

# **Oracle® GlassFish Server 3.1 Add-On Component Development Guide**

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# Contents

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<b>Preface</b> .....	5
<b>9 Creating a New Session Persistence Module</b> .....	13
Extending the StrategyBuilder Class .....	13



# Preface

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This document explains how to use published interfaces of Oracle GlassFish Server to develop add-on components for GlassFish Server. This document explains how to perform *only* those tasks that ensure that the add-on component is suitable for GlassFish Server.

This document is for software developers who are developing add-on components for GlassFish Server. This document assumes that the developers are working with a distribution of GlassFish Server. Access to the source code of the GlassFish project is *not* required to perform the tasks in this document. This document also assumes the ability to program in the Java language.

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

GlassFish Server 3.1 is developed through the GlassFish project open-source community at <https://glassfish.dev.java.net/>. 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.

The following topics are addressed here:

- “GlassFish Server Documentation Set” on page 6
- “Related Documentation” on page 7
- “Typographic Conventions” on page 8
- “Symbol Conventions” on page 9
- “Default Paths and File Names” on page 9
- “Documentation, Support, and Training” on page 10
- “Searching Oracle Product Documentation” on page 10
- “Third-Party Web Site References” on page 11

# GlassFish Server Documentation Set

The GlassFish Server documentation set describes deployment planning and system installation. The Uniform Resource Locator (URL) for GlassFish Server documentation is [http://download.oracle.com/docs/cd/E18930\\_01/index.htm](http://download.oracle.com/docs/cd/E18930_01/index.htm). For an introduction to GlassFish Server, refer to the books in the order in which they are listed in the following table.

TABLE P-1 Books in the GlassFish Server Documentation Set

Book Title	Description
<i>Release Notes</i>	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.
<i>Quick Start Guide</i>	Explains how to get started with the GlassFish Server product.
<i>Installation Guide</i>	Explains how to install the software and its components.
<i>Upgrade Guide</i>	Explains how to upgrade to the latest version of GlassFish Server. This guide also describes differences between adjacent product releases and configuration options that can result in incompatibility with the product specifications.
<i>Deployment Planning Guide</i>	Explains how to build a production deployment of GlassFish Server that meets the requirements of your system and enterprise.
<i>Administration Guide</i>	Explains how to configure, monitor, and manage GlassFish Server subsystems and components from the command line by using the <code>asadmin(1M)</code> utility. Instructions for performing these tasks from the Administration Console are provided in the Administration Console online help.
<i>Application Deployment Guide</i>	Explains how to assemble and deploy applications to the GlassFish Server and provides information about deployment descriptors.
<i>Application Development Guide</i>	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.
<i>Add-On Component Development Guide</i>	Explains how to use published interfaces of GlassFish Server to develop add-on components for GlassFish Server. This document explains how to perform <i>only</i> those tasks that ensure that the add-on component is suitable for GlassFish Server.
<i>Embedded Server Guide</i>	Explains how to run applications in embedded GlassFish Server and to develop applications in which GlassFish Server is embedded.

TABLE P-1 Books in the GlassFish Server Documentation Set (Continued)

Book Title	Description
<i>High Availability Administration Guide</i>	Explains how to configure GlassFish Server to provide higher availability and scalability through failover and load balancing.
<i>Performance Tuning Guide</i>	Explains how to optimize the performance of GlassFish Server.
<i>Troubleshooting Guide</i>	Describes common problems that you might encounter when using GlassFish Server and explains how to solve them.
<i>Error Message Reference</i>	Describes error messages that you might encounter when using GlassFish Server.
<i>Reference Manual</i>	Provides reference information in man page format for GlassFish Server administration commands, utility commands, and related concepts.
<i>Message Queue Release Notes</i>	Describes new features, compatibility issues, and existing bugs for GlassFish Message Queue.
<i>Message Queue Administration Guide</i>	Explains how to set up and manage a Message Queue messaging system.
<i>Message Queue Developer's Guide for JMX Clients</i>	Describes the application programming interface in Message Queue for programmatically configuring and monitoring Message Queue resources in conformance with the Java Management Extensions (JMX).

## Related Documentation

The following tutorials explain how to develop Java EE applications:

- *Your First Cup: An Introduction to the Java EE Platform*. 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.
- *Java EE 6 Tutorial*. This comprehensive tutorial explains how to use Java EE 6 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 6 of Java EE is located at <http://download.oracle.com/javaee/6/api/>.
- The API specification for GlassFish Server 3.1, including Java EE 6 platform packages and nonplatform packages that are specific to the GlassFish Server product, is located at <http://glassfish.java.net/nonav/docs/v3/api/>.

Additionally, the [Java EE Specifications \(http://www.oracle.com/technetwork/java/javasee/tech/index.html\)](http://www.oracle.com/technetwork/java/javasee/tech/index.html) might be useful.

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 Java DB database for use with the GlassFish Server, see the [Java DB product page \(http://www.oracle.com/technetwork/java/javadb/overview/index.html\)](http://www.oracle.com/technetwork/java/javadb/overview/index.html).

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 \(http://java.net/projects/glassfish-samples\)](http://java.net/projects/glassfish-samples).

## Typographic Conventions

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

TABLE P-2 Typographic Conventions

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



## Symbol Conventions

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

TABLE P-3 Symbol Conventions

Symbol	Description	Example	Meaning
[ ]	Contains optional arguments and command options.	ls [-l]	The -l option is not required.
{   }	Contains a set of choices for a required command option.	-d {y n}	The -d option requires that you use either the y argument or the n argument.
\${ }	Indicates a variable reference.	\${com.sun.javaRoot}	References the value of the com.sun.javaRoot variable.
-	Joins simultaneous multiple keystrokes.	Control-A	Press the Control key while you press the A key.
+	Joins consecutive multiple keystrokes.	Ctrl+A+N	Press the Control key, release it, and then press the subsequent keys.
→	Indicates menu item selection in a graphical user interface.	File → New → Templates	From the File menu, choose New. From the New submenu, choose Templates.

## Default Paths and File Names

The following table describes the default paths and file names that are used in this book.

TABLE P-4 Default Paths and File Names

Placeholder	Description	Default Value
<i>as-install</i>	Represents the base installation directory for GlassFish Server.  In configuration files, <i>as-install</i> is represented as follows:  \${com.sun.aas.installRoot}	Installations on the Oracle Solaris operating system, Linux operating system, and Mac operating system:  <i>user's-home-directory/glassfish3/glassfish</i>  Windows, all installations:  <i>SystemDrive:\glassfish3\glassfish</i>

TABLE P-4 Default Paths and File Names (Continued)

Placeholder	Description	Default Value
<i>as-install-parent</i>	Represents the parent of the base installation directory for GlassFish Server.	Installations on the Oracle Solaris operating system, Linux operating system, and Mac operating system: <i>user's-home-directory/glassfish3</i> Windows, all installations: <i>SystemDrive:\glassfish3</i>
<i>domain-root-dir</i>	Represents the directory in which a domain is created by default.	<i>as-install/domains/</i>
<i>domain-dir</i>	Represents the directory in which a domain's configuration is stored.  In configuration files, <i>domain-dir</i> is represented as follows:  <code>\${com.sun.aas.instanceRoot}</code>	<i>domain-root-dir/domain-name</i>

## Documentation, Support, and Training

The Oracle web site provides information about the following additional resources:

- [Documentation \(http://docs.sun.com/\)](http://docs.sun.com/)
- [Support \(http://www.sun.com/support/\)](http://www.sun.com/support/)
- [Training \(http://education.oracle.com/\)](http://education.oracle.com/)

## Searching Oracle Product Documentation

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

*search-term* **site:docs.sun.com**

For example, to search for “broker,” type the following:

**broker site:docs.sun.com**

To include other Oracle web sites in your search (for example, the Java Developer site on the Oracle Technology Network at <http://www.oracle.com/technetwork/java/index.html>), use `oracle.com` in place of `docs.sun.com` in the search field.

# Creating a New Session Persistence Module

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This section describes how to extend the GlassFish Server `StrategyBuilder` interface to create a session persistence module in the web container for high availability-related functionality. Using the `StrategyBuilder` class in an HK2 service makes the session manager extensible since you can implement a new persistence type without having to modify the web container code.

For information about other high-availability, session persistence solutions, see [“Configuring High Availability Session Persistence and Failover”](#) in the *Oracle GlassFish Server High Availability Administration Guide*.

The following topics are addressed here:

- [“Extending the StrategyBuilder Class”](#) on page 13

## Extending the StrategyBuilder Class

You can extend the `StrategyBuilder` class by creating a new web session manager type.

```
package org.glassfish.web.ha
@Contract
public abstract StrategyBuilder {

    public org.apache.catalina.session.Manager getManager() {
        return new PersistentManager();
    }

    public abstract void init(StandardContext ctx, SessionManager sessionManager);
}
```

Here is an example of how to extend the `StrategyBuilder` class by creating a new web session manager and setting a store for it:

```
@Service(name="xyz")
public class XYZStrategyBuilder extends StrategyBuilder {
```

```

public org.apache.catalina.session.Manager getManager() {
    Manager manager = super.getManager();
    manager.setStore(MyStore);
    //MyStore could delegate to for example the BackingStore in the case of our
    in-memory replication return manager;
}
or
//Create a new manager, set the appropriate Store and return it
return XYZManager;
}

public void init(StandardContext ctx, SessionManager sessionManager) {
    add listeners, values etc to the ctx,
}
}

```

If a Manager is provided, then it will be used in GlassFish Server.

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**Note** – If a backing store is required, it is the responsibility of the Manager to make sure that the `findSession` method correctly uses the Store that the Manager provides.

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### Example of Extending StrategyBuilder With Your Own Web Session Manager

Here is an example of using a new session manager type named *MyHASolution*:

```

@Service(name="MyHASolution")
public class MyHASolutionStrategyBuilder extends StrategyBuilder {

    public org.apache.catalina.session.Manager getManager() {
        return new MyHASolutionManager();
    }

    public void init(StandardContext ctx, SessionManager sessionManager) {
        // add listeners, valves etc to the ctx,
    }
}

```

### Example of Web Session Manager in glassfish-web.xml

Here is an example of a session manager configuration in the `glassfish-web.xml` file:

```

<glassfish-web-app>
  <session-config>
    <session-manager persistence-type="myHASolution"/>
  </session-config>
</glassfish-web-app>

```

Based on the `domain.xml` and `glassfish-web.xml` settings, the web container looks up the appropriate `StrategyBuilder` in the `Habitat` and uses it.