic includes the following sections:

- About Deployment Descriptors
- DOCTYPE Declaration
- Summary of Deployment Descriptor Elements
- Description of Deployment Descriptor Elements

In addition, WebLogic Enterprise (WLE) provides the WebLogic EJB Extensions, which are XML elements used to further customize EJBs. For more information, see Chapter 2, “WebLogic EJB Extensions Reference.” For more information about deploying EJBs in the WLE environment, see *Building and Deploying Enterprise JavaBeans (EJBs)*.

About Deployment Descriptors

A *deployment descriptor* is a file in the ejb-jar file that defines the following kinds of information:

- **EJB structural information**, such as the EJB name, class, home and remote interfaces, bean type (session or entity), environment entries, resource factory references, EJB references, security role references, as well as additional information based on the bean type.
- **Application assembly information**, such as EJB references, security roles, security role references, method permissions, and container transaction attributes. Specifying assembly descriptor information is an optional task that an Application Assembler performs.

For a complete discussion of the EJB deployment descriptor, see Chapter 16, “Deployment Descriptor,” in Sun Microsystem’s *Enterprise JavaBeans Specification 1.1*.

EJB Roles and Deployment Descriptors

Specifying deployment descriptor information is a required task that a Bean Provider performs. The Bean Provider creates a standard EJB deployment descriptor file using the XML markup conventions in accordance with the syntax described in Sun Microsystem’s *Enterprise JavaBeans Specification 1.1*. Multiple EJBs can be defined in a single deployment descriptor. For more information about creating deployment descriptors, see *Building and Deploying Enterprise JavaBeans (EJBs)*.

An Application Assembler or Deployer may subsequently modify only certain information (such as the EJB name, values of environment entries, and description entries) in the deployment descriptor. The Deployer may use the WebLogic EJB Deployer to update certain settings in the deployment descriptor.

Thereafter, the Application Assembler creates a deployable ejb-jar file using the `ejbc` command-line tool, specifying the `-i` parameter and passing this filename (`ejb-jar.xml`). For more information about the `ejbc` command-line tool, see the *Command Reference*.

File Formats

Deployment descriptors are stored in the ejb-jar file. The WebLogic EJB Deployer accepts standard, extended, and deployable ejb-jar files.

DOCTYPE Declaration

All valid ejb-jar deployment descriptors must contain the following DOCTYPE declaration:

```
<!DOCTYPE ejb-jar PUBLIC "-//Sun Microsystems, Inc.//DTD Enterprise  
JavaBeans 1.1//EN"  
"http://java.sun.com/j2ee/dtds/ejb-jar_1_1.dtd">
```

Summary of Deployment Descriptor Elements

Table 1-1 List of Standard Deployment Descriptor Elements

Element	Description	EJB Role
assembly-descriptor	Contains application-assembly information.	Application Assembler
cmp-field	Describes a container-managed field.	Bean Provider
container-transaction	Specifies how the container must manage transaction scopes for the EJB's method invocations.	Application Assembler
description	Provides text describing the parent element.	Bean Provider or Application Assembler

Table 1-1 List of Standard Deployment Descriptor Elements (Continued)

Element	Description	EJB Role
display-name	Specifies a short name that is intended to be displayed by tools.	Bean Provider
ejb-class	Specifies the fully qualified name of the EJB's class.	Bean Provider
ejb-jar	Root element of the EJB deployment descriptor.	All
ejb-link	Used in the <code>ejb-ref</code> element to specify that an EJB reference is linked to another EJB in the <code>ejb-jar</code> file.	Application Assembler
ejb-name	Specifies an EJB's name.	Bean Provider or Application Assembler
ejb-ref	Declares a reference to another EJB's home.	Bean Provider
ejb-ref-name	Specifies the name of an EJB reference, which is an entry in the EJB's environment.	Bean Provider
ejb-ref-type	Specifies the expected type (entity or session) of the referenced EJB.	Bean Provider
enterprise-beans	Declares one or more EJBs.	Bean Provider
entity	Declares an entity bean.	Bean Provider
env-entry	Declares an EJB's environment entries.	Bean Provider or Application Assembler
env-entry-name	Specifies the name of an EJB's environment entry.	Bean Provider or Application Assembler
env-entry-type	Specifies the fully qualified Java type of the environment entry value that is expected by the EJB's code.	Bean Provider or Application Assembler
env-entry-value	Specifies the value of an EJB's environment entry.	Bean Provider or Application Assembler
field-name	Specifies the name of a container-managed field.	Bean Provider

Table 1-1 List of Standard Deployment Descriptor Elements (Continued)

Element	Description	EJB Role
home	Specifies the fully qualified name of the EJB's home interface.	Bean Provider
large-icon	Specifies the name of a file containing a large (32 x 32) icon image. The file name is a relative path within the ejb-jar file.	Bean Provider
method	Denotes a method of an EJB's home or remote interface, or a set of methods.	Application Assembler
method-intf	Allows a method element to differentiate between the methods, with the same name and signature, that are defined in both the remote and home interfaces.	Application Assembler
method-name	Specifies the name of an EJB method, or the asterisk (*) character, which is used when the element denotes all the methods of an EJB's remote and home interfaces.	Application Assembler
method-param	Specifies the fully qualified Java type name of a method parameter.	Application Assembler
method-params	Contains a list of the fully qualified Java type names of the method parameters.	Application Assembler
method-permission	Specifies one or more security roles that are allowed to invoke one or more EJB methods.	Application Assembler
persistence-type	Specifies an entity bean's persistence management type (bean- or container-managed).	Bean Provider
prim-key-class	Specifies the fully qualified name of an entity bean's primary key class.	Bean Provider
primkey-field	Specifies the name of the primary key field for an entity with container-managed persistence.	Bean Provider
reentrant	Specifies whether an entity bean is reentrant (True) or not (False).	Bean Provider
remote	Specifies the fully qualified name of the EJB's remote interface.	Bean Provider

Table 1-1 List of Standard Deployment Descriptor Elements (Continued)

Element	Description	EJB Role
res-auth	Specifies whether the EJB code signs on programmatically to the resource manager, or whether the Container will sign on to the resource manager on behalf of the bean. In the latter case, the Container uses information that is supplied by the Deployer.	Bean Provider
res-ref-name	Specifies the name of a resource factory reference.	Bean Provider
res-type	Specifies the type of the data source, which is the Java interface (or class) expected to be implemented by the data source.	Bean Provider
resource-ref	Declares the EJB's reference to an external resource.	Bean Provider
role-link	Links a security role reference to a defined security role.	Application Assembler
role-name	Specifies the name of a security role.	Application Assembler
security-role	Defines a security role.	Application Assembler
security-role-ref	Declares a security role reference in the EJB's code.	Bean Provider
session-type	Specifies the type of a session bean (stateful or stateless).	Bean Provider
session	Declares a session bean.	Bean Provider
small-icon	Specifies the name of a file containing a small (16 x 16) icon image. The file name is relative path within the ejb-jar file.	Bean Provider
transaction-type	Specifies the transaction management type of an EJB (bean- or container-managed).	Bean Provider
trans-attribute	Specifies how the container must manage the transaction boundaries when delegating a method invocation to an EJB's business method.	Application Assembler

Description of Deployment Descriptor Elements

assembly-descriptor

Synopsis	Contains application-assembly information.
Syntax	<code><!ELEMENT assembly-descriptor (security-role*, method-permission*, container-transaction*)></code>
EJB Role	Application Assembler
Used In	<code>ejb-jar</code>

cmp-field

Synopsis	Describes a container-managed field.
Syntax	<code><!ELEMENT cmp-field (description?, field-name)></code>
EJB Role	Bean Provider
Used In	<code>entity</code>

container-transaction

Synopsis	Specifies how the container must manage transaction scopes for the EJB's method invocations.
Syntax	<code><!ELEMENT container-transaction (description?, method+, trans-attribute)></code>
EJB Role	Application Assembler
Used In	<code>assembly-descriptor</code>

description

Synopsis	Provides text describing the parent element.
----------	--

Syntax	<code><!ELEMENT description (#PCDATA)></code>
EJB Role	Bean Provider or Application Assembler, and
Used In	<ul style="list-style-type: none">■ <code>cmp-field</code>■ <code>container-transaction</code>■ <code>ejb-jar</code>■ <code>entity</code>■ <code>env-entry</code>■ <code>ejb-ref</code>■ <code>method</code>■ <code>method-permission</code>■ <code>resource-ref</code>■ <code>security-role</code>■ <code>security-role-ref</code>■ <code>session</code>

display-name

Synopsis	Specifies a short name that is intended to be displayed by tools.
Syntax	<code><!ELEMENT display-name (#PCDATA)></code>
EJB Role	Bean Provider
Used In	<ul style="list-style-type: none">■ <code>ejb-jar</code>■ <code>session</code>■ <code>entity</code>

ejb-class

Synopsis	Specifies the fully qualified name of the EJB's class.
Syntax	<code><!ELEMENT ejb-class (#PCDATA)></code>
EJB Role	Bean Provider
Used In	<ul style="list-style-type: none">■ <code>entity</code>

- session

ejb-jar

Synopsis	Root element of the EJB deployment descriptor.
Syntax	<code><!ELEMENT ejb-jar (description?, display-name?, small-icon?, large-icon?, enterprise-beans, assembly-descriptor?)></code>
EJB Role	All

ejb-link

Synopsis	Used in the <code>ejb-ref</code> element to specify that an EJB reference is linked to another EJB in the <code>ejb-jar</code> file.
Syntax	<code><!ELEMENT ejb-link (#PCDATA)></code>
Valid Values	The value of the <code>ejb-link</code> element must be the <code>ejb-name</code> of an EJB in the same <code>ejb-jar</code> file, or in another <code>ejb-jar</code> file in the same J2EE application unit.
EJB Role	Application Assembler
Used In	<code>ejb-ref</code>

ejb-name

Synopsis	Specifies an EJB's name.
Syntax	<code><!ELEMENT ejb-name (#PCDATA)></code>
Valid Values	<ul style="list-style-type: none">■ The name must be unique among the names of the EJBs in the same <code>ejb-jar</code> file.■ The name must conform to the lexical rules for an NMTOKEN.
EJB Role	Bean Provider or Application Assembler
Used In	<ul style="list-style-type: none">■ entity■ method■ session

ejb-ref

Synopsis	Declares a reference to another EJB's home.
Syntax	<code><!ELEMENT ejb-ref (description?, ejb-ref-name, ejb-ref-type, home, remote, ejb-link?)></code>
EJB Role	Bean Provider
Used In	<ul style="list-style-type: none">■ entity■ session

ejb-ref-name

Synopsis	Specifies the name of an EJB reference, which is an entry in the EJB's environment.
Syntax	<code><!ELEMENT ejb-ref-name (#PCDATA)></code>
Valid Values	It is recommended that name is prefixed with <code>ejb/</code> .
EJB Role	Bean Provider
Used In	<code>ejb-ref</code>

ejb-ref-type

Synopsis	Specifies the expected type (entity or session) of the referenced EJB.
Syntax	<code><!ELEMENT ejb-ref-type (#PCDATA)></code>
Valid Values	One of the following values: <ul style="list-style-type: none">■ Entity■ Session
EJB Role	Bean Provider
Used In	<code>ejb-ref</code>

enterprise-beans

Synopsis	Declares one or more EJBs.
----------	----------------------------

Syntax	<code><!ELEMENT enterprise-beans (session entity)+></code>
EJB Role	Bean Provider

entity

Synopsis	Declares an entity bean.
Syntax	<code><!ELEMENT entity (description?, display-name?, small-icon?, large-icon?, ejb-name, home, remote, ejb-class, persistence-type, prim-key-class, reentrant, cmp-field*, primkey-field?, env-entry*, ejb-ref*, security-role-ref*, resource-ref*)></code>
Valid Values	<ul style="list-style-type: none">■ The optional <code>primkey-field</code> may be present in the descriptor if the entity's <code>persistence-type</code> is <code>Container</code>.■ At least one <code>cmp-field</code> element must be present in the descriptor if the entity's <code>persistency-type</code> is <code>Container</code>, and none must not be present if the entity's <code>persistence-type</code> is <code>Bean</code>.
EJB Role	Bean Provider
Used In	<code>enterprise-beans</code>

env-entry

Synopsis	Declares an EJB's environment entries.
Syntax	<code><!ELEMENT env-entry (description?, env-entry-name, env-entry-type, env-entry-value?)></code>
EJB Role	Bean Provider or Application Assembler
Used In	<ul style="list-style-type: none">■ <code>entity</code>■ <code>session</code>

env-entry-name

Specifies the name of an EJB's environment entry.

Syntax	<code><!ELEMENT env-entry-name (#PCDATA)></code>
EJB Role	Bean Provider or Application Assembler

Used In `env-entry`

env-entry-type

Synopsis Specifies the fully qualified Java type of the environment entry value that is expected by the EJB's code.

Syntax `<!ELEMENT env-entry-type (#PCDATA)>`

Valid Values One of the following values:

- `java.lang.Boolean`
- `java.lang.String`
- `java.lang.Integer`
- `java.lang.Double`
- `java.lang.Byte`
- `java.lang.Short`
- `java.lang.Long`
- `java.lang.Float`

EJB Role Bean Provider or Application Assembler

Used In `env-entry`

env-entry-value

Synopsis Specifies the value of an EJB's environment entry.

Syntax `<!ELEMENT env-entry-value (#PCDATA)>`

EJB Role Bean Provider or Application Assembler

Used In `env-entry`

field-name

Synopsis Specifies the name of a container-managed field.

Syntax `<!ELEMENT field-name (#PCDATA)>`

Valid Values	The name must be a public field of the EJB class or one of its superclasses.
EJB Role	Bean Provider
Used In	cmp-field

home

Synopsis Specifies the fully qualified name of the EJB's home interface.

Syntax `<!ELEMENT home (#PCDATA)>`

EJB Role Bean Provider

Used In

- ejb-ref
- entity
- session

large-icon

Synopsis Specifies the name of a file containing a large (32 x 32) icon image. The file name is a relative path within the ejb-jar file.

Syntax `<!ELEMENT large-icon (#PCDATA)>`

Valid Values

- The image must be either in the JPEG or GIF format.
- The file name must end with the suffix .jpg or .gif respectively.

EJB Role Bean Provider

method

Synopsis Denotes a method of an EJB's home or remote interface, or a set of methods.

Syntax `<!ELEMENT method (description?, ejb-name, method-intf?, method-name, method-params?)>`

Valid Values The ejb-name element must be the name of one of the EJBs declared in the deployment descriptor.

EJB Role Application Assembler

- Used In
- `method-permission`
 - `container-transaction`

method-intf

Synopsis Allows a method element to differentiate between the methods, with the same name and signature, that are defined in both the remote and home interfaces.

Syntax `<!ELEMENT method-intf (#PCDATA)>`

Valid Values One of the following values:

- `Home`
- `Remote`

EJB Role Application Assembler

Used In `method`

method-name

Synopsis Specifies the name of an EJB method, or the asterisk (*) character, which is used when the element denotes all the methods of an EJB's remote and home interfaces.

Syntax `<!ELEMENT method-name (#PCDATA)>`

EJB Role Application Assembler

Used In `method`

method-param

Synopsis Specifies the fully qualified Java type name of a method parameter.

Syntax `<!ELEMENT method-param (#PCDATA)>`

EJB Role Application Assembler

Used In `method-params`

method-params

Synopsis	Contains a list of the fully qualified Java type names of the method parameters.
Syntax	<code><!ELEMENT method-params (method-param*)></code>
EJB Role	Application Assembler
Used In	method

method-permission

Synopsis	Specifies one or more security roles that are allowed to invoke one or more EJB methods.
Syntax	<code><!ELEMENT method-permission (description?, role-name+, method+)></code>
Valid Values	<ul style="list-style-type: none">■ The security roles used in the method-permission element must be defined in the <code>security-role</code> element of the deployment descriptor.■ The methods must be methods defined in the EJB's remote and/or home interfaces.
EJB Role	Application Assembler
Used In	assembly-descriptor

persistence-type

Synopsis	Specifies an entity bean's persistence management type (bean- or container-managed).
Syntax	<code><!ELEMENT persistence-type (#PCDATA)></code>
Valid Values	One of the following values: <ul style="list-style-type: none">■ Bean■ Container
EJB Role	Bean Provider
Used In	entity

prim-key-class

Synopsis	Specifies the fully qualified name of an entity bean's primary key class.
Syntax	<code><!ELEMENT prim-key-class (#PCDATA)></code>
Valid Values	If the definition of the primary key class is deferred to deployment time, the <code>prim-key-class</code> element should specify <code>java.lang.Object</code> .
EJB Role	Bean Provider
Used In	<code>entity</code>

primkey-field

Synopsis	Specifies the name of the primary key field for an entity with container-managed persistence.
Syntax	<code><!ELEMENT primkey-field (#PCDATA)></code>
Valid Values	<ul style="list-style-type: none">■ The <code>primkey-field</code> must be one of the fields declared in the <code>cmp-field</code> element.■ The type of the field must be the same as the primary key type.
EJB Role	Bean Provider
Used In	<code>entity</code>

reentrant

Synopsis	Specifies whether an entity bean is reentrant (True) or not (False).
Syntax	<code><!ELEMENT reentrant (#PCDATA)></code>
Valid Values	One of the following values: <ul style="list-style-type: none">■ True■ False
EJB Role	Bean Provider
Used In	<code>entity</code>

remote

Synopsis Specifies the fully qualified name of the EJB's remote interface.

Syntax `<!ELEMENT remote (#PCDATA)>`

EJB Role **Bean Provider**

Used In ■ `ejb-ref`
 ■ `entity`
 ■ `session`

res-auth

Synopsis Specifies whether the EJB code signs on programmatically to the resource manager, or whether the Container will sign on to the resource manager on behalf of the bean. In the latter case, the Container uses information that is supplied by the Deployer.

Syntax `<!ELEMENT res-auth (#PCDATA)>`

Valid Values One of the following values:

- `Application`
- `Container`

EJB Role **Bean Provider**

res-ref-name

Synopsis Specifies the name of a resource manager connection factory reference.

Syntax `<!ELEMENT res-ref-name (#PCDATA)>`

EJB Role **Bean Provider**

Used In `resource-ref`

res-type

Synopsis Specifies the type of the data source, which is the Java interface (or class) expected to be implemented by the data source.

Syntax	<code><!ELEMENT res-type (#PCDATA)></code>
EJB Role	Bean Provider
Used In	<code>resource-ref</code>

resource-ref

Synopsis	Declares the EJB's reference to an external resource.
Syntax	<code><!ELEMENT resource-ref (description?, res-ref-name, res-type, res-auth)></code>
EJB Role	Bean Provider
Used In	<ul style="list-style-type: none">■ <code>entity</code>■ <code>session</code>

role-link

Synopsis	Links a security role reference to a defined security role.
Syntax	<code><!ELEMENT role-link (#PCDATA)></code>
Valid Values	The <code>role-link</code> element must contain the name of one of the security roles defined in the <code>security-role</code> elements.
EJB Role	Application Assembler
Used In	<code>security-role-ref</code>

role-name

Synopsis	Specifies the name of a security role.
Syntax	<code><!ELEMENT role-name (#PCDATA)></code>
Valid Values	The name must conform to the lexical rules for an NMTOKEN.
EJB Role	Application Assembler
Used In	<ul style="list-style-type: none">■ <code>method-permission</code>■ <code>security-role</code>

- `security-role-ref`

security-role

Synopsis	Defines a security role.
Syntax	<code><!ELEMENT security-role (description?, role-name)></code>
EJB Role	Application Assembler
Used In	<code>assembly-descriptor</code>

security-role-ref

Synopsis	Declares a security role reference in the EJB's code.
Syntax	<code><!ELEMENT security-role-ref (description?, role-name, role-link?)></code>
Valid Values	<ul style="list-style-type: none">■ The value of the <code>role-name</code> element must be the String used as the parameter to the <code>EJBContext.isCallerInRole(String roleName)</code> method.■ The value of the <code>role-link</code> element must be the name of one of the security roles defined in the <code>security-role</code> elements.
EJB Role	Bean Provider
Used In	<ul style="list-style-type: none">■ <code>entity</code>■ <code>session</code>

session-type

Synopsis	Specifies the type of a session bean (stateful or stateless).
Syntax	<code><!ELEMENT session-type (#PCDATA)></code>
Valid Values	One of the following values: <ul style="list-style-type: none">■ <code>Stateful</code>■ <code>Stateless</code>
EJB Role	Bean Provider

session

Synopsis Declares a session bean.

Syntax `<!ELEMENT session (description?, display-name?, small-icon?, large-icon?, ejb-name, home, remote, ejb-class, session-type, transaction-type, env-entry*, ejb-ref*, security-role-ref*, resource-ref*)>`

EJB Role Bean Provider

Used In `enterprise-beans`

small-icon

Synopsis Specifies the name of a file containing a small (16 x 16) icon image. The file name is relative path within the `ejb-jar` file.

Syntax `<!ELEMENT small-icon (#PCDATA)>`

- Valid Values ■ The image must be either in the JPEG or GIF format.
- The file name must end with the suffix `.jpg` or `.gif` respectively.

EJB Role Bean Provider

transaction-type

Synopsis Specifies the transaction management type of an EJB (bean- or container-managed).

Syntax `<!ELEMENT transaction-type (#PCDATA)>`

Valid Values One of the following values:

- Bean
- Container

EJB Role Bean Provider

Used In `session`

trans-attribute

Synopsis	Specifies how the container must manage the transaction boundaries when delegating a method invocation to an EJB's business method.
Syntax	<code><!ELEMENT trans-attribute (#PCDATA)></code>
Valid Values	One of the following values: <ul style="list-style-type: none">■ NotSupported■ Supports■ Required■ RequiresNew■ Mandatory■ Never
EJB Role	Application Assembler
Used In	container-transaction

ID

Synopsis	<p>The ID mechanism allows tools that produce additional deployment information (such as information beyond the standard EJB deployment descriptor information) to store the non-standard information in a separate file, and easily refer from these tools-specific files to the information in the standard deployment descriptor.</p> <p>The EJB architecture does not allow the tools to add the nonstandard information into the EJB deployment descriptor.</p>
Syntax	<pre><!ATTLIST assembly-descriptor id ID #IMPLIED> <!ATTLIST cmp-field id ID #IMPLIED> <!ATTLIST container-transaction id ID #IMPLIED> <!ATTLIST description id ID #IMPLIED> <!ATTLIST display-name id ID #IMPLIED> <!ATTLIST ejb-class id ID #IMPLIED></pre>

```
<!ATTLIST ejb-jar id ID #IMPLIED>
<!ATTLIST ejb-link id ID #IMPLIED>
<!ATTLIST ejb-name id ID #IMPLIED>
<!ATTLIST ejb-ref id ID #IMPLIED>
<!ATTLIST ejb-ref-name id ID #IMPLIED>
<!ATTLIST ejb-ref-type id ID #IMPLIED>
<!ATTLIST enterprise-beans id ID #IMPLIED>
<!ATTLIST entity id ID #IMPLIED>
<!ATTLIST env-entry id ID #IMPLIED>
<!ATTLIST env-entry-name id ID #IMPLIED>
<!ATTLIST env-entry-type id ID #IMPLIED>
<!ATTLIST env-entry-value id ID #IMPLIED>
<!ATTLIST field-name id ID #IMPLIED>
<!ATTLIST home id ID #IMPLIED>
<!ATTLIST large-icon id ID #IMPLIED>
<!ATTLIST method id ID #IMPLIED>
<!ATTLIST method-intf id ID #IMPLIED>
<!ATTLIST method-name id ID #IMPLIED>
<!ATTLIST method-param id ID #IMPLIED>
<!ATTLIST method-params id ID #IMPLIED>
<!ATTLIST method-permission id ID #IMPLIED>
<!ATTLIST persistence-type id ID #IMPLIED>
<!ATTLIST prim-key-class id ID #IMPLIED>
<!ATTLIST primkey-field id ID #IMPLIED>
<!ATTLIST reentrant id ID #IMPLIED>
<!ATTLIST remote id ID #IMPLIED>
<!ATTLIST res-auth id ID #IMPLIED>
```

```
<!ATTLIST res-ref-name id ID #IMPLIED>
<!ATTLIST res-type id ID #IMPLIED>
<!ATTLIST resource-ref id ID #IMPLIED>
<!ATTLIST role-link id ID #IMPLIED>
<!ATTLIST role-name id ID #IMPLIED>
<!ATTLIST security-role id ID #IMPLIED>
<!ATTLIST security-role-ref id ID #IMPLIED>
<!ATTLIST session-type id ID #IMPLIED>
<!ATTLIST session id ID #IMPLIED>
<!ATTLIST small-icon id ID #IMPLIED>
<!ATTLIST transaction-type id ID #IMPLIED>
<!ATTLIST trans-attribute id ID #IMPLIED>
```


2 WebLogic EJB Extensions Reference

This topic describes the WebLogic EJB Extensions, which are XML elements used to configure EJBs used in applications that run under WebLogic Enterprise (WLE). This topic includes the following sections:

- About the WebLogic EJB Extensions
- Summary of WebLogic EJB Extensions
- Description of WebLogic EJB Extension Elements

For more information about deploying EJBs in the WLE environment, see *Building and Deploying Enterprise JavaBeans (EJBs)*.

About the WebLogic EJB Extensions

Sun's *Enterprise JavaBeans Specification 1.1* (Public Release 2 dated October 18, 1999) specification defines a standard DTD for describing EJB deployment information. For a list of the standard XML elements, see Chapter 1, "EJB Deployment Descriptor Reference."

WLE extends the ability to configure EJBs by providing additional, optional XML elements that can be associated with EJBs. The *Enterprise JavaBeans Specification 1.1* mandates that these extensions must be specified in a separate file. The WebLogic EJB Extensions reside in a file named `weblogic-ejb-extensions.xml`, which is included in an `ejb-jar` file.

The Bean Developer is responsible for creating this file, if needed, and the Application Assembler is responsible for including it in a deployable `ejb-jar` file. To add this extensions file to an `ejb-jar` file, an Application Assembler uses the `ejbc` command line tool, specifying the `-x` parameter and passing this file name (`weblogic-ejb-extensions.xml`). For more information about the `ejbc` command line tool, see the *Command Reference*.

Summary of WebLogic EJB Extensions

Table 2-1 WebLogic Enterprise XML Extensions to the EJB Deployment Descriptor

Element	Description	EJB Role
attribute-map	Specifies an attribute map containing one or more attribute map entries, which define a mapping between an EJB field (a container-managed attribute) and a table column name.	Bean Provider
attribute-map-entry	Specifies the mapping between an EJB field and a table column.	Bean Provider
bean-field-name	Specifies the name of an EJB field in an attribute map entry.	Bean Provider
finder-descriptor	Specifies the finder descriptor for finding one or more EJBs.	Bean Provider
jndi-name	Specifies the name for the EJB home that is registered in the Global WLE JNDI namespace.	Bean Provider
module-initializer-class	Specifies the server implementation class for handling the <code>initialize</code> and <code>release</code> methods.	Bean Provider
module-initializer-class-name	Specifies the name of the server implementation class for handling the <code>initialize</code> and <code>release</code> methods.	Bean Provider
persistence-store-descriptor	Specifies the type of persistence storage (in a flat file or a JDBC-managed database) for container-managed persistence.	Bean Provider
persistence-store-directory-root	If persistent storage is kept in a flat file, specifies the directory root for storing all instances of an EJB. Each <code>ejb-name</code> element is converted to a directory name.	Bean Provider
persistence-store-file	Specifies persistent storage in a flat file.	Bean Provider

Table 2-1 WebLogic Enterprise XML Extensions to the EJB Deployment Descriptor (Continued)

Element	Description	EJB Role
<code>persistence-store-jdbc</code>	Specifies persistent storage in a database that is managed by a WLE JDBC connection pool.	Bean Provider
<code>pool-name</code>	Specifies the name of the JDBC connection pool associated with the database used to store EJB state information.	Bean Provider
<code>query-grammar</code>	Specifies the query expression for a finder method.	Bean Provider
<code>table-column-name</code>	Specifies the name of a table column in an attribute map entry.	Bean Provider
<code>table-name</code>	Specifies the name of the table used to store EJB state information.	Bean Provider
<code>trans-timeout-seconds</code>	Specifies the default timeout, in seconds, for container-initiated transactions for this bean. If a transaction duration exceeds this value, the transaction will be rolled back.	Bean Provider
<code>weblogic-deployment-params</code>	Specifies deployment options for the WebLogic Server.	Bean Provider
<code>weblogic-ejb-extensions</code>	Root element of the WLE XML extensions to the deployment descriptor.	Bean Provider
<code>weblogic-enterprise-bean</code>	Specifies deployment information for a bean that is specific to WLE.	Bean Provider
<code>weblogic-version</code>	Specifies the WLE version.	Bean Provider

Description of WebLogic EJB Extension Elements

attribute-map

Synopsis	Specifies an attribute map containing one or more attribute map entries, which define a mapping between an EJB field (a container-managed attribute) and a table column name.
Syntax	<code><!ELEMENT attribute-map (description?, attribute-map-entry+)></code>
EJB Role	Bean Provider
Used In	<code>persistence-store-jdbc</code>

attribute-map-entry

Synopsis	Specifies the mapping between an EJB field and a table column.
Syntax	<code><!ELEMENT attribute-map-entry (bean-field-name, table-column-name)></code>
Description	No automatic type conversion between types is performed on primary key columns, and therefore the specified mapping must be between equivalent types.
EJB Role	Bean Provider
Used In	<code>attribute-map</code>

bean-field-name

Synopsis	Specifies the name of an EJB field in an attribute map entry.
Syntax	<code><!ELEMENT bean-field-name (#PCDATA)></code>
EJB Role	Bean Provider
Used In	<code>attribute-map-entry</code>

finder-descriptor

Synopsis Specifies the finder descriptor for finding one or more EJBs.

Syntax `<!ELEMENT finder-descriptor (description?, method?, query-grammar?)>`

- Valid Values**
- Method names must always start with the prefix `find`.
 - If you use a nonprimitive data type in a finder descriptor, you must specify a fully qualified name, such as `java.sql.Timestamp`.
 - Finder descriptors always use EJB field names, not column names, except for the ordering of the returned beans (the `OrderBy` expression).

Description Finder descriptors are WLE's implementation of the EJB find methods. If an EJB uses container-managed JDBC persistence, you can specify finder methods of the form `findMethod()` to find either an individual or collection of EJBs.

The `finder-descriptor` elements are pairs of method signatures and expressions. You specify a method signature in the `EJBHome` interface and specify the method's expression in the deployment descriptor using the `query-grammar` element. Expressions contain method parameters and EJB attributes. The EJB Container automatically maps the attributes to the appropriate columns in the persistent store.

For complex SQL lookups, such as a dynamically set `WHERE` clause, you need to use bean-managed persistence and write custom finders.

EJB Role Bean Provider

Used In `persistence-store-jdbc`

Example The `findBigAccounts` method has the following interface:

```
public interface AccountHome extends EJBHome {
// ...
    public Enumeration findBigAccounts(double balanceGreaterThan)
        throws FinderException, RemoteException;
// ...
}
```

The following sample expression associated with the `findBigAccounts` method is defined in the deployment descriptor:

```
(> balance $balanceGreaterThan)
```

where `balance` is an attribute (field) of the EJB and `$balanceGreaterThan` is the symbol for the method parameter `balanceGreaterThan`.

A call in the client application, such as `myEJBBean.findBigAccounts(amount)`, will return a list of all EJBs whose `balance` attribute is greater than the value of `amount`.

jndi-name

Synopsis	Specifies the name for the EJB home that is registered in the Global WLE JNDI namespace.
Syntax	<code><!ELEMENT jndi-name (#PCDATA)></code>
Description	<p>To allow Java clients to perform a lookup on the JNDI name for the EJB home and gain access to the object, the name of the EJB home must be registered in the Global WLE JNDI namespace.</p> <p>This name can differ from the <code>ejb-name</code> element specified in the standard EJB XML. Whereas the <code>ejb-name</code> element must be unique only among the names of the EJBs in the same <code>ejb-jar</code> file, however, the JNDI name must be unique among <i>all</i> global factory names in a WLE domain, including EJB homes, CORBA factories, and RMI-named objects.</p>
EJB Role	Bean Provider
Used In	<code>weblogic-deployment-params</code>
Example	<pre><weblogic-ejb-extensions> <weblogic-enterprise-bean> <ejb-name>Trader</ejb-name> <weblogic-deployment-params> <jndi-name>EJB_TraderHome</jndi-name> </weblogic-deployment-params> </weblogic-enterprise-bean> </weblogic-ejb-extensions></pre>

module-initializer-class

Synopsis	Specifies the server implementation class for handling the <code>initialize</code> and <code>release</code> methods.
Syntax	<code><!ELEMENT module-initializer-class (module-initializer-class-name)></code>
Description	<p>The syntax for specifying a Server implementation class for handling the <code>initialize</code> and <code>release</code> methods is specified in the EJB XML deployment descriptor extensions. These XML elements are processed by the <code>ejbc</code> command. The WLE EJB framework parses the XML at run time and performs the startup/shutdown processing.</p> <p>For a complete description of startup and shutdown handling in WLE, see <i>Starting and Shutting Down Applications</i>.</p>
EJB Role	Bean Provider
Used In	<code>weblogic-ejb-extensions</code>

module-initializer-class-name

Synopsis	Specifies the fully qualified name of the server implementation class for handling the <code>initialize</code> and <code>release</code> methods.
Syntax	<code><!ELEMENT module-initializer-class-name (#PCDATA)></code>
EJB Role	Bean Provider
Used In	<code>module-initializer-class</code>
Example	<pre><weblogic-ejb-extensions> ... <module-initializer-class> <moduleinitializer-class-name>ServerImpl </moduleinitializer-class-name> </module-initializer-class> </weblogic-ejb-extensions></pre>

persistence-store-descriptor

Synopsis	Specifies the type of persistence storage (in a flat file or a JDBC-managed database) for container-managed persistence.
Syntax	<code><!ELEMENT persistence-store-descriptor (description?, (persistence-store-file persistence-store-jdbc)?)></code>
Description	<p>For container-managed persistence, WLE EJB Container supports storing an EJB in either of the following formats:</p> <ul style="list-style-type: none"> ■ a flat file (the <code>persistence-store-file</code> element) ■ a database that is managed with a WLE JDBC connection pool (the <code>persistence-store-jdbc</code> element) <p>Note: Database persistence is <i>required</i> for an EJB to fully cooperate in a WLE global transaction. File persistence is intended primarily for development and prototyping.</p> <p>The standard EJB XML descriptor provides XML elements for specifying which fields in the entity bean are to be persisted (the <code>cmp-field</code> element), and information about the primary key. The WebLogic XML extensions provide additional information for mapping to the persistent store.</p> <p>The code for implementing the persistence is generated by the EJB compiler, based on the bean's deployment descriptors.</p>
EJB Role	Bean Provider
Used In	<code>weblogic-deployment-params</code>
Example	<p>Using JDBC persistence, the following sample XML code shows how to define the automatic saving of two fields (<code>accountId</code>, <code>balance</code>) in an entity bean to a database table (<code>ejbAccounts</code>) using a connection pool (<code>ejbPool</code>):</p>

```
<weblogic-ejb-extensions>
  <weblogic-enterprise-bean>
    <ejb-name>Account</ejb-name>
    <weblogic-deployment-params>
      <jndi-name>EJB_AccountHome</jndi-name>
      <persistence-store-descriptor>
```

```
<persistence-store-jdbc>
  <pool-name>ejbPool</pool-name>
  <table-name>ejbAccounts</table-name>
  <attribute-map>
    <attribute-map-entry>
      <bean-field-name>accountId</bean-field-name>
      <table-column-name>id</table-column-name>
    </attribute-map-entry>
    <attribute-map-entry>
      <bean-field-name>balance</bean-field-name>
      <table-column-name>bal</table-column-name>
    </attribute-map-entry>
  </attribute-map>
</persistence-store-jdbc>
</persistence-store-descriptor>
</weblogic-deployment-params>
</weblogic-enterprise-bean>
</weblogic-ejb-extensions>
```

persistence-store-directory-root

- | | |
|-------------|---|
| Synopsis | If persistent storage is kept in a flat file, specifies the directory root for storing all instances of an EJB. Each <code>ejb-name</code> element is converted to a directory name. |
| Syntax | <code><!ELEMENT persistence-store-directory-root (#PCDATA)></code> |
| Description | For EJBs with container-managed persistence, stateful session beans are stored using file persistence when they are passivated. The <code>persistence-store-directory-root</code> element defines the storage location for these instances. By default, the root directory is <code>pstore</code> , which WLE creates in the directory where the JavaServer is run. |

The default file name for a passivated instance is the fully qualified name of the bean, with underscores replacing the periods, plus additional information to ensure uniqueness. For example, if `persistence-store-directory-root` is `c:\weblogic\mystore`, all instances of the EJB `examples.ejb.AccountBean` might be stored in:

```
c:\weblogic\mystore\examples_ejb_AccountBean\SRVGRP_GROUPX_SRVID_Y_Z_examples.ejb.AccountBean_someBigNumber.db
```

EJB Role Bean Provider

Used In `persistence-store-file`

persistence-store-file

Synopsis Specifies persistent storage in a flat file.

Syntax `<!ELEMENT persistence-store-file (description?, persistence-store-directory-root)>`

Description File persistence for EJBs is intended primarily for development and prototyping. For an EJB to fully cooperate in a WLE global transaction, use `persistence-store-jdbc` instead.

EJB Role Bean Provider

Used In `persistence-store-descriptor`

persistence-store-jdbc

Synopsis Specifies persistent storage in a database that is managed by a WLE JDBC connection pool.

Syntax `<!ELEMENT persistence-store-jdbc (description?, pool-name, table-name, attribute-map, finder-descriptor*)>`

Description EJB instances are stored in a database that has been previously set up with the JDBC connection pool specified in the `pool-name` element. The `table-name` and `attribute-map` elements map the EJB fields to the appropriate table columns in the database.

EJB Role Bean Provider

Used In `persistence-store-descriptor`

pool-name

Synopsis	Specifies the name of the JDBC connection pool associated with the database used to store EJB state information.
Syntax	<code><!ELEMENT pool-name (#PCDATA)></code>
EJB Role	Bean Provider
Used In	<code>persistence-store-jdbc</code>

query-grammar

Synopsis	Specifies the query expression for a finder method.
Syntax	<code><!ELEMENT query-grammar (#PCDATA)></code>
Description	<p>The query grammar syntax has an expression prefix notation of:</p> <pre>[operator operand1 operand2]</pre> <p>Valid operators include:</p> <ul style="list-style-type: none">■ <code>() = < > <= >= / ! & </code>■ <code>like</code>■ <code>isNull</code>■ <code>isNotNull</code>■ <code>orderBy</code>■ <code>!</code> is the Boolean <i>not</i>■ <code>&</code> is the Boolean <i>and</i>■ <code> </code> is the Boolean <i>or</i> <p>Valid operands include:</p> <ul style="list-style-type: none">■ another expression■ an EJB field■ a finder method parameter (when preceded by <code>\$</code>)
EJB Role	Bean Provider

Examples The following examples show sample query expressions in finder methods.

The following expression determines whether balance exceeds amount.

```
"(> balance $amount)"
```

The following example shows the use of compound expressions. Note that single quotes are used to denote strings.

```
"(& (> bal $amount) (! (= accountType 'checking')))"
```

The following example is a method signature and an expression that is converted to a `findBigAccounts` method in the generated persistent storage class. The method returns an enumeration of beans of this class that satisfy this expression.

```
"findBigAccounts(double amount)" "> balance $amount)"
```

The following example finds all the EJBs in a table.

```
"findAll()" "(= 1 1)"
```

The following example finds all EJBs whose `lastName` fields starts with M.

```
"findNamesStartingWithM()" "(like lastName M%)"
```

The following example finds all EJBs whose `firstName` field is null.

```
"findNullFirstNames()" "(isNull firstName)"
```

The following example finds all EJBs whose `firstName` field is not null.

```
"findNullFirstNames()" "(isNotNull firstName)"
```

The following expression finds all EJBs in which the value of the `balance` field exceeds `balanceGreaterThan` and returns the beans ordered by the `id` database column. Notice that this expression should all contained in a single line and that no column mapping is performed. The database column must be specified directly.

```
"findOrderedAccounts(double balanceGreaterThan)"  
  "(orderBy 'id' (> balance $balanceGreaterThan))"
```

The following expression is identical to the previous one except that it returns the beans in descending order:

```
"findOrderedAccounts(double balanceGreaterThan)"  
  "(orderBy 'id desc' (> balance $balanceGreaterThan))"
```

Used In finder-descriptor

table-column-name

Synopsis	Specifies the name of a table column in an attribute map entry.
Syntax	<code><!ELEMENT table-column-name (#PCDATA)></code>
EJB Role	Bean Provider
Used In	<code>attribute-map-entry</code>

table-name

Synopsis	Specifies the name of the table used to store EJB state information.
Syntax	<code><!ELEMENT table-name (#PCDATA)></code>
EJB Role	Bean Provider
Used In	<code>persistence-store-jdbc</code>

trans-timeout-seconds

Synopsis	Sets the default timeout, in seconds, for container-initiated transactions for this bean. If a transaction duration exceeds this value, the transaction will be rolled back.
Syntax	<code><!ELEMENT trans-timeout-seconds (#PCDATA)></code>
EJB Role	Bean Provider
Used In	<code>weblogic-deployment-params</code>

weblogic-deployment-params

Synopsis	Specifies deployment options for the WebLogic Server.
Syntax	<code><!ELEMENT weblogic-deployment-params (trans-timeout-seconds?, jndi-name?, persistence-store-descriptor?)></code>
EJB Role	Bean Provider
Used In	<code>weblogic-enterprise-bean</code>

weblogic-ejb-extensions

Synopsis	Root element of the WLE XML extensions to the deployment descriptor.
Syntax	<code><!ELEMENT weblogic-ejb-extensions (description?, weblogic-version?, weblogic-enterprise-bean*, module-initializer-class*)></code>
EJB Role	Bean Provider

weblogic-enterprise-bean

Synopsis	Specifies deployment information for a bean that is specific to WLE.
Syntax	<code><!ELEMENT weblogic-enterprise-bean (ejb-name, weblogic-deployment-params?)></code>
EJB Role	Bean Provider
Used In	weblogic-ejb-extensions

weblogic-version

Synopsis	Specifies the WLE version.
Syntax	<code><!ELEMENT weblogic-version (#PCDATA)></code>
EJB Role	Bean Provider
Used In	weblogic-ejb-extensions

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