GlassFish Server Open Source Edition
Application Deployment Guide
Release 5.0

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This Application Deployment Guide describes deployment of applications and application components to GlassFish Server Open Source Edition, and includes information about deployment descriptors.
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This Application Deployment Guide describes deployment of applications and application components to GlassFish Server Open Source Edition, and includes information about deployment descriptors.

This preface contains information about and conventions for the entire GlassFish Server Open Source Edition (GlassFish Server) documentation set.

GlassFish Server 5.0 is developed through the GlassFish project open-source community at https://github.com/javaee/glassfish. The GlassFish project provides a structured process for developing the GlassFish Server platform that makes the new features of the Java EE platform available faster, while maintaining the most important feature of Java EE: compatibility. It enables Java developers to access the GlassFish Server source code and to contribute to the development of the GlassFish Server. The GlassFish project is designed to encourage communication between Oracle engineers and the community.

- GlassFish Server Documentation Set
- Related Documentation
- Typographic Conventions
- Symbol Conventions
- Default Paths and File Names
- Documentation, Support, and Training
- Searching Oracle Product Documentation
- Documentation Accessibility

GlassFish Server Documentation Set

The GlassFish Server documentation set describes deployment planning and system installation. For an introduction to GlassFish Server, refer to the books in the order in which they are listed in the following table.

<table>
<thead>
<tr>
<th>Book Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release Notes</td>
<td>Provides late-breaking information about the software and the documentation and includes a comprehensive, table-based summary of the supported hardware, operating system, Java Development Kit (JDK), and database drivers.</td>
</tr>
<tr>
<td>Quick Start Guide</td>
<td>Explains how to get started with the GlassFish Server product.</td>
</tr>
<tr>
<td>Installation Guide</td>
<td>Explains how to install the software and its components.</td>
</tr>
</tbody>
</table>
The following tutorials explain how to develop Java EE applications:

- **Your First Cup: An Introduction to the Java EE Platform** ([https://javaee.github.io/firstcup/](https://javaee.github.io/firstcup/)). For beginning Java EE programmers, this short tutorial explains the entire process for developing a simple enterprise application. The sample application is a web application that consists of a component that is based on the Enterprise JavaBeans specification, a JAX-RS web service, and a JavaServer Faces component for the web front end.

- **The Java EE 8 Tutorial** ([https://javaee.github.io/tutorial/](https://javaee.github.io/tutorial/)). This comprehensive tutorial explains how to use Java EE 8 platform technologies and APIs to develop Java EE applications.

Javadoc tool reference documentation for packages that are provided with GlassFish Server is available as follows.

- **The API specification for version 8 of Java EE** is located at [https://javaee.github.io/javaee-spec/](https://javaee.github.io/javaee-spec/).

- **The API specification for GlassFish Server 5.0, including Java EE 8 platform packages and nonplatform packages that are specific to the GlassFish Server product**, is located at [https://javaee.github.io/glassfish/documentation](https://javaee.github.io/glassfish/documentation).

For information about creating enterprise applications in the NetBeans Integrated Development Environment (IDE), see the NetBeans Documentation, Training & Support page ([http://www.netbeans.org/kb/](http://www.netbeans.org/kb/)).

For information about the Apache Derby database for use with the GlassFish Server, see the Apache Derby product page ([http://db.apache.org/derby/](http://db.apache.org/derby/)).

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<table>
<thead>
<tr>
<th>Book Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administration Guide</strong></td>
<td>Explains how to configure, monitor, and manage GlassFish Server subsystems and components from the command line by using the <code>asadmin</code> utility. Instructions for performing these tasks from the Administration Console are provided in the Administration Console online help.</td>
</tr>
<tr>
<td><strong>Security Guide</strong></td>
<td>Provides instructions for configuring and administering GlassFish Server security.</td>
</tr>
<tr>
<td><strong>Application Deployment Guide</strong></td>
<td>Explains how to assemble and deploy applications to the GlassFish Server and provides information about deployment descriptors.</td>
</tr>
<tr>
<td><strong>Application Development Guide</strong></td>
<td>Explains how to create and implement Java Platform, Enterprise Edition (Java EE platform) applications that are intended to run on the GlassFish Server. These applications follow the open Java standards model for Java EE components and application programmer interfaces (APIs). This guide provides information about developer tools, security, and debugging.</td>
</tr>
<tr>
<td><strong>Error Message Reference</strong></td>
<td>Describes error messages that you might encounter when using GlassFish Server.</td>
</tr>
<tr>
<td><strong>Reference Manual</strong></td>
<td>Provides reference information in man page format for GlassFish Server administration commands, utility commands, and related concepts.</td>
</tr>
<tr>
<td><strong>Message Queue Release Notes</strong></td>
<td>Describes new features, compatibility issues, and existing bugs for Open Message Queue.</td>
</tr>
</tbody>
</table>

---

**Related Documentation**

The following tutorials explain how to develop Java EE applications:

- **Your First Cup: An Introduction to the Java EE Platform** ([https://javaee.github.io/firstcup/](https://javaee.github.io/firstcup/)). For beginning Java EE programmers, this short tutorial explains the entire process for developing a simple enterprise application. The sample application is a web application that consists of a component that is based on the Enterprise JavaBeans specification, a JAX-RS web service, and a JavaServer Faces component for the web front end.

- **The Java EE 8 Tutorial** ([https://javaee.github.io/tutorial/](https://javaee.github.io/tutorial/)). This comprehensive tutorial explains how to use Java EE 8 platform technologies and APIs to develop Java EE applications.

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For information about the Apache Derby database for use with the GlassFish Server, see the Apache Derby product page ([http://db.apache.org/derby/](http://db.apache.org/derby/)).
The Java EE Samples project is a collection of sample applications that demonstrate a broad range of Java EE technologies. The Java EE Samples are bundled with the Java EE Software Development Kit (SDK) and are also available from the Java EE Samples project page (https://github.com/javaee/glassfish-samples).

**Typographic Conventions**

The following table describes the typographic changes that are used in this book.

<table>
<thead>
<tr>
<th>Typeface</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>AaBbCc123</td>
<td>The names of commands, files, and directories, and onscreen computer output</td>
<td>Edit your .login file. Use ls a to list all files. machine_name% you have mail.</td>
</tr>
<tr>
<td>AaBbCc123</td>
<td>What you type, contrasted with onscreen computer output</td>
<td>machine_name% su Password:</td>
</tr>
<tr>
<td>AaBbCc123</td>
<td>A placeholder to be replaced with a real name or value</td>
<td>The command to remove a file is rm filename.</td>
</tr>
<tr>
<td>AaBbCc123</td>
<td>Book titles, new terms, and terms to be emphasized (note that some emphasized items appear bold online)</td>
<td>Read Chapter 6 in the User’s Guide. A cache is a copy that is stored locally. Do not save the file.</td>
</tr>
</tbody>
</table>

**Symbol Conventions**

The following table explains symbols that might be used in this book.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Example</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>Contains optional arguments and command options.</td>
<td>ls [-l]</td>
<td>The -l option is not required.</td>
</tr>
<tr>
<td>( )</td>
<td>Contains a set of choices for a required command option.</td>
<td>-d {y</td>
<td>n}</td>
</tr>
<tr>
<td>${ }</td>
<td>Indicates a variable reference.</td>
<td>${com.sun.javaRoot}</td>
<td>References the value of the com.sun.javaRoot variable.</td>
</tr>
<tr>
<td>-</td>
<td>Joins simultaneous multiple keystrokes.</td>
<td>Control-A</td>
<td>Press the Control key while you press the A key.</td>
</tr>
<tr>
<td>+</td>
<td>Joins consecutive multiple keystrokes.</td>
<td>Ctrl+A+N</td>
<td>Press the Control key, release it, and then press the subsequent keys.</td>
</tr>
<tr>
<td>&gt;</td>
<td>Indicates menu item selection in a graphical user interface.</td>
<td>File &gt; New &gt; Templates</td>
<td>From the File menu, choose New. From the New submenu, choose Templates.</td>
</tr>
</tbody>
</table>

**Default Paths and File Names**

The following table describes the default paths and file names that are used in this book.
The Oracle web site provides information about the following additional resources:

- Documentation (http://docs.oracle.com/)
- Training (http://education.oracle.com/)

Searching Oracle Product Documentation

Besides searching Oracle product documentation from the Oracle Documentation (http://docs.oracle.com/) web site, you can use a search engine by typing the following syntax in the search field:

`search-term site:oracle.com`

For example, to search for "broker," type the following:

`broker site:oracle.com`

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or
visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.
Overview of GlassFish Server Open Source Edition 5.0 Application Deployment

GlassFish Server Open Source Edition 5.0 provides an environment for developing and deploying Java applications and web services. GlassFish Server applications include Java Platform, Enterprise Edition (Java EE platform) standard features as well as features specific to GlassFish Server. This guide explains the tools and processes used for deploying applications and modules in the GlassFish Server environment. Only GlassFish Server features are described in detail in this document.

The following topics are addressed here:

- About Application Deployment
- About Assembly and Deployment Events
- About Deployment Tools
- Additional Information on Application Deployment

Information and instructions on deploying from the command line are provided in this document. Information and instructions for accomplishing the deployment tasks by using the Administration Console are contained in the Administration Console online help.

About Application Deployment

Assembly, also known as packaging, is the process of combining discrete components of an application or module into a single unit that can be installed on an application server. The GlassFish Server assembly process conforms to the customary Java EE specifications. The only difference is that when you assemble applications or modules in GlassFish Server, you can include optional GlassFish Server deployment descriptors that enhance functionality.

Deployment is the process of installing an application or module on GlassFish Server, optionally specifying location-specific information, such as a list of local users that can access the application, or the name of the local database. GlassFish Server deployment tools expand the archive file into an open directory structure that is ready for users. GlassFish Server deployment tools are described in About Deployment Tools.

The following topics are addressed here:

- General Deployment Functionality
- Deployment Descriptors and Annotations
- Modules and Applications
About Application Deployment

- Access to Shared Framework Classes
- Naming Standards
- Module and Application Versions

General Deployment Functionality

Various Java EE module types, such as connector module, web module, EJB module, application client module, can be deployed in the following ways:

- **Archive Deployment.** Deploys the application as an archive file. For instructions, see To Deploy an Application or Module.
- **Dynamic Reloading.** Redeploys the application by creating or modifying a special .reload file in the applications repository. For instructions, see To Reload Changes to Applications or Modules Dynamically.
- **Automatic Deployment.** Deploys the application archive that is placed in the autodeployment directory. For instructions, see To Deploy an Application or Module Automatically.
- **Directory Deployment.** Deploys the application in a directory format. For instructions, see To Deploy an Application or Module in a Directory Format.
- **JSR 88 Deployment.** A deployment mechanism implemented based on the JSR 88 standard from jcp.org. It delivers vendor neutral deployment options. See JSR 88 Client and JSR 88 Naming.

A deployment plan, which deploys a portable archive along with a deployment plan containing GlassFish Server deployment descriptors, can apply to any of these deployment techniques. For instructions, see To Deploy an Application or Module by Using a Deployment Plan.

There are two work situations that require different safeguards and processes:

- A development environment provides a loose set of tools and work spaces for a relatively small number of developers who are creating and testing applications and modules.
- A production environment provides a stable, protected environment where applications are tuned to maximum efficiency for business use rather than for development.

Some deployment methods that are used effectively in a development environment should not be used in production. In addition, whenever a reload is done, the sessions that are in transit become invalid, which might not be a concern for development, but can be a serious matter in production. The client must restart the session, another negative in a production environment.

For production environments, any upgrade should be performed as a rolling upgrade, which upgrades applications and modules without interruption in service. For more information, see Upgrading Applications Without Loss of Availability in GlassFish Server Open Source Edition High Availability Administration Guide.

Deployment Descriptors and Annotations

A deployment descriptor is an XML file that describes how a Java EE application or module should be deployed. Each deployment descriptor XML file has a corresponding Document Type Definition (DTD) file or schema (XSD) file, which defines the elements, data, and attributes that the deployment descriptor file can contain. The deployment descriptor directs a deployment tool to deploy a module or
application with specific container options, and also describes specific configuration requirements that you must resolve.

Because the information in a deployment descriptor is declarative, it can be changed without requiring modifications to source code. During deployment, GlassFish Server reads the information in the deployment descriptor and deploys the application or module as directed.

The following types of deployment descriptors are associated with GlassFish Server:

- **Java EE Standard Descriptors.** Java EE standard deployment descriptors are described in the Java EE 8 specification. You can find the specification at [http://www.oracle.com/technetwork/java/javaee/tech/](http://www.oracle.com/technetwork/java/javaee/tech/). Information about the XML schemas that define Java EE standard deployment descriptors is available at [http://xmlns.jcp.org/xml/ns/javaee/](http://xmlns.jcp.org/xml/ns/javaee/).

  The Java EE 8 specification permits the use of alternate top-level standard deployment descriptors that reside outside of the application archive using the alt-dd mechanism (alternate module-level deployment descriptors were permitted prior to Java EE 7). Alternate deployment descriptors are described in the Java EE 7 specification. You can find the specification at [http://www.oracle.com/technetwork/java/javaee/tech/](http://www.oracle.com/technetwork/java/javaee/). Alternate deployment descriptors override the top-level deployment descriptors packaged in an application archive. For example, for EAR files, an alternate deployment descriptor overrides `application.xml`. For standalone modules, an alternate deployment descriptor overrides the top-level module descriptor, such as `web.xml`.

- **GlassFish Server Descriptors.** GlassFish Server provides optional deployment descriptors for configuring features that are specific to GlassFish Server. For example, when you assemble an EJB module, you annotate or create two GlassFish Server deployment descriptor files with these names: `ejb-jar.xml` and `glassfish-ejb-jar.xml`. If the EJB component is an entity bean with container-managed persistence (CMP), you can also create a `.dbschema` file and a `sun-cmp-mapping.xml` file. For complete descriptions of these files and their elements, see [GlassFish Server Deployment Descriptor Files](http://www.oracle.com/technetwork/java/glassfish/deployment/development/enhancements/standard-descriptor-standard-descriptor-155010.html) and [Elements of the GlassFish Server Deployment Descriptors](http://www.oracle.com/technetwork/java/glassfish/deployment/development/enhancements/standard-descriptor-standard-descriptor-155010.html).

  GlassFish Server also permits the use of alternate top-level GlassFish Server runtime deployment descriptors that reside outside of an application archive. Alternate GlassFish Server deployment descriptors override the top-level deployment descriptors packaged in the archive. For example, for EAR files, an alternate GlassFish Server deployment descriptor overrides `glassfish-application.xml`. For standalone modules, an alternate GlassFish Server deployment descriptor overrides the top-level module descriptor, such as `glassfish-web.xml`. The name of the GlassFish Server alternate deployment descriptor file must begin with `glassfish-`. Alternate deployment descriptors do not apply to `sun-*.xml` deployment descriptors.

  Unless otherwise stated, settings in the GlassFish Server deployment descriptors override corresponding settings in the Java EE standard descriptors and in the GlassFish Server configuration.

An annotation, also called metadata, enables a declarative style of programming. You can specify information within a class file by using annotations. When the application or module is deployed, the information can either be used or overridden by the deployment descriptor. GlassFish Server supports annotation according to the following specifications:

■ JSR 181 Annotation for Web Services Specification
(http://www.jcp.org/en/jsr/detail?id=181)
■ EJB 3.1 Specification (http://www.jcp.org/en/jsr/detail?id=318)

The following annotation and deployment descriptor combinations are supported:
■ Java EE applications or modules can be packaged with full Java EE compliant standard and runtime deployment descriptors. If the standard deployment descriptors have specified the metadata-complete attribute, annotations in the application or module are ignored.
■ Java EE applications or modules can be fully annotated with metadata defined by the listed specifications. Annotation eliminates the need for Java EE standard deployment descriptors. In most cases, the GlassFish Server deployment descriptors are also not needed.
■ Java EE applications or modules can be partially annotated with some deployment information in standard deployment descriptors. In case of conflicts, deployment descriptor values supersede the annotated metadata, and a warning message is logged.

Modules and Applications
An application is a logical collection of one or more modules joined by application annotations or deployment descriptors. You assemble components into JAR, WAR, or RAR files, then combine these files and, optionally, deployment descriptors into an Enterprise archive (EAR) file which is deployed.

A module is a collection of one or more Java EE components that run in the same container type, such as a web container or EJB container. The module uses annotations or deployment descriptors of that container type. You can deploy a module alone or as part of an application.
The following topics are addressed here:
■ Types of Modules
■ Module-Based Deployment
■ Application-Based Deployment

Types of Modules
GlassFish Server supports the following types of modules:
■ Web Module. A web module, also known as a web application, is a collection of servlets, EJBs, HTML pages, classes, and other resources that you can bundle and deploy to several Java EE application servers. A web application archive (WAR) file is the standard format for assembling web applications. A WAR file can consist of the following items: servlets, JavaServer Pages (JSP) files, JSP tag libraries, utility classes, static pages, client-side applets, beans, bean classes, enterprise bean classes, plus annotations or web deployment descriptors (web.xml and glassfish-web.xml).
■ EJB Module. An EJB module is a deployable software unit that consists of one or more enterprise beans, plus an EJB deployment descriptor. A Java archive (JAR) file is the standard format for assembling enterprise beans. An EJB JAR file contains the bean classes (home, remote, local, and implementation), all of the utility classes, and annotations or deployment descriptors (ejb-jar.xml and glassfish-ejb-jar.xml). If the EJB component is a version 2.1 or earlier entity
bean with container managed persistence (CMP), you can also include a .dbschema file and a CMP mapping descriptor (sun-cmp-mapping.xml).

- **Connector Module.** A connector module, also known as a resource adapter module, is a deployable software unit that provides a portable way for EJB components to access foreign enterprise information system (EIS) data. A connector module consists of all Java interfaces, classes, and native libraries for implementing a resource module, plus a resource deployment descriptor. A resource adapter archive (RAR) is the standard format for assembling connector modules. Each GlassFish Server connector has annotations or a deployment descriptor file (ra.xml).

  After deploying a J2EE connector module, you must configure it as described in Developing Connectors in *GlassFish Server Open Source Edition Application Development Guide.*

- **Application Client Module.** An application client module is a deployable software unit that consists of one or more classes, and application client deployment descriptors (application-client.xml and glassfish-application-client.xml). An application client JAR file applies to a GlassFish Server type of Java EE client. An application client supports the standard Java EE Application Client specifications.

- **Lifecycle Module.** A lifecycle module provides a means of running short-duration or long-duration Java-based tasks within the GlassFish Server environment. Lifecycle modules are not Java EE standard modules. See Developing Lifecycle Listeners in *GlassFish Server Open Source Edition Application Development Guide* for more information.

**Module-Based Deployment**

You can deploy web, EJB, and application client modules separately, outside of any application. Module-based deployment is appropriate when components need to be accessed by other modules, applications, or application clients. Module-based deployment allows shared access to a bean from a web, EJB, or application client component.

The following figure shows separately-deployed EJB, web, and application client modules.
Application-Based Deployment

Application-based deployment is appropriate when components need to work together as one unit.

The following figure shows EJB, web, application client, and connector modules assembled into a Java EE application.
Access to Shared Framework Classes

If you assemble a large, shared library into every module that uses it, the result is a huge file that takes too long to register with the server. In addition, several versions of the same class could exist in different class loaders, which is a waste of resources. When Java EE applications and modules use shared framework classes (such as utility classes and libraries), the classes can be put in the path for the common class loader or an application-specific class loader rather than in an application or module.

To specify an application-specific library file during deployment, use the --libraries option of the deploy or redeploy subcommand of the asadmin command. To add a library JAR file to the Common class loader directory, the Java optional package directory, or the application-specific class loader directory, use the add-library subcommand. You can then list the libraries with list-libraries and remove the libraries with remove-library. For more information about all these commands, see the GlassFish Server Open Source Edition Reference Manual.

For more information about class loaders, see Class Loaders in GlassFish Server Open Source Edition Application Development Guide.
About Application Deployment

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**Note:** According to the Java EE specification, section 8.1.1.2, "Dependencies," you cannot package utility classes within an individually-deployed EJB module. Instead, you must package the EJB module and utility JAR within an application using the JAR Extension Mechanism Architecture.

---

**Naming Standards**

Names of applications and individually-deployed modules must be unique within a GlassFish Server domain. Modules within an application must have unique names. In addition, for enterprise beans that use container-managed persistence (CMP), the .dbschema file names must be unique within an application.

You should use a hierarchical naming scheme for module file names, EAR file names, module names as found in the *module-name* portion of the *ejb-jar.xml* files, and EJB names as found in the *ejb-name* portion of the *ejb-jar.xml* files. This hierarchical naming scheme ensures that name collisions do not occur. The benefits of this naming practice apply not only to GlassFish Server, but to other Java EE application servers as well.

The following topics are addressed here:

- Portable Naming
- JNDI Naming
- Directory Structure
- JSR 88 Naming

**Portable Naming**

Starting in Java EE 6, the Java EE specification defines the portable *application-name*, which allows you to specify an application name in the *application.xml* file. For example:

```xml
<application-name>xyz</application-name>
```

The Java EE specification also defines the portable *module-name* element in the module standard deployment descriptors.

GlassFish Server determines the application registration name according to the following order of precedence:

1. The name specified at deployment time in the Administration Console or in the --name option of the asadmin deploy command is used.
2. If no name is specified at deployment time, the portable *application-name* or *module-name* in the Java EE deployment descriptor is used.
3. If no name is specified at deployment time or in the deployment descriptors, the archive name, minus the file type suffix, is used.

**JNDI Naming**

Java Naming and Directory Interface (JNDI) lookup names for EJB components must also be unique. Establishing a consistent naming convention can help. For example, appending the application name and the module name to the EJB name is a way to guarantee unique names, such as, jms/qConnPool.
Directory Structure

Application and module directory structures must follow the structure outlined in the Java EE specification. During deployment, the application or module is expanded from the archive file to an open directory structure. The directories that hold the individual modules are named with _jar, _rar, and _war suffixes.

If you deploy a directory instead of an EAR file, your directory structure must follow this same convention. For instructions on performing directory deployment, see To Deploy an Application or Module in a Directory Format.

JSR 88 Naming

There are two JSR 88 APIs that can be used to deploy applications in GlassFish Server.

If you are using the following JSR 88 API, there is no file name:

```java
javax.enterprise.deploy.spi.DeploymentManager.distribute(Target[], InputStream, InputStream)
```

Because there is no file name, the name of the application is taken from the application-name or module-name entry in the Java EE standard deployment descriptor. If the application-name or module-name entry is not present, GlassFish Server creates a temporary file name and uses that name to deploy the application. Neither the Administration Console nor the asadmin utility uses this API.

If you are using the following preferred JSR 88 API, the name is derived from the application-name or module-name entry if present or the first portion of the file name (without the .war or .jar extension):

```java
javax.enterprise.deploy.spi.DeploymentManager.distribute(Target[], File, File)
```

For more information about JSR 88, see http://jcp.org/en/jsr/detail?id=88.

Module and Application Versions

Application and module versioning allows multiple versions of the same application to exist in a GlassFish Server domain, which simplifies upgrade and rollback tasks. At most one version of an application or module can be enabled on a server any given time. Versioning provides extensions to tools for deploying, viewing, and managing multiple versions of modules and applications, including the Administration Console and deployment-related asadmin subcommands. Different versions of the same module or application can have the same context root or JNDI name. Use of versioning is optional.

The following topics are addressed here:

- Version Identifiers and Expressions
- Choosing the Enabled Version
- Versioning Restrictions and Limitations

Version Identifiers and Expressions

The version identifier is a suffix to the module or application name. It is separated from the name by a colon (:). It must begin with a letter or number. It can contain alphanumeric characters plus underscore (_), dash (-), and period (.) characters. The following examples show valid version identifiers for the foo application:

```
foo:1
foo:BETA-2e
foo:3.8
```
foo:patch39875

A module or application without a version identifier is called the *untagged* version. This version can coexist with other versions of the same module or application that have version identifiers.

In some deployment-related `asadmin` commands, you can use an asterisk (*) as a wildcard character to specify a *version expression*, which selects multiple version identifiers. Using the asterisk by itself after the colon selects all versions of a module or application, including the untagged version. The following table shows example version expressions and the versions they select.

<table>
<thead>
<tr>
<th>Version Expression</th>
<th>Selected Versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>foo:*</td>
<td>All versions of foo, including the untagged version</td>
</tr>
<tr>
<td>foo:BETA*</td>
<td>All BETA versions of foo</td>
</tr>
<tr>
<td>foo:3.*</td>
<td>All 3.x versions of foo</td>
</tr>
<tr>
<td>foo:patch*</td>
<td>All patch versions of foo</td>
</tr>
</tbody>
</table>

The following table summarizes which `asadmin` subcommands are identifier-aware or expression-aware. All expression-aware subcommands are also identifier-aware.

<table>
<thead>
<tr>
<th>Identifier-Aware Subcommands</th>
<th>Expression-Aware Subcommands</th>
</tr>
</thead>
<tbody>
<tr>
<td>deploy, deploydir, redeploy</td>
<td>undeploy</td>
</tr>
<tr>
<td>enable</td>
<td>disable</td>
</tr>
<tr>
<td>list-sub-components</td>
<td>show-component-status</td>
</tr>
<tr>
<td>get-client-stubs</td>
<td>create-application-ref,</td>
</tr>
<tr>
<td></td>
<td>delete-application-ref</td>
</tr>
</tbody>
</table>

The `create-application-ref` subcommand is expression-aware only if the `--enabled` option is set to false. Because the `--enabled` option is set to true by default, the `create-application-ref` subcommand is identifier-aware by default.

The `list-applications` and `list-application-refs` subcommands display information about all deployed versions of a module or application. To find out which version is enabled, use the `--long` option.

**Choosing the Enabled Version**

At most one version of a module or application can be enabled on a server instance. All other versions are disabled. Enabling one version automatically disables all others. You can disable all versions of a module or application, leaving none enabled.

The `--enabled` option of the `deploy` and `redeploy` subcommands is set to true by default. Therefore, simply deploying or redeploying a module or application with a new version identifier enables the new version and disables all others. To deploy a new version in a disabled state, set the `--enabled` option to false.

To enable a version that has been deployed previously, use the `enable` subcommand.

**Versioning Restrictions and Limitations**

Module and application versioning in GlassFish Server is subject to the following restrictions and limitations:
About Assembly and Deployment Events

The deployment tools that are provided by GlassFish Server can be used by any user authorized as an administrator to deploy applications and modules into any GlassFish Server environment. However, effective application deployment requires planning and care. Only the developer knows exactly what is required by an application, so the developer is responsible for initial assembly and deployment.

1. **Deployment Descriptor or Annotation Creation.** The developer creates the deployment descriptors or equivalent annotations using Java standards and tools. Details of the GlassFish Server deployment descriptors are contained in GlassFish Server Deployment Descriptor Files and Elements of the GlassFish Server Deployment Descriptors. The GlassFish Server sample applications contain deployment descriptors that can be used as templates for developing deployment descriptors.

2. **Assembly.** The developer assembles the archive file(s) using Java standards and tools, such as the jar command. The application or module is packaged into a JAR, WAR, RAR, or EAR file. For guidelines on naming, see Naming Standards. There are no GlassFish Server issues to consider.

3. **Test Deployment.** The developer performs a test deployment of the archive. For instructions, see To Deploy an Application or Module.

4. **Archive Submission.** The developer submits the verified archive to the administrator for deployment into a production environment. The developer includes instructions for any additional deployment tasks that the administrator

- Use of the --name option is mandatory for modules and applications that use versioning. There is no automatic version identifier generation.
- GlassFish Server does not recognize any relationship between versions such as previous or later versions. All version relationships must be tracked manually.
- There is no limit to the number of versions you can deploy except what is imposed by disk space limits.
- A module or application in a directory should not be deployed twice with a different version identifier. To redeploy a module or application from a directory with a new version, you must use the --force option of the deploy subcommand.
- Database tables created or deleted as part of deployment and undeployment are global resources and cannot be qualified by an application version. Be very careful when using global resources among versions of the same application.
- Web sessions are preserved during redeployment of a new version. However, preserving sessions among different versions of the same module or application is complex, because the key used for session variables is the same for the old and new versions.
- Resources are created with reference to a resource-adapter’s module or application name. This means that an older version’s resources do not automatically refer to a newer version of the module or application. Therefore, you must explicitly create resources for a newer version of a module or application. GlassFish Server ignores duplicate exported global resources and lets deployment succeed.
- OSGi already has its own versioning system. Therefore, when you deploy an OSGi bundle, GlassFish Server ignores any version information provided with the name but permits the deployment to succeed with warnings.
must perform. For an example of such additional instructions, see Access to Shared Framework Classes.

5. **Configuration.** The administrator applies additional deployment specifics. Sometimes the developer has indicated additional deployment needs, such as specifying the production database. In this case, the administrator edits and reassembles the archive.

6. **Production Deployment.** The administrator deploys the archive to production. See To Deploy an Application or Module.

7. **Troubleshooting.** If deployment fails, the administrator returns the archive to the developer. The developer fixes the problem and resubmits the archive to the administrator. Sometimes the administrator resolves the problem, depending on what the problem is.

---

**About Deployment Tools**

GlassFish Server provides tools for assembling and deploying a module or application. The following topics are addressed here:

- Administration Console
- The `asadmin` Utility
- NetBeans IDE
- Eclipse IDE
- JSR 88 Client

**Administration Console**

The GlassFish Server Administration Console is a browser-based utility that features a graphical interface that includes extensive online help for the administrative tasks. The format for starting the Administration Console in a web browser is `http://hostname:port`. For example:

`http://localhost:4848`

Step-by-step instructions for using the Administration Console for deployment are provided in the Administration Console online help. You can display the help material for a page by clicking the Help button. The initial help page describes the functions and fields of the page itself. To find instructions for performing associated tasks, click a link in the See Also list.

**The `asadmin` Utility**

The GlassFish Server `asadmin` utility is a command-line tool that invokes subcommands for identifying the operation or task that you want to perform. You can run `asadmin` commands either from a command prompt or from a script. The format for starting the `asadmin` utility on the command line is `as-install/bin/asadmin subcommand --option`. For example:

`asadmin list-applications --type web`

Application deployment commands are listed in The `asadmin` Deployment Subcommands. All GlassFish Server `asadmin` subcommands are documented in the GlassFish Server Open Source Edition Reference Manual.
For the most part, you can perform the same administrative tasks by using either the graphical Administration Console or the asadmin command-line utility, however, there are exceptions. Procedures for using the command-line utilities are provided in this guide and in the command-line help pages, which are similar to man pages. You can display the help material for a command by typing help followed by the subcommand. For example:

```
asadmin help list-applications
```

For additional information on the asadmin utility, see “Using the asadmin Utility” in GlassFish Server Open Source Edition Administration Guide and the asadmin(1M) help page.

NetBeans IDE

You can use the NetBeans Integrated Development Environment (IDE), or another IDE, to assemble Java EE applications and modules. The NetBeans IDE is included in the tools bundle of the Java EE Software Development Kit (SDK). To download, see http://www.oracle.com/technetwork/java/javaee/downloads/index.html. For additional information, see http://www.netbeans.org.

Eclipse IDE

In addition to the bundled NetBeans IDE, a plug-in for the Eclipse IDE extends GlassFish to the Eclipse community.

JSR 88 Client

The syntax of the URI entry for the getDeploymentManager method is as follows:

deployer:Sun:AppServer::admin-host:admin-port[:https]

For example:

deployer:Sun:AppServer::localhost:4848:https

Additional Information on Application Deployment

As specified from Java EE 8 specifications, the relevant specifications are the following:

- Java Platform, Enterprise Edition 8 Specification
- Java EE Application Deployment JSR 88 Specification
- Common Annotations for the Java Platform 1.6 Specification
- Java Servlet 3.0 Specification
- Enterprise JavaBeans 3.1 Specification
  http://jcp.org/en/jsr/detail?id=318
- Java EE Connector Architecture 1.6 Specification
The following product documentation might be relevant to some aspects of application deployment:

- GlassFish Server Open Source Edition Application Development Guide
- GlassFish Server Open Source Edition Administration Guide
- GlassFish Server Administration Console online help

This chapter provides procedures and guidelines for deploying applications and modules in the GlassFish Server Open Source Edition environment by using the \texttt{asadmin} command-line utility.

The following topics are addressed here:

- Deploying Applications and Modules
- Modifying the Configuration of a Web Application or Module
- Web Module Deployment Guidelines
- EJB Module Deployment Guidelines
- Deploying a Connector Module
- Assembling and Deploying an Application Client Module
- Lifecycle Module Deployment Guidelines
- Web Service Deployment Guidelines
- OSGi Bundle Deployment Guidelines
- Transparent JDBC Connection Pool Reconfiguration
- Application Scoped Resources

Instructions for accomplishing these tasks by using the Administration Console are contained in the Administration Console online help.

**Deploying Applications and Modules**

Application deployment is a dynamic process, which means that deployed applications and modules become available without requiring you to restart the server instance. Dynamic deployment can be useful in production environments to bring new applications and modules online easily. If you do restart the server, all deployed components are still deployed and available.

The following topics are addressed here:

- To Deploy an Application or Module
- To Change Targets for a Deployed Application or Module
- To List Deployed Applications or Modules
- To Redeploy an Application or Module
- To Disable an Application or Module
To Enable an Application or Module
To Undeploy an Application or Module
To Reload Changes to Applications or Modules Dynamically
To Deploy an Application or Module Automatically
To Deploy an Application or Module by Using a Deployment Plan
To Deploy an Application or Module in a Directory Format

Instructions for accomplishing these tasks by using the Administration Console are contained in the Administration Console online help.

To Deploy an Application or Module

Use the `deploy` subcommand in remote mode to deploy an assembled application or module to GlassFish Server. If an error occurs during deployment, the application or module is not deployed. If a module within an application contains an error, the entire application is not deployed. These failures prevent a partial deployment that could leave the server in an inconsistent state.

By default, the deployment target is the default server instance, `server`. To deploy only to the default server instance, specify no target. If you deploy the application or module only to the domain target, it exists in the domain central repository, but no server instances or clusters can reference the component unless you add references.

You can also deploy a component to a specific stand-alone server instance or cluster. When you deploy to server instances or clusters, the application or module exists in the domain’s central repository and is referenced by any clusters or server instances that you deployed to. For a cluster, the preselected deployment target is `server`.

If the component is already deployed or already exists, you can forcefully redeploy if you set the `--force` option of the `deploy` subcommand to true. The `redeploy` subcommand also accomplishes this. See Example 2–10. You can see the enabled or disabled status of an application or module by using the `show-component-status` subcommand.

For information about how the application or module name is derived, see Naming Standards.

Use the `--altdd` or `--runtimealtdd` options of the `deploy` (and `redeploy`) subcommand to deploy an application or module using a top-level alternate deployment descriptor. The `--altdd` option specifies a top-level alternate Java EE standard deployment descriptor. The `--runtimealtdd` option specifies a top-level alternate GlassFish Server runtime deployment descriptor. See Example 2–3. For more information about deployment descriptors associated with GlassFish Server, see Deployment Descriptors and Annotations.

You can also specify the deployment order of an application by using the `--deploymentorder` option of the `deploy` (and `redeploy`) subcommand. This is useful for applications that must be loaded in a certain order at server startup. Applications with lower deployment order numbers are loaded first. See Example 2–4. If a deployment order is not specified at the time an application is deployed, the default deployment order of 100 is assigned. If two applications have the same deployment order, the application that was deployed first is loaded first at server startup.

1. Ensure that the server is running.
   Remote commands require a running server.
2. List deployed applications by using the `list-applications` subcommand.
3. Deploy the application or module by using the `deploy` subcommand.
   Information about the options and properties of the subcommand is included in
   this help page.

4. If needed, fix issues and rerun the `deploy` subcommand.

**Example 2–1  Deploying an Enterprise Application**

This example deploys `newApp.ear` to the default server, `server`.

```bash
asadmin> deploy Cart.ear
Application deployed successfully with name Cart.
Command deploy executed successfully
```

**Example 2–2  Deploying a Connector Module**

This example deploys a connector module that is packaged in an RAR file.

```bash
asadmin> deploy jdbcra.rar
Application deployed successfully with name jdbcra.
Command deploy executed successfully
```

**Example 2–3  Using an Alternate Java EE Standard Deployment Descriptor**

This example deploys an application using an alternate Java EE standard deployment
descriptor file that resides outside of an application archive. Specify an absolute path
or a relative path to the alternate deployment descriptor file.

```bash
asadmin> deploy --altdd path_to_alternate_descriptor cart.ear
Application deployed successfully with name cart.
Command deploy executed successfully
```

**Example 2–4  Specifying the Deployment Order of an Application**

This example specifies the deployment order of two applications. The `cart` application
is loaded before the `horse` application at server startup.

Some lines of output are omitted from this example for readability.

```bash
asadmin> deploy --deploymentorder 102 --name cart cart.war
...
asadmin> deploy --deploymentorder 110 --name horse horse.war
...
```

**See Also**

You can also view the full syntax and options of the subcommand by typing `asadmin help deploy` at the command line.

**To Change Targets for a Deployed Application or Module**

After deployment, the deployed application or module exists in the central repository
and can be referenced by the server instances or clusters that you deployed to as
targets. The `asadmin create-application-ref` and `asadmin delete-application-ref` subcommands enable you to add or delete targets for a
deployed component. Because the application or module itself is stored in the central
Deploying Applications and Modules

1. Ensure that the server is running.
   Remote commands require a running server.

2. Add and remove targets by using the `create-application-ref` and `delete-application-ref` subcommands.

**See Also**
You can also view the full syntax and options of the subcommand by typing `asadmin help create-application-ref` or `asadmin help delete-application-ref` at the command line.

**To List Deployed Applications or Modules**
There are a number of commands that can be used to list deployed applications or modules and their subcomponents. Use the commands in this section in remote mode.

1. Ensure that the server is running.
   Remote commands require a running server.

2. List the desired applications by using the `list-applications` subcommand or the `list-sub-components` subcommand.
   Information about these commands is included in these help pages.

3. Show the status of a deployed component by using the `show-component-status` subcommand.

**Example 2–5  Listing Applications**
The `list-applications` subcommand lists all deployed Java EE applications or modules. If the `--type` option is not specified, all components are listed. This example lists deployed applications.
```
asadmin> list-applications --type web
hellojsp <web>
Command list-applications executed successfully
```

**Example 2–6  Listing Subcomponents**
The `list-sub-components` subcommand lists EJBs or servlets in a deployed module or in a module of the deployed application. If a module is not identified, all modules are listed. The `--appname` option functions only when the given module is standalone. To display a specific module in an application, you must specify the module name and the `--appname` option. This example gets the subcomponents of module `mejb.jar` within application `MEjbApp`.
```
asadmin> list-sub-components --appname MEjbApp mejb.jar
MEJBBean <StatelessSessionBean>
Command list-sub-components executed successfully
```

**Example 2–7  Showing Status of a Deployed Component**
The `show-component-status` subcommand gets the status (enabled or disabled) of the deployed component. This example gets the status of the `MEjbApp` component.
asadmin show-component-status MEjbApp
Status of MEjbApp is enabled
Command show-component-status executed successfully

To Redeploy an Application or Module

Use the redeploy subcommand in remote mode to overwrite a previously-deployed application or module. You can also accomplish this task by using the --force option of the deploy subcommand. Whenever a redeployment is done, the HTTP and SFSB sessions in transit at that time, and the EJB timers, become invalid unless you use the --keepstate=true option of the redeploy subcommand.

Before You Begin

You must remove a preconfigured resource before it can be updated.

1. Ensure that the server is running.
   Remote commands require a running server.
2. Redeploy an application or module by using the redeploy subcommand or the deploy subcommand with the --force option.
   Information about the options and properties of these commands is included in these help pages.

Example 2–8  Retaining HTTP Session State During Redeployment

This example redeploy the hello web application. In a production environment, you usually want to retain sessions. If you use the --keepstate option, active sessions of the application are retained and restored when redeployment is complete.

asadmin> redeploy --name hello --keepstate=true hello.war
Application deployed successfully with name hello.
Command redeploy executed successfully.

Keep State is a checkbox option when you redeploy using the Administration Console. For instructions, see the Administration Console online help.

Example 2–9  Redeploying a Web Application That Was Deployed From a Directory

This example redeploy the hello web application, which was originally deployed from the hellodir directory.

asadmin> redeploy --name hellodir
Application deployed successfully with name hellodir.
Command redeploy executed successfully.

Example 2–10  Redeploying an Application by Using asadmin deploy --force

The --force option is set to false by default. This example redeploys newApp.ear even if has been deployed or already exists.

asadmin> deploy --force=true newApp.ear
Application deployed successfully with name newApp.
Command deploy executed successfully.
See Also
You can also view the full syntax and options of the subcommand by typing `asadmin help redeploy` at the command line.

To Disable an Application or Module
Use the `disable` subcommand in remote mode to immediately deactivate a deployed application or module without removing it from the server. Disabling a component makes the component inaccessible to clients. However, the component is not overwritten or uninstalled, and can be enabled by using the `asadmin enable` subcommand.

An application or module is enabled by default.

1. Ensure that the server is running.
   Remote commands require a running server.

2. Obtain the exact name of the application or module that you are disabling.
   To list deployed applications or modules, use the `list-applications` subcommand. If you do not specify a type, all deployed applications and modules are listed. For example, valid types can be `web, ejb, connector, application, and webservice`.
   To see the status of deployed components, use the `show-component-status` subcommand.

3. Deactivate the application or module by using the `disable` subcommand.
   Information about the options and properties of the subcommand is included in this help page.

Example 2–11  Listing Deployed Web Applications
This example lists all deployed web applications.
`asadmin> list-applications --type web`
`hellojsp <web>`
Command list-applications executed successfully.

Example 2–12  Disabling a Web Application
This example disables the `hellojsp` application.
`asadmin> disable hellojsp`
Command disable executed successfully.

See Also
You can also view the full syntax and options of the subcommand by typing `asadmin help disable` at the command line.

To Enable an Application or Module
An enabled application or module is runnable and can be accessed by clients if it has been deployed to an accessible server instance or cluster. An application or module is enabled by default. Use the `enable` subcommand in remote mode to enable an application or module that has been disabled.
An application or module that is deployed to more than one target can be enabled on one target and disabled on another. If a component is referenced by a target, it is not available to users unless it is enabled on that target.

1. Ensure that the server is running.
   Remote commands require a running server.
2. Enable the application or module by using the `enable` subcommand.
   If the component has not been deployed, an error message is displayed. If the component is already enabled, it is re-enabled. To see the status of deployed components, use the `show-component-status` subcommand.
   Information about the options and properties of the subcommand is included in this help page.

**Example 2–13  Enabling an Application**

This example enables the `sampleApp` application.

```
asadmin> enable sampleApp
Command enable executed successfully.
```

**See Also**

You can also view the full syntax and options of the subcommand by typing `asadmin help enable` at the command line.

**To Undeploy an Application or Module**

Use the `undeploy` subcommand in remote mode to uninstall a deployed application or module and remove it from the repository. To reinstate the component, you must deploy the component again using the `deploy` subcommand.

1. Ensure that the server is running.
   Remote commands require a running server.
2. Obtain the exact name of the application or module you are undeploying.
   To list deployed applications or modules, use the `list-applications` subcommand. If you do not specify a type, all deployed applications and modules are listed. For example, valid types can be `web`, `ejb`, `connector`, `application`, and `webservice`.
   To see the status of deployed components, use the `show-component-status` subcommand.
3. Undeploy the application or module by using the `undeploy` subcommand.
   Information about the options and properties of the subcommand is included in this help page.

**Example 2–14  Listing Deployed Applications or Modules**

This example lists all applications of type `web`.

```
asadmin> list-applications --type web
hellojsp <web>
Command list-applications executed successfully.
```
Example 2–15  Undeploying an Application

This example uninstalls the hellojsp application.

asadmin> undeploy hellojsp
hellojsp <web>
Command undeploy executed successfully.

See Also
You can also view the full syntax and options of the subcommand by typing asadmin help undeploy at the command line.

To Reload Changes to Applications or Modules Dynamically

Dynamic reloading enables you to change the code or deployment descriptors of an application or module without needing to perform an explicit redeployment. Instead, you can copy the changed class files or descriptors into the deployment directory for the application or module. The server checks for changes periodically and automatically redeploys the changes if the timestamp of the .reload file in the root directory for the application or module has changed.

Dynamic reloading is enabled by default, and is available only on the default server instance.

1. Go to the root directory of the deployed application or module.
   
   For an application:
   
   domain-dir/applications/app-name
   
   For an individually deployed module:
   
   domain-dir/applications/module-name

   **Note:** Deployment directories might change between GlassFish Server releases.

   2. Create or update the timestamp of the .reload file to load the changes.
      
      For UNIX: touch .reload
      
      For Windows: echo> .reload
      
      If the .reload file doesn’t exist, the touch or echo command creates it.

   To Deploy an Application or Module Automatically

   **Note:** This task is best suited for use in a development environment.

   Automatic deployment involves copying an archive file into a special autodeploy directory where the archive is automatically deployed by GlassFish Server at predefined intervals. This method is useful in a development environment because it allows new code to be tested quickly. Automatic deployment is enabled by default, and is available only on the default server instance.
1. Use the `set` subcommand to adjust the autodeployment interval.
   This sets the interval at which applications and modules are checked for code changes and dynamically reloaded. The default is 2.

2. Use the `set` subcommand to enable JSP precompilation.

3. Copy your archive file to the autodeploy directory.
   The default location is `domain-dir/autodeploy`. The application will be deployed at the next interval.
   To undeploy an automatically deployed application or module, remove its archive file from the autodeploy directory.

---

**Note:** Deployment directories might change between GlassFish Server releases.

---

**Example 2–16** Setting the Autodeployment Interval

This example sets the autodeployment interval to 3 seconds (default is 2).

```bash
asadmin> set
server.admin-service.das-config.autodeploy-polling-interval-in-seconds=3
Command set executed successfully.
```

**Example 2–17** Setting JSP Precompilation

This example enables JSP precompilation (default is false).

```bash
asadmin>
set server.admin-service.das-config.autodeploy-jsp-precompilation-enabled=true
Command set executed successfully.
```

**See Also**

You can also view the full syntax and options of the subcommand by typing `asadmin set --help` at the command line.

---

**To Deploy an Application or Module by Using a Deployment Plan**

In the deployment plan for an EAR file, the `glassfish-application.xml` file is located at the root. The deployment descriptor for each module is stored according to this syntax: `module-name.gf-dd-name`, where the `gf-dd-name` depends on the module type. If a module named `MyModule` contains a CMP mappings file, the file is named `MyModule.sun-cmp-mappings.xml`. A `.dbschema` file is stored at the root level. Each `/` (forward slash) is replaced by a `#` (pound sign).

1. Ensure that the server is running.
   Remote commands require a running server.

2. Deploy the application or module by using the `deploy` subcommand with the `--deploymentplan` option.

---

**Note:** Deployment directories might change between GlassFish Server releases.
**Example 2–18  Deploying by Using a Deployment Plan**

This example deploys the application in the `myrostapp.ear` file according to the plan specified by the `mydeployplan.jar` file.

```bash
asadmin deploy --deploymentplan mydeployplan.jar myrostapp.ear
```

Application deployed successfully with name myrostapp.

Command deploy executed successfully.

**Example 2–19  Deployment Plan Structure for an Enterprise Application**

This listing shows the structure of the deployment plan JAR file for an EAR file.

```bash
$ jar -tvf mydeployplan.jar
420 Thu Mar 13 15:37:48 PST 2003 glassfish-application.xml
370 Thu Mar 13 15:37:48 PST 2003 RosterClient.war.glassfish-web.xml
418 Thu Mar 13 15:37:48 PST 2003 roster-ac.jar.glassfish-application-client.xml
```

**Example 2–20  Deployment Plan Structure for an EJB Module**

In the deployment plan for an EJB module, the deployment descriptor that is specific to GlassFish Server is at the root level. If a standalone EJB module contains a CMP bean, the deployment plan includes the `sun-cmp-mappings.xml` and `.dbschema` files at the root level. In the following listing, the deployment plan describes a CMP bean:

```bash
$ jar r -tvf myotherplan.jar
3603 Thu Mar 13 15:24:20 PST 2003 glassfish-ejb-jar.xml
3432 Thu Mar 13 15:24:20 PST 2003 sun-cmp-mappings.xml
```

See Also

The deployment plan is part of the implementation of JSR 88. For more information about JSR 88, see [JSR 88 Naming](http://jcp.org/en/jsr/detail?id=88) and the JSR 88 page at [http://jcp.org/en/jsr/detail?id=88](http://jcp.org/en/jsr/detail?id=88).

---

**To Deploy an Application or Module in a Directory Format**

Note: This task is best suited for use in a development environment.

An expanded directory, also known as an exploded directory, contains an unassembled (unpackaged) application or module. To deploy a directory format instead of an archive, file, use the `asadmin deploy` subcommand in remote mode and specify a path to a directory instead of to an archive file. The contents of the directory must be the same as the contents of a corresponding archive file, with one exception. An application archive file contains archive files for its modules, for example `myUI.war` and `myEJB.jar`. The expanded application directory contains expanded directories for the modules, for example `myUI_war` and `myEJB_jar`, instead.

You can change deployment descriptor files directly in the expanded directory.
If your environment is configured to use dynamic reloading, you can also dynamically reload applications or modules that are deployed from the directory. For instructions, see To Reload Changes to Applications or Modules Dynamically.

Unlike archive file deployment, directory deployment does not copy the directory contents to the remote hosts. This means that for deployment to a cluster, the directory path may exist for both the DAS and the remote server instances but may not actually correspond to the same physical location. If any target server instance cannot see the deployed directory, or finds that it contains different files from those detected by the DAS, deployment fails.

Integrated development environments (IDEs) typically use directory deployment, so you do not need to deal directly with the expanded format.

**Before You Begin**

On each cluster or stand-alone server instance to which the application or module is deployed, the directory must be accessible and must contain the same files as found by the DAS.

On Windows, if you are deploying a directory on a mapped drive, you must be running GlassFish Server as the same user to which the mapped drive is assigned. This enables GlassFish Server to access the directory.

1. Ensure that the server is running.
   Remote commands require a running server.
2. Verify that the expanded directory contents match the archive file.
   For information about the required directory contents, see the appropriate specifications.
3. Deploy the directory by using the `deploy` subcommand and specifying the path to the expanded directory.

```
Note: Deployment directories might change between GlassFish Server releases.
```

**Example 2–21  Deploying an Application From a Directory**

This example deploys the expanded directory `/apps/MyApp` for the `hello` application.

```
asadmin> deploy --name hello /apps/MyApp
Application deployed successfully with name hello.
Command deploy executed successfully.
```

**See Also**

You can also view the full syntax and options of the subcommand by typing `asadmin help deploy` at the command line.

**Modifying the Configuration of a Web Application or Module**

You can modify the configuration of a web application or a module by modifying the deployment descriptors and then repackaging and redeploying the application.

The instructions in this section enable you to change the configuration of a deployed application without the need to modify the application’s deployment descriptors and
repackage and redeploy the application. If the application or module entry is unset, its value reverts to the value, if any, that is set in the application’s deployment descriptor.

The following topics are addressed here:

- To Set a Web Context Parameter
- To Unset a Web Context Parameter
- To List Web Context Parameters
- To Set a Web Environment Entry
- To Unset a Web Environment Entry
- To List Web Environment Entries

### To Set a Web Context Parameter

Use the `set-web-context-param` subcommand in remote mode to change the configuration of a deployed application without the need to modify the application's deployment descriptors and repackage and redeploy the application. By using this subcommand, you are either adding a new parameter that did not appear in the original web module's descriptor, or overriding the descriptor's setting of the parameter.

If the `--ignoreDescriptorItem` option is set to true, then the server ignores any setting for that context parameter in the descriptor, which means you do not need to specify an overriding value on the `set-web-context-param` subcommand. The server behaves as if the descriptor had never contained a setting for that context parameter.

This subcommand sets a servlet context-initialization parameter of one of the following items:

- A deployed web application
- A web module in a deployed Java Platform, Enterprise Edition (Java EE) application

### Before You Begin

The application must already be deployed. Otherwise, an error occurs.

1. Ensure that the server is running.
   
   Remote commands require a running server.

2. Set a servlet context-initialization parameter by using the `set-web-context-param` subcommand.
   
   Information about the options for the subcommand is included in this help page.

### Example 2–22 Setting a Servlet Context-Initialization Parameter for a Web Application

This example sets the servlet context-initialization parameter `javax.faces.STATE_SAVING_METHOD` of the web application `basic-ezcomp` to `client`.

```sh
asadmin> set-web-context-param --name=javax.faces.STATE_SAVING_METHOD
--description="The location where the application's state is preserved"
--value=client basic-ezcomp
Command set-web-context-param executed successfully.
```
See Also
You can also view the full syntax and options of the subcommand by typing `asadmin help set-web-context-param` at the command line.

To Unset a Web Context Parameter
Use the `unset-web-context-param` subcommand in remote mode to unset an environment entry for a deployed web application or module that has been set by using the `set-web-env-entry` subcommand. There is no need to modify the application's deployment descriptors and repackage and redeploy the application.

This subcommand unsets an environment entry for one of the following items:
- A deployed web application
- A web module in a deployed Java Platform, Enterprise Edition (Java EE) application

When an entry is unset, its value reverts to the value, if any, that is set in the application's deployment descriptor. This subcommand cannot be used to change the value of an environment entry that is set in an application's deployment descriptor. Instead, use the `set-web-context-param` subcommand for this purpose.

Before You Begin
The application must already be deployed, and the entry must have previously been set by using the `set-web-env-entry` subcommand. Otherwise, an error occurs.

1. Ensure that the server is running.
   Remote commands require a running server.
2. Unset an environment entry by using the `unset-web-context-param` subcommand.

   Information about the options for the subcommand is included in this help page.

Example 2–23  Unsetting a Servlet Context-Initialization Parameter for a Web Application
This example unsets the servlet context-initialization parameter `javax.faces.STATE_SAVING_METHOD` of the web application `basic-ezcomp`.

```
asadmin> unset-web-context-param --name=javax.faces.STATE_SAVING_METHOD basic-ezcomp
Command unset-web-context-param executed successfully.
```

See Also
You can also view the full syntax and options of the subcommand by typing `asadmin help unset-web-context-param` at the command line.

To List Web Context Parameters
Use the `list-web-context-param` subcommand in remote mode to list the parameters that have previously been set by using the `set-web-context-param` subcommand. The subcommand does not list parameters that are set only in the application's deployment descriptor. For each parameter, the following information is displayed:
- The name of the parameter
- The value to which the parameter is set
The value of the --ignoreDescriptorItem option of the set-web-context-param subcommand that was specified when the parameter was set

The description of the parameter or null if no description was specified when the parameter was set

1. Ensure that the server is running.
   Remote commands require a running server.

2. List servlet context-initialization parameters by using the list-web-context-param subcommand.

Example 2–24  Listing Servlet Context-Initialization Parameters for a Web Application

This example lists all servlet context-initialization parameters of the web application basic-ezcomp that have been set by using the set-web-context-param subcommand. Because no description was specified when the javax.faces.PROJECT_STAGE parameter was set, null is displayed instead of a description for this parameter.

```bash
asadmin> list-web-context-param basic-ezcomp
javax.faces.STATE_SAVING_METHOD = client ignoreDescriptorItem=false
//The location where the application's state is preserved
javax.faces.PROJECT_STAGE = null ignoreDescriptorItem=true //null
Command list-web-context-param executed successfully.
```

See Also

You can also view the full syntax and options of the subcommand by typing asadmin help list-web-context-param at the command line.

To Set a Web Environment Entry

An application uses the values of environment entries to customize its behavior or presentation. Use the set-web-env-entry subcommand in remote mode to change the configuration of a deployed application without the need to modify the application’s deployment descriptors and repackage and redeploy the application. By using this subcommand, you are either adding a new parameter that did not appear in the original web module’s descriptor, or overriding the descriptor’s setting of the parameter.

If you the --ignoreDescriptorItem option is set to true, then the server ignores any setting for that environment entry in the descriptor, which means you do not need to specify an overriding value on the set-web-env-entry subcommand. The server behaves as if the descriptor had never contained a setting for that environment entry.

This subcommand sets an environment entry for one of the following items:

- A deployed web application
- A web module in a deployed Java Platform, Enterprise Edition (Java EE) application

Before You Begin

The application must already be deployed. Otherwise, an error occurs.

- Ensure that the server is running.
  Remote commands require a running server.
2. Set an environment entry for a deployed web application or module by using the `set-web-env-entry` subcommand.
   Information about the options for the subcommand is included in this help page.

   **Example 2–25  Setting an Environment Entry for a Web Application**
   This example sets the environment entry Hello User of the application hello to `techscribe`. The Java type of this entry is `java.lang.String`.
   
   ```
   asadmin> set-web-env-entry --name="Hello User" --type=java.lang.String --value=techscribe --description="User authentication for Hello application" hello
   Command set-web-env-entry executed successfully
   ```

   **See Also**
   You can also view the full syntax and options of the subcommand by typing `asadmin help set-web-env-entry` at the command line.

**To Unset a Web Environment Entry**
Use the `unset-web-env-entry` subcommand in remote mode to unset an environment entry for a deployed web application or module.

1. Ensure that the server is running.
   Remote commands require a running server.

2. Unset a web environment entry by using the `unset-web-env-entry` subcommand.
   Information about the options for the subcommand is included in this help page.

   **Example 2–26  Unsetting an Environment Entry for a Web Application**
   This example unsets the environment entry Hello User of the web application `hello`.
   
   ```
   asadmin> unset-web-env-entry --name="Hello User" hello
   Command unset-web-env-entry executed successfully.
   ```

   **See Also**
   You can also view the full syntax and options of the subcommand by typing `asadmin help unset-web-env-entry` at the command line.

**To List Web Environment Entries**
Use the `list-web-env-entry` subcommand to list environment entries for a deployed web application or module. For each entry, the following information is displayed:

- The name of the entry
- The Java type of the entry
- The value to which the entry is set
- The description of the entry or null if no description was specified when the entry was set
- The value of the `--ignoreDescriptorItem` option of the `set-web-env-entry` subcommand that was specified when the entry was set

1. Ensure that the server is running.
Remote commands require a running server.

2. List the environment entries by using the `list-web-env-entry` subcommand.

**Example 2–27  Listing Environment Entries for a Web Application**

This example lists all environment entries that have been set for the web application `hello` by using the `set-web-env-entry` subcommand.

```
asadmin> list-web-env-entry hello
Hello User (java.lang.String) = techscribe ignoreDescriptorItem=false
//User authentication for Hello application
Hello Port (java.lang.Integer) = null ignoreDescriptorItem=true //null
Command list-web-env-entry executed successfully.
```

**See Also**

You can also view the full syntax and options of the subcommand by typing `asadmin help list-web-env-entry` at the command line.

---

**Web Module Deployment Guidelines**

The following guidelines apply to deploying a web module in GlassFish Server:

- **Context Root.** When you deploy a web module, if you do not specify a context root, the default is the name of the WAR file without the `.war` extension. The web module context root must be unique within the server instance.

  The domain administration server (DAS) in GlassFish Server versions 2.1.1 and later supports the deployment of multiple web applications using the same web context root as long as those applications are deployed to different GlassFish Server stand-alone instances. Deploying multiple applications using the same context root within a single instance produces an error.

- **Data Source.** If a web application accesses a `DataSource` that is not specified in a `resource-ref` in `glassfish-web.xml`, or there is no `glassfish-web.xml` file, the `resource-ref-name` defined in `web.xml` is used. A warning message is logged, recording the JNDI name that was used to look up the resource.

- **Virtual Servers.** If you deploy a web application and do not specify any assigned virtual servers, the web application is assigned to all currently-defined virtual servers with the exception of the virtual server with ID `__asadmin`, which is reserved for administrative purposes. If you then create additional virtual servers and want to assign existing web applications to them, you must redeploy the web applications.

- **HTTP Sessions.** If a web application is undeployed, all its HTTP sessions will be invalidated and removed, unless the application is being undeployed as part of a redeployment and the `--keepstate` deployment option was set to true. This option is not supported and ignored in a clustered environment. See **Example 2–8**.

  For information about HTTP session persistence, see the *GlassFish Server Open Source Edition High Availability Administration Guide*.

- **Load Balancing.** See the *GlassFish Server Open Source Edition High Availability Administration Guide* for information about load balancing.

- **JSP Precompilation.** You can precompile JSP files during deployment by checking the appropriate box in the Administration Console, or by using the `--precompilejsp` option of the `deploy` subcommand.
You can keep the generated source for JSP files by adding the `keepgenerated` flag to the `jsp-config` element in `glassfish-web.xml`. For example:

```xml
<glassfish-web-app>
  ...
  <jsp-config>
    <property name="keepgenerated" value="true" />
  </jsp-config>
</glassfish-web-app>
```

If you include this property when you deploy the WAR file, the generated source is kept in `domain-dir/generated/jsp/app-name/module-name` for an application, or `domain-dir/generated/jsp/module-name` for an individually-deployed web module.

For more information about JSP precompilation, see `jsp-config`.

- **Web Context Parameters.** You can set web context parameters after deployment. See the following sections:
  - To Set a Web Context Parameter
  - To Unset a Web Context Parameter
  - To List Web Context Parameters

- **Web Environment Entries.** You can set web environment entries after deployment. See the following sections:
  - To Set a Web Environment Entry
  - To Unset a Web Environment Entry
  - To List Web Environment Entries

---

**EJB Module Deployment Guidelines**

**Note:** The GlassFish Server Web Profile supports the EJB 3.1 Lite specification, which allows enterprise beans within web applications, among other features. The GlassFish Server Full Platform Profile supports the entire EJB 3.1 specification. For details, see JSR 318 ([http://jcp.org/en/jsr/detail?id=318](http://jcp.org/en/jsr/detail?id=318)).

The following guidelines apply to deploying an EJB module in GlassFish Server:

- **JNDI Name.** — If no JNDI name for the EJB JAR module is specified in the `jndi-name` element immediately under the `ejb` element in `glassfish-ejb-jar.xml`, or there is no `glassfish-ejb-jar.xml` file, a default, non-clashing JNDI name is derived. A warning message is logged, recording the JNDI name used to look up the EJB JAR module.

  Because the EJB 3.1 specification defines portable EJB JNDI names, there is less need for GlassFish Server specific JNDI names. By default, GlassFish Server specific default JNDI names are applied automatically for backward compatibility. To disable GlassFish Server specific JNDI names for an EJB module, set the value of the `<disable-nonportable-jndi-names>` element in the `glassfish-ejb-jar.xml` file to true. The default is false.

- **Stateful Session Bean and Timer State.** — Use the `--keepstate` option of the `redeploy` subcommand or the `<keepstate>` element in the
Deploying a Connector Module

Deploying a stand-alone connector module allows multiple deployed Java EE applications to share the connector module. A resource adapter configuration is automatically created for the connector module.

The following topics are addressed here:

- To Deploy and Configure a Stand-Alone Connector Module
- Redeploying a Stand-Alone Connector Module
- Deploying and Configuring an Embedded Resource Adapter

To Deploy and Configure a Stand-Alone Connector Module

As an alternative to Step 3 through Step 6, you can define application-scoped resources in the glassfish-resources.xml deployment descriptor. For more information, see Application-Scoped Resources.

1. Ensure that the server is running.

   Remote commands require a running server.

2. Deploy the connector module by using the deploy subcommand.

3. Configure connector connection pools for the deployed connector module.

   Use the create-connector-connection-pool subcommand. For procedures, see “To Create a Connector Connection Pool” in GlassFish Server Open Source Edition Administration Guide.

4. Configure connector resources for the connector connection pools.

   Use the create-resource-adapter-config subcommand. For procedures, see “To Create Configuration Information for a Resource Adapter” in GlassFish Server Open Source Edition Administration Guide.

The following topics are addressed here:

- EJB Singletons. — EJB Singletons are created for each server instance in a cluster, and not once per cluster.
- Stubs and Ties. — Use the get-client-stubs subcommand in remote mode to retrieve stubs and ties.
- Compatibility of JAR Visibility Requirements. — Use the compatibility element of the glassfish-application.xml or glassfish-ejb-jar.xml file to specify the GlassFish Server release with which to be backward compatible in terms of JAR visibility requirements for applications. The current allowed value is v2, which refers to GlassFish Server version 2 or GlassFish Server version 9.1 or 9.1.1. Starting in Java EE 6, the Java EE specification imposes stricter requirements than Java EE 5 did on which JAR files can be visible to various modules within an EAR file. Setting this element to v2 removes these Java EE 6 and later restrictions.

The glassfish-ejb-jar.xml file to retain stateful session bean instances and persistently created EJB timers across redeployments. The --keepstate option of the redeploy subcommand takes precedence. The default for both is false. This option is not supported and ignored in a clustered environment.

Some changes to an application between redeployments can prevent this feature from working properly. For example, do not change the set of instance variables in the SFSB bean class. Other examples would be changes to EJB names, or adding or removing EJBs to or from an application.
Source Edition Administration Guide. If needed, you can override the default configuration properties of a resource adapter.

This step associates a connector resource with a JNDI name.

5. Configure a resource adapter.

Use the `create-resource-adapter-config` subcommand. For procedures, see "To Create Configuration Information for a Resource Adapter" in GlassFish Server Open Source Edition Administration Guide. If needed, you can override the default configuration properties of a resource adapter.

6. If needed, create an administered object for an inbound resource adapter.

Use the `create-admin-object` subcommand. For procedures, see "To Create an Administered Object" in GlassFish Server Open Source Edition Administration Guide.

Redeploying a Stand-Alone Connector Module

Redeployment of a connector module maintains all connector connection pools, connector resources, and administered objects defined for the previously deployed connector module. You do not need to reconfigure any of these resources.

However, you should redeploy any dependent modules. A dependent module uses or refers to a connector resource of the redeployed connector module. Redeployment of a connector module results in the shared class loader reloading the new classes. Other modules that refer to the old resource adapter classes must be redeployed to gain access to the new classes. For more information about class loaders, see "Class Loaders" in GlassFish Server Open Source Edition Application Development Guide.

During connector module redeployment, the server log provides a warning indicating that all dependent applications should be redeployed. Client applications or application components using the connector module's resources may throw class cast exceptions if dependent applications are not redeployed after connector module redeployment.

To disable automatic redeployment, set the `--force` option to `false`. In this case, if the connector module has already been deployed, GlassFish Server provides an error message.

Deploying and Configuring an Embedded Resource Adapter

A connector module can be deployed as a Java EE component in a Java EE application. Such connectors are only visible to components residing in the same Java EE application. Deploy this application as you would any other Java EE application.

You can create new connector connection pools and connector resources for a connector module embedded within a Java EE application by prefixing the connector name with `app-name#`. For example, if an application `appX.ear` has `jdbcra.rar` embedded within it, the connector connection pools and connector resources refer to the connector module as `appX#jdbcra`.

An embedded connector module cannot be undeployed using the name `app-name#connector-name`. To undeploy the connector module, you must undeploy the application in which it is embedded.

The association between the physical JNDI name for the connector module in GlassFish Server and the logical JNDI name used in the application component is specified in the GlassFish Server-specific XML descriptor `glassfish-ejb-jar.xml`.

Assembling and Deploying an Application Client Module

Deployment is necessary for application clients that communicate with EJB components or that use Java Web Start launch support. Java Web Start is supported for application clients and for applications that contain application clients. By default, Java Web Start is enabled in application clients and in GlassFish Server.

The following topics are addressed here:

- To Assemble and Deploy an Application Client
- To Prepare Another Machine for Running an Application Client
- To Undeploy an Application Client

To Assemble and Deploy an Application Client

1. Assemble the necessary client components.
   The client JAR file is created.
2. Assemble the EJB components that are to be accessed by the client.
   The EJB JAR file is created.
3. Assemble the client and EJB JAR files together in an EAR.
   An EAR file contains all the components of the application.
4. Deploy the application.
   Instructions are contained in To Deploy an Application or Module.
5. If you are using the appclient script to run the application client, retrieve the client files.
   The client artifacts contain the ties and necessary classes for the application client. In this release of GlassFish Server, the client artifacts include multiple files. You can use either the get-client-stubs subcommand or the --retrieval option of the deploy subcommand, but you do not need to use both.
   - Use the deploy subcommand with the --retrieval option to retrieve the client files as part of deploying the application.
   - Use the get-client-stubs subcommand to retrieve client files for a previously-deployed application.
6. Test the client on the GlassFish Server machine in one of the following ways:
   - If Java Web Start is enabled for the application client, use the Launch link on the Application Client Modules.
   - Run an application client by using the appclient script.
     The appclient script is located in the as-install/bin directory.
     If you are using the default server instance, the only required option is -client, which points to the client JAR file. For example:
     appclient -client converterClient.jar

Note: The Application Client Container is supported only in the GlassFish Server Full Platform Profile, not in the Web Profile.
Assembling and Deploying an Application Client Module

The -xml parameter, which specifies the location of the sun-acc.xml file, is also required if you are not using the default instance.

See Also
For more detailed information about the appclient script, see appclient(IM).
For more detailed information about creating application clients, see "Developing Java Clients" in GlassFish Server Open Source Edition Application Development Guide. This chapter includes information on the following topics:

- Accessing EJB components and JMS resources from application clients
- Connecting to a remote EJB module through a firewall
- Using Java Web Start and creating a custom JNLP file
- Using libraries with application clients
- Specifying a splash screen, login retries, and other customizations

To Prepare Another Machine for Running an Application Client

If Java Web Start is enabled, the default URL format for an application is http://host:port/context-root. For example:

http://localhost:80/myapp

The default URL format for a standalone application client module is http://host:port/module-id. For example:

http://localhost:80/myclient

To set a different URL for an application client, set the context-root subelement of the java-web-start-access element in the glassfish-application-client.xml file.

If the context-root or module-id is not specified during deployment, the name of the EAR or JAR file without the .ear or .jar extension is used. For an application, the relative path to the application client JAR file is also included. If the application or module is not in EAR or JAR file format, a context-root or module-id is generated. Regardless of how the context-root or module-id is determined, it is written to the server log. For details about naming, see Naming Standards.

Before You Begin
This task applies if you want to use the appclient script to run the application client on a system other than where the server runs.

1. Create the application client package JAR file.
   Use the package-appclient script in the as-install/bin directory. This JAR file is created in the as-install/lib/appclient directory.
2. Copy the application client package JAR file to the client machine.
3. Extract the contents of the JAR file.
   For example: jar xf filename.jar
   If you used the package-appclient script, this file is located in the appclient/appserv/lib/appclient directory by default.
5. Configure the asenv.conf (asenv.bat on Windows) file.
This file is located in `appclient/appserv/bin` by default if you used the `package-appclient` script.

6. Copy the client JAR file to the client machine.
   You are now ready to run the client.

See Also
For more detailed information about Java Web Start and the `package-appclient` script, see `appclient(IM)`.

To Undeploy an Application Client
After application clients are downloaded, they remain on the client until they are manually removed. Use the Java Web Start control panel to discard downloaded application clients that used Java Web Start.

If you undeploy an application client, you can no longer use Java Web Start, or any other mechanism, to download that application client because it might be in an inconsistent state. If you try to launch an application client that was previously downloaded (even though the server side of the application client is no longer present), the results are unpredictable unless the application client has been written to tolerate such situations.

You can write your application client so that it detects failures in contacting server-side components, but continues running. In this case, Java Web Start can run an undeployed application client while the client is cached locally. For example, your application client can be written to detect and then recover from `javax.naming.NamingException` when locating a resource, or from `java.rmi.RemoteException` when referring to a previously-located resource that becomes inaccessible.

Lifecycle Module Deployment Guidelines
A lifecycle module, also called a lifecycle listener module, provides a means of running long or short Java-based tasks within the GlassFish Server environment, such as instantiation of singletons or RMI servers. Lifecycle modules are automatically initiated at server startup and are notified at various phases of the server life cycle. All lifecycle module interfaces are in the `as-install/modules/glassfish-api.jar` file.

For general information about lifecycle modules, see "Developing Lifecycle Listeners" in GlassFish Server Open Source Edition Application Development Guide.

You can deploy a lifecycle module using the `create-lifecycle-module` subcommand. Do not use `asadmin deploy` or related commands.

You do not need to specify a classpath for the lifecycle module if you place it in the `domain-dir/lib` or `domain-dir/lib/classes` directory for the Domain Administration Server (DAS). Do not place it in the `lib` directory for a particular server instance, or it will be deleted when that instance synchronizes with the GlassFish Server.

After you deploy a lifecycle module, you must restart the server. During server initialization, the server instantiates the module and registers it as a lifecycle event listener.
Web Service Deployment Guidelines

Note: If you installed the Web Profile, web services are not supported unless the optional Metro Web Services Stack add-on component is downloaded. Without the Metro add-on component, a servlet or EJB component cannot be a web service endpoint, and the glassfish-web.xml and glassfish-ejb-jar.xml elements related to web services are ignored.

The following guidelines apply when deploying a web service in GlassFish Server:

- **Web Service Endpoint.** Deploy a web service endpoint to GlassFish Server as you would any servlet or stateless session bean. If the deployed application or module has a web service endpoint, the endpoint is detected automatically during deployment. The GlassFish Server-specific deployment descriptor files, glassfish-web.xml and glassfish-ejb-jar.xml, provide optional web service enhancements in their webservice-endpoint and webservice-description elements.

- **Web Service Management.** Web service management is fully supported in the Administration Console. After the application or module is deployed, click the Web Service component. The table in the right frame lists deployed web service endpoints.

For more information about web services, see "Developing Web Services" in GlassFish Server Open Source Edition Application Development Guide.

OSGi Bundle Deployment Guidelines

To deploy an OSGi bundle using the Administration Console, select Other from the Type drop-down list and check the OSGI Type checkbox.

To deploy an OSGi bundle using the asadmin deploy command, set the --type option to the value osgi. For example:

```
asadmin> deploy --type=osgi MyBundle.jar
```

To automatically deploy an OSGi bundle, copy the bundle archive to the domain-dir/autodeploy/bundles directory.

Note: For components packaged as OSGi bundles (--type=osgi), the deploy subcommand accepts properties arguments to wrap a WAR file as a WAB (Web Application Bundle) at the time of deployment. The subcommand looks for a key named UriScheme and, if present, uses the key as a URL stream handler to decorate the input stream. Other properties are used in the decoration process. For example, the GlassFish Server OSGi web container registers a URL stream handler named webbundle, which is used to wrap a plain WAR file as a WAB.
Transparent JDBC Connection Pool Reconfiguration

In this GlassFish Server release, reconfiguration of a JDBC connection pool due to attribute or property changes can be transparent to the applications or modules that use the pool, even if pool reconfiguration results in pool recreation. You do not need to redeploy the application or module.

To enable transparent pool reconfiguration, set the `dynamic-reconfiguration-wait-timeout-in-seconds` property. This property specifies the timeout for dynamic reconfiguration of the pool. In-progress connection requests must complete before this timeout expires or they must be retried. New connection requests wait for this timeout to expire before acquiring connections to the reconfigured pool. If this property exists and has a positive value, it is enabled.

You can set this property in the `glassfish-resources.xml` file. For more information, see the property descriptions under `jdbc-connection-pool`.

For JDBC connection pools that are not application-scoped, use the `set` subcommand to set this property. For example, to configure `mypool` on `myserver`, type the following all on one line:

```
asadmin> set myserver.resources.jdbc-connection-pool.mypool.property. dynamic-reconfiguration-wait-timeout-in-seconds=30```

Application-Scoped Resources

You can define an application-scoped JDBC resource or other resource for an enterprise application, web module, EJB module, connector module, or application client module. This allows single-step deployment for resource-dependent modules and applications. An application-scoped resource has the following characteristics:

- It is available only to the module or application that defines it.
- It cannot be referenced or looked up by other modules or applications.
- It is created during deployment, destroyed during undeployment, and recreated during redeployment.
- It is free from unexpected resource starvation or delay in acquiring connections because no other application or module competes for accesses to it.

The following resource types can be application-scoped:

- JDBC connection pools
- JDBC resources
- Connector connection pools
- Connector resources
- Resource adapters
- External JNDI resources
- Custom resources
- Admin object resources
- JavaMail resources

Deployment Descriptor. An application-scoped resource is defined in the `glassfish-resources.xml` deployment descriptor file. This file is placed in the `META-INF` directory of the module or application archive. For web applications or
modules, this file is placed in the WEB-INF directory. If any submodule archives of an enterprise application archive have their own glassfish-resources.xml files, the resource definitions are scoped to those modules only. For more information about the glassfish-resources.xml file, see GlassFish Server Deployment Descriptor Files and Elements of the GlassFish Server Deployment Descriptors.

**Naming.** Application-scoped resource JNDI names begin with java:app or java:module. If one of these prefixes is not specified in the JNDI name, it is added. For example, application-scoped databases have JNDI names in the following format: java:app/jdbc/DataSourceName or java:module/jdbc/DataSourceName. This is in accordance with the naming scopes introduced in the Java EE 6 Specification.

**Errors.** Application-scoped resource definitions with same resource name, resource type, attributes, and properties are *duplicates.* These generate WARNING level log messages and deployment continues. Definitions with the same resource name and type but different attributes or properties are *conflicts* and cause deployment failure. When an application or module tries to look up a scoped resource that does not belong to it, a naming exception is thrown.

**Redeployment.** When an application or module is undeployed, its scoped resources are deleted. During redeployment, resources are destroyed and recreated based on changes in the glassfish-resources.xml file. To preserve old resource definitions during redeployment, use the preserveAppScopedResources property of the redeploy (or deploy --force=true) subcommand. For example:

```bash
asadmin> redeploy --property preserveAppScopedResources=true MyApp.ear
asadmin> deploy --force=true --property preserveAppScopedResources=true MyApp.ear
```

For more information, see redeploy(1) and deploy(1).

**Listing.** Use the --resources option of the list-applications subcommand to list application-scoped resources. Use the --subcomponents option in addition to list scoped resources for enterprise application modules or for module subcomponents. To list scoped resources for subcomponents only, use the --resources option of the list-subcomponents subcommand.

For more information, see list-applications(1) and list-sub-components(1).

**Restrictions.** Use of application-scoped resources is subject to the following restrictions:

- **resource-adapter-config and connector-work-security-map** — These can only be specified in the glassfish-resources.xml file of the corresponding connector module. In an enterprise application, the resource-adapter-config or connector-work-security-map for an embedded connector module must be specified in the glassfish-resources.xml file of the connector module. You cannot specify a resource-adapter-config or connector-work-security-map in an application for a connector module that is not part of the application.


- **Global resources** — Defining java:global JNDI names is not supported.

- **Cross definitions** — Defining java:app JNDI names at the module level is not supported.
The asadmin Deployment Subcommands

This appendix lists the asadmin deployment subcommands that are included with this release of the GlassFish Server Open Source Edition software. For information on additional asadmin subcommands, see “Subcommands for the asadmin Utility” in GlassFish Server Open Source Edition Administration Guide or see the GlassFish Server Open Source Edition Reference Manual.

**add-library**
Adds one or more library JAR files to GlassFish Server. You can specify whether the libraries are added to the Common class loader directory, the Java optional package directory, or the application-specific class loader directory.

**create-application-ref**
Creates a reference from a cluster or an unclustered server instance to a previously deployed Java EE application or module. This effectively results in the application element being deployed and made available on the targeted instance or cluster.

**create-lifecycle-module**
Creates a lifecycle module. A lifecycle module provides a means of running a short or long duration Java-based task at a specific stage in the server life cycle.

**delete-application-ref**
Removes a reference from a cluster or an unclustered server instance to a previously deployed Java EE application or module. This effectively results in the application element being undeployed on the targeted instance or cluster.

**delete-lifecycle-module**
Deletes a lifecycle module.

**deploy**
Deploys an enterprise application, web application, EJB module, connector module, or application client module. If the component is already deployed or already exists, you can forcefully redeploy if you set the **--force** option to **true**. A directory can also be deployed. Supported in remote mode only. For usage instructions, see To Deploy an Application or Module.

**deploydir**
This subcommand is deprecated. Use the deploy subcommand instead.

**disable**
Immediately deactivates the named application or module. If the component has not been deployed, an error message is returned. Supported in remote mode only. For usage instructions, see To Disable an Application or Module.
enable
Enables the specified application or module. If the component has not been deployed, an error message is returned. If the component is already enabled, then it is re-enabled. Supported in remote mode only. For usage instructions, see To Enable an Application or Module.

get-client-stubs
Gets the client stubs JAR file for an application client module or an application containing the application client module, from the server machine to the local directory. For usage instructions, see EJB Module Deployment Guidelines.

list-applications
Lists deployed Java EE applications and modules. Optionally lists subcomponents and scoped resources. If the --type option is not specified, all applications and modules are listed. Supported in remote mode only. For usage instructions, see To List Deployed Applications or Modules.

list-application-refs
Lists Java EE applications and modules deployed on the specified target server instance or cluster.

list-libraries
Lists library JAR files that have been added to GlassFish Server. You can specify whether to list libraries in the Common class loader directory, the Java optional package directory, or the application-specific class loader directory.

list-lifecycle-modules
Lists lifecycle modules.

list-components
This subcommand is deprecated. Use the list-applications subcommand instead.

list-sub-components
Lists EJBs or servlets in a deployed module or in a module of the deployed application. If a module is not identified, all modules are listed. To display a specific module in an application, you must specify the module name and the --appname option. Supported in remote mode only. For usage instructions, see To List Deployed Applications or Modules.

list-web-context-param
Lists servlet context-initialization parameters of a deployed web application or module. Supported in remote mode only. For usage instructions, see To List Web Context Parameters.

list-web-env-entry
Lists environment entries for a deployed web application or module. Supported in remote mode only. For usage instructions, see To List Web Environment Entries.

redeploy
Overwrites an application or module that is already deployed. Supported in remote mode only. For usage instructions, see To Redeploy an Application or Module.

remove-library
Removes one or more library JAR files from GlassFish Server. You can specify whether the libraries are removed from the Common class loader directory, the Java optional package directory, or the application-specific class loader directory.
**set-web-context-param**
Sets a servlet context-initialization parameter of a deployed web application or module. Supported in remote mode only. For usage instructions, see To Set a Web Context Parameter.

**set-web-env-entry**
Sets an environment entry for a deployed web application or module. Supported in remote mode only. For usage instructions, see To Set a Web Environment Entry.

**show-component-status**
Shows the status of a deployed component. The possible statuses include enabled or disabled. Supported in remote mode only. For usage instructions, see To List Deployed Applications or Modules.

**undeploy**
Uninstalls the specified deployed application or module. Supported in remote mode only. For usage instructions, see To Undeploy an Application or Module.

**unset-web-context-param**
Unsets a servlet context-initialization parameter of a deployed web application or module. Supported in remote mode only. For usage instructions, see To Unset a Web Context Parameter.

**unset-web-env-entry**
Unsets an environment entry for a deployed web application or module. Supported in remote mode only. For usage instructions, see To Unset a Web Environment Entry.
GlassFish Server Deployment Descriptor Files

This appendix describes the element hierarchies in the GlassFish Server deployment descriptors that are included in this release of the GlassFish Server Open Source Edition software.

The following topics are addressed here:

- About the GlassFish Server Deployment Descriptors
- The glassfish-application.xml File
- The glassfish-web.xml File
- The glassfish-ejb-jar.xml File
- The sun-cmp-mappings.xml File
- The glassfish-application-client.xml file
- The sun-acc.xml File
- The glassfish-resources.xml File
- WebLogic Server Deployment Descriptor Support in GlassFish Server

About the GlassFish Server Deployment Descriptors

Each deployment descriptor XML file has a corresponding Document Type Definition (DTD) file, which defines the elements, data, and attributes that the deployment descriptor file can contain. For example, the glassfish-application_6_0-1.dtd file defines the structure of the glassfish-application.xml file. The DTD files for the GlassFish Server deployment descriptors are located in the as-install/lib/dtds directory.

The GlassFish Server deployment descriptor files must be readable and writable by the file owners. In each deployment descriptor file, subelements must be defined in the order in which they are listed under each Subelements heading, unless otherwise noted. For general information about DTD files and XML, see the XML specification at http://www.w3.org/TR/REC-xml.

**Note:** Do not edit the DTD files; their contents change only with new versions of GlassFish Server.

The following table lists the GlassFish Server deployment descriptors and their DTD files.
The glassfish-application.xml File

**Table B–1**  GlassFish Server Deployment Descriptors and DTDs

<table>
<thead>
<tr>
<th>Deployment Descriptor</th>
<th>DTD File</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>glassfish-application.xml</td>
<td>glassfish-application_6_0-1.dtd</td>
<td>Configures an entire Java EE application (EAR file).</td>
</tr>
<tr>
<td>glassfish-web.xml</td>
<td>glassfish-web-app_3_0-1.dtd</td>
<td>Configures a web application (WAR file).</td>
</tr>
<tr>
<td>glassfish-ejb-jar.xml</td>
<td>glassfish-ejb-jar_3_1-1.dtd</td>
<td>Configures an enterprise bean (EJB JAR file).</td>
</tr>
<tr>
<td>sun-cmp-mappings.xml</td>
<td>sun-cmp-mapping_1_2.dtd</td>
<td>Configures container-managed persistence for an EJB 2.0 or 2.1 entity bean.</td>
</tr>
<tr>
<td>glassfish-application-client.</td>
<td>glassfish-application-client_6_0-1.dtd</td>
<td>Configures an Application Client Container (ACC) client (JAR file).</td>
</tr>
<tr>
<td>xml</td>
<td>sun-application-client-container_1_2.dtd</td>
<td>Configures the Application Client Container. This is more of a configuration file than a deployment descriptor. GlassFish Server provides a default file in the domain-dir/config directory. Specifying a different file is optional.</td>
</tr>
<tr>
<td>sun-acc.xml</td>
<td>sun-application-client-container_1_2.dtd</td>
<td></td>
</tr>
<tr>
<td>glassfish-resources.xml</td>
<td>glassfish-resources_1_5.dtd</td>
<td>Configures application-scoped resources.</td>
</tr>
</tbody>
</table>

**Note:** The sun-application.xml, sun-web.xml, sun-ejb-jar.xml, sun-application-client.xml, and sun-resources.xml deployment descriptors are supported for backward compatibility.

The **glassfish-application.xml** File

The glassfish-application.xml file configures an entire Java EE application (EAR file). The element hierarchy is as follows:

```
glassfish-application
  .  web
    .  web-uri
    .  context-root
    .  pass-by-reference
    .  unique-id
    .  security-role-mapping
      .  role-name
      .  principal-name
      .  group-name
      .  realm
    .  ejb-ref
      .  ejb-ref-name
      .  jndi-name
      .  resource-ref
      .  res-ref-name
      .  jndi-name
      .  default-resource-principal
      .  .  .  name
      .  .  .  password
      .  resource-env-ref
```
The glassfish-web.xml File

Here is a sample glassfish-application.xml file:

```xml
<![DOCTYPE glassfish-application PUBLIC "-//GlassFish.org//DTD GlassFish Application Server 3.1 Java EE Application 6.0//EN" "http://glassfish.org/dtds/glassfish-application_6_0-1.dtd">
<glassfish-application>
  <unique-id>67488732739338240</unique-id>
</glassfish-application>
```

The glassfish-web.xml File

The glassfish-web.xml file configures a web application (WAR file). The element hierarchy is as follows:

glassfish-web-app
The glassfish-web.xml File

- context-root
- security-role-mapping
  - role-name
  - principal-name
  - group-name
- servlet
  - servlet-name
  - principal-name
  - webservice-endpoint
    - port-component-name
    - endpoint-address-uri
  - login-config
    - auth-method
  - message-security-binding
    - message-security
      - message
        - java-method
          - method-name
          - method-params
          - operation-name
          - request-protection
          - response-protection
        - transport-guarantee
        - service-qname
        - tie-class
        - servlet-impl-class
        - debugging-enabled
        - property (with attributes)
          - description
          - idempotent-url-pattern
        - session-config
          - session-manager
            - manager-properties
          - property (with attributes)
            - description
          - store-properties
            - property (with attributes)
              - description
            - session-properties
            - property (with attributes)
              - description
            - cookie-properties
              - property (with attributes)
                - description
            - ejb-ref
              - ejb-ref-name
              - jndi-name
            - resource-ref
              - res-ref-name
              - jndi-name
              - default-resource-principal
                - name
                - password
            - resource-env-ref
              - resource-env-ref-name
              - jndi-name
            - service-ref
              - service-ref-name
              - port-info
The glassfish-web.xml File

GlassFish Server Deployment Descriptor Files

- service-endpoint-interface
- wsd1-port
- . namespaceURI
- . localpart
- . stub-property
- . name
- . value
- . call-property
- . name
- . value
- . message-security-binding
- . . message-security
- . . . java-method
- . . . . method-name
- . . . . . method-params
- . . . . . method-param
- . . . . operation-name
- . . . request-protection
- . . . response-protection
- . call-property
- . . name
- . . value
- . wsd1-override
- . . service-impl-class
- . . service-qname
- . . namespaceURI
- . . localpart
- . message-destination-ref
- . . message-destination-ref-name
- . . jndi-name
- cache
- . . cache-helper
- . . . property (with attributes)
- . . . . description
- . . . default-helper
- . . . property (with attributes)
- . . . . description
- . . property (with attributes)
- . . . description
- . . cache-mapping
- . . . servlet-name
- . . . url-pattern
- . . . cache-helper-ref
- . . . dispatcher
- . . timeout
- . . . refresh-field
- . . . http-method
- . . . key-field
- . . . constraint-field
- . . . . constraint-field-value
- class-loader
- . . property (with attributes)
- . . . description
- jsp-config
- locale-charset-info
- . . locale-charset-map
- . . parameter-encoding
- parameter-encoding
- property (with attributes)
Here is a sample `glassfish-web.xml` file:

```xml
<!DOCTYPE glassfish-web-app PUBLIC "-//GlassFish.org//DTD GlassFish Application Server 3.1 Servlet 3.0//EN" "http://glassfish.org/dtds/glassfish-web-app_3_0-1.dtd">
<glassfish-web-app>
  <session-config>
    <session-manager/>
  </session-config>
  <resource-ref>
    <res-ref-name>mail/Session</res-ref-name>
    <jndi-name>mail/Session</jndi-name>
  </resource-ref>
  <jsp-config/>
</glassfish-web-app>
```

### The `glassfish-ejb-jar.xml` File

The `glassfish-ejb-jar.xml` file configures an enterprise bean (EJB JAR file). The element hierarchy is as follows:

```
glassfish-ejb-jar
  .  security-role-mapping
    .  role-name
    .  principal-name
    .  group-name
  enterprise-beans
    .  name
    .  unique-id
  ejb
    .  ejb-name
    .  jndi-name
    .  ejb-ref
      .  .  ejb-ref-name
      .  .  jndi-name
      .  .  resource-ref
      .  .  res-ref-name
      .  .  jndi-name
      .  .  default-resource-principal
        .  .  name
        .  .  password
        .  .  resource-env-ref
        .  .  resource-env-ref-name
        .  .  jndi-name
        .  .  service-ref
        .  .  service-ref-name
        .  .  port-info
        .  .  service-endpoint-interface
```
The glassfish-ejb-jar.xml File

- wsd1-port
- namespaceURI
- localpart
- stub-property
- name
- value
- call-property
- name
- value
- message-security-binding
- message-security
- message
- java-method
- method-name
- method-params
- method-param
- operation-name
- request-protection
- response-protection
- call-property
- name
- value
- wsd1-override
- service-impl-class
- service-qname
- namespaceURI
- localpart
- message-destination-ref
- message-destination-ref-name
- jndi-name
- pass-by-reference
- cmp
- mapping-properties
- is-one-one-cmp
- one-one-finders
- finder
- method-name
- query-params
- query-filter
- query-variables
- query-ordering
- prefetch-disabled
- query-method
- method-name
- method-params
- method-param
- principal
- name
- mdb-connection-factory
- jndi-name
- default-resource-principal
- name
- password
- jms-durable-subscription-name
- jms-max-messages-load
- ior-security-config
- transport-config
- integrity
- confidentiality
- establish-trust-in-target
. . . . . . establish-trust-in-client
. . . . . . as-context
. . . . . . auth-method
. . . . . . realm
. . . . . . required
. . . . . . sas-context
. . . . . . caller-propagation
. . . . is-read-only-bean
. . . refresh-period-in-seconds
. . commit-option
. . cmt-timeout-in-seconds
. . use-thread-pool-id
. . gen-classes
. . . . remote-impl
. . . . local-impl
. . . . remote-home-impl
. . . . local-home-impl
. . . . bean-pool
. . . . steady-pool-size
. . . . resize-quantity
. . . . max-pool-size
. . . . pool-idle-timeout-in-seconds
. . . . max-wait-time-in-millis
. . . . bean-cache
. . . . max-cache-size
. . . . resize-quantity
. . . . is-cache-overflow-allowed
. . . . cache-idle-timeout-in-seconds
. . . . removal-timeout-in-seconds
. . . . victim-selection-policy
. . . . mdb-resource-adapter
. . . . resource-adapter-mid
. . . . activation-config
. . . . . . description
. . . . . . . activation-config-property
. . . . . . . . activation-config-property-name
. . . . . . . . activation-config-property-value
. . . . webservice-endpoint
. . . . . . port-component-name
. . . . . . endpoint-address-uri
. . . . login-config
. . . . . . . auth-method
. . . . . . . realm
. . . . message-security-binding
. . . . . . . message-security
. . . . . . . . message
. . . . . . . . . java-method
. . . . . . . . . . method-name
. . . . . . . . . . . method-params
. . . . . . . . . . . . method-param
. . . . . . . . . . . . . operation-name
. . . . . . . . . . . . . request-protection
. . . . . . . . . . . . . response-protection
. . . . . . transport-guarantee
. . . . . . service-qname
. . . . . tie-class
. . . . . servlet-impl-class
. . . . debugging-enabled
. . . . property {with subelements}
. . . . . name
The glassfish-ejb-jar.xml File

Here is a sample glassfish-ejb-jar.xml file:

```xml
<!DOCTYPE glassfish-ejb-jar PUBLIC "-//GlassFish.org//DTD GlassFish Application Server 3.1 EJB 3.1//EN" "http://glassfish.org/dtds/glassfish-ejb-jar_3_1-1.dtd">

Note: If any configuration information for an enterprise bean is not specified in the glassfish-ejb-jar.xml file, it defaults to a corresponding setting in the EJB container if an equivalency exists.
The sun-cmp-mappings.xml File

The sun-cmp-mappings.xml file configures container-managed persistence for an EJB 2.0 or 2.1 entity bean. The element hierarchy is as follows:

sun-cmp-mappings
 . sun-cmp-mapping
   . schema
   . entity-mapping
     . ejb-name
     . table-name
     . cmp-field-mapping
       . field-name
       . column-name
       . read-only
       . fetched-with
         . default
         . level
         . named-group
         . none
     . cmr-field-mapping
       . cmr-field-name
       . column-pair
       . column-name
       . fetched-with
         . default
         . level
         . named-group
         . none
     . secondary-table
       . table-name
Here is a sample database schema definition:

create table TEAMEJB {
    TEAMID varchar2(256) not null,
    NAME varchar2(120) null,
    CITY char(30) not null,
    LEAGUEEJB_LEAGUEID varchar2(256) null,
    constraint PK_TEAMEJB primary key (TEAMID)
}

create table PLAYEREJB {
    POSITION varchar2(15) null,
    PLAYERID varchar2(256) not null,
    NAME char(64) null,
    SALARY number(10, 2) not null,
    constraint PK_PLAYEREJB primary key (PLAYERID)
}

create table LEAGUEEJB {
    LEAGUEID varchar2(256) not null,
    NAME varchar2(256) null,
    SPORT varchar2(256) null,
    constraint PK_LEAGUEEJB primary key (LEAGUEID)
}

create table PLAYEREJBTEAMEJB {
    PLAYEREJB_PLAYERID varchar2(256) null,
    TEAMEJB_TEAMID varchar2(256) null
}

alter table TEAMEJB
    add constraint FK_LEAGUE foreign key (LEAGUEEJB_LEAGUEID)
    references LEAGUEEJB (LEAGUEID)

alter table PLAYEREJBTEAMEJB
    add constraint FK_TEAMS foreign key (PLAYEREJB_PLAYERID)
    references PLAYEREJB (PLAYERID)

alter table PLAYEREJBTEAMEJB
    add constraint FK_PLAYERS foreign key (TEAMEJB_TEAMID)
    references TEAMEJB (TEAMID)

Here is a corresponding sample sun-cmp-mappings.xml file:

```xml
<?xml version='1.0' encoding='UTF-8'?>
<sun-cmp-mappings>
  <sun-cmp-mapping>
    <schema>Roster</schema>
    <entity-mapping>
      <ejb-name>TeamEJB</ejb-name>
      <table-name>TEAMEJB</table-name>
      <cmp-field-mapping>
        <field-name>teamId</field-name>
        <column-name>TEAMEJB.TEAMID</column-name>
      </cmp-field-mapping>
    </entity-mapping>
  </sun-cmp-mapping>
</sun-cmp-mappings>
```
The sun-cmp-mappings.xml File

```xml
<cmp-field-mapping>
  <field-name>name</field-name>
  <column-name>TEAMEJB.NAME</column-name>
</cmp-field-mapping>
<cmp-field-mapping>
  <field-name>city</field-name>
  <column-name>TEAMEJB.CITY</column-name>
</cmp-field-mapping>
<cmr-field-mapping>
  <cmr-field-name>league</cmr-field-name>
  <column-pair>
    <column-name>TEAMEJB.LEAGUEEJB_LEAGUEID</column-name>
    <column-name>LEAGUEEJB.LEAGUEID</column-name>
  </column-pair>
  <fetched-with>
    <none/>
  </fetched-with>
</cmr-field-mapping>
<cmr-field-mapping>
  <cmr-field-name>players</cmr-field-name>
  <column-pair>
    <column-name>TEAMEJB.TEAMID</column-name>
    <column-name>PLAYEREJBTEAMEJB.TEAMEJB_TEAMID</column-name>
  </column-pair>
  <column-pair>
    <column-name>PLAYEREJBTEAMEJB.PLAYEREJB_PLAYERID</column-name>
    <column-name>PLAYEREJB.PLAYERID</column-name>
  </column-pair>
  <fetched-with>
    <none/>
  </fetched-with>
</cmr-field-mapping>
</entity-mapping>
<entity-mapping>
  <ejb-name>PlayerEJB</ejb-name>
  <table-name>PLAYEREJB</table-name>
  <cmp-field-mapping>
    <field-name>position</field-name>
    <column-name>PLAYEREJB.POSITION</column-name>
  </cmp-field-mapping>
  <cmp-field-mapping>
    <field-name>playerId</field-name>
    <column-name>PLAYEREJB.PLAYERID</column-name>
  </cmp-field-mapping>
  <cmp-field-mapping>
    <field-name>name</field-name>
    <column-name>PLAYEREJB.NAME</column-name>
  </cmp-field-mapping>
  <cmp-field-mapping>
    <field-name>salary</field-name>
    <column-name>PLAYEREJB.SALARY</column-name>
  </cmp-field-mapping>
  <cmr-field-mapping>
    <cmr-field-name>teams</cmr-field-name>
    <column-pair>
      <column-name>PLAYEREJB.PLAYERID</column-name>
      <column-name>PLAYEREJBTEAMEJB.PLAYEREJB_PLAYERID</column-name>
    </column-pair>
    <column-pair>
      <column-name>PLAYEREJBTEAMEJB.PLAYEREJB_PLAYERID</column-name>
      <column-name>PLAYEREJB.PLAYERID</column-name>
    </column-pair>
  </cmr-field-mapping>
</entity-mapping>
```
The glassfish-application-client.xml file

The glassfish-application-client.xml file configures an Application Client Container (ACC) client (JAR file). The element hierarchy is as follows:

glassfish-application-client
  .  ejb-ref
    .  ejb-ref-name
    .  jndi-name
    .  resource-ref
    .  res-ref-name
    .  jndi-name
    .  default-resource-principal
      .  .  name
      .  .  password
      .  resource-env-ref
    .  resource-env-ref-name
    .  jndi-name
    .  service-ref
    .  service-ref-name
    .  port-info
    .  .  service-endpoint-interface
The sun-acc.xml File

The sun-acc.xml file configures the Application Client Container. This is more of a configuration file than a deployment descriptor. GlassFish Server provides a default file in the domain-dir/config directory. Specifying a different file is optional. The element hierarchy is as follows:

Here is a sample glassfish-application-client.xml file:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE glassfish-application-client PUBLIC "-//GlassFish.org//DTD GlassFish Application Server 3.1 Application Client 6.0//EN" "http://glassfish.org/dtads/glassfish-application-client_6_0-1.dtd">
<glassfish-application-client>
  <message-destination-ref>
    <message-destination-ref-name>ClientQueue</message-destination-ref-name>
    <jndi-name>jms/security_mdb_OutQueue</jndi-name>
  </message-destination-ref>
</glassfish-application-client>
```
client-container
  .  target-server
  .  .  description
  .  .  security
  .  .  .  ssl
  .  .  .  .  cert-db
  .  .  .  auth-realm
  .  .  .  .  property (with attributes)
  .  .  .  client-credential
  .  .  .  property (with attributes)
  .  log-service
  .  .  property (with attributes)
  .  message-security-config
  .  .  provider-config
  .  .  .  request-policy
  .  .  .  response-policy
  .  .  .  property (with attributes)
  .  property (with attributes)
WebLogic Server Deployment Descriptor Support in GlassFish Server

GlassFish Server offers limited support for the `weblogic-application.xml`, `weblogic.xml`, and `weblogic-webservices.xml` deployment descriptor files.

The only element in `weblogic-application.xml` that GlassFish Server supports is `security`. The equivalent element in the `glassfish-application.xml` file is `security-role-mapping`.

The elements of `weblogic.xml` that GlassFish Server supports are explained in the following table.

<table>
<thead>
<tr>
<th><code>weblogic.xml</code> Element Name</th>
<th>GlassFish Server Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>role-name under security-role-assignment</td>
<td>role-name under security-role-mapping <code>glassfish-web.xml</code> equivalent</td>
</tr>
<tr>
<td>principal-name under security-role-assignment</td>
<td>principal-name under security-role-mapping <code>glassfish-web.xml</code> equivalent</td>
</tr>
<tr>
<td>resource-description</td>
<td>resource-ref <code>glassfish-web.xml</code> equivalent, but resource-link not supported</td>
</tr>
<tr>
<td>resource-env-description</td>
<td>resource-env-ref <code>glassfish-web.xml</code> equivalent, but resource-link not supported</td>
</tr>
<tr>
<td>ejb-reference-description</td>
<td>ejb-ref <code>glassfish-web.xml</code> equivalent</td>
</tr>
<tr>
<td>service-reference-description</td>
<td>service-ref <code>glassfish-web.xml</code> equivalent</td>
</tr>
<tr>
<td>timeout-secs under session-descriptor</td>
<td><code>timeoutSeconds</code> property of <code>session-properties </code> <code>glassfish-web.xml</code> equivalent</td>
</tr>
<tr>
<td>invalidation-interval-secs under session-descriptor</td>
<td><code>reapIntervalSeconds</code> property of <code>manager-properties </code> <code>glassfish-web.xml</code> equivalent</td>
</tr>
<tr>
<td>max-in-memory-sessions under session-descriptor</td>
<td><code>maxSessions</code> property of <code>manager-properties </code> <code>glassfish-web.xml</code> equivalent</td>
</tr>
<tr>
<td>persistent-store-dir under session-descriptor</td>
<td>directory property of <code>store-properties </code> <code>glassfish-web.xml</code> equivalent</td>
</tr>
<tr>
<td>prefer-web-inf-classes under container-descriptor</td>
<td>delegate attribute of <code>class-loader </code> <code>glassfish-web.xml</code> equivalent</td>
</tr>
<tr>
<td>context-root</td>
<td><code>context-root </code> <code>glassfish-web.xml</code> equivalent</td>
</tr>
<tr>
<td>cookies-enabled under session-descriptor</td>
<td>Servlet 3.0</td>
</tr>
<tr>
<td>cookie-name under session-descriptor</td>
<td>Servlet 3.0</td>
</tr>
<tr>
<td>cookie-path under session-descriptor</td>
<td>Servlet 3.0</td>
</tr>
<tr>
<td>cookie-domain under session-descriptor</td>
<td>Servlet 3.0</td>
</tr>
<tr>
<td>cookie-comment under session-descriptor</td>
<td>Servlet 3.0</td>
</tr>
</tbody>
</table>
The elements of `weblogic-webservices.xml` that GlassFish Server supports are explained in the following table.

<table>
<thead>
<tr>
<th><code>weblogic-webservices.xml</code> Element Name</th>
<th>GlassFish Server Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cookie-secure</code> under <code>session-descriptor</code></td>
<td>Servlet 3.0</td>
</tr>
<tr>
<td><code>cookie-max-age-secs</code> under <code>session-descriptor</code></td>
<td>Servlet 3.0</td>
</tr>
<tr>
<td><code>cookie-http-only</code> under <code>session-descriptor</code></td>
<td>Servlet 3.0</td>
</tr>
<tr>
<td><code>url-rewriting-enabled</code> under <code>session-descriptor</code></td>
<td>Servlet 3.0</td>
</tr>
<tr>
<td><code>persistent-store-cookie-name</code> under <code>session-descriptor</code></td>
<td>Cookie-based persistence is supported</td>
</tr>
<tr>
<td><code>keepgenerated</code> under <code>jsp-descriptor</code></td>
<td>keepgenerated init parameter of JspServlet</td>
</tr>
<tr>
<td><code>working-dir</code> under <code>jsp-descriptor</code></td>
<td>scratchdir init parameter of JspServlet</td>
</tr>
<tr>
<td><code>compress-html-template</code> under <code>jsp-descriptor</code></td>
<td>trimSpaces init parameter of JspServlet</td>
</tr>
<tr>
<td><code>index-directory-enabled</code> under <code>container-descriptor</code></td>
<td>listings init parameter of DefaultServlet</td>
</tr>
<tr>
<td><code>index-directory-sort-by</code> under <code>container-descriptor</code></td>
<td>sortedBy init parameter of DefaultServlet</td>
</tr>
<tr>
<td><code>save-sessions-enabled</code> under <code>container-descriptor</code></td>
<td>Same as <code>asadmin redeploy --keepstate=true</code> or keep-state in <code>glassfish-web.xml</code></td>
</tr>
<tr>
<td><code>run-as-principal-name</code> under <code>servlet-descriptor</code></td>
<td>principal-name under servlet <code>glassfish-web.xml</code> equivalent</td>
</tr>
</tbody>
</table>

The use of this element is limited, because the container can find out if the type is JAX-WS or JAX-RPC based on presence of JSR 181 annotations.

<table>
<thead>
<tr>
<th><code>weblogic-webservices.xml</code> Element Name</th>
<th>GlassFish Server Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>wsdl-publish-file</code></td>
<td>Same as <code>wsdl-publish-location</code> in <code>glassfish-web.xml</code></td>
</tr>
<tr>
<td><code>service-endpoint-address</code></td>
<td>Similar to <code>endpoint-address-uri</code> in <code>glassfish-web.xml</code>, except that <code>webservice-contextpath</code> and <code>webservice-serviceuri</code> are specified separately</td>
</tr>
<tr>
<td><code>j2ee:login-config</code></td>
<td>Same as <code>login-config</code> in <code>glassfish-web.xml</code></td>
</tr>
<tr>
<td><code>j2ee:transport-guarantee</code></td>
<td>Same as <code>transport-guarantee</code> in <code>glassfish-web.xml</code></td>
</tr>
<tr>
<td><code>exposed under wsdl</code></td>
<td>Accepts true or false, defaults to true. Controls the publishing of WSDL to clients.</td>
</tr>
<tr>
<td><code>stream-attachments</code></td>
<td>Accepts true or false, defaults to true. Only for JAX-RPC based on presence of JSR 181 annotations.</td>
</tr>
<tr>
<td><code>validate-request</code></td>
<td>Accepts true or false, defaults to false. Only for JAX-RPC based on presence of JSR 181 annotations.</td>
</tr>
<tr>
<td><code>http-response-buffersize</code></td>
<td>Property of <code>ReliabilityMessagingFeature</code> configuration, similar to <code>ReliableMessagingFeature.setDestinationBufferQuota()</code></td>
</tr>
</tbody>
</table>

Table B–3  `weblogic-webservices.xml` Support in GlassFish Server
### Table B–3  (Cont.)  `weblogic-webservices.xml` Support in GlassFish Server

<table>
<thead>
<tr>
<th><code>weblogic-webservices.xml</code> Element Name</th>
<th>GlassFish Server Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>reliability-config</td>
<td>Partially supported. Subelements map to Metro’s ReliableMessagingFeature.</td>
</tr>
<tr>
<td>inactivity-timeout under reliability-config</td>
<td>Maps to ReliableMessagingFeature.getSequenceInactivityTimeout()</td>
</tr>
<tr>
<td>base-retransmission-interval under reliability-config</td>
<td>Maps to ReliableMessagingFeature.getMessageRetransmissionInterval()</td>
</tr>
<tr>
<td>retransmission-exponential-backoff under reliability-config</td>
<td>Maps to ReliableMessagingFeature.getRetransmissionBackoffAlgorithm(). Returns enum values, one of them is exponential.</td>
</tr>
<tr>
<td>acknowledgement-interval under reliability-config</td>
<td>Maps to ReliableMessagingFeature.getAcknowledgementTransmissionInterval()</td>
</tr>
<tr>
<td>sequence-expiration under reliability-config</td>
<td>Maps to ReliableMessagingFeature.getSequenceInactivityTimeout(). In WebLogic Server this value applies regardless of activity. In Metro it applies only to inactive sequences.</td>
</tr>
<tr>
<td>buffer-retry-count under reliability-config</td>
<td>Maps to ReliableMessagingFeature.getMaxMessageRetransmissionCount()</td>
</tr>
<tr>
<td>buffer-retry-delay under reliability-config</td>
<td>Maps to ReliableMessagingFeature.getMessageRetransmissionInterval()</td>
</tr>
</tbody>
</table>
Elements of the GlassFish Server Deployment Descriptors

This appendix describes the elements of the GlassFish Server Open Source Edition deployment descriptors.

activation-config

Specifies an activation configuration, which includes the runtime configuration properties of the message-driven bean in its operational environment. For example, this can include information about the name of a physical JMS destination. Matches and overrides the activation-config element in the ejb-jar.xml file.

Superelements

mdb-resource-adapter (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the activation-config element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>zero or one</td>
<td>Specifies a text description of the activation configuration.</td>
</tr>
<tr>
<td>activation-config-property</td>
<td>one or more</td>
<td>Specifies an activation configuration property.</td>
</tr>
</tbody>
</table>

activation-config-property

Specifies the name and value of an activation configuration property.

Superelements

activation-config (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the activation-config-property element.
### activation-config-property-name

Specifies the name of an activation configuration property.

**Superelements**

activation-config-property (glassfish-ejb-jar.xml)

**Subelements**

none - contains data

### activation-config-property-value

Specifies the value of an activation configuration property.

**Superelements**

activation-config-property (glassfish-ejb-jar.xml)

**Subelements**

none - contains data

### admin-object-resource

Defines an administered object for an inbound resource adapter.

**Superelements**

resources (glassfish-resources.xml)

**Subelements**

The following table describes subelements for the admin-object-resource element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>zero or one</td>
<td>Contains a text description of this element.</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property or a variable.</td>
</tr>
</tbody>
</table>

**Attributes**

The following table describes attributes for the admin-object-resource element.
Properties

Properties of the admin-object-resource element are the names of setter methods of the class referenced by the adminobject-class of the ra.xml file. Some of the property names can be specified in the adminobjectType element.

as-context

Specifies the authentication mechanism used to authenticate the client.

Superelements

ior-security-config (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the as-context element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auth-method</td>
<td>only one</td>
<td>Specifies the authentication method. The only supported value is USERNAME_PASSWORD.</td>
</tr>
<tr>
<td>realm</td>
<td>only one</td>
<td>Specifies the realm in which the user is authenticated.</td>
</tr>
<tr>
<td>required</td>
<td>only one</td>
<td>Specifies whether the authentication method specified in the auth-method element must be used for client authentication.</td>
</tr>
</tbody>
</table>

archive-name

Specifies the name of the archive file. The value of the archive-name element is used to derive the default application name when display-name is not present in the application.xml file. The default application name is the archive-name value minus the file extension. For example, if archive-name is foo.ear, the default application name is foo.

Superelements

glassfish-application (glassfish-application.xml)
**auth-method**

Specifies the authentication method.

If the parent element is `as-context`, the only supported value is `USERNAME_PASSWORD`.

If the parent element is `login-config`, specifies the authentication mechanism for the web service endpoint. As a prerequisite to gaining access to any web resources protected by an authorization constraint, a user must be authenticated using the configured mechanism.

**Superelements**

- `login-config` (glassfish-web.xml), `as-context` (glassfish-ejb-jar.xml)

**Subelements**

- none - contains data

**auth-realm**

JAAS is available on the ACC. Defines the optional configuration for a JAAS authentication realm. Authentication realms require provider-specific properties, which vary depending on what a particular implementation needs. For more information about how to define realms, see "Realm Configuration" in GlassFish Server Open Source Edition Application Development Guide.

**Superelements**

- `client-container` (sun-acc.xml)

**Subelements**

The following table describes subelements for the `auth-realm` element.

<table>
<thead>
<tr>
<th>Table C–6 auth-realm subelement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
</tr>
<tr>
<td>property (with attributes)</td>
</tr>
</tbody>
</table>

**Attributes**

The following table describes attributes for the `auth-realm` element.

<table>
<thead>
<tr>
<th>Table C–7 auth-realm attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attribute</strong></td>
</tr>
<tr>
<td>name</td>
</tr>
<tr>
<td>classname</td>
</tr>
</tbody>
</table>

**Example**

Here is an example of the default file realm:
<auth-realm name="file"
    classname="com.sun.enterprise.security.auth.realm.file.FileRealm">
    <property name="file" value="/domain-dir/config/keyfile"/>
    <property name="jaas-context" value="fileRealm"/>
</auth-realm>

Which properties an auth-realm element uses depends on the value of the auth-realm element's name attribute. The file realm uses file and jaas-context properties. Other realms use different properties. See "Realm Configuration" in GlassFish Server Open Source Edition Application Development Guide.

**backend-principal**

Specifies the user name and password required by the Enterprise Information System (EIS).

**Superelements**

security-map (glassfish-resources.xml)

**Subelements**

none

**Attributes**

The following table describes attributes for the backend-principal element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user-name</td>
<td>none</td>
<td>Specifies the user name required by the EIS.</td>
</tr>
<tr>
<td>password</td>
<td>none</td>
<td>(optional) Specifies the password required by the EIS, if any.</td>
</tr>
</tbody>
</table>

**bean-cache**

Specifies the entity bean cache properties. Used for entity beans and stateful session beans.

**Superelements**

ejb (glassfish-ejb-jar.xml)

**Subelements**

The following table describes subelements for the bean-cache element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>max-cache-size</td>
<td>zero or one</td>
<td>Specifies the maximum number of beans allowable in cache.</td>
</tr>
<tr>
<td>is-cache-overflow-allowed</td>
<td>zero or one</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>cache-idle-timeout-in-seconds</td>
<td>zero or one</td>
<td>Specifies the maximum time that a stateful session bean or entity bean is allowed to be idle in cache before being passivated. Default value is 10 minutes (600 seconds).</td>
</tr>
</tbody>
</table>
Example

```
<bean-cache>
  <max-cache-size>100</max-cache-size>
  <cache-resize-quantity>10</cache-resize-quantity>
  <removal-timeout-in-seconds>3600</removal-timeout-in-seconds>
  <victim-selection-policy>LRU</victim-selection-policy>
  <cache-idle-timeout-in-seconds>600</cache-idle-timeout-in-seconds>
  <removal-timeout-in-seconds>5400</removal-timeout-in-seconds>
</bean-cache>
```

**bean-pool**

Specifies the pool properties of stateless session beans, entity beans, and message-driven bean.

**Superelements**

ejb (glassfish-ejb-jar.xml)

**Subelements**

The following table describes subelements for the bean-pool element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>steady-pool-size</td>
<td>zero or one</td>
<td>Specifies the initial and minimum number of beans maintained in the pool. Default is 32.</td>
</tr>
<tr>
<td>resize-quantity</td>
<td>zero or one</td>
<td>Specifies the number of beans to be created if the pool is empty (subject to the max-pool-size limit). Values are from 0 to MAX_INTEGER.</td>
</tr>
<tr>
<td>max-pool-size</td>
<td>zero or one</td>
<td>Specifies the maximum number of beans in the pool. Values are from 0 to MAX_INTEGER. Default is to the EJB container value or 60.</td>
</tr>
<tr>
<td>max-wait-time-in-millis</td>
<td>zero or one</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>pool-idle-timeout-in-seconds</td>
<td>zero or one</td>
<td>Specifies the maximum time that a bean is allowed to be idle in the pool. After this time, the bean is removed. This is a hint to the server. Default time is 600 seconds (10 minutes).</td>
</tr>
</tbody>
</table>
Example

```xml
<bean-pool>
  <steady-pool-size>10</steady-pool-size>
  <resize-quantity>10</resize-quantity>
  <max-pool-size>100</max-pool-size>
  <pool-idle-timeout-in-seconds>600</pool-idle-timeout-in-seconds>
</bean-pool>
```

cache

Configures caching for web application components.

Superelements

glassfish-web-app (glassfish-web.xml)

Subelements

The following table describes subelements for the `cache` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cache-helper</td>
<td>zero or more</td>
<td>Specifies a custom class that implements the CacheHelper interface.</td>
</tr>
<tr>
<td>default-helper</td>
<td>zero or one</td>
<td>Allows you to change the properties of the default, built-in cache-helper class.</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a cache property, which has a name and a value.</td>
</tr>
<tr>
<td>cache-mapping</td>
<td>zero or more</td>
<td>Maps a URL pattern or a servlet name to its cacheability constraints.</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the `cache` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>max-entries</td>
<td>4096</td>
<td>(optional) Specifies the maximum number of entries the cache can contain. Must be a positive integer.</td>
</tr>
<tr>
<td>timeout-in-seconds</td>
<td>30</td>
<td>(optional) Specifies the maximum amount of time in seconds that an entry can remain in the cache after it is created or refreshed. Can be overridden by a timeout element.</td>
</tr>
<tr>
<td>enabled</td>
<td>true</td>
<td>(optional) Determines whether servlet and JSP caching is enabled.</td>
</tr>
</tbody>
</table>

Properties

The following table describes properties for the `cache` element.
### Cache Class Names

The following table lists possible values of the `cacheClassName` property.

**Table C–14  `cacheClassName` Values**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>com.sun.appserv.web.cache.LruCache</td>
<td>A bounded cache with an LRU (least recently used) cache replacement policy.</td>
</tr>
<tr>
<td>com.sun.appserv.web.cache.BaseCache</td>
<td>An unbounded cache suitable if the maximum number of entries is known.</td>
</tr>
<tr>
<td>com.sun.appserv.web.cache.BoundedMultiLruCache</td>
<td>A cache suitable for limiting the cache size by memory rather than number of entries. Uses the <code>MaxSize</code> property.</td>
</tr>
</tbody>
</table>

**Cache-helper**

Specifies a class that implements the `com.sun.appserv.web.cache.CacheHelper` interface.

**Superelements**

- `cache` *(glassfish-web.xml)*

**Subelements**

The following table describes subelements for the `cache-helper` element.

**Table C–15  `cache-helper` Subelements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property, which has a name and a value.</td>
</tr>
</tbody>
</table>

**Attributes**

The following table describes attributes for the `cache-helper` element.
cache-helper-ref

Specifies the name of the cache-helper used by the parent cache-mapping element.

Superelements

cache-mapping (glassfish-web.xml)

Subelements

none - contains data

cache-idle-timeout-in-seconds

Specifies the maximum time that a bean can remain idle in the cache. After this amount of time, the container can passivate this bean. A value of 0 specifies that beans never become candidates for passivation. Default is 600.

Applies to stateful session beans and entity beans.

Superelements

bean-cache (glassfish-ejb-jar.xml)

Subelements

none - contains data

cache-mapping

Maps a URL pattern or a servlet name to its cacheability constraints.

Superelements

cache (glassfish-web.xml)

Subelements

The following table describes subelements for the cache-mapping element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>default</td>
<td>Specifies a unique name for the helper class, which is referenced in the cache-mapping element.</td>
</tr>
<tr>
<td>class-name</td>
<td>none</td>
<td>Specifies the fully qualified class name of the cache helper, which must implement the com.sun.appserv.web.CacheHelper interface.</td>
</tr>
</tbody>
</table>
**call-property**

Specifies JAX-RPC property values that can be set on a `javax.xml.rpc.Call` object before it is returned to the web service client. The property names can be any properties supported by the JAX-RPC `Call` implementation.

**Superelements**

- `port-info`, `service-ref` (`glassfish-web.xml`, `glassfish-ejb-jar.xml`, `glassfish-application-client.xml`)

**Subelements**

The following table describes subelements for the `call-property` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>servlet-name</code></td>
<td>requires one servlet-name or url-pattern</td>
<td>Contains the name of a servlet.</td>
</tr>
<tr>
<td><code>url-pattern</code></td>
<td>requires one servlet-name or url-pattern</td>
<td>Contains a servlet URL pattern for which caching is enabled.</td>
</tr>
<tr>
<td><code>cache-helper-ref</code></td>
<td>required if dispatcher, timeout, refresh-field, http-method, key-field, and constraint-field are not used</td>
<td>Contains the name of the <code>cache-helper</code> used by the parent cache-mapping element.</td>
</tr>
<tr>
<td><code>dispatcher</code></td>
<td>zero or one if cache-helper-ref is not used</td>
<td>Contains a comma-separated list of <code>RequestDispatcher</code> methods for which caching is enabled.</td>
</tr>
<tr>
<td><code>timeout</code></td>
<td>zero or one if cache-helper-ref is not used</td>
<td>Contains the <code>cache-mapping</code> specific maximum amount of time in seconds that an entry can remain in the cache after it is created or refreshed.</td>
</tr>
<tr>
<td><code>refresh-field</code></td>
<td>zero or one if cache-helper-ref is not used</td>
<td>Specifies a field that gives the application component a programmatic way to refresh a cached entry.</td>
</tr>
<tr>
<td><code>http-method</code></td>
<td>zero or more if cache-helper-ref is not used</td>
<td>Contains an HTTP method that is eligible for caching.</td>
</tr>
<tr>
<td><code>key-field</code></td>
<td>zero or more if cache-helper-ref is not used</td>
<td>Specifies a component of the key used to look up and extract cache entries.</td>
</tr>
<tr>
<td><code>constraint-field</code></td>
<td>zero or more if cache-helper-ref is not used</td>
<td>Specifies a cacheability constraint for the given url-pattern or servlet-name.</td>
</tr>
</tbody>
</table>

**caller-propagation**

Specifies whether the target accepts propagated caller identities. The values are `NONE`, `SUPPORTED`, or `REQUIRED`. 

---

C-10  GlassFish Server Open Source Edition 4.0 Application Deployment Guide
Superelements

sas-context (glassfish-ejb-jar.xml)

Subelements

none - contains data

cert-db

Not implemented. Included for backward compatibility only. Attribute values are ignored.

Superelements

security (sun-acc.xml)

Subelements

none

Attributes

The following table describes attributes for the cert-db element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>path</td>
<td>none</td>
<td>Specifies the absolute path of the certificate database.</td>
</tr>
<tr>
<td>password</td>
<td>none</td>
<td>Specifies the password to access the certificate database.</td>
</tr>
</tbody>
</table>

check-all-at-commit

This element is not implemented. Do not use.

Superelements

consistency (sun-cmp-mappings.xml)

check-modified-at-commit

Checks concurrent modification of fields in modified beans at commit time.

Superelements

consistency (sun-cmp-mappings.xml)

Subelements

none - element is present or absent

check-version-of-accessed-instances

Checks the version column of the modified beans.
Version consistency allows the bean state to be cached between transactions instead of read from a database. The bean state is verified by primary key and version column values. This occurs during a custom query (for dirty instances only) or commit (for both clean and dirty instances).

The version column must be a numeric type, and must be in the primary table. You must provide appropriate update triggers for this column.

**Superelements**

*consistency* (*sun-cmp-mappings.xml*)

**Subelements**

The following table describes subelements for the `check-version-of-accessed-instances` element.

<table>
<thead>
<tr>
<th>Table C–20</th>
<th>check-version-of-accessed-instances Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td>Required</td>
</tr>
<tr>
<td>column-name</td>
<td>only one</td>
</tr>
</tbody>
</table>

**checkpoint-at-end-of-method**

Specifies that the stateful session bean state is checkpointed, or persisted, after the specified methods are executed. The `availability-enabled` attribute of the parent `ejb` element must be set to `true`.

**Superelements**

*ejb* (*glassfish-ejb-jar.xml*)

**Subelements**

The following table describes subelements for the `checkpoint-at-end-of-method` element.

<table>
<thead>
<tr>
<th>Table C–21</th>
<th>checkpoint-at-end-of-method Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td>Required</td>
</tr>
<tr>
<td>method</td>
<td>one or more</td>
</tr>
</tbody>
</table>

**checkpointed-methods**


**Superelements**

*ejb* (*glassfish-ejb-jar.xml*)

**class-loader**

Configures the class loader for the web module.
Superelements

glassfish-web-app (glassfish-web.xml)

Subelements

The following table describes subelements for the class-loader element.

<table>
<thead>
<tr>
<th>Table C–22 class-loader Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
</tr>
<tr>
<td>property (with attributes)</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the class-loader element.

<table>
<thead>
<tr>
<th>Table C–23 class-loader Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute</td>
</tr>
<tr>
<td>extra-class-path</td>
</tr>
</tbody>
</table>
| delegate                           | true    | (optional) If true, the web module follows the standard class loader delegation model and delegates to its parent class loader first before looking in the local class loader. You must set this to true for a web module that accesses EJB components or that acts as a web service client or endpoint.

If false, the web module follows the delegation model specified in the Servlet specification and looks in its class loader before looking in the parent class loader. It's safe to set this to false only for a web module that does not interact with any other modules.

For a number of packages, including java.*, and javax.*, symbol resolution is always delegated to the parent class loader regardless of the delegate setting. This prevents applications from overriding core Java runtime classes or changing the API versions of specifications that are part of the Java EE platform. |
| dynamic-reload-interval            |         | (optional) Not implemented. Included for backward compatibility with previous Oracle Web Server versions. |

Note: If the delegate attribute is set to false, the class loader delegation behavior complies with the Servlet 2.4 specification, section 9.7.2. If set to its default value of true, classes and resources residing in container-wide library JAR files are loaded in preference to classes and resources packaged within the WAR file.

Portable programs that use this element should not be packaged with any classes or interfaces that are a part of the Java EE specification. The behavior of a program that includes such classes or interfaces in its WAR file is undefined.

Properties

The following table describes properties for the class-loader element.
client-container

Defines the GlassFish Server specific configuration for the application client container. This is the root element; there can only be one client-container element in a sun-acc.xml file. See The sun-acc.xml File.

Superelements

none

Subelements

The following table describes subelements for the client-container element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>target-server</td>
<td>one or more</td>
<td>Specifies the IIOP listener for the target server. Also specifies IIOP endpoints used for load balancing. If the GlassFish Server instance on which the application client is deployed participates in a cluster, GlassFish Server finds all currently active IIOP endpoints in the cluster automatically. However, a client should have at least two endpoints specified for bootstrapping purposes, in case one of the endpoints has failed. A listener or endpoint is in the form host:port, where the host is an IP address or host name, and the port specifies the port number.</td>
</tr>
<tr>
<td>auth-realm</td>
<td>zero or one</td>
<td>Specifies the optional configuration for JAAS authentication realm.</td>
</tr>
<tr>
<td>client-credential</td>
<td>zero or one</td>
<td>Specifies the default client credential that is sent to the server.</td>
</tr>
<tr>
<td>log-service</td>
<td>zero or one</td>
<td>Specifies the default log file and the severity level of the message.</td>
</tr>
<tr>
<td>message-security-config</td>
<td>zero or more</td>
<td>Specifies configurations for message security providers.</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property, which has a name and a value.</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the client-container element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>send-password</td>
<td>true</td>
<td>If true, specifies that client authentication credentials must be sent to the server. Without authentication credentials, all access to protected EJB components results in exceptions.</td>
</tr>
</tbody>
</table>

Properties

The following table describes properties for the client-container element.

Table C–24  class-loader Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ignoreHiddenJarFiles</td>
<td>false</td>
<td>If true, specifies that all JAR and ZIP files in the WEB-INF/lib directory that start with a period (.) are ignored by the class loader.</td>
</tr>
</tbody>
</table>
client-credential

Default client credentials that are sent to the server. If this element is present, the credentials are automatically sent to the server, without prompting the user for the user name and password on the client side.

Superelements

client-container (sun-acc.xml)

Subelements

The following table describes subelements for the client-credential element.

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>com.sun.appserv.iiop.endpoints</td>
<td>none</td>
<td>Specifies a comma-separated list of one or more IIOP endpoints used for load balancing. An IIOP endpoint is in the form host:port, where the host is an IP address or host name, and the port specifies the port number. Deprecated. Use target-server elements instead.</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the client-credential element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user-name</td>
<td>none</td>
<td>The user name used to authenticate the Application client container.</td>
</tr>
<tr>
<td>password</td>
<td>none</td>
<td>The password used to authenticate the Application client container.</td>
</tr>
<tr>
<td>realm</td>
<td>default realm for the domain (optional)</td>
<td>The realm (specified by name) where credentials are to be resolved.</td>
</tr>
</tbody>
</table>

cmp

Describes runtime information for a CMP entity bean object for EJB 1.1 and EJB 2.1 beans.

Superelements

ejb (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the cmp element.
The `cmp-field-mapping` element associates a field with one or more columns to which it maps. The column can be from a bean’s primary table or any defined secondary table. If a field is mapped to multiple columns, the column listed first in this element is used as a source for getting the value from the database. The columns are updated in the order they appear. There is one `cmp-field-mapping` element for each `cmp-field` element defined in the `ejb-jar.xml` file.

**Superelements**

<table>
<thead>
<tr>
<th>Superelements</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>entity-mapping</code> (sun-cmp-mappings.xml)</td>
</tr>
</tbody>
</table>

**Subelements**

The following table describes subelements for the `cmp-field-mapping` element.

Table C–30  `cmp` Subelements

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mapping-properties</td>
<td>zero or one</td>
<td>This element is not implemented.</td>
</tr>
<tr>
<td>is-one-one-cmp</td>
<td>zero or one</td>
<td>This element is not implemented.</td>
</tr>
<tr>
<td>one-one-finders</td>
<td>zero or one</td>
<td>Describes the finders for CMP 1.1 beans.</td>
</tr>
<tr>
<td>prefetch-disabled</td>
<td>zero or one</td>
<td>Disables prefetching of entity bean states for the specified query methods.</td>
</tr>
</tbody>
</table>

**cmp-field-mapping**

The `cmp-resource` element specifies the database to be used for storing CMP beans. For more information about this element, see "Configuring the CMP Resource" in GlassFish Server Open Source Edition Application Development Guide.

**Superelements**

<table>
<thead>
<tr>
<th>Superelements</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>enterprise-beans</code> (glassfish-ejb-jar.xml)</td>
</tr>
</tbody>
</table>

**Subelements**

The following table describes subelements for the `cmp-resource` element.
A container-managed relationship field has a name and one or more column pairs that define the relationship. There is one `cmr-field-mapping` element for each `cmr-field` element in the `ejb-jar.xml` file. A relationship can also participate in a fetch group.

**Superelements**

`entity-mapping` *(sun-cmp-mappings.xml)*

**Subelements**

The following table describes subelements for the `cmr-field-mapping` element.

| Table C–33  cmr-field-mapping Subelements |
|-----------------------------|-----------------------------|
| Element                    | Required | Description                                                                 |
| cmr-field-name             | only one | Specifies the Java identifier of a field. Must match the value of the cmr-field-name subelement of the cmr-field that is being mapped. |
| column-pair                | one or more | Specifies the pair of columns that determine the relationship between two database tables. |
| fetched-with               | zero or one | Specifies the fetch group for this CMR field's relationship. |

**cmr-field-name**

Specifies the Java identifier of a field. Must match the value of the `cmr-field-name` subelement of the `cmr-field` element in the `ejb-jar.xml` file.

**Superelements**

`cmr-field-mapping` *(sun-cmp-mappings.xml)*

**Subelements**

none - contains data
Overrides the Transaction Timeout setting of the Transaction Service for an individual bean. The default value, 0, specifies that the default Transaction Service timeout is used. If positive, this value is used for all methods in the bean that start a new container-managed transaction. This value is not used if the bean joins a client transaction.

**Superelements**

`ejb (glassfish-ejb-jar.xml)`

**Subelements**

none - contains data

**column-name**

Specifies the name of a column from the primary table, or the qualified table name (TABLE.COLUMN) of a column from a secondary or related table.

**Superelements**

`check-version-of-accessed-instances, cmp-field-mapping, column-pair (sun-cmp-mappings.xml)`

**Subelements**

none - contains data

**column-pair**

Specifies the pair of columns that determine the relationship between two database tables. Each column-pair must contain exactly two column-name subelements, which specify the column's names. The first column-name element names the table that this bean is mapped to, and the second column-name names the column in the related table.

**Superelements**

`cmr-field-mapping, secondary-table (sun-cmp-mappings.xml)`

**Subelements**

The following table describes subelements for the column-pair element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>column-name</td>
<td>two</td>
<td>Specifies the name of a column from the primary table, or the qualified table name (TABLE.COLUMN) of a column from a secondary or related table.</td>
</tr>
</tbody>
</table>

**commit-option**

Specifies the commit option used on transaction completion. Valid values for GlassFish Server are B or C. Default value is B. Applies to entity beans.
Superelements
ejb (glassfish-ejb-jar.xml)

Subelements
none - contains data

**compatibility**
Specifies the GlassFish Server release with which to be backward compatible in terms of JAR visibility requirements for applications. The current allowed value is v2, which refers to GlassFish Server version 2 or GlassFish Server version 9.1 or 9.1.1. Starting in Java EE 6, the Java EE specification imposes stricter requirements than Java EE 5 did on which JAR files can be visible to various modules within an EAR file. Setting this element to v2 removes these Java EE 6 and later restrictions.

Superelements
glassfish-application (glassfish-application.xml), glassfish-ejb-jar (glassfish-ejb-jar.xml)

Subelements
none - contains data

**confidentiality**
Specifies if the target supports privacy-protected messages. The values are NONE, SUPPORTED, or REQUIRED.

Superelements
transport-config (glassfish-ejb-jar.xml)

Subelements
none - contains data

**connector-connection-pool**
Defines a connector connection pool.

Superelements
resources (glassfish-resources.xml)

Subelements
The following table describes subelements for the connector-connection-pool element.

---

**Note:** Commit option A is not supported for this GlassFish Server release.
Attributes

The following table describes attributes for the `connector-connection-pool` element. Changing the following attributes requires a server restart or the redeployment or disabling and re-enabling of applications that refer to the resource:


<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>none</td>
<td>Specifies the name of the connection pool. A <code>connector-resource</code> element's pool-name attribute refers to this name.</td>
</tr>
<tr>
<td>resource-adapter-name</td>
<td>none</td>
<td>Specifies the name of the deployed connector module or application. If no name is specified during deployment, the name of the .rar file is used. If the resource adapter is embedded in an application, then it is app_name.rar_.name.</td>
</tr>
<tr>
<td>connection-definition-name</td>
<td>none</td>
<td>Specifies a unique name, identifying a resource adapter's connection-definition element in the ra.xml file. This is usually the connectionfactory-interface of the connection-definition element.</td>
</tr>
<tr>
<td>steady-pool-size</td>
<td>8</td>
<td>(optional) Specifies the initial and minimum number of connections maintained in the pool.</td>
</tr>
<tr>
<td>max-pool-size</td>
<td>32</td>
<td>(optional) Specifies the maximum number of connections that can be created to satisfy client requests.</td>
</tr>
<tr>
<td>max-wait-time-in-millis</td>
<td>60000</td>
<td>(optional) Specifies the amount of time, in milliseconds, that the caller is willing to wait for a connection. If 0, the caller is blocked indefinitely until a resource is available or an error occurs.</td>
</tr>
<tr>
<td>pool-resize-quantity</td>
<td>2</td>
<td>(optional) Specifies the number of idle connections to be destroyed if the existing number of connections is above the steady-pool-size (subject to the max-pool-size limit). This is enforced periodically at the idle-timeout-in-seconds interval. An idle connection is one that has not been used for a period of idle-timeout-in-seconds. When the pool size reaches steady-pool-size, connection removal stops.</td>
</tr>
<tr>
<td>idle-timeout-in-seconds</td>
<td>300</td>
<td>(optional) Specifies the maximum time that a connection can remain idle in the pool. After this amount of time, the pool can close this connection.</td>
</tr>
<tr>
<td>fail-all-connections</td>
<td>false</td>
<td>(optional) If true, closes all connections in the pool if a single validation check fails.</td>
</tr>
</tbody>
</table>
**Table C–36 (Cont.) connector-connection-pool Attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
</table>
| transaction-support        | none    | (optional) Specifies the transaction support for this connection pool. Overrides the transaction support defined in the resource adapter in a downward compatible way: supports a transaction level lower than or equal to the resource adapter's, but not higher. Allowed values in descending order are:  
  - XATransaction - Supports distributed transactions.  
  - LocalTransaction - Supports local transactions only.  
  - NoTransaction - No transaction support. |
| is-connection-validation-required | false  | (optional) Specifies whether connections have to be validated before being given to the application. If a resource's validation fails, it is destroyed, and a new resource is created and returned. |
| validate-atmost-once-period-in-seconds | 0      | Specifies the time interval within which a connection is validated at most once. Minimizes the number of validation calls. A value of zero allows unlimited validation calls. |
| connection-leak-timeout-in-seconds | 0      | Detects potential connection leaks by the application. A connection that is not returned back to the pool by the application within the specified period is assumed to be potentially leaking, and a stack trace of the caller is logged. A zero value disables leak detection. A nonzero value enables leak tracing. |
| connection-leak-reclaim     | false   | If true, the pool will reclaim a connection after connection-leak-timeout-in-seconds occurs. |
| connection-creation-retry-attempts | 0      | Specifies the number of attempts to create a new connection. |
| connection-creation-retry-interval-in-seconds | 10     | Specifies the time interval between attempts to create a connection when connection-creation-retry-attempts is greater than 0. |
| lazy-connection-enlistment | false   | If true, a connection is not enlisted in a transaction until it is used. If false, any connection object available to a transaction is enlisted in the transaction. |
| lazy-connection-association | false   | If true, a physical connection is not associated with a logical connection until it is used. If false, a physical connection is associated with a logical connection even before it is used. |
Most properties of the `connector-connection-pool` element are the names of setter methods of the `ManagedConnectionFactory` class element in the `ra.xml` file. Properties of the `connector-connection-pool` element override the `ManagedConnectionFactory` JavaBean configuration settings.

All but the last four properties in the following table are `connector-connection-pool` properties of `jmsra`, the resource adapter used to communicate with the Open Message Queue software. For a complete list of the available properties (called `administered object attributes` in the Message Queue software), see the `Open Message Queue Administration Guide`.

Changes to `connector-connection-pool` properties require a server restart.

### Table C–36 (Cont.) `connector-connection-pool` Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>associate-with-thread</td>
<td>false</td>
<td>If true, allows connections to be saved as ThreadLocal in the calling thread. Connections get reclaimed only when the calling thread dies or when the calling thread is not in use and the pool has run out of connections. If false, the thread must obtain a connection from the pool each time the thread requires a connection. This attribute associates connections with a thread such that when the same thread is in need of connections, it can reuse the connections already associated with that thread. In this case, the overhead of getting connections from the pool is avoided. However, when this value is set to true, you should verify that the value of the <code>max-pool-size</code> attribute is comparable to the <code>max-thread-pool-size</code> attribute of the associated thread pool. If the <code>max-thread-pool-size</code> value is much higher than the <code>max-pool-size</code> value, a lot of time is spent associating connections with a new thread after dissociating them from an older one. Use this attribute in cases where the thread pool should reuse connections to avoid this overhead.</td>
</tr>
<tr>
<td>match-connections</td>
<td>true</td>
<td>If true, enables connection matching. You can set to false if connections are homogeneous.</td>
</tr>
<tr>
<td>max-connection-usage-count</td>
<td>0</td>
<td>Specifies the number of times a connection is reused by the pool, after which it is closed. A zero value disables this feature.</td>
</tr>
<tr>
<td>ping</td>
<td>false</td>
<td>(optional) Specifies whether to ping the pool during pool creation or reconfiguration to identify and warn of any erroneous attribute values.</td>
</tr>
<tr>
<td>pooling</td>
<td>true</td>
<td>(optional) If false, disables connection pooling.</td>
</tr>
</tbody>
</table>
Table C–37  connector-connection-pool Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AddressList</td>
<td>none</td>
<td>Specifies a list of host/port combinations of the Message Queue software. For JMS resources of the Type javax.jms.TopicConnectionFactory or javax.jms.QueueConnectionFactory.</td>
</tr>
<tr>
<td>ClientId</td>
<td>none</td>
<td>Specifies the JMS Client Identifier to be associated with a Connection created using the createTopicConnection method of the TopicConnectionFactory class. For JMS resources of the Type javax.jms.TopicConnectionFactory. Durable subscription names are unique and only valid within the scope of a client identifier. To create or reactivate a durable subscriber, the connection must have a valid client identifier. The JMS specification ensures that client identifiers are unique and that a given client identifier is allowed to be used by only one active connection at a time.</td>
</tr>
<tr>
<td>UserName</td>
<td>guest</td>
<td>Specifies the user name for connecting to the Message Queue software. For JMS resources of the Type javax.jms.TopicConnectionFactory or javax.jms.QueueConnectionFactory.</td>
</tr>
<tr>
<td>Password</td>
<td>guest</td>
<td>Specifies the password for connecting to the Message Queue software. For JMS resources of the Type javax.jms.TopicConnectionFactory or javax.jms.QueueConnectionFactory.</td>
</tr>
<tr>
<td>ReconnectAttempts</td>
<td>6</td>
<td>Specifies the number of attempts to connect (or reconnect) for each address in the imqAddressList before the client runtime moves on to try the next address in the list. A value of -1 indicates that the number of reconnect attempts is unlimited (the client runtime attempts to connect to the first address until it succeeds).</td>
</tr>
<tr>
<td>ReconnectInterval</td>
<td>30000</td>
<td>Specifies the interval between reconnect attempts in milliseconds. This applies to attempts on each address in the imqAddressList and on successive addresses in the list. If too short, this time interval does not give a broker time to recover. If too long, the reconnect might represent an unacceptable delay.</td>
</tr>
<tr>
<td>ReconnectEnabled</td>
<td>false</td>
<td>If true, specifies that the client runtime attempts to reconnect to a message server (or the list of addresses in imqAddressList) when a connection is lost.</td>
</tr>
<tr>
<td>AddressListBehavior</td>
<td>priority</td>
<td>Specifies whether connection attempts are in the order of addresses in the imqAddressList attribute (priority) or in a random order (random). If many clients are attempting a connection using the same connection factory, use a random order to prevent them from all being connected to the same address.</td>
</tr>
<tr>
<td>AddressListIterations</td>
<td>-1</td>
<td>Specifies the number of times the client runtime iterates through the imqAddressList in an effort to establish (or reestablish) a connection. A value of -1 indicates that the number of attempts is unlimited.</td>
</tr>
</tbody>
</table>

Note: All JMS administered object resource properties that worked with version 7 of the GlassFish Server are supported for backward compatibility.

connector-resource

Defines the connection factory object of a specific connection definition in a connector (resource adapter).
consistency

Superelements

resources (glassfish-resources.xml)

Subelements

The following table describes subelements for the connector-resource element.

<table>
<thead>
<tr>
<th>Table C–38</th>
<th>connector-resource Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
<td><strong>Required</strong></td>
</tr>
<tr>
<td>description</td>
<td>zero or one</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the connector-resource element.

<table>
<thead>
<tr>
<th>Table C–39</th>
<th>connector-resource Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attribute</strong></td>
<td><strong>Default</strong></td>
</tr>
<tr>
<td>jndi-name</td>
<td>none</td>
</tr>
<tr>
<td>pool-name</td>
<td>none</td>
</tr>
<tr>
<td>object-type</td>
<td>user (optional)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>enabled</td>
<td>true (optional)</td>
</tr>
</tbody>
</table>

consistency

Specifies container behavior in guaranteeing transactional consistency of the data in the bean.

Superelements

entity-mapping (sun-cmp-mappings.xml)

Subelements

The following table describes subelements for the consistency element.

<table>
<thead>
<tr>
<th>Table C–40</th>
<th>consistency Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
<td><strong>Required</strong></td>
</tr>
<tr>
<td>none</td>
<td>exactly one subelement is required</td>
</tr>
<tr>
<td>check-modified-at-commit</td>
<td>exactly one subelement is required</td>
</tr>
<tr>
<td>lock-when-loaded</td>
<td>exactly one subelement is required</td>
</tr>
</tbody>
</table>
constraint-field

Specifies a cacheability constraint for the given url-pattern or servlet-name. All constraint-field constraints must pass for a response to be cached. If there are value constraints, at least one of them must pass.

Superelements

cache-mapping (glassfish-web.xml)

Subelements

The following table describes subelements for the constraint-field element.

<table>
<thead>
<tr>
<th>Table C–41</th>
<th>constraint-field Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td>Required</td>
</tr>
<tr>
<td>constraint-field-value</td>
<td>zero or more</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the constraint-field element.

<table>
<thead>
<tr>
<th>Table C–42</th>
<th>constraint-field Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute</td>
<td>Default</td>
</tr>
<tr>
<td>name</td>
<td>none</td>
</tr>
<tr>
<td>scope</td>
<td>request.parameter</td>
</tr>
<tr>
<td>cache-on-match</td>
<td>true</td>
</tr>
<tr>
<td>cache-on-match-f</td>
<td>false</td>
</tr>
</tbody>
</table>

constraint-field-value

Specifies a value to be matched to the input parameter value. The matching is case sensitive. For example:

<value match-expr="in-range">1-60</value>
Superelements

constraint-field (glassfish-web.xml)

Subelements

none - contains data

Attributes

The following table describes attributes for the constraint-field-value element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>match-expr</td>
<td>equals</td>
<td>(optional) Specifies the type of comparison performed with the value. Allowed values are equals, not-equals, greater, lesser, and in-range. If match-expr is greater or lesser, the value must be a number. If match-expr is in-range, the value must be of the form n1-n2, where n1 and n2 are numbers.</td>
</tr>
<tr>
<td>cache-on-match</td>
<td>true</td>
<td>(optional) If true, caches the response if matching succeeds.</td>
</tr>
<tr>
<td>cache-on-match-failure</td>
<td>false</td>
<td>(optional) If true, caches the response if matching fails.</td>
</tr>
</tbody>
</table>

context-root

Contains the web context root for the application or web application that was packaged as a WAR file. Overrides the corresponding element in the application.xml or web.xml file.

If the parent element is java-web-start-access, this element contains the context root for the Java Web Start enabled application client module. If none is specified, a default is generated; see java-web-start-access.

If you are setting up load balancing, web module context roots must be unique within a server instance. See the GlassFish Server Open Source Edition High Availability Administration Guide for more information about load balancing.

Superelements

web (glassfish-application.xml), glassfish-web-app (glassfish-web.xml), java-web-start-access (glassfish-application-client.xml)

Subelements

none - contains data

cookie-properties

Specifies session cookie properties.

Note: If cookie settings are defined declaratively in the web.xml file, the cookie properties defined here take precedence. If cookie settings are defined programatically using javax.servlet.SessionCookieConfig methods, those cookie settings take precedence over the cookie properties defined here.
Superelements

**session-config** *(glassfish-web.xml)*

Subelements

The following table describes subelements for the `cookie-properties` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>property</code> <em>(with attributes)</em></td>
<td>zero or more</td>
<td>Specifies a property, which has a name and a value.</td>
</tr>
</tbody>
</table>

Properties

The following table describes properties for the `cookie-properties` element.

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cookieName</code></td>
<td>none</td>
<td>Specifies the cookie name.</td>
</tr>
<tr>
<td><code>cookiePath</code></td>
<td>Context path at which the web module is installed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specifies the pathname that is set when the cookie is created. The browser sends the cookie if the pathname for the request contains this pathname. If set to `/ (slash), the browser sends cookies to all URLs served by GlassFish Server. You can set the path to a narrower mapping to limit the request URLs to which the browser sends cookies.</td>
</tr>
<tr>
<td><code>cookieMaxAgeSeconds</code></td>
<td>none</td>
<td>Specifies the expiration time (in seconds) after which the browser expires the cookie. If this is unset, the cookie doesn’t expire.</td>
</tr>
<tr>
<td><code>cookieDomain</code></td>
<td>(unset)</td>
<td>Specifies the domain for which the cookie is valid.</td>
</tr>
<tr>
<td><code>cookieComment</code></td>
<td>none</td>
<td>Specifies the comment that identifies the session tracking cookie in the cookie file.</td>
</tr>
</tbody>
</table>
| `cookieSecure` | dynamic | Sets the `Secure` attribute of any `JSESSIONID` cookies associated with the web application. Allowed values are as follows:  
  ■ `true` — sets `Secure` to `true`.  
  ■ `false` — sets `Secure` to `false`.  
  ■ `dynamic` — The `JSESSIONID` cookie inherits the `Secure` setting of the request that initiated the session.  
  To set the `Secure` attribute of a `JSESSIONIDSSO` cookie, use the `ssoCookieSecure` virtual-server property. For details, see `create-virtual-server(1)`. |
| `cookieHttpOnly` | none    | Specifies that the cookie is marked HTTP only. Allowed values are `true` or `false`. |

**create-tables-at-deploy**

Specifies whether database tables are created for beans that are automatically mapped by the EJB container. If `true`, creates tables in the database. If `false` (the default if this element is not present), does not create tables.

This element can be overridden during deployment. See "Generation Options for CMP" in *GlassFish Server Open Source Edition Application Development Guide*.

Superelements

**cmp-resource** *(glassfish-ejb-jar.xml)*
Subelements

none - contains data

custom-resource

Defines a custom resource, which specifies a custom server-wide resource object factory. Such object factories implement the javax.naming.spi.ObjectFactory interface.

Superelements

resources (glassfish-resources.xml)

Subelements

The following table describes subelements for the custom-resource element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>zero or one</td>
<td>Contains a text description of this element.</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property or a variable.</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the custom-resource element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>jndi-name</td>
<td>none</td>
<td>Specifies the JNDI name for the resource.</td>
</tr>
<tr>
<td>res-type</td>
<td>none</td>
<td>Specifies the fully qualified type of the resource.</td>
</tr>
<tr>
<td>factory-class</td>
<td>none</td>
<td>Specifies the fully qualified name of the user-written factory class, which implements javax.naming.spi.ObjectFactory.</td>
</tr>
<tr>
<td>object-type</td>
<td>user</td>
<td>(optional) Defines the type of the resource. Allowed values are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- system-all - A system resource for all server instances and the domain application server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- system-admin - A system resource only for the domain application server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- system-instance - A system resource for all server instances only.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- user - A user resource.</td>
</tr>
<tr>
<td>enabled</td>
<td>true</td>
<td>(optional) Determines whether this resource is enabled at runtime.</td>
</tr>
</tbody>
</table>

database-vendor-name

Specifies the name of the database vendor for which tables can be created. Allowed values are javadb, db2, mssql, mysql, oracle, postgresql, pointbase, derby (also for CloudScape), and sybase, case-insensitive.

If no value is specified, a connection is made to the resource specified by the jndi-name subelement of the cmp-resource element, and the database vendor name is read. If the connection cannot be established, or if the value is not recognized, SQL-92 compliance is presumed.
This element can be overridden during deployment. See "Generation Options for CMP" in GlassFish Server Open Source Edition Application Development Guide.

**Superelements**

`cmp-resource` (glassfish-ejb-jar.xml)

**Subelements**

none - contains data

**debugging-enabled**

Specifies whether the debugging servlet is enabled for this web service endpoint. Allowed values are `true` (the default) and `false`.

**Superelements**

`webservice-endpoint` (glassfish-web.xml, glassfish-ejb-jar.xml)

**Subelements**

none - contains data

**default**

Specifies that a field belongs to the default hierarchical fetch group, and enables prefetching for a CMR field. To disable prefetching for specific query methods, use a `prefetch-disabled` element in the glassfish-ejb-jar.xml file.

**Superelements**

`fetched-with` (sun-cmp-mappings.xml)

**Subelements**

none - element is present or absent

**default-helper**

Passes property values to the built-in default `cache-helper` class.

**Superelements**

`cache` (glassfish-web.xml)

**Subelements**

The following table describes subelements for the default-helper element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>property</code> (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property, which has a name and a value.</td>
</tr>
</tbody>
</table>
Properties

The following table describes properties for the default-helper element.

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cacheKeyGeneratorAttrName</td>
<td>Uses the built-in default cache-helper key generation, which concatenates the servlet path with key-field values, if any.</td>
<td>The caching engine looks in the ServletContext for an attribute with a name equal to the value specified for this property to determine whether a customized CacheKeyGenerator implementation is used. An application can provide a customized key generator rather than using the default helper. See “The CacheKeyGenerator Interface” in GlassFish Server Open Source Edition Application Development Guide.</td>
</tr>
</tbody>
</table>

**default-resource-principal**

Specifies the default principal (user) for the resource.

If this element is used in conjunction with a JMS Connection Factory resource, the name and password subelements must be valid entries in the Open Message Queue broker user repository. See “Configuring and Managing Security Services” in Open Message Queue Administration Guide for details.

**Superelements**

resource-ref (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml); cmp-resource, mdb-connection-factory (glassfish-ejb-jar.xml)

**Subelements**

The following table describes subelements for the default-resource-principal element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>only one</td>
<td>Specifies the default resource principal name used to sign on to a resource manager.</td>
</tr>
<tr>
<td>password</td>
<td>only one</td>
<td>Specifies password of the default resource principal.</td>
</tr>
</tbody>
</table>

**description**

Specifies a text description of the containing element.

**Superelements**

property (with attributes), valve (glassfish-web.xml); activation-config, method (glassfish-ejb-jar.xml); target-server (sun-acc.xml); admin-object-resource, connector-connection-pool, connector-resource, custom-resource, external-jndi-resource, jdbc-connection-pool, jdbc-resource, mail-resource, property (with attributes), resource-adapter-config (glassfish-resources.xml)

**Subelements**

none - contains data
disable-nonportable-jndi-names
Because the EJB 3.1 specification defines portable EJB JNDI names, there is less need for GlassFish Server specific JNDI names. By default, GlassFish Server specific default JNDI names are applied automatically for backward compatibility. To disable GlassFish Server specific JNDI names for an EJB module, set the value of this element to true. The default is false.

Superelements
glassfish-ejb-jar (glassfish-ejb-jar.xml)

Subelements
none - contains data
dispatcher
Specifies a comma-separated list of RequestDispatcher methods for which caching is enabled on the target resource. Valid values are REQUEST, FORWARD, INCLUDE, and ERROR. If this element is not specified, the default is REQUEST. See SRV.6.2.5 of the Servlet 2.4 specification for more information.

Superelements
cache-mapping (glassfish-web.xml)

Subelements
none - contains data
drop-tables-at-undeploy
Specifies whether database tables that were automatically created when the bean(s) were last deployed are dropped when the bean(s) are undeployed. If true, drops tables from the database. If false (the default if this element is not present), does not drop tables.
This element can be overridden during deployment. See "Generation Options for CMP" in GlassFish Server Open Source Edition Application Development Guide.

Superelements
cmp-resource (glassfish-ejb-jar.xml)

Subelements
none - contains data
ejb
Defines runtime properties for a single enterprise bean within the application. The subelements listed below apply to particular enterprise beans as follows:
All types of beans: ejb-name, ejb-ref, resource-ref, resource-env-ref, ior-security-config, gen-classes, jndi-name, use-thread-pool-id, message-destination-ref, pass-by-reference, service-ref

Stateless session beans: bean-pool, webservice-endpoint

Stateful session beans: bean-cache, webservice-endpoint, checkpoint-at-end-of-method

Entity beans: commit-option, bean-cache, bean-pool, cmp, is-read-only-bean, refresh-period-in-seconds, flush-at-end-of-method

Message-driven beans: mdb-resource-adapter, mdb-connection-factory, jms-durable-subscription-name, jms-max-messages-load, bean-pool

Superelements

enterprise-beans (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the ejb element.

| Table C–51  ejb Subelements |
|---|---|---|
| **Element** | **Required** | **Description** |
| ejb-name | only one | Matches the ejb-name in the corresponding ejb-jar.xml file. |
| jndi-name | zero or more | Specifies the absolute jndi-name. |
| ejb-ref | zero or more | Maps the absolute JNDI name to the ejb-ref element in the corresponding Java EE XML file. |
| resource-ref | zero or more | Maps the absolute JNDI name to the resource-ref in the corresponding Java EE XML file. |
| resource-env-ref | zero or more | Maps the absolute JNDI name to the resource-env-ref in the corresponding Java EE XML file. |
| service-ref | zero or more | Specifies runtime settings for a web service reference. |
| message-destination-ref | zero or more | Specifies the name of a physical message destination. |
| pass-by-reference | zero or one | Specifies the passing method used by an enterprise bean calling a remote interface method in another bean that is colocated within the same process. |
| cmp | zero or one | Specifies runtime information for a container-managed persistence (CMP) entity bean for EJB 1.1 and EJB 2.1 beans. |
| principal | zero or one | Specifies the principal (user) name in an enterprise bean that has the run-as role specified. |
| mdb-connection-factory | zero or one | Specifies the connection factory associated with a message-driven bean. |
| jms-durable-subscription-name | zero or one | Specifies the durable subscription associated with a message-driven bean. |
| jms-max-messages-load | zero or one | Specifies the maximum number of messages to load into a Java Message Service session at one time for a message-driven bean to serve. The default is 1. |
| ior-security-config | zero or one | Specifies the security information for the IOR. |
| is-read-only-bean | zero or one | Specifies that this entity bean is read-only. |
The following table describes attributes for the `<ejb>` element.

**Table C–52   `<ejb>` Attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>availability-enabled</td>
<td>false</td>
<td>(optional) If set to <code>true</code>, and if availability is enabled in the EJB container, high-availability features apply to this bean if it is a stateful session bean.</td>
</tr>
</tbody>
</table>

**Example**

```xml
<ejb>
    <ejb-name>CustomerEJB</ejb-name>
    <jndi-name>customer</jndi-name>
    <resource-ref>
        <res-ref-name>jdbc/SimpleBank</res-ref-name>
        <jndi-name>jdbc/__default</jndi-name>
    </resource-ref>
    <is-read-only.bean>false</is-read-only.bean>
    <commit-option>B</commit-option>
    <bean-pool>
        <steady-pool-size>10</steady-pool-size>
        <resize-quantity>10</resize-quantity>
    </bean-pool>
</ejb>
```
In the `glassfish-ejb-jar.xml` file, matches the `ejb-name` in the corresponding `ejb-jar.xml` file. The name must be unique among the names of the enterprise beans in the same EJB JAR file.

There is no architected relationship between the `ejb-name` in the deployment descriptor and the JNDI name that the deployer assigns to the EJB component’s home.

In the `sun-cmp-mappings.xml` file, specifies the `ejb-name` of the entity bean in the `ejb-jar.xml` file to which the container-managed persistence (CMP) bean corresponds.

**Superelements**

- `ejb, method (glassfish-ejb-jar.xml)`, `entity-mapping (sun-cmp-mappings.xml)`

**Subelements**

- none - contains data

**ejb-ref**

Maps the `ejb-ref-name` in the corresponding Java EE deployment descriptor file `ejb-ref` entry to the absolute `jndi-name` of a resource.

The `ejb-ref` element is used for the declaration of a reference to an EJB’s home. Applies to session beans or entity beans.

**Superelements**

- `glassfish-web-app (glassfish-web.xml), ejb (glassfish-ejb-jar.xml),
glassfish-application-client (glassfish-application-client.xml)`

**Subelements**

The following table describes subelements for the `ejb-ref` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ejb-ref-name</code></td>
<td>only one</td>
<td>Specifies the <code>ejb-ref-name</code> in the corresponding Java EE deployment descriptor file <code>ejb-ref</code> entry.</td>
</tr>
<tr>
<td><code>jndi-name</code></td>
<td>only one</td>
<td>Specifies the absolute <code>jndi-name</code> of a resource.</td>
</tr>
</tbody>
</table>
**ejb-ref-name**

Specifies the `ejb-ref-name` in the corresponding Java EE deployment descriptor file `ejb-ref` entry.

**Superelements**

`ejb-ref` (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

**Subelements**

none - contains data

**eligible**

Specifies whether the application client module is eligible to be Java Web Start enabled. Allowed values are `true` (the default) and `false`.

**Superelements**

`java-web-start-access` (glassfish-application-client.xml)

**Subelements**

none - contains data

**endpoint-address-uri**

Specifies the relative path combined with the web server root to form the fully qualified endpoint address for a web service endpoint. This is a required element for EJB endpoints and an optional element for servlet endpoints.

For servlet endpoints, this value is relative to the web application context root. For EJB endpoints, the URI is relative to root of the web server (the first portion of the URI is a context root). The context root portion must not conflict with the context root of any web application deployed to the same web server.

In all cases, this value must be a fixed pattern (no "*" allowed).

If the web service endpoint is a servlet that implements only a single endpoint and has only one `url-pattern`, it is not necessary to set this value, because the web container derives it from the `web.xml` file.

**Superelements**

`webservice-endpoint` (glassfish-web.xml, glassfish-ejb-jar.xml)

**Subelements**

none - contains data

**Example**

If the web server is listening at `http://localhost:8080`, the following `endpoint-address-uri`: 
<endpoint-address-uri>StockQuoteService/StockQuotePort</endpoint-address-uri>

results in the following target endpoint address:

http://localhost:8080/StockQuoteService/StockQuotePort

table c–54  enterprise–beans subelements

<table>
<thead>
<tr>
<th>element</th>
<th>required</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>zero or one</td>
<td>Specifies the name string.</td>
</tr>
<tr>
<td>unique-id</td>
<td>zero or one</td>
<td>Specifies a unique system identifier. This data is automatically generated and updated at deployment/redeployment. Do not specify or edit this value.</td>
</tr>
<tr>
<td>ejb</td>
<td>zero or more</td>
<td>Defines runtime properties for a single enterprise bean within the application.</td>
</tr>
<tr>
<td>pm-descriptors</td>
<td>zero or one</td>
<td>Deprecated.</td>
</tr>
<tr>
<td>cmp-resource</td>
<td>zero or one</td>
<td>Specifies the database to be used for storing container-managed persistence (CMP) beans in an EJB JAR file.</td>
</tr>
<tr>
<td>message-destination</td>
<td>zero or more</td>
<td>Specifies the name of a logical message destination.</td>
</tr>
<tr>
<td>webservice-description</td>
<td>zero or more</td>
<td>Specifies a name and optional publish location for a web service.</td>
</tr>
<tr>
<td>property (with subelements)</td>
<td>zero or more</td>
<td>Specifies a property or a variable.</td>
</tr>
</tbody>
</table>

Example

<enterprise-beans>
  <ejb>
    <ejb-name>CustomerEJB</ejb-name>
    <jndi-name>customer</jndi-name>
    <resource-ref>
      <res-ref-name>jdbc/SimpleBank</res-ref-name>
      <jndi-name>jdbc/____default</jndi-name>
    </resource-ref>
    <is-read-only-bean>false</is-read-only-bean>
    <commit-option>B</commit-option>
    <bean-pool>
      <steady-pool-size>10</steady-pool-size>
      <resize-quantity>10</resize-quantity>
      <max-pool-size>100</max-pool-size>
      <pool-idle-timeout-in-seconds>600</pool-idle-timeout-in-seconds>
    </bean-pool>
    <bean-cache>
      <max-cache-size>100</max-cache-size>
    </bean-cache>
  </ejb>
</enterprise-beans>
entity-mapping

Specifies the mapping a bean to database columns.

Superelements

sun-cmp-mapping (sun-cmp-mappings.xml)

Subelements

The following table describes subelements for the entity-mapping element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ejb-name</td>
<td>only one</td>
<td>Specifies the name of the entity bean in the ejb-jar.xml file to which the CMP bean corresponds.</td>
</tr>
<tr>
<td>table-name</td>
<td>only one</td>
<td>Specifies the name of a database table. The table must be present in the database schema file.</td>
</tr>
<tr>
<td>cmp-field-mapping</td>
<td>one or more</td>
<td>Associates a field with one or more columns to which it maps.</td>
</tr>
<tr>
<td>cmr-field-mapping</td>
<td>zero or more</td>
<td>A container-managed relationship field has a name and one or more column pairs that define the relationship.</td>
</tr>
<tr>
<td>secondary-table</td>
<td>zero or more</td>
<td>Describes the relationship between a bean’s primary and secondary table.</td>
</tr>
<tr>
<td>consistency</td>
<td>zero or one</td>
<td>Specifies container behavior in guaranteeing transactional consistency of the data in the bean.</td>
</tr>
</tbody>
</table>

establish-trust-in-client

Specifies if the target is capable of authenticating a client. The values are NONE, SUPPORTED, or REQUIRED.

Superelements

transport-config (glassfish-ejb-jar.xml)

Subelements

none - contains data

eestablish-trust-in-target

Specifies if the target is capable of authenticating to a client. The values are NONE, SUPPORTED, or REQUIRED.
external-jndi-resource

**Superelements**

transport-config (glassfish-ejb-jar.xml)

**Subelements**

none - contains data

**external-jndi-resource**

Defines a resource that resides in an external JNDI repository. For example, a generic Java object could be stored in an LDAP server. An external JNDI factory must implement the javax.naming.spi.InitialContextFactory interface.

**Superelements**

resources (glassfish-resources.xml)

**Subelements**

The following table describes subelements for the external-jndi-resource element.

<table>
<thead>
<tr>
<th>Table C–56</th>
<th>external-jndi-resource Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td>Required</td>
</tr>
<tr>
<td>description</td>
<td>zero or one</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
</tr>
</tbody>
</table>

**Attributes**

The following table describes attributes for the external-jndi-resource element.

<table>
<thead>
<tr>
<th>Table C–57</th>
<th>external-jndi-resource Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute</td>
<td>Default</td>
</tr>
<tr>
<td>jndi-name</td>
<td>none</td>
</tr>
<tr>
<td>jndi-lookup-name</td>
<td>none</td>
</tr>
<tr>
<td>res-type</td>
<td>none</td>
</tr>
<tr>
<td>factory-class</td>
<td>none</td>
</tr>
<tr>
<td>object-type</td>
<td>user</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>enabled</td>
<td>true</td>
</tr>
</tbody>
</table>
**fetched-with**

Specifies the fetch group configuration for fields and relationships. The fetched-with element has different allowed and default subelements based on its parent element and the data types of the fields.

- If there is no fetched-with subelement of a *cmp-field-mapping*, and the data type is not BLOB, CLOB, VARBINARY, LONGVARBINARY, or OTHER, fetched-with can have any valid subelement. The default subelement is as follows:
  
```xml
<fetched-with><default/></fetched-with>
```

- If there is no fetched-with subelement of a *cmp-field-mapping*, and the data type is BLOB, CLOB, VARBINARY, LONGVARBINARY, or OTHER, fetched-with can have any valid subelement except `<default/>`. The default subelement is as follows:

  ```xml
  <fetched-with><none/></fetched-with>
  ```

- If there is no fetched-with subelement of a *cmr-field-mapping*, fetched-with can have any valid subelement. The default subelement is as follows:

  ```xml
  <fetched-with><none/></fetched-with>
  ```

Managed fields are multiple CMP or CMR fields that are mapped to the same column. A managed field can have any fetched-with subelement except `<default/>`. For additional information, see "Managed Fields" in *GlassFish Server Open Source Edition Application Development Guide*.

**Superelements**

cmp-field-mapping, cmr-field-mapping (sun-cmp-mappings.xml)

**Subelements**

The following table describes subelements for the fetched-with element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>default</td>
<td>exactly one subelement is required</td>
<td>Specifies that a CMP field belongs to the default hierarchical fetch group, which means it is fetched any time the bean is loaded from a database. Enables prefetching of a CMR field.</td>
</tr>
<tr>
<td>level</td>
<td>exactly one subelement is required</td>
<td>Specifies the level number of a hierarchical fetch group.</td>
</tr>
<tr>
<td>named-group</td>
<td>exactly one subelement is required</td>
<td>Specifies the name of an independent fetch group.</td>
</tr>
<tr>
<td>none</td>
<td>exactly one subelement is required</td>
<td>Specifies that this field or relationship is placed into its own individual fetch group, which means it is loaded from a database the first time it is accessed in this transaction.</td>
</tr>
</tbody>
</table>

**field-name**

Specifies the Java identifier of a field. This identifier must match the value of the *field-name* subelement of the *cmp-field* element in the *ejb-jar.xml* file.
finder

**Superelements**

*cmp-field-mapping*(sun-cmp-mappings.xml)

**Subelements**

none - contains data

finder

Describes the finders for CMP 1.1 with a method name and query.

**Superelements**

*one-one-finders*(glassfish-ejb-jar.xml)

**Subelements**

The following table describes subelements for the *finder* element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>method-name</td>
<td>only one</td>
<td>Specifies the method name for the finder.</td>
</tr>
<tr>
<td>query-params</td>
<td>zero or one</td>
<td>Specifies the query parameters for the CMP 1.1 finder.</td>
</tr>
<tr>
<td>query-filter</td>
<td>zero or one</td>
<td>Specifies the query filter for the CMP 1.1 finder.</td>
</tr>
<tr>
<td>query-variables</td>
<td>zero or one</td>
<td>Specifies variables in query expression for the CMP 1.1 finder.</td>
</tr>
<tr>
<td>query-ordering</td>
<td>zero or one</td>
<td>Specifies the query ordering for the CMP 1.1 finder.</td>
</tr>
</tbody>
</table>

flush-at-end-of-method

Specifies the methods that force a database flush after execution. Applicable to entity beans.

**Superelements**

*ejb*(glassfish-ejb-jar.xml)

**Subelements**

The following table describes subelements for the *flush-at-end-of-method* element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>method</td>
<td>one or more</td>
<td>Specifies a bean method.</td>
</tr>
</tbody>
</table>

gen-classes

Specifies all the generated class names for a bean.
Note: This value is automatically generated by the server at deployment or redeployment time. Do not specify it or change it after deployment.

Superelements

ejb (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the gen-classes element.

<table>
<thead>
<tr>
<th>Table C–61</th>
<th>gen-classes Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td>Required</td>
</tr>
<tr>
<td>remote-impl</td>
<td>zero or one</td>
</tr>
<tr>
<td>local-impl</td>
<td>zero or one</td>
</tr>
<tr>
<td>remote-home-impl</td>
<td>zero or one</td>
</tr>
<tr>
<td>local-home-impl</td>
<td>zero or one</td>
</tr>
</tbody>
</table>

**glassfish-application**

Defines the GlassFish Server specific configuration for an application. This is the root element; there can only be one glassfish-application element in a glassfish-application.xml file. See The glassfish-application.xml File.

Superelements

none

Subelements

The following table describes subelements for the glassfish-application element.

<table>
<thead>
<tr>
<th>Table C–62</th>
<th>glassfish-application Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td>Required</td>
</tr>
<tr>
<td>web</td>
<td>zero or more</td>
</tr>
<tr>
<td>pass-by-reference</td>
<td>zero or one</td>
</tr>
<tr>
<td>unique-id</td>
<td>zero or one</td>
</tr>
<tr>
<td>security-role-mapping</td>
<td>zero or more</td>
</tr>
<tr>
<td>realm</td>
<td>zero or one</td>
</tr>
<tr>
<td>ejb-ref</td>
<td>zero or more</td>
</tr>
<tr>
<td>resource-ref</td>
<td>zero or more</td>
</tr>
</tbody>
</table>
glassfish-application-client

Defines the GlassFish Server specific configuration for an application client. This is the root element; there can only be one glassfish-application-client element in a glassfish-application-client.xml file. See The glassfish-application-client.xml file.

Superelements

none

Subelements

The following table describes subelements for the glassfish-application-client element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>resource-env-ref</td>
<td>zero or more</td>
<td>Maps the absolute JNDI name to the resource-env-ref in the corresponding Java EE XML file.</td>
</tr>
<tr>
<td>service-ref</td>
<td>zero or more</td>
<td>Specifies runtime settings for a web service reference.</td>
</tr>
<tr>
<td>message-destination-ref</td>
<td>zero or more</td>
<td>Specifies the name of a physical message destination.</td>
</tr>
<tr>
<td>message-destination</td>
<td>zero or more</td>
<td>Specifies the name of a logical message destination.</td>
</tr>
<tr>
<td>archive-name</td>
<td>zero or one</td>
<td>Specifies the name of the archive file.</td>
</tr>
<tr>
<td>compatibility</td>
<td>zero or one</td>
<td>Specifies the GlassFish Server release with which to be backward compatible in terms of JAR visibility requirements for applications.</td>
</tr>
<tr>
<td>keep-state</td>
<td>zero or one</td>
<td>Retains web sessions, stateful session bean instances, and persistently created EJB timers across redeployments.</td>
</tr>
<tr>
<td>version-identifier</td>
<td>zero or one</td>
<td>Contains version information for an application.</td>
</tr>
</tbody>
</table>

Table C–63 glassfish-application-client subelements

glassfish-ejb-jar

Defines the GlassFish Server specific configuration for an EJB JAR file. This is the root element; there can only be one glassfish-ejb-jar element in a glassfish-ejb-jar.xml file. See The glassfish-ejb-jar.xml File.
Superelements

none

Subelements

The following table describes subelements for the *glassfish-ejb-jar* element.

**Table C–64  *glassfish-ejb-jar* Subelements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>security-role-mapping</td>
<td>zero or more</td>
<td>Maps a role in the corresponding Java EE XML file to a user or group.</td>
</tr>
<tr>
<td>enterprise-beans</td>
<td>only one</td>
<td>Describes all the runtime properties for an EJB JAR file in the application.</td>
</tr>
<tr>
<td>compatibility</td>
<td>zero or one</td>
<td>Specifies the GlassFish Server release with which to be backward compatible in terms of JAR visibility requirements for applications.</td>
</tr>
<tr>
<td>disable-nonportable-jndi-names</td>
<td>zero or one</td>
<td>Disables GlassFish Server specific JNDI names.</td>
</tr>
<tr>
<td>keep-state</td>
<td>zero or one</td>
<td>Retains stateful session bean instances and persistently created EJB timers across redeployments.</td>
</tr>
<tr>
<td>version-identifier</td>
<td>zero or one</td>
<td>Contains version information for an EJB module.</td>
</tr>
</tbody>
</table>

**glassfish-web-app**

Defines GlassFish Server specific configuration for a web module. This is the root element; there can only be one *glassfish-web-app* element in a *glassfish-web.xml* file. See The *glassfish-web.xml* File.

Superelements

none

Subelements

The following table describes subelements for the *glassfish-web-app* element.

**Table C–65  *glassfish-web-app* Subelements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>context-root</td>
<td>zero or one</td>
<td>Contains the web context root for the web module.</td>
</tr>
<tr>
<td>security-role-mapping</td>
<td>zero or more</td>
<td>Maps roles to users or groups in the currently active realm.</td>
</tr>
<tr>
<td>servlet</td>
<td>zero or more</td>
<td>Specifies a principal name for a servlet, which is used for the run-as role defined in web.xml.</td>
</tr>
<tr>
<td>idempotent-url-pattern</td>
<td>zero or more</td>
<td>Specifies a URL pattern for idempotent requests.</td>
</tr>
<tr>
<td>session-config</td>
<td>zero or one</td>
<td>Specifies session manager, session cookie, and other session-related information.</td>
</tr>
<tr>
<td>ejb-ref</td>
<td>zero or more</td>
<td>Maps the absolute JNDI name to the ejb-ref in the corresponding Java EE XML file.</td>
</tr>
<tr>
<td>resource-ref</td>
<td>zero or more</td>
<td>Maps the absolute JNDI name to the resource-ref in the corresponding Java EE XML file.</td>
</tr>
<tr>
<td>resource-env-ref</td>
<td>zero or more</td>
<td>Maps the absolute JNDI name to the resource-env-ref in the corresponding Java EE XML file.</td>
</tr>
</tbody>
</table>
The following table describes attributes for the `glassfish-web-app` element.

### Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>error-url</td>
<td>(blank)</td>
<td>(optional) Not implemented. Do not use.</td>
</tr>
<tr>
<td>httpServlet-security-provider</td>
<td>none</td>
<td>(optional) Specifies the <code>HttpServlet</code> message layer provider that the web container’s <code>servlet auth-constraint</code> processing calls.</td>
</tr>
</tbody>
</table>

The following table describes properties for the `glassfish-web-app` element.

### Properties
### Table C–67  glassfish-web-app Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>allowLinking</td>
<td>false</td>
<td>If true, resources in this web application that are symbolic links are served. You can also define this property for a virtual server. Web applications on the virtual server that do not define this property use the virtual server's value. For details, see create-virtual-server(1). <strong>Caution:</strong> Setting this property to true on Windows systems exposes JSP source code.</td>
</tr>
</tbody>
</table>
| alternatedocroot_# | none | Specifies an alternate document root (docroot), where n is a positive integer that allows specification of more than one. Alternate docroots allow web applications to serve requests for certain resources from outside their own docroot, based on whether those requests match one (or more) of the URI patterns of the web application's alternate docroots. If a request matches an alternate docroot's URI pattern, it is mapped to the alternate docroot by appending the request URI (minus the web application's context root) to the alternate docroot's physical location (directory). If a request matches multiple URI patterns, the alternate docroot is determined according to the following precedence order:  
  - Exact match  
  - Longest path match  
  - Extension match  

For example, the following properties specify three alternate docroots. The URI pattern of the first alternate docroot uses an exact match, whereas the URI patterns of the second and third alternate docroots use extension and longest path prefix matches, respectively.

```xml
<property name="alternatedocroot_1" value="from=/my.jpg dir=/srv/images/jpg"/>
<property name="alternatedocroot_2" value="from=*.jpg dir=/srv/images/jpg"/>
<property name="alternatedocroot_3" value="from=jpg/* dir=/src/images"/>
```

The value of each alternate docroot has two components: The first component, from, specifies the alternate docroot's URI pattern, and the second component, dir, specifies the alternate docroot's physical location (directory). Spaces are allowed in the dir component.

You can set this property for all the web applications on a specific virtual server. For details, see create-virtual-server(1).
Table C–67 (Cont.) glassfish-web-app Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
</table>
| valve_\(n\)       | none    | This property is deprecated. Use the valve subelement instead. Specifies a fully qualified class name of a custom valve, where \(n\) is a positive integer that allows specification of more than one. The valve class must implement the org.apache.catalina.Valve interface from Tomcat or previous GlassFish Server releases, or the org.glassfish.web.valve.GlassFishValve interface from the current GlassFish Server release. For example:  

<property name="valve_1" value="org.glassfish.extension.Valve"/>

You can set this property for all the web applications on a specific virtual server. For details, see create-virtual-server(1). |
| listener_\(n\)    | none    | Specifies a fully qualified class name of a custom Catalina listener, where \(n\) is a positive integer that allows specification of more than one. The listener class must implement the org.apache.catalina.ContainerListener, org.apache.catalina.LifecycleListener, or org.apache.catalina.InstanceListener interface. For example:  

<property name="listener_1" value="org.glassfish.extension.MyLifecycleListener"/>

You can set this property for all the web applications on a specific virtual server. For details, see create-virtual-server(1). |
| crossContextAllowed | true    | If true, allows this web application to access the contexts of other web applications using the ServletContext.getServletContext() method. |
| relativeRedirectAllowed | false  | If true, allows this web application to send a relative URL to the client using HttpServletResponse.sendRedirect(), and instructs the web container not to translate any relative URLs to fully qualified ones. |
| reuseSessionID     | false   | If true, sessions generated for this web application use the session ID specified in the request. |
| securePagesWithPragma | true    | Set this property to false to ensure that for this web application file downloads using SSL work properly in Internet Explorer. You can set this property for all the web applications on a specific virtual server. For details, see create-virtual-server(1). |
Maps an EIS group to a group defined in the GlassFish Server domain.

**Attributes**

The following table describes attributes for the `group-map` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>eis-group</td>
<td>none</td>
<td>Specifies an EIS group.</td>
</tr>
<tr>
<td>mapped-group</td>
<td>none</td>
<td>Specifies a group defined in the GlassFish Server domain.</td>
</tr>
</tbody>
</table>

**group-name**

Specifies a group name in the current realm.

**http-method**

Specifies an HTTP method that is eligible for caching. The default is `GET`.

---

**Table C–67 (Cont.) glassfish-web-app Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>singleThreadedServletPoolSize</td>
<td>5</td>
<td>Specifies the maximum number of servlet instances allocated for each SingleThreadModel servlet in the web application.</td>
</tr>
<tr>
<td>tempdir</td>
<td>domain-dir/generated/app-name or domain-dir/generated/module-name</td>
<td>Specifies a temporary directory for use by this web module. This value is used to construct the value of the <code>javax.servlet.context.tempdir</code> context attribute. Compiled JSP files are also placed in this directory.</td>
</tr>
<tr>
<td>useResponseCTForHeaders</td>
<td>false</td>
<td>If true, response headers are encoded using the response’s charset instead of the default (UTF-8).</td>
</tr>
</tbody>
</table>

---

**Table C–68 group-map Attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>eis-group</td>
<td>none</td>
<td>Specifies an EIS group.</td>
</tr>
<tr>
<td>mapped-group</td>
<td>none</td>
<td>Specifies a group defined in the GlassFish Server domain.</td>
</tr>
</tbody>
</table>
Elements of the GlassFish Server Deployment Descriptors

ior-security-config

Superelements

cache-mapping (glassfish-web.xml)

Subelements

none - contains data

idempotent-url-pattern

Specifies a URL pattern for idempotent requests.

Superelements

glassfish-web-app (glassfish-web.xml)

Subelements

none

Attributes

The following table describes attributes for the idempotent-url-pattern element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>url-pattern</td>
<td>none</td>
<td>Specifies a URL pattern, which can contain wildcards. The URL pattern must conform to the mappings specified in section SRV 11.2 of the Servlet 2.4 specification.</td>
</tr>
<tr>
<td>no-of-retries</td>
<td>-1</td>
<td>(optional) Specifies the number of times the load balancer retries an idempotent request. A value of -1 indicates infinite retries.</td>
</tr>
</tbody>
</table>

Example

The following example specifies that all requests for the URI sun-java/* are idempotent.

```
<idempotent-url-pattern url-pattern="sun_java/*" no-of-retries="10"/>
```

integrity

Specifies if the target supports integrity-protected messages. The values are NONE, SUPPORTED, or REQUIRED.

Superelements

transport-config (glassfish-ejb-jar.xml)

Subelements

none - contains data

ior-security-config

Specifies the security information for the interoperable object reference (IOR).
Superelements

**ejb** (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the ior-security-config element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>transport-config</td>
<td>zero or one</td>
<td>Specifies the security information for transport.</td>
</tr>
<tr>
<td>as-context</td>
<td>zero or one</td>
<td>Specifies the authentication mechanism used to authenticate the client. If specified, it is USERNAME_PASSWORD.</td>
</tr>
<tr>
<td>sas-context</td>
<td>zero or one</td>
<td>Describes the sas-context fields.</td>
</tr>
</tbody>
</table>

**is-cache-overflow-allowed**

This element is deprecated. Do not use.

Superelements

**bean-cache** (glassfish-ejb-jar.xml)

**is-one-one-cmp**

This element is not used.

Superelements

**cmp** (glassfish-ejb-jar.xml)

**is-read-only-bean**

Specifies that this entity bean is a read-only bean if true. If this element is absent, the default value of false is used.

Superelements

**ejb** (glassfish-ejb-jar.xml)

Subelements

none - contains data

**java-method**

Specifies a method.

Superelements

**message** (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)
Subelements

The following table describes subelements for the java-method element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>method-name</td>
<td>only one</td>
<td>Specifies a method name.</td>
</tr>
<tr>
<td>method-params</td>
<td>zero or one</td>
<td>Specifies fully qualified Java type names of method parameters.</td>
</tr>
</tbody>
</table>

java-web-start-access

 Specifies changes to default Java Web Start parameters for an embedded or stand-alone application client module.

Superelements

 glassfish-application-client (glassfish-application-client.xml)

Subelements

 The following table describes subelements for the java-web-start-access element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>context-root</td>
<td>zero or one</td>
<td>Contains the context root for the Java Web Start enabled application client module. If none is specified, a default is generated. The default for a web module is as follows: <a href="http://host:port/app-name/relative-URI-to-appclient-jar">http://host:port/app-name/relative-URI-to-appclient-jar</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The default for a stand-alone application client module is as follows: <a href="http://host:port/module-name">http://host:port/module-name</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the module-name is not specified during deployment, the name of the EAR or JAR file without the extension is used. If the web module is not in EAR or JAR file format, a name is generated and written to the server log.</td>
</tr>
<tr>
<td>eligible</td>
<td>zero or one</td>
<td>Specifies whether the application client module is eligible to be Java Web Start enabled. Allowed values are true (the default) and false.</td>
</tr>
<tr>
<td>vendor</td>
<td>zero or one</td>
<td>Specifies the name of the vendor as it appears in Java Web Start download and launch screens. The default value is Application Client.</td>
</tr>
<tr>
<td>jnlp-doc</td>
<td>zero or one</td>
<td>Specifies the name of a custom JNLP file. If none is specified, a default JNLP file is generated.</td>
</tr>
</tbody>
</table>

jdbc-connection-pool

 Defines the attributes and properties that are required for creating a JDBC connection pool.

Superelements

 resources (glassfish-resources.xml)
Subelements

The following table describes subelements for the `jdbc-connection-pool` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>zero or one</td>
<td>Contains a text description of this element.</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property or a variable.</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the `jdbc-connection-pool` element. Changing the following attributes requires a server restart or the redeployment or disabling and re-enabling of applications that refer to the resource: `datasource-classname, associate-with-thread, lazy-connection-association, and lazy-connection-enlistment`.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>none</td>
<td>Specifies the name of the connection pool. A <code>jdbc-resource</code> element’s <code>pool-name</code> attribute refers to this name.</td>
</tr>
<tr>
<td>datasource-classname</td>
<td>none</td>
<td>(optional) Specifies the class name of the associated vendor-supplied data source. This class must implement <code>javax.sql.DataSource</code>, <code>javax.sql.XADataSource</code>, <code>javax.sql.ConnectionPoolDataSource</code>, or a combination.</td>
</tr>
<tr>
<td>res-type</td>
<td>none</td>
<td>(optional) Specifies the interface the data source class implements. The value of this attribute can be <code>javax.sql.DataSource</code>, <code>javax.sql.XADataSource</code>, <code>javax.sql.ConnectionPoolDataSource</code>, or <code>java.sql.DriverManager</code>. To support configuration of JDBC drivers and applications that use <code>java.sql.DriverManager</code>, set this attribute to <code>java.sql.DriverManager</code>. This attribute must be specified to avoid ambiguity when a data source class implements two or more of these interfaces or when a <code>driver-classname</code> is specified. An error occurs if this attribute has a legal value and the indicated interface is not implemented by the data source class.</td>
</tr>
<tr>
<td>driver-classname</td>
<td>none</td>
<td>(optional) Specifies the vendor-supplied JDBC driver class name. This driver must implement the <code>java.sql.DriverManager</code> interface.</td>
</tr>
<tr>
<td>ping</td>
<td>false</td>
<td>(optional) Specifies whether to ping the pool during pool creation or reconfiguration to identify and warn of any erroneous attribute values.</td>
</tr>
<tr>
<td>steady-pool-size</td>
<td>8</td>
<td>(optional) Specifies the initial and minimum number of connections maintained in the pool.</td>
</tr>
<tr>
<td>max-pool-size</td>
<td>32</td>
<td>(optional) Specifies the maximum number of connections that can be created to satisfy client requests.</td>
</tr>
<tr>
<td>max-wait-time-in-millis</td>
<td>60000</td>
<td>(optional) Specifies the amount of time, in milliseconds, that the caller is willing to wait for a connection. If 0, the caller is blocked indefinitely until a resource is available or an error occurs.</td>
</tr>
</tbody>
</table>
Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
</table>
| pool-resize-quantity       | 2       | (optional) Specifies the number of idle connections to be destroyed if the existing number of connections is above the steady-pool-size (subject to the max-pool-size limit).

This is enforced periodically at the idle-timeout-in-seconds interval. An idle connection is one that has not been used for a period of idle-timeout-in-seconds. When the pool size reaches steady-pool-size, connection removal stops.

| idle-timeout-in-seconds    | 300     | (optional) Specifies the maximum time that a connection can remain idle in the pool. After this amount of time, the pool can close this connection.

This timeout value must be kept shorter than the server side (database) timeout value to prevent the accumulation of unusable connections in the application.

| transaction-isolation-level| default JDBC driver isolation level | (optional) Specifies the transaction isolation level on the pooled database connections. Allowed values are read-uncommitted, read-committed, repeatable-read, or serializable.

Applications that change the isolation level on a pooled connection programatically risk polluting the pool, which can lead to errors. See is-isolation-level-guaranteed for more details.

| is-isolation-level-guaranteed | true | (optional) Applicable only when transaction-isolation-level is explicitly set. If true, every connection obtained from the pool is guaranteed to have the desired isolation level. This might impact performance on some JDBC drivers. Only set this attribute to false if you are certain that the hosted applications do not return connections with altered isolation levels.

| is-connection-validation-required | false | (optional) Specifies whether connections have to be validated before being given to the application. If a resource's validation fails, it is destroyed, and a new resource is created and returned.

| connection-validation-method | table | (optional) Legal values are as follows:

- auto-commit, which uses Connection.setAutoCommit(Connection.getAutoCommit())

- meta-data, which uses Connection.getMetaData()

- table, which performs a query on a table specified in the validation-table-name attribute

- custom-validation, which uses a user-defined validation mechanism specified by the custom implementation class in validation-classname.

Because many JDBC drivers cache the results of auto-commit and meta-data calls, they do not always provide reliable validations. Check with the driver vendor to determine whether these calls are cached or not.

The table must exist and be accessible, but it doesn’t require any rows. Do not use an existing table that has a large number of rows or a table that is already frequently accessed.
### Table C–74 (Cont.) jdbc-connection-pool Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>validation-table-name</td>
<td>none</td>
<td>(optional) Specifies the table name to be used to perform a query to validate a connection. This parameter is mandatory if and only if connection-validation-method is set to table.</td>
</tr>
</tbody>
</table>
| validation-classname    | none    | (optional) Specifies the custom validation implementation class name. This parameter is mandatory if connection-validation-method is set to custom-validation. The classname provided must be accessible to the GlassFish Server. The specified class must implement the org.glassfish.api.jdbc.ConnectionValidation interface. GlassFish Server provides the following custom validation class templates for MSSQL, DB2, and Sybase databases. All of them implement the org.glassfish.api.jdbc.ConnectionValidation interface.  
  - org.glassfish.api.jdbc.MSSQLConnectionValidation  
  - org.glassfish.api.jdbc.DB2ConnectionValidation  
  - org.glassfish.api.jdbc.SybaseConnectionValidation |
| init-sql                | none    | (optional) Specifies an SQL string to be executed whenever a connection is created (not reused) in the pool. This initializes the state of the connection. |
| fail-all-connections    | false   | (optional) If true, closes all connections in the pool if a single validation check fails. This parameter is mandatory if and only if is-connection-validation-required is set to true. |
| non-transactional-connections | false | (optional) If true, non-transactional connections can be made to the JDBC connection pool. These connections are not automatically enlisted with the transaction manager. |
| allow-non-component-callers | false | (optional) If true, non-Java-EE components, such as servlet filters, lifecycle modules, and third party persistence managers, can use this JDBC connection pool. The returned connection is automatically enlisted with the transaction context obtained from the transaction manager. Standard Java EE components can also use such pools. Connections obtained by non-component callers are not automatically closed at the end of a transaction by the container. They must be explicitly closed by the caller. |
| validate-atmost-once-period-in-seconds | 0 | (optional) Specifies the time interval within which a connection is validated at most once. Minimizes the number of validation calls.  
A value of zero implies that GlassFish Server does not attempt to minimize the number of validation requests by a connection. That is, a value of zero disables this attribute. As a result, the same connection is validated every time the application acquires the connection. |
### Table C–74 (Cont.) jdbc-connection-pool Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>connection-leak-timeout-in-seconds</td>
<td>0</td>
<td>(optional) Detects potential connection leaks by the application. A connection that is not returned back to the pool by the application within the specified period is assumed to be potentially leaking, and a stack trace of the caller is logged. A zero value disables leak detection. A nonzero value enables leak tracing. Use this attribute along with connection-leak-reclaim to avoid potential connection leaks from the application.</td>
</tr>
<tr>
<td>connection-leak-reclaim</td>
<td>false</td>
<td>(optional) If true, the pool will reclaim a connection after connection-leak-timeout-in-seconds occurs.</td>
</tr>
<tr>
<td>connection-creation-retry-attempts</td>
<td>0</td>
<td>(optional) Specifies the number of attempts to create a new connection in case of a failure.</td>
</tr>
<tr>
<td>connection-creation-retry-interval-in-seconds</td>
<td>10</td>
<td>(optional) Specifies the time interval between attempts to create a connection when connection-creation-retry-attempts is greater than 0.</td>
</tr>
<tr>
<td>statement-leak-timeout-in-seconds</td>
<td>0</td>
<td>(optional) Detects potential statement leaks by the application. A statement that is not closed by the application within the specified period is assumed to be potentially leaking, and a stack trace of the caller is logged. A zero value disables leak detection. A nonzero value enables leak tracing. Use this attribute along with statement-leak-reclaim to avoid potential statement leaks from the application.</td>
</tr>
<tr>
<td>statement-leak-reclaim</td>
<td>false</td>
<td>(optional) If true, the reclaim of a statement after statement-leak-timeout-in-seconds occurs.</td>
</tr>
<tr>
<td>statement-timeout-in-seconds</td>
<td>-1</td>
<td>(optional) Sets the query timeout property of a statement to enable termination of abnormally long running queries. The default value of -1 disables this feature. An abnormally long running JDBC query executed by an application may leave it in a hanging state unless a timeout is explicitly set on the statement. This attribute guarantees that all queries automatically time out if not completed within the specified period. When statements are created, the queryTimeout is set according to the value specified in this attribute. This works only when the underlying JDBC driver supports queryTimeout for Statement, PreparedStatement, CallableStatement, and ResultSet.</td>
</tr>
<tr>
<td>lazy-connection-enlistment</td>
<td>false</td>
<td>(optional) If true, a connection is not enlisted in a transaction until it is used. If false, any connection object available to a transaction is enlisted in the transaction.</td>
</tr>
<tr>
<td>lazy-connection-association</td>
<td>false</td>
<td>(optional) If true, a physical connection is not associated with a logical connection until it is used. If false, a physical connection is associated with a logical connection even before it is used.</td>
</tr>
</tbody>
</table>
associate-with-thread | false | (optional) Specifies whether connections are associated with the thread to enable the thread to reuse the connections. If true, allows connections to be saved as ThreadLocal in the calling thread. Connections get reclaimed only when the calling thread dies or when the calling thread is not in use and the pool has run out of connections. If false, the thread must obtain a connection from the pool each time the thread requires a connection.

This attribute associates connections with a thread such that when the same thread is in need of connections, it can reuse the connections already associated with that thread. In this case, the overhead of getting connections from the pool is avoided. However, when this value is set to true, you should verify that the value of the max-pool-size attribute is comparable to the max-thread-pool-size attribute of the associated thread pool. If the max-thread-pool-size value is much higher than the max-pool-size value, a lot of time is spent associating connections with a new thread after dissociating them from an older one. Use this attribute in cases where the thread pool should reuse connections to avoid this overhead.

match-connections | false | (optional) Specifies whether a connection that is selected from the pool should be matched with the connections with certain credentials. If true, enables connection matching. You can set to false if connections are homogeneous.

If the connection pool is used by applications that have multiple user credentials, match-connections must be true. The connection pool matches the request's credential with the connections in the pool and returns a matched connection for use. For new requests with different credentials, unmatched free connections are automatically purged to provide new connections to satisfy the new requests. This attribute need not be true if it is known that there is only one credential used by the applications and therefore the pool has homogeneous connections.

max-connection-usage-count | 0 | (optional) Specifies the number of times a connections is reused by the pool, after which it is closed. A zero value disables this feature. By limiting the maximum number of times a connection can be reused, you can avoid statement leaks if the application does not close statements.

sql-trace-listeners | none | (optional) Specifies that SQL statements executed by applications need to be traced. Helps administrators analyze the statements. Expects as a value a comma-separated list of listener implementation class names. Enables easy filtering of log messages for the SQL statements. SQL trace listeners must implement the org.glassfish.api.jdbc.SQLTraceListener interface.
GlassFish Server Properties

The following table describes properties for the jdbc-connection-pool element that are specific to GlassFish Server.

### Table C–75  jdbc-connection-pool Database Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dynamic-reconfiguration-wait-timeout-in-seconds</td>
<td>none</td>
<td>Specifies the timeout for dynamic reconfiguration of the pool. In-progress connection requests must complete before this timeout expires or they must be retried. New connection requests wait for this timeout to expire before acquiring connections to the reconfigured pool. If this property exists and has a positive value, it is enabled. If this property is not set and pool reconfiguration results in pool recreation, in-progress connection requests must be retried.</td>
</tr>
<tr>
<td>number-of-top-queries-to-report</td>
<td>10</td>
<td>Specifies the number of most frequently used queries to display. For example, the default value of 10 displays the top ten queries. This property is disabled when jdbc-connection-pool monitoring is set to LOW or OFF. It is enabled when jdbc-connection-pool monitoring is set to HIGH and the sql-trace-listeners attribute is set.</td>
</tr>
<tr>
<td>time-to-keep-queries-in-minutes</td>
<td>5</td>
<td>Specifies the time to retain queries in a cache before they are purged. This property is disabled when jdbc-connection-pool monitoring is set to LOW or OFF. It is enabled when jdbc-connection-pool monitoring is set to HIGH and the sql-trace-listeners attribute is set.</td>
</tr>
</tbody>
</table>

### Database Properties

Most JDBC drivers allow use of standard property lists to specify the user, password, and other resource configuration information. Although properties are optional with respect to the GlassFish Server, some properties might be necessary for most databases. For details, see the JDBC 4.0 Standard Extension API.

When properties are specified, they are passed to the vendor’s data source class (specified by the datasource-classname attribute) as is using setName(value) methods.

The user and password properties are used as the default principal if container managed authentication is specified and a default-resource-principal is not found in the application deployment descriptors.
The following table describes some common properties for the jdbc-connection-pool element.

Changing JDBC driver properties requires a server restart.

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user</td>
<td>Specifies the user name for connecting to the database.</td>
</tr>
<tr>
<td>password</td>
<td>Specifies the password for connecting to the database.</td>
</tr>
<tr>
<td>databaseName</td>
<td>Specifies the database for this connection pool.</td>
</tr>
<tr>
<td>serverName</td>
<td>Specifies the database server for this connection pool.</td>
</tr>
<tr>
<td>port</td>
<td>Specifies the port on which the database server listens for requests.</td>
</tr>
<tr>
<td>networkProtocol</td>
<td>Specifies the communication protocol.</td>
</tr>
<tr>
<td>roleName</td>
<td>Specifies the initial SQL role name.</td>
</tr>
<tr>
<td>dataSourceName</td>
<td>Specifies an underlying XADataSource, or a ConnectionPoolDataSource if connection pooling is done.</td>
</tr>
<tr>
<td>description</td>
<td>Specifies a text description.</td>
</tr>
<tr>
<td>url</td>
<td>Specifies the URL for this connection pool. Although this is not a standard property, it is commonly used.</td>
</tr>
</tbody>
</table>

**jdbc-resource**

Defines a JDBC (javax.sql.DataSource) resource.

**Superelements**

resources (glassfish-resources.xml)

**Subelements**

The following table describes subelements for the jdbc-resource element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>zero or one</td>
<td>Contains a text description of this element.</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property or a variable.</td>
</tr>
</tbody>
</table>

**Attributes**

The following table describes attributes for the jdbc-resource element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>jndi-name</td>
<td>none</td>
<td>Specifies the JNDI name for the resource.</td>
</tr>
<tr>
<td>description</td>
<td>none</td>
<td>(optional) Specifies a text description of this element.</td>
</tr>
</tbody>
</table>
**jndi-name**

Specifies the absolute jndi-name of a URL resource or a resource.

For entity beans and session beans, this value specifies the global JNDI name of the EJBHome object. It is only needed if the entity or session bean exposes a remote view.

For JMS message-driven beans, this is the JNDI name of the JMS resource from which the message-driven bean consumes JMS messages. This information is alternatively specified within the activation-config subelement of the mdb-resource-adapter element. For more information about JMS resources, see "Using the Java Message Service" in GlassFish Server Open Source Edition Application Development Guide.
**Superelements**

`ejb-ref, message-destination, resource-env-ref, resource-ref`  
(glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml);  
`cmp-resource, ejb, mdb-connection-factory` (glassfish-ejb-jar.xml)

**Subelements**

none - contains data

**jnlp-doc**

Contains the name of a custom JNLP file, which modifies the behavior of a Java Web Start enabled application client module. If none is specified, a default JNLP file is generated.

The value of this element is a relative path with the following format:

`[path-to-JAR-in-EAR!]path-to-JNLP-in-JAR`

The default `path-to-JAR-in-EAR` is the current application client JAR file. For example, if the JNLP file is in the application client JAR file at `custom/myInfo.jnlp`, the element value would look like this:

```xml
<java-web-start-access>
  <jnlp-doc>custom/myInfo.jnlp</jnlp-doc>
</java-web-start-access>
```

If the application client is inside an EAR file, you can place the custom JNLP file inside another JAR file in the EAR. For example, if the JNLP file is in a JAR file at `other/myLib.jar`, the element value would look like this, with an exclamation point (!) separating the path to the JAR from the path in the JAR:

```xml
<java-web-start-access>
  <jnlp-doc>other/myLib.jar!custom/myInfo.jnlp</jnlp-doc>
</java-web-start-access>
```

For information about the allowed contents of a custom JNLP file, see "Developing Java Clients" in *GlassFish Server Open Source Edition Application Development Guide*.

**Superelements**

`java-web-start-access` (glassfish-application-client.xml)

**Subelements**

none - contains data

**jsp-config**

Specifies JSP configuration information.

**Superelements**

`glassfish-web-app` (glassfish-web.xml)
### Subelements

The following table describes subelements for the **jsp-config** element.

**Table C–79  jsp-config Subelements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>property</td>
<td>zero or more</td>
<td>Specifies a property, which has a name and a value.</td>
</tr>
</tbody>
</table>

### Properties

The default property values are tuned for development of JSP files at the cost of performance. To maximize performance, set **jsp-config** properties to these non-default values:

- development - false (as an alternative, set to true and give modificationTestInterval a large value)
- mappedfile - false
- trimSpaces - true
- suppressSmap - true
- fork - false (on Solaris)
- classdebuginfo - false

The following table describes properties for the **jsp-config** element.

**Table C–80  jsp-config Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>checkInterval</td>
<td>0</td>
<td>If development is set to false and checkInterval is greater than zero, background compilations are enabled. The checkInterval is the time in seconds between checks to see if a JSP file needs to be recompiled.</td>
</tr>
<tr>
<td>classdebuginfo</td>
<td>true</td>
<td>Specifies whether the generated Java servlets are compiled with the debug option set (-g for javac).</td>
</tr>
<tr>
<td>classpath</td>
<td>created dynamically based on the current web application</td>
<td>Specifies the classpath to use when compiling generated servlets.</td>
</tr>
<tr>
<td>compilerSourceVM</td>
<td>Depends on GlassFish Server's Java runtime</td>
<td>Specifies the JDK release with which source compatibility of the generated servlets is provided. Same as the -source release option of javac. For more information, see <a href="http://docs.oracle.com/javase/7/docs/technotes/tools/solaris/javac.html#options">http://docs.oracle.com/javase/7/docs/technotes/tools/solaris/javac.html#options</a>.</td>
</tr>
<tr>
<td>compilerTargetVM</td>
<td>Depends on GlassFish Server's Java runtime</td>
<td>Specifies the Virtual Machine for the Java platform (JVM software) version for which the servlet class files are generated. Same as the -target release option of javac. For more information, see <a href="http://docs.oracle.com/javase/7/docs/technotes/tools/solaris/javac.html#options">http://docs.oracle.com/javase/7/docs/technotes/tools/solaris/javac.html#options</a>.</td>
</tr>
</tbody>
</table>
### Table C–80 (Cont.) *jsp-config* Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>defaultBufferNone</td>
<td>false</td>
<td>If true, the default for the buffer attribute of the page directive is none.</td>
</tr>
<tr>
<td>development</td>
<td>true</td>
<td>If set to true, enables development mode, which allows JSP files to be checked for modification. Specify the frequency at which JSPs are checked using the modificationTestInterval property.</td>
</tr>
<tr>
<td>dumpSmap</td>
<td>false</td>
<td>If set to true, dumps SMAP information for JSR 45 debugging to a file. Set to false if suppressSmap is true.</td>
</tr>
<tr>
<td>enablePooling</td>
<td>true</td>
<td>If set to true, tag handler pooling is enabled.</td>
</tr>
<tr>
<td>enableTldValidation</td>
<td>false</td>
<td>If set to true, all Tag Library Descriptor (TLD) files referenced by the web application are validated against their underlying schema or DTD file.</td>
</tr>
<tr>
<td>errorOnUseBeanInvalidClassAttribute</td>
<td>false</td>
<td>If set to true, issues an error when the value of the class attribute in a useBean action is not a valid bean class.</td>
</tr>
<tr>
<td>fork</td>
<td>true</td>
<td>Specifies that Ant forks the compiling of JSP files, using a JVM machine separate from the one in which Tomcat is running.</td>
</tr>
<tr>
<td>genStrAsByteArray</td>
<td>true</td>
<td>If true, text strings are generated as bytes (encoded with the page encoding), if the page is not buffered.</td>
</tr>
<tr>
<td>genStrAsCharArray</td>
<td>false</td>
<td>If set to true, generates text strings as char arrays, which improves performance in some cases.</td>
</tr>
<tr>
<td>httpMethods</td>
<td>* for all methods</td>
<td>Specifies a comma separated list of HTTP methods supported by the JspServlet.</td>
</tr>
<tr>
<td>ieClassId</td>
<td>clsid:8AD 9C840-044 E-11D1-B3 E9-00805F 499D93</td>
<td>Specifies the Java plug-in COM class ID for Internet Explorer. Used by the <a href="">jsp:plugin</a> tags.</td>
</tr>
<tr>
<td>ignoreJspFragmentErrors</td>
<td>false</td>
<td>If set to true, instructs the compiler to ignore any JSP precompilation errors pertaining to statically included JSP segments that, despite not being top level JSP files, use the .jsp or .jspx extension (instead of the recommended .jspf).</td>
</tr>
<tr>
<td>initialCapacity</td>
<td>32</td>
<td>Specifies the initial capacity of the HashMap that maps JSP files to their corresponding servlets.</td>
</tr>
<tr>
<td>javaEncoding</td>
<td>UTF8</td>
<td>Specifies the encoding for the generated Java servlet. This encoding is passed to the Java compiler that is used to compile the servlet as well. By default, the web container tries to use UTF8. If that fails, it tries to use the javaEncoding value. For encodings, see: <a href="http://docs.oracle.com/javase/7/docs/technotes/guides/intl/encoding.doc.html">http://docs.oracle.com/javase/7/docs/technotes/guides/intl/encoding.doc.html</a></td>
</tr>
<tr>
<td>keepgenerated</td>
<td>true with JDK 5 and before and for jspc, otherwise false</td>
<td>If set to true, keeps the generated Java files. If false, deletes the Java files.</td>
</tr>
<tr>
<td>mappedfile</td>
<td>true</td>
<td>If set to true, generates static content with one print statement per input line, to ease debugging.</td>
</tr>
<tr>
<td>modificationTestInterval</td>
<td>0</td>
<td>Specifies the frequency in seconds at which JSPs are checked for modification. A value of 0 causes the JSP to be checked on every access. Used only if development is set to true.</td>
</tr>
</tbody>
</table>
If set to `true`, retains web sessions, stateful session bean instances, and persistently created EJB timers across redeployments. The `--keepstate` option of the redeploy subcommand takes precedence. The default for both is `false`.

Some changes to an application between redeployments prevent this feature from working properly. For example, do not change the set of instance variables in the SFSB bean class.

For web applications, this feature is applicable only if in the `glassfish-web-app.xml` file the `persistence-type` attribute of the `session-manager` element is `file`.

For stateful session bean instances, the persistence type without high availability is set in the server (the `sfsb-persistence-type` attribute) and must be set to `file`, which is the default and recommended value.

If any active web session, SFSB instance, or EJB timer fails to be preserved or restored, **none** of these will be available when the redeployment is complete. However, the redeployment continues and a warning is logged.

To preserve active state data, GlassFish Server serializes the data and saves it in memory. To restore the data, the class loader of the newly redeployed application deserializes the data that was previously saved.

### Superelements

- `glassfish-application` (`glassfish-application.xml`)
- `glassfish-web-app` (`glassfish-web-app.xml`)
- `glassfish-ejb-jar` (`glassfish-ejb-jar.xml`)
key-field

Subelements

none - contains data

key-field

Specifies a component of the key used to look up and extract cache entries. The web container looks for the named parameter, or field, in the specified scope.

If this element is not present, the web container uses the Servlet Path (the path section that corresponds to the servlet mapping that activated the current request). See the Servlet 2.4 specification, section SRV 4.4, for details on the Servlet Path.

Superelements

cache-mapping (glassfish-web.xml)

Subelements

none

Attributes

The following table describes attributes for the key-field element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>none</td>
<td>Specifies the input parameter name.</td>
</tr>
<tr>
<td>scope</td>
<td>request.parameter</td>
<td>(optional) Specifies the scope from which the input parameter is retrieved. Allowed values are context.attribute, request.header, request.parameter, request.cookie, session.id, and session.attribute.</td>
</tr>
</tbody>
</table>

level

Specifies the name of a hierarchical fetch group. The name must be an integer. Fields and relationships that belong to a hierarchical fetch group of equal (or lesser) value are fetched at the same time. The value of level must be greater than zero. Only one is allowed.

Superelements

fetched-with (sun-cmp-mappings.xml)

Subelements

none - contains data

local-home-impl

Specifies the fully-qualified class name of the generated EJBLocalHome impl class.

Note: This value is automatically generated by the server at deployment or redeployment time. Do not specify it or change it after deployment.
Superelements

gen-classes (glassfish-ejb-jar.xml)

Subelements

none - contains data

local-impl

Specifies the fully-qualified class name of the generated EJBJObject impl class.

---

**Note:** This value is automatically generated by the server at deployment or redeployment time. Do not specify it or change it after deployment.

---

Superelements

gen-classes (glassfish-ejb-jar.xml)

Subelements

none - contains data

locale-charset-info

Deprecated. For backward compatibility only. Use the parameter-encoding subelement of glassfish-web-app instead. Specifies information about the application’s internationalization settings.

Superelements

glassfish-web-app (glassfish-web.xml)

Subelements

The following table describes subelements for the locale-charset-info element.

<table>
<thead>
<tr>
<th>Table C–82</th>
<th>locale-charset-info Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td>Required</td>
</tr>
<tr>
<td>locale-charset-map</td>
<td>one or more</td>
</tr>
<tr>
<td>parameter-encoding</td>
<td>zero or one</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the locale-charset-info element.
locale-charset-map

Maps locales and agents to character encodings. Provided for backward compatibility. Used only for request processing. Used only if the character encoding is not specified in the request and cannot be derived from the optional parameter-encoding element. For encodings, see http://docs.oracle.com/javase/7/docs/technotes/guides/intl/encoding.doc.html.

Superelements

locale-charset-info (glassfish-web.xml)

Subelements

The following table describes subelements for the locale-charset-map element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>zero or one</td>
<td>Specifies an optional text description of a mapping.</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the locale-charset-map element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>locale</td>
<td>none</td>
<td>Specifies the locale name.</td>
</tr>
<tr>
<td>agent</td>
<td>none</td>
<td>(optional) Specifies the type of client that interacts with the GlassFish Server. For a given locale, different agents can have different preferred character encodings. The value of this attribute must exactly match the value of the user-agent HTTP request header sent by the client. See Table C–86 for more information.</td>
</tr>
<tr>
<td>charset</td>
<td>none</td>
<td>Specifies the character encoding to which the locale maps.</td>
</tr>
</tbody>
</table>

Example Agents

The following table specifies example agent attribute values.

<table>
<thead>
<tr>
<th>Agent</th>
<th>user-agent Header and agent Attribute Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Explorer 5.00 for Windows 2000</td>
<td>Mozilla/4.0 (compatible; MSIE 5.01; Windows NT 5.0)</td>
</tr>
<tr>
<td>Netscape 4.7.7 for Windows 2000</td>
<td>Mozilla/4.77 [en] (Windows NT 5.0; U)</td>
</tr>
<tr>
<td>Netscape 4.7 for Solaris</td>
<td>Mozilla/4.7 [en] (X11; u; Sun OS 5.6 sun4u)</td>
</tr>
</tbody>
</table>
localpart

Specifies the local part of a QName.

Superelements

service-qname, wsd1-port (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

Subelements

none - contains data

lock-when-loaded

Places a database update lock on the rows corresponding to the bean whenever the bean is loaded. How the lock is placed is database-dependent. The lock is released when the transaction finishes (commit or rollback). While the lock is in place, other database users have read access to the bean.

Superelements

consistency (sun-cmp-mappings.xml)

Subelements

none - element is present or absent

lock-when-modified

This element is not implemented. Do not use.

Superelements

consistency (sun-cmp-mappings.xml)

log-service

Specifies configuration settings for the log file.

Superelements

client-container (sun-acc.xml)

Subelements

The following table describes subelements for the log-service element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property, which has a name and a value.</td>
</tr>
</tbody>
</table>
login-config

Attributes

The following table describes attributes for the log-service element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>log-file</td>
<td>your-ACC-dir/logs/client.log</td>
<td>(optional) Specifies the file where the application client container logging information is stored.</td>
</tr>
<tr>
<td>level</td>
<td>SEVERE</td>
<td>(optional) Sets the base level of severity. Messages at or above this setting get logged to the log file.</td>
</tr>
</tbody>
</table>

login-config

Specifies the authentication configuration for an EJB web service endpoint. Not needed for servlet web service endpoints. A servlet's security configuration is contained in the web.xml file.

Superelements

webservice-endpoint (glassfish-web.xml, glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the login-config element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auth-method</td>
<td>only one</td>
<td>Specifies the authentication method.</td>
</tr>
<tr>
<td>realm</td>
<td>zero or one</td>
<td>Specifies the name of the realm used to process all authentication requests.</td>
</tr>
</tbody>
</table>

mail-resource

Defines a JavaMail (javax.mail.Session) resource.

Superelements

resources (glassfish-resources.xml)

Subelements

The following table describes subelements for the mail-resource element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>zero or one</td>
<td>Contains a text description of this element.</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property or a variable.</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the mail-resource element.
Properties

You can set properties for the `mail-resource` element and then get these properties in a JavaMail Session object later. Every property name must start with a `mail-` prefix. The GlassFish Server changes the dash (`-`) character to a period (`.`) in the name of the property, then saves the property to the `MailConfiguration` and JavaMail Session objects. If the name of the property doesn’t start with `mail-`, the property is ignored.

For example, to define the property `mail.password` in a JavaMail Session object, first edit `glassfish-resources.xml` as follows:

```xml
...<mail-resource jndi-name="mail/Session" ...>
    <property name="mail-password" value="adminadmin"/>
</mail-resource>
```
After getting the JavaMail Session object, get the mail.password property to retrieve the value adminadmin, as follows:

```java
String password = session.getProperty("mail.password");
```

For more information about JavaMail properties, see JavaMail API Documentation (http://javamail.kenai.com/nonav/javadocs/index.html).

**manager-properties**

Specifies session manager properties.

**Superelements**

- `session-manager` (glassfish-web.xml)

**Subelements**

The following table describes subelements for the `manager-properties` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property, which has a name and a value.</td>
</tr>
</tbody>
</table>

**Properties**

The following table describes properties for the `manager-properties` element.
Table C–93  manager-properties Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>reapIntervalSeconds</td>
<td>60</td>
<td>Specifies the number of seconds between checks for expired sessions. This is also the interval at which sessions are passivated if maxSessions is exceeded. If persistenceFrequency is set to time-based, active sessions are stored at this interval. To prevent data inconsistency, set this value lower than the frequency at which session data changes. For example, this value should be as low as possible (1 second) for a hit counter servlet on a frequently accessed web site, or the last few hits might be lost each time the server is restarted. Applicable only if the persistence-type attribute of the parent session-manager element is file or replicated.</td>
</tr>
<tr>
<td>maxSessions</td>
<td>-1</td>
<td>Specifies the maximum number of sessions that are permitted in the cache, or -1 for no limit. After this, an attempt to create a new session causes an IllegalStateException to be thrown. If the persistence-type attribute of the parent session-manager element is file or replicated, the session manager passivates sessions to the persistent store when this maximum is reached.</td>
</tr>
<tr>
<td>sessionFilename</td>
<td>empty string</td>
<td>Specifies the absolute or relative path to the directory in which the session state is preserved between application restarts, if preserving the state is possible. A relative path is relative to the temporary directory for this web module, one of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>domain-dir/generated/jsp/module-name</td>
</tr>
<tr>
<td></td>
<td></td>
<td>domain-dir/generated/jsp/app-name/module-name</td>
</tr>
<tr>
<td></td>
<td></td>
<td>By default, this property's value is set to an empty string, which disables this property and does not preserve the session state. Applicable only if the persistence-type attribute of the parent session-manager element is memory.</td>
</tr>
<tr>
<td>persistenceFrequency</td>
<td>web-method</td>
<td>Specifies how often the session state is stored. Allowed values are as follows:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• web-method - The session state is stored at the end of each web request prior to sending a response back to the client. This mode provides the best guarantee that the session state is fully updated in case of failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• time-based - The session state is stored in the background at the frequency set by reapIntervalSeconds. This mode provides less of a guarantee that the session state is fully updated. However, it can provide a significant performance improvement because the state is not stored after each request. Applicable only if the persistence-type attribute of the parent session-manager element is replicated.</td>
</tr>
</tbody>
</table>

mapping-properties

This element is not implemented.

Superelements

cmp (glassfish-ejb-jar.xml)
**max-cache-size**

Specifies the maximum number of beans allowable in cache. A value of zero indicates an unbounded cache. In reality, there is no hard limit. The max-cache-size limit is just a hint to the cache implementation. Default is 512.

Applies to stateful session beans and entity beans.

**Superelements**

`bean-cache` *(glassfish-ejb-jar.xml)*

**Subelements**

None - contains data

---

**max-pool-size**

Specifies the maximum number of bean instances in the pool. Values are from 0 (1 for message-driven bean) to MAX_INTEGER. A value of 0 means the pool is unbounded. Default is 64.

Applies to all beans.

**Superelements**

`bean-pool` *(glassfish-ejb-jar.xml)*

**Subelements**

None - contains data

---

**max-wait-time-in-millis**

This element is deprecated. Do not use.

**Superelements**

`bean-pool` *(glassfish-ejb-jar.xml)*

---

**mdb-connection-factory**

Specifies the connection factory associated with a message-driven bean. Queue or Topic type must be consistent with the Java Message Service Destination type associated with the message-driven bean class.

**Superelements**

`ejb` *(glassfish-ejb-jar.xml)*

**Subelements**

The following table describes subelements for the `mdb-connection-factory` element.
**mdb-resource-adapter**

Specifies runtime configuration information for a message-driven bean.

**Superelements**

ejb (glassfish-ejb-jar.xml)

**Subelements**

The following table describes subelements for the `mdb-resource-adapter` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>resource-adapter-mid</td>
<td>zero or one</td>
<td>Specifies a resource adapter module ID.</td>
</tr>
<tr>
<td>activation-config</td>
<td>one or more</td>
<td>Specifies an activation configuration.</td>
</tr>
</tbody>
</table>

**message**

Specifies the methods or operations to which message security requirements apply.

**Superelements**

message-security (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

**Subelements**

The following table describes subelements for the `message` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>java-method</td>
<td>zero or one</td>
<td>Specifies the methods or operations to which message security requirements apply.</td>
</tr>
<tr>
<td>operation-name</td>
<td>zero or one</td>
<td>Specifies the WSDL name of an operation of a web service.</td>
</tr>
</tbody>
</table>

**message-destination**

Specifies the name of a logical `message-destination` defined within an application. The `message-destination-name` matches the corresponding `message-destination-name` in the corresponding Java EE deployment descriptor file. Use when the message destination reference in the corresponding Java EE deployment descriptor file specifies a `message-destination-link` to a logical `message-destination`.
Superelements

glassfish-web-app (glassfish-web.xml), enterprise-beans (glassfish-ejb-jar.xml), glassfish-application-client (glassfish-application-client.xml)

Subelements

The following table describes subelements for the message-destination element.

<table>
<thead>
<tr>
<th>Table C–97 message-destination subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
</tr>
<tr>
<td>message-destination-name</td>
</tr>
<tr>
<td>jndi-name</td>
</tr>
</tbody>
</table>

message-destination-name

Specifies the name of a logical message destination defined within the corresponding Java EE deployment descriptor file.

Superelements

message-destination (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

Subelements

none - contains data

message-destination-ref

Directly binds a message destination reference to the JNDI name of a Queue, Topic, or other physical destination. Use only when the message destination reference in the corresponding Java EE deployment descriptor file does not specify a message-destination-link to a logical message-destination.

Superelements

glassfish-web-app (glassfish-web.xml), ejb (glassfish-ejb-jar.xml), glassfish-application-client (glassfish-application-client.xml)

Subelements

The following table describes subelements for the message-destination-ref element.

<table>
<thead>
<tr>
<th>Table C–98 message-destination-ref subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
</tr>
<tr>
<td>message-destination-ref-name</td>
</tr>
<tr>
<td>jndi-name</td>
</tr>
</tbody>
</table>
message-destination-ref-name

Specifies the name of a physical message destination defined within the corresponding Java EE deployment descriptor file.

Superelements

message-destination-ref (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

Subelements

none - contains data

message-security

Specifies message security requirements.

- If the grandparent element is webservice-endpoint, these requirements pertain to request and response messages of the endpoint.
- If the grandparent element is port-info, these requirements pertain to the port of the referenced service.

Superelements

message-security-binding (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

Subelements

The following table describes subelements for the message-security element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>message</td>
<td>one or more</td>
<td>Specifies the methods or operations to which message security requirements apply.</td>
</tr>
<tr>
<td>request-protection</td>
<td>zero or one</td>
<td>Defines the authentication policy requirements of the application’s request processing.</td>
</tr>
<tr>
<td>response-protection</td>
<td>zero or one</td>
<td>Defines the authentication policy requirements of the application’s response processing.</td>
</tr>
</tbody>
</table>

message-security-binding

Specifies a custom authentication provider binding for a parent webservice-endpoint or port-info element in one or both of these ways:

- By binding to a specific provider
- By specifying the message security requirements enforced by the provider

Superelements

webservice-endpoint, port-info (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)
**message-security-config**

**Subelements**

The following table describes subelements for the `message-security-binding` element.

<table>
<thead>
<tr>
<th>Table C–100</th>
<th><strong>message-security-binding Subelements</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td>Required</td>
</tr>
<tr>
<td>message-security</td>
<td>zero or more</td>
</tr>
</tbody>
</table>

**Attributes**

The following table describes attributes for the `message-security-binding` element.

<table>
<thead>
<tr>
<th>Table C–101</th>
<th><strong>message-security-binding Attributes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute</td>
<td>Default</td>
</tr>
<tr>
<td>auth-layer</td>
<td>none</td>
</tr>
<tr>
<td>provider-id</td>
<td>none</td>
</tr>
</tbody>
</table>

**message-security-config**

Specifies configurations for message security providers.

**Superelements**

`client-container` *(sun-acc.xml)*

**Subelements**

The following table describes subelements for the `message-security-config` element.

<table>
<thead>
<tr>
<th>Table C–102</th>
<th><strong>message-security-config Subelements</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td>Required</td>
</tr>
<tr>
<td>provider-config</td>
<td>one or more</td>
</tr>
</tbody>
</table>

**Attributes**

The following table describes attributes for the `message-security-config` element.

<table>
<thead>
<tr>
<th>Table C–103</th>
<th><strong>message-security-config Attributes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute</td>
<td>Default</td>
</tr>
<tr>
<td>auth-layer</td>
<td>none</td>
</tr>
<tr>
<td>default-provider</td>
<td>none</td>
</tr>
<tr>
<td>default-client-provider</td>
<td>none</td>
</tr>
</tbody>
</table>
method

Specifies a bean method.

Superelements

checkpoint-at-end-of-method, flush-at-end-of-method (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the method element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>zero or one</td>
<td>Specifies an optional text description.</td>
</tr>
<tr>
<td>ejb-name</td>
<td>zero or one</td>
<td>Matches the ejb-name in the corresponding ejb-jar.xml file.</td>
</tr>
<tr>
<td>method-name</td>
<td>only one</td>
<td>Specifies a method name.</td>
</tr>
<tr>
<td>method-intf</td>
<td>zero or one</td>
<td>Specifies the method interface to distinguish between methods with the same name in different interfaces.</td>
</tr>
<tr>
<td>method-params</td>
<td>zero or one</td>
<td>Specifies fully qualified Java type names of method parameters.</td>
</tr>
</tbody>
</table>

method-intf

Specifies the method interface to distinguish between methods with the same name in different interfaces. Allowed values are Home, Remote, LocalHome, and Local.

Superelements

method (glassfish-ejb-jar.xml)

Subelements

none - contains data

method-name

Specifies a method name or * (an asterisk) for all methods. If a method is overloaded, specifies all methods with the same name.

Superelements

java-method (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml); finder, query-method, method (glassfish-ejb-jar.xml)

Subelements

none - contains data

Examples

<method-name>findTeammates</method-name>

<method-name>*</method-name>
**method-param**

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

**Superelements**

- method-params (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

**Subelements**

- none - contains data

**method-params**

Specifies fully qualified Java type names of method parameters.

**Superelements**

- java-method (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml); query-method, method (glassfish-ejb-jar.xml)

**Subelements**

The following table describes subelements for the `method-params` element.

<table>
<thead>
<tr>
<th>Table C–105 method-params Subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
</tr>
<tr>
<td>method-param</td>
</tr>
</tbody>
</table>

**name**

Specifies the name of the entity.

**Superelements**

- call-property, default-resource-principal, stub-property (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml); enterprise-beans, principal, property (with subelements) (glassfish-ejb-jar.xml)

**Subelements**

- none - contains data

**named-group**

Specifies the name of one independent fetch group. All the fields and relationships that are part of a named group are fetched at the same time. A field belongs to only one fetch group, regardless of what type of fetch group is used.

**Superelements**

- fetched-with (sun-cmp-mappings.xml)
Subelements
none - contains data

namespaceURI
Specifies the namespace URI.

Superelements
service-qname, wsd1-port (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

Subelements
none - contains data

none
Specifies that this field or relationship is fetched by itself, with no other fields or relationships.

Superelements
consistency, fetched-with (sun-cmp-mappings.xml)

Subelements
none - element is present or absent

one-one-finders
Describes the finders for CMP 1.1 beans.

Superelements
cmp (glassfish-ejb-jar.xml)

Subelements
The following table describes subelements for the one-one-finders element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>finder</td>
<td>one or more</td>
<td>Describes the finders for CMP 1.1 with a method name and query.</td>
</tr>
</tbody>
</table>

operation-name
Specifies the WSDL name of an operation of a web service.

Superelements
message (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)
**parameter-encoding**

Specifies the default request character encoding and how the web container decodes parameters from forms according to a hidden field value.

If both the `glassfish-web-app` and `locale-charset-info` elements have parameter-encoding subelements, the subelement of `glassfish-web-app` takes precedence. For encodings, see [http://docs.oracle.com/javase/7/docs/technotes/guides/intl/encoding.doc.html](http://docs.oracle.com/javase/7/docs/technotes/guides/intl/encoding.doc.html).

**Superelements**

`locale-charset-info, glassfish-web-app` (glassfish-web.xml)

**Subelements**

none

**Attributes**

The following table describes attributes for the `parameter-encoding` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>form-hint-field</td>
<td>none</td>
<td>(optional) The name of the hidden field in the form. This field specifies the character encoding the web container uses for <code>request.getParameter</code> and <code>request.getReader</code> calls when the charset is not set in the request's <code>content-type</code> header.</td>
</tr>
<tr>
<td>default-charset</td>
<td>ISO-8859-1</td>
<td>(optional) The default request character encoding.</td>
</tr>
</tbody>
</table>

**pass-by-reference**

Specifies the passing method used by a servlet or enterprise bean calling a remote interface method in another bean that is colocated within the same process.

- If `false` (the default if this element is not present), this application uses pass-by-value semantics.
- If `true`, this application uses pass-by-reference semantics.
When a servlet or enterprise bean calls a remote interface method in another bean that is colocated within the same process, by default GlassFish Server makes copies of all the call parameters in order to preserve the pass-by-value semantics. This increases the call overhead and decreases performance.

However, if the calling method does not change the object being passed as a parameter, it is safe to pass the object itself without making a copy of it. To do this, set the pass-by-reference value to `true`.

The setting of this element in the `glassfish-application.xml` file applies to all EJB modules in the application. For an individually deployed EJB module, you can set the same element in the `glassfish-ejb-jar.xml` file. If `pass-by-reference` is used at both the bean and application level, the bean level takes precedence.

**Superelements**

`glassfish-application` (`glassfish-application.xml`), `ejb` (`glassfish-ejb-jar.xml`)

**Subelements**

- none - contains data

**password**

Specifies the password for the principal.

**Superelements**

`default-resource-principal` (`glassfish-web.xml`, `glassfish-ejb-jar.xml`, `glassfish-application-client.xml`)

**Subelements**

- none - contains data

**Note:** The `pass-by-reference` element only applies to remote calls. As defined in the EJB 2.1 specification, section 5.4, calls to local interfaces use pass-by-reference semantics.

If the `pass-by-reference` element is set to its default value of `false`, the passing semantics for calls to remote interfaces comply with the EJB 2.1 specification, section 5.4. If set to `true`, remote calls involve pass-by-reference semantics instead of pass-by-value semantics, contrary to this specification.

Portable programs cannot assume that a copy of the object is made during such a call, and thus that it's safe to modify the original. Nor can they assume that a copy is not made, and thus that changes to the object are visible to both caller and callee. When this element is set to `true`, parameters and return values should be considered read-only. The behavior of a program that modifies such parameters or return values is undefined.

If the `pass-by-reference` element is set to its default value of `false`, the passing semantics for calls to remote interfaces comply with the EJB 2.1 specification, section 5.4. If set to `true`, remote calls involve pass-by-reference semantics instead of pass-by-value semantics, contrary to this specification.

Portable programs cannot assume that a copy of the object is made during such a call, and thus that it's safe to modify the original. Nor can they assume that a copy is not made, and thus that changes to the object are visible to both caller and callee. When this element is set to `true`, parameters and return values should be considered read-only. The behavior of a program that modifies such parameters or return values is undefined.
per-request-load-balancing

Specifies the per-request load balancing behavior of EJB 2.x and 3.x remote client invocations on a stateless session bean. If set to `true`, per-request load balancing is enabled for the associated stateless session bean. If set to `false` or not set, per-request load balancing is not enabled. The default is `false`.

Superelements

ejb (glassfish-ejb-jar.xml)

Subelements

none - contains data

pm-descriptors

This element and its subelements are deprecated. Do not use.

Superelements

enterprise-beans (glassfish-ejb-jar.xml)

pool-idle-timeout-in-seconds

Specifies the maximum time, in seconds, that a bean instance is allowed to remain idle in the pool. When this timeout expires, the bean instance in a pool becomes a candidate for passivation or deletion. This is a hint to the server. A value of 0 specifies that idle beans remain in the pool indefinitely. Default value is 600.

Applies to stateless session beans, entity beans, and message-driven beans.

---

Note: For a stateless session bean or a message-driven bean, the bean is removed (garbage collected) when the timeout expires.

---

Superelements

bean-pool (glassfish-ejb-jar.xml)

Subelements

none - contains data

port-component-name

Specifies a unique name for a port component within a web or EJB module.

Superelements

webservice-endpoint (glassfish-web.xml, glassfish-ejb-jar.xml)

Subelements

none - contains data
port-info

Specifies information for a port within a web service reference.

Either a service-endpoint-interface or a wsdl-port or both must be specified. If both are specified, wsdl-port specifies the port that the container chooses for container-managed port selection.

The same wsdl-port value must not appear in more than one port-info element within the same service-ref.

If a service-endpoint-interface is using container-managed port selection, its value must not appear in more than one port-info element within the same service-ref.

Superelements

service-ref (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

Subelements

The following table describes subelements for the port-info element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>service-endpoint-interface</td>
<td>zero or one</td>
<td>Specifies the web service reference name relative to java:comp/env.</td>
</tr>
<tr>
<td>wsdl-port</td>
<td>zero or one</td>
<td>Specifies the WSDL port.</td>
</tr>
<tr>
<td>stub-property</td>
<td>zero or more</td>
<td>Specifies JAX-RPC property values that are set on a javax.xml.rpc.Stub object before it is returned to the web service client.</td>
</tr>
<tr>
<td>call-property</td>
<td>zero or more</td>
<td>Specifies JAX-RPC property values that are set on a javax.xml.rpc.Call object before it is returned to the web service client.</td>
</tr>
<tr>
<td>message-security-binding</td>
<td>zero or one</td>
<td>Specifies a custom authentication provider binding.</td>
</tr>
</tbody>
</table>

prefetch-disabled

Disables prefetching of entity bean states for the specified query methods. Container-managed relationship fields are prefetched if their fetched-with element is set to default.

Superelements

cmp (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the prefetch-disabled element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>query-method</td>
<td>one or more</td>
<td>Specifies a query method.</td>
</tr>
</tbody>
</table>
principal

Defines a user name on the platform.

Superelements

ejb (glassfish-ejb-jar.xml); security-map (glassfish-resources.xml)

Subelements

The following table describes subelements for the principal element.

Table C–110  principal Subelements

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>only one</td>
<td>Specifies the name of the user.</td>
</tr>
</tbody>
</table>

principal-map

Maps an EIS principal to a principal defined in the GlassFish Server domain.

Superelements

work-security-map (glassfish-resources.xml)

Subelements

none

Attributes

The following table describes attributes for the principal-map element.

Table C–111  principal-map Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>eis-principal</td>
<td>none</td>
<td>Specifies an EIS principal.</td>
</tr>
<tr>
<td>mapped-principal</td>
<td>none</td>
<td>Specifies a principal defined in the GlassFish Server domain.</td>
</tr>
</tbody>
</table>

principal-name

Contains the principal (user) name.

In an enterprise bean, specifies the principal (user) name that has the run-as role specified.

Superelements

security-role-mapping (glassfish-application.xml, glassfish-web.xml, glassfish-ejb-jar.xml), servlet (glassfish-web.xml)

Subelements

none - contains data
Attributes

The following table describes attributes for the `principal-name` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>class-name</td>
<td>com.sun.enterprise.deployment.PrincipalImpl</td>
<td>Optional (with respect to GlassFish Server) Specifies the custom principal implementation class corresponding to the named principal.</td>
</tr>
</tbody>
</table>

**property (with attributes)**

Specifies the name and value of a property. A property adds configuration information to its parent element that is one or both of the following:

- Optional with respect to GlassFish Server
- Needed by a system or object that GlassFish Server doesn't have knowledge of, such as an LDAP server or a Java class

**Superelements**

cache, cache-helper, class-loader, cookie-properties, default-helper, manager-properties, session-properties, store-properties, glassfish-web-app, valve, webservice-endpoint (glassfish-web.xml); auth-realm, client-container, client-credential, log-service, provider-config (sun-acc.xml); admin-object-resource, connector-connection-pool, connector-resource, custom-resource, external-jndi-resource, jdbc-connection-pool, jdbc-resource, mail-resource, resource-adapter-config (glassfish-resources.xml)

**Subelements**

The following table describes subelements for the `property` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>zero or one</td>
<td>Specifies an optional text description of a property.</td>
</tr>
</tbody>
</table>

**Note:** The `property` element in the `sun-acc.xml` file has no subelements.

**Attributes**

The following table describes attributes for the `property` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>none</td>
<td>Specifies the name of the property.</td>
</tr>
<tr>
<td>value</td>
<td>none</td>
<td>Specifies the value of the property.</td>
</tr>
</tbody>
</table>

**Example**

```xml
<property name='reapIntervalSeconds' value='20' />
```
**property (with subelements)**

Specifies the name and value of a property. A property adds configuration information to its parent element that is one or both of the following:

- Optional with respect to GlassFish Server
- Needed by a system or object that GlassFish Server doesn't have knowledge of, such as an LDAP server or a Java class

**Superelements**

- enterprise-beans,
- cmp-resource,
- schema-generator-properties,
- webservice-endpoint (glassfish-ejb-jar.xml)

**Subelements**

The following table describes subelements for the `property` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>only one</td>
<td>Specifies the name of the property.</td>
</tr>
<tr>
<td>value</td>
<td>only one</td>
<td>Specifies the value of the property.</td>
</tr>
</tbody>
</table>

**Example**

```xml
<property>
  <name>use-unique-table-names</name>
  <value>true</value>
</property>
```

**provider-config**

Specifies a configuration for one message security provider.

Although the `request-policy` and `response-policy` subelements are optional, the `provider-config` element does nothing if they are not specified.

Use property subelements to configure provider-specific properties. Property values are passed to the provider when its `initialize` method is called.

**Superelements**

- message-security-config (sun-acc.xml)

**Subelements**

The following table describes subelements for the `provider-config` element.
Attributes

The following table describes attributes for the provider-config element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>provider-id</td>
<td>none</td>
<td>Specifies the provider ID.</td>
</tr>
<tr>
<td>provider-type</td>
<td>none</td>
<td>Specifies whether the provider is a client, server, or client-server</td>
</tr>
<tr>
<td></td>
<td></td>
<td>authentication provider.</td>
</tr>
<tr>
<td>class-name</td>
<td>none</td>
<td>Specifies the Java implementation class of the provider. Client authentication providers must implement the com.sun.enterprise.security.jauth.ClientAuthModule interface. Server authentication providers must implement the com.sun.enterprise.security.jauth.ServerAuthModule interface. Client-server providers must implement both interfaces.</td>
</tr>
</tbody>
</table>

query-filter

Specifies the query filter for the CMP 1.1 finder.

Superelements

finder (glassfish-ejb-jar.xml)

Subelements

none - contains data

query-method

Specifies a query method.

Superelements

prefetch-disabled (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the query-method element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>method-name</td>
<td>only one</td>
<td>Specifies a method name.</td>
</tr>
<tr>
<td>method-params</td>
<td>only one</td>
<td>Specifies the fully qualified Java type names of method parameters.</td>
</tr>
</tbody>
</table>
query-ordering
Specifies the query ordering for the CMP 1.1 finder.

Superelements
finder (glassfish-ejb-jar.xml)

Subelements
none - contains data

query-params
Specifies the query parameters for the CMP 1.1 finder.

Superelements
finder (glassfish-ejb-jar.xml)

Subelements
none - contains data

query-variables
Specifies variables in the query expression for the CMP 1.1 finder.

Superelements
finder (glassfish-ejb-jar.xml)

Subelements
none - contains data

read-only
Specifies that a field is read-only if true. If this element is absent, the default value is false.

Superelements
cmp-field-mapping (sun-cmp-mappings.xml)

Subelements
none - contains data

realm
Specifies the name of the realm used to process all authentication requests associated with this application. If this element is not specified or does not match the name of a configured realm, the default realm is used. For more information about realms, see

### Superelements

- `玻璃fish-application` (`glassfish-application.xml`), `as-context`, `login-config` (`glassfish-ejb-jar.xml`)

### Subelements

- `glassfish-application` (`glassfish-application.xml`), `as-context`, `login-config` (`glassfish-ejb-jar.xml`)

### `refresh-field`

Specifies a field that gives the application component a programmatic way to refresh a cached entry.

### Superelements

- `cache-mapping` (`glassfish-web.xml`)

### Subelements

- `cache-mapping` (`glassfish-web.xml`)

### Attributes

The following table describes attributes for the `refresh-field` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>none</td>
<td>Specifies the input parameter name.</td>
</tr>
<tr>
<td>scope</td>
<td>request.parameter</td>
<td>(optional) Specifies the scope from which the input parameter is retrieved. Allowed values are context.attribute, request.header, request.parameter, request.cookie, session.id, and session.attribute.</td>
</tr>
</tbody>
</table>

### `refresh-period-in-seconds`

Specifies the rate at which a read-only-bean must be refreshed from the data source. If the value is less than or equal to zero, the bean is never refreshed; if the value is greater than zero, the bean instances are refreshed at the specified interval. This rate is just a hint to the container. Default is 0 (no refresh).

### Superelements

- `ejb` (`glassfish-ejb-jar.xml`)

### Subelements

- `ejb` (`glassfish-ejb-jar.xml`)

none - contains data
**removal-timeout-in-seconds**

Specifies the amount of time a bean instance can remain idle in the container before it is removed (timeout). A value of 0 specifies that the container does not remove inactive beans automatically. The default value is 5400.

If `removal-timeout-in-seconds` is less than or equal to `cache-idle-timeout-in-seconds`, beans are removed immediately without being passivated.

Applies to stateful session beans.

For related information, see `cache-idle-timeout-in-seconds`.

**Superelements**

`bean-cache (glassfish-ejb-jar.xml)`

**Subelements**

`none - contains data`

**remote-home-impl**

Specifies the fully-qualified class name of the generated EJBHome impl class.

---

**Note:** This value is automatically generated by the server at deployment or redeployment time. Do not specify it or change it after deployment.

---

**Superelements**

`gen-classes (glassfish-ejb-jar.xml)`

**Subelements**

`none - contains data`

**remote-impl**

Specifies the fully-qualified class name of the generated EJBObject impl class.

---

**Note:** This value is automatically generated by the server at deployment or redeployment time. Do not specify it or change it after deployment.

---

**Superelements**

`gen-classes (glassfish-ejb-jar.xml)`

**Subelements**

`none - contains data`
**request-policy**

Defines the authentication policy requirements of the authentication provider’s request processing.

**Superelements**

`provider-config` *(sun-acc.xml)*

**Subelements**

none

**Attributes**

The following table describes attributes for the `request-policy` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auth-source</td>
<td>none</td>
<td>Specifies the type of required authentication, either sender (user name and password) or content (digital signature).</td>
</tr>
<tr>
<td>auth-recipient</td>
<td>none</td>
<td>Specifies whether recipient authentication occurs before or after content authentication. Allowed values are before-content and after-content.</td>
</tr>
</tbody>
</table>

**request-protection**

Defines the authentication policy requirements of the application’s request processing.

**Superelements**

`message-security` *(glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)*

**Subelements**

none

**Attributes**

The following table describes attributes for the `request-protection` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auth-source</td>
<td>none</td>
<td>Specifies the type of required authentication, either sender (user name and password) or content (digital signature).</td>
</tr>
<tr>
<td>auth-recipient</td>
<td>none</td>
<td>Specifies whether recipient authentication occurs before or after content authentication. Allowed values are before-content and after-content.</td>
</tr>
</tbody>
</table>

**required**

Specifies whether the authentication method specified in the `auth-method` element must be used for client authentication. The value is `true` or `false` (the default).
**Superelements**

*as-context* (glassfish-ejb-jar.xml)

**Subelements**

none - contains data

---

**res-ref-name**

Specifies the `res-ref-name` in the corresponding Java EE deployment descriptor file `resource-ref` entry. The `res-ref-name` element specifies the name of a resource manager connection factory reference. The name must be unique within an enterprise bean.

**Superelements**

*resource-ref* (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

**Subelements**

none - contains data

---

**resize-quantity**

Specifies the number of bean instances to be:

- Created, if a request arrives when the pool has less than `steady-pool-size` quantity of beans (applies to pools only for creation). If the pool has more than `steady-pool-size` minus `resize-quantity` of beans, then `resize-quantity` is still created.

- Removed, when the `pool-idle-timeout-in-seconds` timer expires and a cleaner thread removes any unused instances.
  - For caches, when `max-cache-size` is reached, `resize-quantity` beans are selected for passivation using the `victim-selection-policy`. In addition, the `cache-idle-timeout-in-seconds` or `removal-timeout-in-seconds` timers passivate beans from the cache.
  - For pools, when the `max-pool-size` is reached, `resize-quantity` beans are selected for removal. In addition, the `pool-idle-timeout-in-seconds` timer removes beans until `steady-pool-size` is reached.

Values are from 0 to MAX_INTEGER. The pool is not resized below the `steady-pool-size`. Default is 16.

Applies to stateless session beans, entity beans, and message-driven beans.
For EJB pools, the value can be defined in the EJB container. Default is 16.
For EJB caches, the value can be defined in the EJB container. Default is 32.
For message-driven beans, the value can be defined in the EJB container. Default is 2.

**Superelements**

*bean-cache, bean-pool* (glassfish-ejb-jar.xml)
Subelements

- none - contains data

**resource-adapter-config**

Defines a connector (resource adapter) configuration. Stores configuration information for the resource adapter JavaBean in property subelements.

Superelements

- resources (glassfish-resources.xml)

Subelements

The following table describes subelements for the `resource-adapter-config` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property or a variable.</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the `resource-adapter-config` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>none</td>
<td>(optional) Not used. See <code>resource-adapter-name</code>.</td>
</tr>
<tr>
<td>thread-pool-ids</td>
<td>none</td>
<td>(optional) Specifies a comma-separated list of the names of thread pools.</td>
</tr>
<tr>
<td>object-type</td>
<td>user</td>
<td>(optional) Defines the type of the resource. Allowed values are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- system-all - A system resource for all server instances and the domain application server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- system-admin - A system resource only for the domain application server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- system-instance - A system resource for all server instances only.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- user - A user resource.</td>
</tr>
<tr>
<td>resource-adapter-name</td>
<td>none</td>
<td>Specifies the name of a deployed connector module or application. If the resource adapter is embedded in an application, then it is <code>app_name#rar_name</code>.</td>
</tr>
</tbody>
</table>

Properties

Properties of the `resource-adapter-config` element are the names of setter methods of the `resourceadapter-class` element in the `ra.xml` file, which defines the class name of the resource adapter JavaBean. Any properties defined here override the default values present in `ra.xml`.

**resource-adapter-mid**

Specifies the module ID of the resource adapter that is responsible for delivering messages to the message-driven bean.
**resource-env-ref**

Maps the res-ref-name in the corresponding Java EE deployment descriptor file resource-env-ref entry to the absolute jndi-name of a resource.

**Superelements**

- mdb-resource-adapter (glassfish-ejb-jar.xml)

**Subelements**

- none - contains data

---

**resource-env-ref**

The following table describes subelements for the resource-env-ref element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>resource-env-ref-name</td>
<td>only one</td>
<td>Specifies the res-ref-name in the corresponding Java EE deployment descriptor file resource-env-ref entry.</td>
</tr>
<tr>
<td>jndi-name</td>
<td>only one</td>
<td>Specifies the absolute jndi-name of a resource.</td>
</tr>
</tbody>
</table>

**Example**

```xml
<resource-env-ref>
  <resource-env-ref-name>jms/StockQueueName</resource-env-ref-name>
  <jndi-name>jms/StockQueue</jndi-name>
</resource-env-ref>
```

**resource-env-ref-name**

Specifies the res-ref-name in the corresponding Java EE deployment descriptor file resource-env-ref entry.

**Superelements**

- resource-env-ref (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

**Subelements**

- none - contains data

---

**resource-ref**

Maps the res-ref-name in the corresponding Java EE deployment descriptor file resource-ref entry to the absolute jndi-name of a resource.
Superelements

glassfish-web-app (glassfish-web.xml), ejb (glassfish-ejb-jar.xml),
glassfish-application-client (glassfish-application-client.xml)

Subelements

The following table describes subelements for the resource-ref element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>res-ref-name</td>
<td>only one</td>
<td>Specifies the res-ref-name in the corresponding Java EE deployment descriptor file resource-ref entry.</td>
</tr>
<tr>
<td>jndi-name</td>
<td>only one</td>
<td>Specifies the absolute jndi-name of a resource.</td>
</tr>
<tr>
<td>default-resource-principal</td>
<td>zero or one</td>
<td>Specifies the default principal (user) for the resource.</td>
</tr>
</tbody>
</table>

Example

```xml
<resource-ref>
  <res-ref-name>jdbc/EmployeeDBName</res-ref-name>
  <jndi-name>jdbc/EmployeeDB</jndi-name>
</resource-ref>
```

resources

Defines application-scoped resources for an enterprise application, web module, EJB module, connector module, or application client module. This is the root element; there can only be one resources element in a glassfish-resources.xml file. See The glassfish-resources.xml File.

Note: You must specify a Java Naming and Directory Interface (JNDI) name for each resource. To avoid collisions with names of other enterprise resources in JNDI, and to avoid portability problems, all names in a GlassFish Server application should begin with the string java:app/.

Superelements

none
**Subelements**

The following table describes subelements for the `resources` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>custom-resource</td>
<td>zero or more</td>
<td>Defines a custom resource.</td>
</tr>
<tr>
<td>external-jndi-resource</td>
<td>zero or more</td>
<td>Defines a resource that resides in an external JNDI repository.</td>
</tr>
<tr>
<td>jdbc-resource</td>
<td>zero or more</td>
<td>Defines a JDBC (Java Database Connectivity) resource.</td>
</tr>
<tr>
<td>mail-resource</td>
<td>zero or more</td>
<td>Defines a JavaMail resource.</td>
</tr>
<tr>
<td>admin-object-resource</td>
<td>zero or more</td>
<td>Defines an administered object for an inbound resource adapter.</td>
</tr>
<tr>
<td>connector-resource</td>
<td>zero or more</td>
<td>Defines a connector (resource adapter) resource.</td>
</tr>
<tr>
<td>resource-adapter-config</td>
<td>zero or more</td>
<td>Defines a resource adapter configuration.</td>
</tr>
<tr>
<td>jdbc-connection-pool</td>
<td>zero or more</td>
<td>Defines the properties that are required for creating a JDBC connection pool.</td>
</tr>
<tr>
<td>connector-connection-pool</td>
<td>zero or more</td>
<td>Defines the properties that are required for creating a connector connection pool.</td>
</tr>
<tr>
<td>work-security-map</td>
<td>zero or more</td>
<td>Defines a work security map.</td>
</tr>
</tbody>
</table>

**Note:** Subelements of a `resources` element can occur in any order.

**response-policy**

Defines the authentication policy requirements of the authentication provider's response processing.

**Superelements**

`provider-config (sun-acc.xml)`

**Subelements**

none

**Attributes**

The following table describes attributes for the `response-policy` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auth-source</td>
<td>none</td>
<td>Specifies the type of required authentication, either sender (user name and password) or content (digital signature).</td>
</tr>
<tr>
<td>auth-recipient</td>
<td>none</td>
<td>Specifies whether recipient authentication occurs before or after content authentication. Allowed values are before-content and after-content.</td>
</tr>
</tbody>
</table>

**response-protection**

Defines the authentication policy requirements of the application's response processing.
Superelements

message-security (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

Subelements

none

Attributes

The following table describes attributes for the response-protection element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auth-source</td>
<td>none</td>
<td>Specifies the type of required authentication, either sender (user name and password) or content (digital signature).</td>
</tr>
<tr>
<td>auth-recipient</td>
<td>none</td>
<td>Specifies whether recipient authentication occurs before or after content authentication. Allowed values are before-content and after-content.</td>
</tr>
</tbody>
</table>

role-name

Contains the role-name in the security-role element of the corresponding Java EE deployment descriptor file.

Superelements

security-role-mapping (glassfish-application.xml, glassfish-web.xml, glassfish-ejb-jar.xml)

Subelements

none - contains data

sas-context

Describes the sas-context fields.

Superelements

ior-security-config (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the sas-context element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>caller-propagation</td>
<td>only one</td>
<td>Specifies whether the target accepts propagated caller identities. The values are NONE, SUPPORTED, or REQUIRED.</td>
</tr>
</tbody>
</table>
**schema**

Specifies the file that contains a description of the database schema to which the beans in this `sun-cmp-mappings.xml` file are mapped. If this element is empty, the database schema file is automatically generated at deployment time. Otherwise, the `schema` element names a `.dbschema` file with a pathname relative to the directory containing the `sun-cmp-mappings.xml` file, but without the `.dbschema` extension. See "Automatic Database Schema Capture" in GlassFish Server Open Source Edition Application Development Guide.

**Superelements**

`sun-cmp-mapping` (`sun-cmp-mappings.xml`)

**Subelements**

none - contains data

**Examples**

```
<schema/> <!-- use automatic schema generation -->
<schema>CompanySchema</schema> <!-- use "CompanySchema.dbschema" -->
```

**schema-generator-properties**

Specifies field-specific column attributes in property subelements.

**Superelements**

`cmp-resource` (`glassfish-ejb-jar.xml`)

**Subelements**

The following table describes subelements for the `schema-generator-properties` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>property (with subelements)</td>
<td>zero or more</td>
<td>Specifies a property name and value.</td>
</tr>
</tbody>
</table>

**Properties**

The following table describes properties for the `schema-generator-properties` element.

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>use-unique-table-names</td>
<td>false</td>
<td>Specifies that generated table names are unique within each GlassFish Server domain. This property can be overridden during deployment. See &quot;Generation Options for CMP&quot; in GlassFish Server Open Source Edition Application Development Guide.</td>
</tr>
<tr>
<td>bean-name.field-name.attribute</td>
<td>none</td>
<td>Defines a column attribute. For attribute descriptions, see Table C–132.</td>
</tr>
</tbody>
</table>
The following table lists the column attributes for properties defined in the `schema-generator-properties` element.

### Table C–132  
**schema-generator-properties** Column Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>jdbc-type</td>
<td>Specifies the JDBC type of the column created for the CMP field. The actual SQL type generated is based on this JDBC type but is database vendor specific.</td>
</tr>
<tr>
<td>jdbc-maximum-length</td>
<td>Specifies the maximum number of characters stored in the column corresponding to the CMP field. Applies only when the actual SQL that is generated for the column requires a length. For example, a <code>jdbc-maximum-length</code> of 32 on a CMP String field such as <code>firstName</code> normally results in a column definition such as <code>VARCHAR(32)</code>. But if the <code>jdbc-type</code> is CLOB and you are deploying on Oracle, the resulting column definition is CLOB. No length is given, because in an Oracle database, a CLOB has no length.</td>
</tr>
<tr>
<td>jdbc-precision</td>
<td>Specifies the maximum number of digits stored in a column which represents a numeric type.</td>
</tr>
<tr>
<td>jdbc-scale</td>
<td>Specifies the number of digits stored to the right of the decimal point in a column that represents a floating point number.</td>
</tr>
<tr>
<td>jdbc-nullable</td>
<td>Specifies whether the column generated for the CMP field allows null values.</td>
</tr>
</tbody>
</table>

#### Example

```
<schema-generator-properties>
  <property>
    <name>Employee.firstName.jdbc-type</name>
    <value>char</value>
  </property>
  <property>
    <name>Employee.firstName.jdbc-maximum-length</name>
    <value>25</value>
  </property>
  <property>
    <name>use-unique-table-names</name>
    <value>true</value>
  </property>
</schema-generator-properties>
```

**secondary-table**

Specifies a bean’s secondary table(s).

**Superelements**

- [entity-mapping](sun-cmp-mappings.xml)

**Subelements**

The following table describes subelements for the `secondary-table` element.
security

Defines the SSL security configuration for IIOP/SSL communication with the target server.

Superelements

target-server (sun-acc.xml)

Subelements

The following table describes subelements for the security element.

Table C–134  security Subelements

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ssl</td>
<td>only one</td>
<td>Specifies the SSL processing parameters.</td>
</tr>
<tr>
<td>cert-db</td>
<td>only one</td>
<td>Not implemented. Included for backward compatibility only.</td>
</tr>
</tbody>
</table>

security-map

Maps the principal received during servlet or EJB authentication to the credentials accepted by the EIS. This mapping is optional. It is possible to map multiple GlassFish Server principals to the same back-end principal.

This is different from a work-security-map, which maps a principal associated with an incoming work instance to a principal in the GlassFish Server's security domain.

Superelements

connector-connection-pool (glassfish-resources.xml)

Subelements

The following table describes subelements for the security-map element.

Table C–135  security-map Subelements

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>principal</td>
<td>one or more</td>
<td>Contains the principal of the servlet or EJB client.</td>
</tr>
<tr>
<td>user-group</td>
<td>one or more</td>
<td>Contains the group to which the principal belongs.</td>
</tr>
<tr>
<td>backend-principal</td>
<td>only one</td>
<td>Specifies the user name and password required by the EIS.</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the security-map element.
Elements of the GlassFish Server Deployment Descriptors

security-role-mapping

Maps roles to users or groups in the currently active realm. See "Realm Configuration" in GlassFish Server Open Source Edition Application Development Guide.

The role mapping element maps a role, as specified in the EJB JAR role-name entries, to a environment-specific user or group. If it maps to a user, it must be a concrete user which exists in the current realm, who can log into the server using the current authentication method. If it maps to a group, the realm must support groups and the group must be a concrete group which exists in the current realm. To be useful, there must be at least one user in that realm who belongs to that group.

Superelements

glassfish-application (glassfish-application.xml), glassfish-web-app (glassfish-web.xml), glassfish-ejb-jar (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the security-role-mapping element.

Table C–137  security-role-mapping Subelements

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>role-name</td>
<td>only one</td>
<td>Contains the role-name in the security-role element of the corresponding Java EE deployment descriptor file.</td>
</tr>
<tr>
<td>principal-name</td>
<td>one or more if no group-name, otherwise zero or more</td>
<td>Contains a principal (user) name in the current realm. In an enterprise bean, the principal must have the run-as role specified.</td>
</tr>
<tr>
<td>group-name</td>
<td>one or more if no principal-name, otherwise zero or more</td>
<td>Contains a group name in the current realm.</td>
</tr>
</tbody>
</table>

service-endpoint-interface

Specifies the web service reference name relative to java:comp/env.

Superelements

glassfish-application (glassfish-application.xml), glassfish-web-app (glassfish-web.xml), glassfish-ejb-jar (glassfish-ejb-jar.xml)

Subelements

none - contains data

service-impl-class

Specifies the name of the generated service implementation class.
Superelements

   service-ref (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

Subelements

   none - contains data

**service-qname**

   Specifies the WSDL service element that is being referred to.

Superelements

   service-ref (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml); webservice-endpoint (glassfish-web.xml, glassfish-ejb-jar.xml)

Subelements

   The following table describes subelements for the service-qname element.

   Table C–138  service-qname subelements

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>namespaceURI</td>
<td>only one</td>
<td>Specifies the namespace URI.</td>
</tr>
<tr>
<td>localpart</td>
<td>only one</td>
<td>Specifies the local part of a QName.</td>
</tr>
</tbody>
</table>

**service-ref**

   Specifies runtime settings for a web service reference. Runtime information is only needed in the following cases:
   - To define the port used to resolve a container-managed port
   - To define the default Stub/Call property settings for Stub objects
   - To define the URL of a final WSDL document to be used instead of the one associated with the service-ref in the standard Java EE deployment descriptor

Superelements

   glassfish-web-app (glassfish-web.xml), ejb (glassfish-ejb-jar.xml), glassfish-application-client (glassfish-application-client.xml)

Subelements

   The following table describes subelements for the service-ref element.
### service-ref-name

Specifies the web service reference name relative to `java:comp/env`.

#### Superelements

- `service-ref` (`glassfish-web.xml`, `glassfish-ejb-jar.xml`, `glassfish-application-client.xml`)

#### Subelements

- none - contains data

### servlet

Specifies a principal name for a servlet. Used for the `run-as` role defined in `web.xml`.

#### Superelements

- `glassfish-web-app` (`glassfish-web.xml`)

#### Subelements

The following table describes subelements for the `servlet` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>servlet-name</td>
<td>only one</td>
<td>Contains the name of a servlet, which is matched to a <code>servlet-name</code> in <code>web.xml</code>.</td>
</tr>
<tr>
<td>principal-name</td>
<td>zero or one</td>
<td>Contains a principal (user) name in the current realm.</td>
</tr>
<tr>
<td>webservice-endpoint</td>
<td>zero or more</td>
<td>Specifies information about a web service endpoint.</td>
</tr>
</tbody>
</table>

### servlet-impl-class

Specifies the automatically generated name of the servlet implementation class.

#### Superelements

- `webservice-endpoint` (`glassfish-web.xml`, `glassfish-ejb-jar.xml`)
Subelements

none - contains data

**servlet-name**

Specifies the name of a servlet, which is matched to a `servlet-name` in `web.xml`. This name must be present in `web.xml`.

Superelements

cache-mapping, servlet (glassfish-web.xml)

Subelements

none - contains data

**session-config**

Specifies session configuration information. Overrides the web container settings for an individual web module.

Superelements

glassfish-web-app (glassfish-web.xml)

Subelements

The following table describes subelements for the `session-config` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>session-manager</td>
<td>zero or one</td>
<td>Specifies session manager configuration information.</td>
</tr>
<tr>
<td>session-properties</td>
<td>zero or one</td>
<td>Specifies session properties.</td>
</tr>
<tr>
<td>cookie-properties</td>
<td>zero or one</td>
<td>Specifies session cookie properties.</td>
</tr>
</tbody>
</table>

**session-manager**

Specifies session manager information.

Superelements

`session-config` (glassfish-web.xml)

Subelements

The following table describes subelements for the `session-manager` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>manager-properties</td>
<td>zero or one</td>
<td>Specifies session manager properties.</td>
</tr>
<tr>
<td>store-properties</td>
<td>zero or one</td>
<td>Specifies session persistence (storage) properties.</td>
</tr>
</tbody>
</table>
Attributes

The following table describes attributes for the session-manager element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>persistence-type</td>
<td>memory</td>
<td>(optional) Specifies the session persistence mechanism. Allowed values are memory, file, and replicated.</td>
</tr>
</tbody>
</table>

If you have installed and configured Coherence*Web, the coherence-web persistence type is also available. For more information, see Using Coherence*Web with GlassFish Server (http://docs.oracle.com/cd/E18686_01/coh.37/e18690/glassfish.htm).

**session-properties**

Specifies session properties.

Superelements

session-config (glassfish-web.xml)

Subelements

The following table describes subelements for the session-properties element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property, which has a name and a value.</td>
</tr>
</tbody>
</table>

Properties

The following table describes properties for the session-properties element.

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>timeoutSeconds</td>
<td>1800</td>
<td>Specifies the default maximum inactive interval (in seconds) for all sessions created in this web module. If set to 0 or less, sessions in this web module never expire.</td>
</tr>
</tbody>
</table>

If a session-timeout element is specified in the web.xml file, the session-timeout value overrides any timeoutSeconds value. If neither session-timeout nor timeoutSeconds is specified, the timeoutSeconds default is used.

Note that the session-timeout element in web.xml is specified in minutes, not seconds.

<table>
<thead>
<tr>
<th>enableCookies</th>
<th>true</th>
<th>Uses cookies for session tracking if set to true.</th>
</tr>
</thead>
<tbody>
<tr>
<td>enableURLRewriting</td>
<td>true</td>
<td>Enables URL rewriting. This provides session tracking via URL rewriting when the browser does not accept cookies. You must also use an encodeURL or encodeRedirectURL call in the servlet or JSP.</td>
</tr>
</tbody>
</table>

ssl

Defines SSL processing parameters.
steady-pool-size

**Superelements**

- security (sun-acc.xml)

**Subelements**

- none

**Attributes**

The following table describes attributes for the `SSL` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cert-nickname</td>
<td>slas</td>
<td>(optional) The nickname of the server certificate in the certificate database or the PKCS#11 token. In the certificate, the name format is <code>tokenname:nickname</code>. Including the <code>tokenname</code> part of the name in this attribute is optional.</td>
</tr>
<tr>
<td>ssl2-enabled</td>
<td>false</td>
<td>(optional) Determines whether SSL2 is enabled.</td>
</tr>
<tr>
<td>ssl2-ciphers</td>
<td>none</td>
<td>(optional) A comma-separated list of the SSL2 ciphers to be used. Ciphers not explicitly listed will be disabled for the target, even if those ciphers are available in the particular cipher suite you are using. If this option is not used, all supported ciphers are assumed to be enabled. Allowed values are <code>rc4, rc4export, rc2, rc2export, idea, des, desede3</code>.</td>
</tr>
<tr>
<td>ssl3-enabled</td>
<td>true</td>
<td>(optional) Determines whether SSL3 is enabled.</td>
</tr>
<tr>
<td>ssl3-tls-ciphers</td>
<td>none</td>
<td>(optional) A comma-separated list of the SSL3 and/or TLS ciphers to be used. Ciphers not explicitly listed will be disabled for the target, even if those ciphers are available in the particular cipher suite you are using. If this option is not used, all supported ciphers are assumed to be enabled. Allowed values are <code>SSL_RSA_WITH_RC4_128_MD5, SSL_RSA_WITH_3DES_EDE_CBC_SHA, SSL_RSA_WITH_AES_128_CBC_SHA, SSL_RSA_EXPORT_WITH_RC4_40_MD5, SSL_RSA_WITH_NULL_MD5, SSL_RSA_WITH_NULL_SHA</code>. Values available in previous releases are supported for backward compatibility.</td>
</tr>
<tr>
<td>tls-enabled</td>
<td>true</td>
<td>(optional) Determines whether TLS is enabled.</td>
</tr>
<tr>
<td>tls-rollback-enabled</td>
<td>true</td>
<td>(optional) Determines whether TLS rollback is enabled. Enable TLS rollback for Microsoft Internet Explorer 5.0 and 5.5.</td>
</tr>
</tbody>
</table>

**steady-pool-size**

Specifies the initial and minimum number of bean instances that are maintained in the pool. Default is 32. Applies to stateless session beans and message-driven beans.

**Superelements**

- bean-pool (glassfish-ejb-jar.xml)

**Subelements**

- none - contains data

**store-properties**

Specifies session persistence (storage) properties.
Superelements

**session-manager** *(glassfish-web.xml)*

Subelements

The following table describes subelements for the `store-properties` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property, which has a name and value.</td>
</tr>
</tbody>
</table>

Properties

The following table describes properties for the `store-properties` element.

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>directory</td>
<td>domain-dir/generated/jsp/app-name/module-name_war</td>
<td>Specifies the absolute or relative pathname of the directory into which individual session files are written. A relative path is relative to the temporary work directory for this web module. Applicable only if the <code>persistence-type</code> attribute of the parent <code>session-manager</code> element is <code>file</code>.</td>
</tr>
</tbody>
</table>
| persistenceScope | session                                      | Specifies how much of the session state is stored. Allowed values are as follows:  
  - `session` - The entire session state is stored every time. This mode provides the best guarantee that your session data is correctly stored for any distributable web module.  
  - `modified-session` - The entire session state is stored if it has been modified. A session is considered to have been modified if `HttpSession.setAttribute()` or `HttpSession.removeAttribute()` was called. You must guarantee that `setAttribute` is called every time an attribute is changed. This is not a Java EE specification requirement, but it is required for this mode to work properly.  
  - `modified-attribute` - Only modified session attributes are stored. For this mode to work properly, you must follow some guidelines, which are explained immediately following this table. Applicable only if the `persistence-type` attribute of the parent `session-manager` element is `replicated`. |

If the `persistenceScope` store property is set to `modified-attribute`, a web module must follow these guidelines:

- Call `setAttribute` every time the session state is modified.
- Make sure there are no cross-references between attributes. The object graph under each distinct attribute key is serialized and stored separately. If there are any object cross references between the objects under each separate key, they are not serialized and deserialized correctly.
- Distribute the session state across multiple attributes, or at least between a read-only attribute and a modifiable attribute.
**stub-property**

Specifies JAX-RPC property values that are set on a `javax.xml.rpc.Stub` object before it is returned to the web service client. The property names can be any properties supported by the JAX-RPC `Stub` implementation.

**Superelements**

`port-info` (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

**Subelements**

The following table describes subelements for the `stub-property` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>only one</td>
<td>Specifies the name of the entity.</td>
</tr>
<tr>
<td>value</td>
<td>only one</td>
<td>Specifies the value of the entity.</td>
</tr>
</tbody>
</table>

**Properties**

The following table describes properties for the `stub-property` element.

<table>
<thead>
<tr>
<th>Property</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>jbi-enabled</td>
<td>true</td>
<td>Determines whether the visibility of this endpoint as a Java Business Integration service is enabled or disabled.</td>
</tr>
</tbody>
</table>

**Example**

```xml
<service-ref>
  <service-ref-name>service/FooProxy</service-ref-name>
  <port-info>
    <service-endpoint-interface>a.FooPort</service-endpoint-interface>
    <wsdl-port>
      <namespaceURI>urn:Foo</namespaceURI>
      <localpart>FooPort</localpart>
    </wsdl-port>
    <stub-property>
      <name>javax.xml.rpc.service.endpoint.address</name>
      <value>http://localhost:8080/a/Foo</value>
    </stub-property>
  </port-info>
</service-ref>
```

**sun-cmp-mapping**

Specifies beans mapped to a particular database schema.

**Note:** A bean cannot be related to a bean that maps to a different database schema, even if the beans are deployed in the same EJB JAR file.
Superelements

`sun-cmp-mappings` *(sun-cmp-mappings.xml)*

Subelements

The following table describes subelements for the `sun-cmp-mapping` element.

### Table C–151 `sun-cmp-mapping` Subelements

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>schema</code></td>
<td>only one</td>
<td>Specifies the file that contains a description of the database schema.</td>
</tr>
<tr>
<td><code>entity-mapping</code></td>
<td>one or more</td>
<td>Specifies the mapping of a bean to database columns.</td>
</tr>
</tbody>
</table>

**`sun-cmp-mappings`**

Defines the GlassFish Server specific CMP mapping configuration for an EJB JAR file. This is the root element; there can only be one `sun-cmp-mappings` element in a `sun-cmp-mappings.xml` file. See The `sun-cmp-mappings.xml` File.

Superelements

none

Subelements

The following table describes subelements for the `sun-cmp-mappings` element.

### Table C–152 `sun-cmp-mappings` Subelements

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>sun-cmp-mapping</code></td>
<td>one or more</td>
<td>Specifies beans mapped to a particular database schema.</td>
</tr>
</tbody>
</table>

**`table-name`**


Superelements

`entity-mapping, secondary-table` *(sun-cmp-mappings.xml)*

Subelements

none - contains data

**`target-server`**

Specifies the IIOP listener for the target server. Also specifies IIOP endpoints used for load balancing. If the GlassFish Server instance on which the application client is deployed participates in a cluster, GlassFish Server finds all currently active IIOP endpoints in the cluster automatically. However, a client should have at least two endpoints specified for bootstrapping purposes, in case one of the endpoints has failed.
A listener or endpoint is in the form host:port, where the host is an IP address or host name, and the port specifies the port number.
Not used if the deprecated endpoints property is defined for load balancing. For more information, see client-container.

Superelements

client-container (sun-acc.xml)

Subelements

The following table describes subelements for the target-server element.

<table>
<thead>
<tr>
<th>Table C–153</th>
<th>target-server subelements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td>Required</td>
</tr>
<tr>
<td>description</td>
<td>zero or one</td>
</tr>
<tr>
<td>security</td>
<td>zero or one</td>
</tr>
</tbody>
</table>

Attributes

The following table describes attributes for the target-server element.

<table>
<thead>
<tr>
<th>Table C–154</th>
<th>target-server attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute</td>
<td>Default</td>
</tr>
<tr>
<td>name</td>
<td>none</td>
</tr>
<tr>
<td>address</td>
<td>none</td>
</tr>
<tr>
<td>port</td>
<td>none</td>
</tr>
</tbody>
</table>

tie-class

Specifies the automatically generated name of a tie implementation class for a port component.

Superelements

webservice-endpoint (glassfish-web.xml, glassfish-ejb-jar.xml)

Subelements

none - contains data

timeout

Specifies the cache-mapping specific maximum amount of time in seconds that an entry can remain in the cache after it is created or refreshed. If not specified, the default is the value of the timeout attribute of the cache element.
Superelements

- cache-mapping (glassfish-web.xml)

Subelements

- none - contains data

Attributes

The following table describes attributes for the `timeout` element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>none</td>
<td>Specifies the timeout input parameter, whose value is interpreted in seconds. The field's type must be <code>java.lang.Long</code> or <code>java.lang.Integer</code>.</td>
</tr>
<tr>
<td>scope</td>
<td>request.attribute</td>
<td>(optional) Specifies the scope from which the input parameter is retrieved. Allowed values are <code>context.attribute</code>, <code>request.header</code>, <code>request.parameter</code>, <code>request.cookie</code>, <code>request.attribute</code>, and <code>session.attribute</code>.</td>
</tr>
</tbody>
</table>

transport-config

Specifies the security transport information.

Superelements

- ior-security-config (glassfish-ejb-jar.xml)

Subelements

The following table describes subelements for the `transport-config` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>integrity</td>
<td>only one</td>
<td>Specifies if the target supports integrity-protected messages. The values are NONE, SUPPORTED, or REQUIRED.</td>
</tr>
<tr>
<td>confidentiality</td>
<td>only one</td>
<td>Specifies if the target supports privacy-protected messages. The values are NONE, SUPPORTED, or REQUIRED.</td>
</tr>
<tr>
<td>establish-trust-in-target</td>
<td>only one</td>
<td>Specifies if the target is capable of authenticating to a client. The values are NONE, SUPPORTED, or REQUIRED.</td>
</tr>
<tr>
<td>establish-trust-in-client</td>
<td>only one</td>
<td>Specifies if the target is capable of authenticating a client. The values are NONE, SUPPORTED, or REQUIRED.</td>
</tr>
</tbody>
</table>

transport-guarantee

Specifies that the communication between client and server is NONE, INTEGRAL, or CONFIDENTIAL.

- NONE means the application does not require any transport guarantees.
- INTEGRAL means the application requires that the data sent between client and server be sent in such a way that it can't be changed in transit.
- **CONFIDENTIAL** means the application requires that the data be transmitted in a fashion that prevents other entities from observing the contents of the transmission.

In most cases, a value of **INTEGRAL** or **CONFIDENTIAL** indicates that the use of SSL is required.

### Superelements

**webservice-endpoint** *(glassfish-web.xml, glassfish-ejb-jar.xml)*

### Subelements

none - contains data

### unique-id

Contains the unique ID for the application. This value is automatically updated each time the application is deployed or redeployed. Do not edit this value.

### Superelements

**glassfish-application** *(glassfish-application.xml)*, **enterprise-beans** *(glassfish-ejb-jar.xml)*

### Subelements

none - contains data

### url-pattern

Specifies a servlet URL pattern for which caching is enabled. See the Servlet 2.4 specification section SRV.11.2 for applicable patterns.

### Superelements

**cache-mapping** *(glassfish-web.xml)*

### Subelements

none - contains data

### user-group

Contains the group to which the principal belongs.

### Superelements

**security-map** *(glassfish-resources.xml)*

### Subelements

none - contains data
**use-thread-pool-id**

Specifies the thread pool from which threads are selected for remote invocations of this bean.

**Superelements**

ejb (glassfish-ejb-jar.xml)

**Subelements**

none - contains data

**value**

Specifies the value of the entity.

**Superelements**

call-property, stub-property (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml); property (with subelements)

**Subelements**

none - contains data

**valve**

Specifies a custom valve for this web application. You can define a valve for all the web applications on a specific virtual server. For details, see create-virtual-server(1).

**Superelements**

glassfish-web-app (glassfish-web.xml)

**Subelements**

The following table describes subelements for the valve element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>zero or one</td>
<td>Specifies a text description of this element.</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property, which has a name and a value.</td>
</tr>
</tbody>
</table>

**Attributes**

The following table describes attributes for the valve element.
Example

```xml
<valve name="MyValve" classname="org.glassfish.extension.Valve">
  <property name="MyProperty1" value="MyValue1" />
  <property name="MyProperty2" value="MyValue2" />
</valve>
```

vendor

Specifies a vendor-specific icon, splash screen, text string, or a combination of these for Java Web Start download and launch screens. The complete format of this element’s data is as follows:

```xml
<vendor>
  icon-image-URI::splash-screen-image-URI::vendor-text
</vendor>
```

The following example vendor element contains an icon, a splash screen, and a text string:

```xml
<vendor>
  images/icon.jpg::otherDir/splash.jpg::MyCorp, Inc.
</vendor>
```

The following example vendor element contains an icon and a text string:

```xml
<vendor>
  images/icon.jpg::MyCorp, Inc.
</vendor>
```

The following example vendor element contains a splash screen and a text string; note the initial double colon:

```xml
<vendor>::otherDir/splash.jpg::MyCorp, Inc.
```

The following example vendor element contains only a text string:

```xml
<vendor>
  MyCorp, Inc.
</vendor>
```

The default value is the text string `Application Client`.

Superelements

- `java-web-start-access` (`glassfish-application-client.xml`)

Subelements

- none - contains data

version-identifier

Contains version information for an application or module. For more information about application versioning, see Module and Application Versions.
Superelements

glassfish-application (glassfish-application.xml), glassfish-web-app (glassfish-web-app.xml), glassfish-ejb-jar (glassfish-ejb-jar.xml),
glassfish-application-client (glassfish-application-client.xml)

Subelements

none - contains data

victim-selection-policy

Specifies how stateful session beans are selected for passivation. Possible values are First In, First Out (FIFO), Least Recently Used (LRU), Not Recently Used (NRU). The default value is NRU, which is actually pseudo-LRU.

---

Note: You cannot plug in your own victim selection algorithm.

The victims are generally passivated into a backup store (typically a file system or database). This store is cleaned during startup, and also by a periodic background process that removes idle entries as specified by removal-timeout-in-seconds. The backup store is monitored by a background thread (or sweeper thread) to remove unwanted entries.

Applies to stateful session beans.

Superelements

bean-cache (glassfish-ejb-jar.xml)

Subelements

none - contains data

Example

<victim-selection-policy>LRU</victim-selection-policy>

If both SSL2 and SSL3 are enabled, the server tries SSL3 encryption first. If that fails, the server tries SSL2 encryption. If both SSL2 and SSL3 are enabled for a virtual server, the server tries SSL3 encryption first. If that fails, the server tries SSL2 encryption.

web

Specifies the application’s web tier configuration.

Superelements

glassfish-application (glassfish-application.xml)

Subelements

The following table describes subelements for the web element.
### Table C–159  **web Subelements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>web-uri</td>
<td>only one</td>
<td>Contains the web URI for the application.</td>
</tr>
<tr>
<td>context-root</td>
<td>only one</td>
<td>Contains the web context root for the web module.</td>
</tr>
</tbody>
</table>

### web-uri

Contains the web URI for the application. Must match the corresponding element in the application.xml file.

### Superelements

**web** *(glassfish-application.xml)*

### Subelements

none - contains data

### webservice-description

Specifies a name and optional publish location for a web service.

### Superelements

**glassfish-web-app** *(glassfish-web.xml)*, **enterprise-beans** *(glassfish-ejb-jar.xml)*

### Subelements

The following table describes subelements for the webservice-description element.

### Table C–160  **webservice-description subelements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>webservice-description-name</td>
<td>only one</td>
<td>Specifies a unique name for the web service within a web or EJB module.</td>
</tr>
<tr>
<td>wsdl-publish-location</td>
<td>zero or one</td>
<td>Specifies the URL of a directory to which a web service’s WSDL is published during deployment.</td>
</tr>
</tbody>
</table>

### webservice-description-name

Specifies a unique name for the web service within a web or EJB module.

### Superelements

**webservice-description** *(glassfish-web.xml, glassfish-ejb-jar.xml)*

### Subelements

none - contains data
**webservice-endpoint**

Specifies information about a web service endpoint.

**Superelements**

`servlet` (glassfish-web.xml), `ejb` (glassfish-ejb-jar.xml)

**Subelements**

The following table describes subelements for the `webservice-endpoint` element.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>port-component-name</td>
<td>only one</td>
<td>Specifies a unique name for a port component within a web or EJB module.</td>
</tr>
<tr>
<td>endpoint-address-uri</td>
<td>zero or one</td>
<td>Specifies the automatically generated endpoint address.</td>
</tr>
<tr>
<td>login-config</td>
<td>zero or one</td>
<td>Specifies the authentication configuration for an EJB web service endpoint.</td>
</tr>
<tr>
<td>message-security-binding</td>
<td>zero or one</td>
<td>Specifies a custom authentication provider binding.</td>
</tr>
<tr>
<td>transport-guarantee</td>
<td>zero or one</td>
<td>Specifies that the communication between client and server is NONE, INTEGRAL, or CONFIDENTIAL.</td>
</tr>
<tr>
<td>service-qname</td>
<td>zero or one</td>
<td>Specifies the WSDL service element that is being referenced.</td>
</tr>
<tr>
<td>tie-class</td>
<td>zero or one</td>
<td>Specifies the automatically generated name of a tie implementation class for a port component.</td>
</tr>
<tr>
<td>servlet-impl-class</td>
<td>zero or one</td>
<td>Specifies the automatically generated name of the generated servlet implementation class.</td>
</tr>
<tr>
<td>debugging-enabled</td>
<td>zero or one</td>
<td>Specifies whether the debugging servlet is enabled for this web service endpoint. Allowed values are true and false (the default).</td>
</tr>
<tr>
<td>property (with attributes)</td>
<td>zero or more</td>
<td>Specifies a property, which has a name and a value.</td>
</tr>
<tr>
<td>(glassfish-web.xml)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>property (with subelements)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(glassfish-ejb-jar.xml)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**work-security-map**

Defines a work security map, which maps a principal associated with an incoming work instance to a principal in the GlassFish Server's security domain. It is possible to map multiple EIS group or user principals to the same GlassFish Server principal.

This is different from a `security-map`, which maps the principal received during servlet or EJB authentication to the credentials accepted by the EIS.

**Superelements**

`resources` (glassfish-resources.xml)

**Subelements**

The following table describes subelements for the `work-security-map` element.
**Table C–162**  
**work-security-map Subelements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>description</strong></td>
<td>zero or one</td>
<td>Contains a text description of this element.</td>
</tr>
<tr>
<td><strong>principal-map</strong></td>
<td>zero or more</td>
<td>Maps an EIS principal to a principal defined in the GlassFish Server domain.</td>
</tr>
<tr>
<td><strong>group-map</strong></td>
<td>zero or more</td>
<td>Maps an EIS group to a group defined in the GlassFish Server domain.</td>
</tr>
</tbody>
</table>

**Attributes**

The following table describes attributes for the **work-security-map** element.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>name</strong></td>
<td>none</td>
<td>Specifies a unique name for the work security map.</td>
</tr>
<tr>
<td><strong>description</strong></td>
<td>none</td>
<td>Specifies a text description for this element.</td>
</tr>
</tbody>
</table>

**wsdl-override**

Specifies a valid URL pointing to a final WSDL document. If not specified, the WSDL document associated with the **service-ref** in the standard Java EE deployment descriptor is used.

**Superelements**

**service-ref** (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

**Subelements**

none - contains data

**Example**

```xml
// available via HTTP

// in a file
<wsdl-override>file:/home/user1/myfinalwsdl.wsdl</wsdl-override>
```

**wsdl-port**

Specifies the WSDL port.

**Superelements**

**port-info** (glassfish-web.xml, glassfish-ejb-jar.xml, glassfish-application-client.xml)

**Subelements**

The following table describes subelements for the **wsdl-port** element.
wsdl-publish-location

Specifies the URL of a directory to which a web service's WSDL is published during deployment. Any required files are published to this directory, preserving their location relative to the module-specific WSDL directory (META-INF/wsdl or WEB-INF/wsdl).

Superelements

\textit{webservice-description} (glassfish-web.xml, glassfish-ejb-jar.xml)

Subelements

none - contains data

Example

Suppose you have an \textit{ejb.jar} file whose \textit{webservices.xml} file's \textit{wsdl-file} element contains the following reference:

\texttt{META-INF/wsdl/a/Foo.wsdl}

Suppose your \textit{glassfish-ejb.jar} file contains the following element:

\texttt{<wsdl-publish-location>file:/home/user1/publish</wsdl-publish-location>}

The final WSDL is stored in \texttt{/home/user1/publish/a/Foo.wsdl}.

<table>
<thead>
<tr>
<th>Element</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>namespaceURI</td>
<td>only one</td>
<td>Specifies the namespace URI.</td>
</tr>
<tr>
<td>localpart</td>
<td>only one</td>
<td>Specifies the local part of a QNAME.</td>
</tr>
</tbody>
</table>