# Eclipse GlassFish Server Upgrade Guide, Release 5.1

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# Eclipse GlassFish Server

Upgrade Guide

Release 5.1

Contributed 2018, 2019

This guide explains how to upgrade to Eclipse GlassFish Server 5.1 from previous GlassFish Server and Sun GlassFish Enterprise Server product releases. Also included in this guide are instructions for upgrading configuration data and Java EE applications from binary-compatible earlier versions of this software to work with Eclipse GlassFish Server 5.1. Finally, this guide describes compatibility issues that affect data and applications that are to be migrated.

Note: The main thrust of the Eclipse GlassFish Server 5.1 release is to provide an application server for developers to explore and begin exploiting the new and updated technologies in the Java EE 7 platform. Thus, the upgrade feature of GlassFish Server was not a focus of this release. The feature is included in the release, but it may not function properly with some of the new features added in support of the Java EE 7 platform.

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# Preface

This guide explains how to upgrade to GlassFish Server Open Source Edition 4.0 from previous GlassFish Server and Sun GlassFish Enterprise Server product releases. Also included in this guide are instructions for upgrading configuration data and Java EE applications from binary-compatible earlier versions of this software to work with GlassFish Server Open Source Edition 4.0. Finally, this guide describes compatibility issues that affect data and applications that are to be migrated.

Note:

The main thrust of the GlassFish Server Open Source Edition 4.0 release is to provide an application server for developers to explore and begin exploiting the new and updated technologies in the Java EE 7 platform. Thus, the upgrade feature of GlassFish Server was not a focus of this release. The feature is included in the release, but it may not function properly with some of the new features added in support of the Java EE 7 platform.

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

GlassFish Server 4.0 is developed through the GlassFish project open-source community at `http://glassfish.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
- Related Documentation
- Typographic Conventions
- Symbol Conventions
- Default Paths and File Names


## Eclipse 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.

| Book Title | Description |
|---|---|
| Release Notes | 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. |
| Quick Start Guide | Explains how to get started with the GlassFish Server product. |
| Installation Guide | Explains how to install the software and its components. |
| Upgrade Guide | 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. |
| Deployment Planning Guide | Explains how to build a production deployment of GlassFish Server that meets the requirements of your system and enterprise. |
| Administration Guide | Explains how to configure, monitor, and manage GlassFish Server subsystems and components from the command line by using the `asadmin` utility. Instructions for performing these tasks from the Administration Console are provided in the Administration Console online help. |
| Security Guide | Provides instructions for configuring and administering GlassFish Server security. |
| Application Deployment Guide | Explains how to assemble and deploy applications to the GlassFish Server and provides information about deployment descriptors. |
| Application Development Guide | 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. |
| Embedded Server Guide | Explains how to run applications in embedded GlassFish Server and to develop applications in which GlassFish Server is embedded. |
| High Availability Administration Guide | Explains how to configure GlassFish Server to provide higher availability and scalability through failover and load balancing. |
| Performance Tuning Guide | Explains how to optimize the performance of GlassFish Server. |
| Troubleshooting Guide | Describes common problems that you might encounter when using GlassFish Server and explains how to solve them. |
| Error Message Reference | Describes error messages that you might encounter when using GlassFish Server. |
| Reference Manual | Provides reference information in man page format for GlassFish Server administration commands, utility commands, and related concepts. |
| Message Queue Release Notes | Describes new features, compatibility issues, and existing bugs for Open Message Queue. |

| Book Title | Description |
|---|---|
| Message Queue Technical Overview | Provides an introduction to the technology, concepts, architecture, capabilities, and features of the Message Queue messaging service. |
| Message Queue Administration Guide | Explains how to set up and manage a Message Queue messaging system. |
| Message Queue Developer's Guide for JMX Clients | Describes the application programming interface in Message Queue for programmatically configuring and monitoring Message Queue resources in conformance with the Java Management Extensions (JMX). |
| Message Queue Developer's Guide for Java Clients | Provides information about concepts and procedures for developing Java messaging applications (Java clients) that work with GlassFish Server. |
| Message Queue Developer's Guide for C Clients | Provides programming and reference information for developers working with Message Queue who want to use the C language binding to the Message Queue messaging service to send, receive, and process Message Queue messages. |

# Related Documentation

The following tutorials explain how to develop Java EE applications:

- Your First Cup: An Introduction to the Java EE Platform (`http://docs.oracle.com/javaee/7/firstcup/doc/home.html`). 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 7 Tutorial (`http://docs.oracle.com/javaee/7/tutorial/doc/home.html`). This comprehensive tutorial explains how to use Java EE 7 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 7 of Java EE is located at `http://docs.oracle.com/javaee/7/api/`.
- The API specification for GlassFish Server 4.0, including Java EE 7 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/javaee/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/).

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).

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://glassfish-samples.java.net/).

# Typographic Conventions

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

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

# Symbol Conventions

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

| 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.

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

| Placeholder | Description | Default Value |
|---|---|---|
| domain-root-dir | Represents the directory in which a domain is created by default. | as-install`/domains/` |
| domain-dir | Represents the directory in which a domain's configuration is stored.<br><br>In configuration files, domain-dir is represented as follows:<br><br>`${com.sun.aas.instanceRoot}` | domain-root-dir`/`domain-name |
| instance-dir | Represents the directory for a server instance. | domain-dir`/`instance-name |

# 1 GlassFish Server Upgrade Compatibility Issues

This section describes some compatibility issues between GlassFish Server 4.0 and earlier product releases. This section also describes some compatibility issues that affect Java applications that run on earlier product releases with which Oracle GlassFish Server 4.0 is binary-compatible. When you upgrade to GlassFish Server 4.0, you must address these issues.

The following topics are addressed here:


- Binary-Compatible Releases For GlassFish Server 4.0
- New Default Installation Directory
- Changes to Group Management Service Settings
- Application Client Interoperability
- Node Agent Support
- HADB and `hadbm` Command Support
- Command Line Interface: The `asadmin` Command
- Applications That Use Java DB
- Applications That Use Persistence
- HTTP Service to Network Service Changes
- NSS Cryptographic Token Support


## Binary-Compatible Releases For GlassFish Server 4.0

GlassFish Server Open Source Edition 4.0 is binary-compatible with the following earlier releases of the software:

- Sun GlassFish Enterprise Server v2.1.1 (Enterprise and Developer Profiles)
- Sun GlassFish Enterprise Server v3
- GlassFish Server Open Source Edition 3.0.1
- GlassFish Server Open Source Edition 3.1
- GlassFish Server Open Source Edition 3.1.1

Java applications that run on these releases also work on GlassFish Server Open Source Edition 4.0 except for the compatibility issues that are listed in the remainder of this chapter.

Note:

The compatibility issues that are listed in the remainder of this chapter do not affect Java applications that run on Sun GlassFish Enterprise Server v3 and GlassFish Server 3.0.1. The differences between GlassFish Server 4.0 and the Enterprise Server v3 releases do not affect applications and data.

# New Default Installation Directory

The default GlassFish Server 4.0 installation directories are as follows:

**Solaris, Linux, and Mac OS X systems**

```
user-home-directory/glassfish3
```

**Windows systems**

```
SystemDrive\glassfish3
```

In GlassFish Server 3.0.1 and Enterprise Server v3, the default installation root directory was `glassfishv3`.

# Changes to Group Management Service Settings

The functionality of the Group Management Service (GMS) has not changed since Sun GlassFish Enterprise Server v2.1.1, but the names of GMS settings have been changed in the Administration Console to make them more understandable. These changes are made automatically during the upgrade process.

Changes to settings on the Edit Group Management Service page in the Administration Console are summarized in the following table.

Table 1-1 GMS Administration Console Settings Changes from 2.1.1 to 4.0

| Old Setting Name | New Setting Name |
|---|---|
| Protocol Maximum Trial | Maximum Missed Heartbeats |
| Protocol Timeout | Heartbeat Frequency |
| Ping Timeout | Group Discovery Timeout |

| Old Setting Name | New Setting Name |
|---|---|
| Verified Timeout | Failure Verification Wait Time |

The Merge Protocol settings from Sun GlassFish Enterprise Server v2.1.1 are not supported and have been removed.

# Application Client Interoperability

The Java EE 6 platform specification imposes stricter requirements than Java EE 5 did on which JAR files can be visible to various modules within an EAR file. In particular, application clients must not have access to EJB JAR files or other JAR files in the EAR file unless they use a `Class-Path` header in the manifest file, or unless references use the standard Java SE mechanisms (extensions, for example), or use the Java EE `library-directory` mechanism. Deployed Java EE 5 applications that are upgraded to GlassFish Server 4.0 will have the `compatibility` property set to `v2` and will run without change on GlassFish Server 4.0. You may, however, want to consider modifying the applications to conform to Java EE 6 requirements.

If your upgrade includes a deployed application with an application client, you will need to retrieve the client stubs using GlassFish Server 4.0 in order to run the client. Use the `asadmin get-client-stubs` command.

If you try to run the application client before retrieving the client stubs, you will see the following error message:

```
Invalid or corrupt jarfile jar-file-name
```

If you commonly distribute application clients to remote systems from which users will run them, you must not only retrieve the client stubs, but you must also run the `package-appclient` utility for GlassFish Server 4.0 to upgrade the GlassFish Server system files. This utility creates a JAR file, which you can then expand on the remote systems.

Application clients use EJBs, web services, or other enterprise components that are in the application server (on the server side). The application client and the application server must use the same version and implementation of the RMI-IIOP protocol. GlassFish Server 4.0 does not support communication between different versions of the protocol implementation. You cannot run application clients with one version of the application server runtime with a server that has a different version. Most often, this would happen if you upgraded the server but had not upgraded all the application client installations. If you run the `package-appclient` utility, this issue will not arise.

You can use the Java Web Start support to distribute and launch the application client. If the runtime on the server has changed since the end-user last used the application client, Java Web Start automatically retrieves the updated runtime. Java Web Start enables you to keep the clients and

servers synchronized and using the same runtime.

# Node Agent Support

GlassFish Server 4.0 does not support node agents. When updating from installations of earlier product versions in which node agents were configured, the cluster definitions will be migrated, but the clustered instances themselves must be manually re-created. See Upgrading Clusters and Node Agent Configurations for more information.

# HADB and `hadbm` Command Support

GlassFish Server 4.0 does not support HADB or the `hadbm` management command.

Instead of HADB, GlassFish Server 4.0 supports high availability clustering by means of in-memory session state replication and ActiveCache for GlassFish. See "High Availability in GlassFish Server" in GlassFish Server Open Source Edition High Availability Administration Guide for more information.

# Command Line Interface: The `asadmin` Command

The following sections describe changes to the command line utility `asadmin`:

- Deprecated `asadmin` Subcommands
- Deprecated, Unsupported, and Obsolete Options

For more information about `asadmin` and its subcommands, see the GlassFish Server Open Source Edition Reference Manual.

## Deprecated `asadmin` Subcommands

In GlassFish Server 4.0, it is recommended that utility options of the `asadmin` command precede the subcommand. Utility options are options that control the behavior of the `asadmin` utility, as distinguished from subcommand options. Use of the following options after the subcommand is deprecated.

- `--host`
- `--port`
- `--user`

- --passwordfile
- --terse
- --secure
- --echo
- --interactive

## Deprecated, Unsupported, and Obsolete Options

Options in Table 1-2 are deprecated or no longer supported, or are obsolete and are ignored.

Table 1-2 Deprecated, Unsupported, and Obsolete Options for asadmin and Subcommands

| Option | Affected Subcommands |
|---|---|
| --acceptlang | Unsupported for the create-virtual-server subcommand. |
| --acls | Unsupported for the create-virtual-server subcommand. |
| --adminpassword | Unsupported for all relevant subcommands. Use --passwordfile instead. |
| --autoapplyenabled | Obsolete for the create-http-lb subcommand. |
| --autohadb | Obsolete for the create-cluster subcommand. |
| --autohadboverride | Obsolete for the start-cluster subcommand and the stop-cluster subcommand |
| --blockingenabled | Unsupported for the create-http-listener subcommand. |
| --configfile | Unsupported for the create-virtual-server subcommand. |
| --defaultobj | Unsupported for the create-virtual-server subcommand. |
| --defaultvs | Deprecated for the create-http-listener subcommand. Use --default-virtual-server instead. |
| --description | Obsolete for the restore-domain subcommand. |
| --devicesize | Obsolete for the create-cluster subcommand. |
| --haadminpassword | Obsolete for the create-cluster subcommand. |
| --haadminpasswordfile | Obsolete for the create-cluster subcommand. |
| --haagentport | Obsolete for the create-cluster subcommand. |
| --haproperty | Obsolete for the create-cluster subcommand. |
| --heartbeataddress | Deprecated for the create-cluster subcommand. Use --multicastaddress instead. |
| --heartbeatport | Deprecated for the create-cluster subcommand. Use --multicastport instead. |

| Option | Affected Subcommands |
|---|---|
| `--hosts` | Obsolete for the `create-cluster` subcommand. |
| `--ignoreDescriptorItem` | Replaced by the all lowercase option `--ignoredescriptoritem` in the `set-web-context-param` subcommand and the `set-web-env-entry` subcommand. |
| `--mime` | Unsupported for the `create-virtual-server` subcommand. |
| `--password` | Unsupported for all remote subcommands. Use `--passwordfile` instead. |
| `--path` | Unsupported for the `create-domain` subcommand. Use `--domaindir` instead. |
| `--portbase` | Obsolete only for the `create-cluster` subcommand. This option is still valid in other subcommands such as `create-domain`, `create-instance`, and `create-local-instance`. |
| `--resourcetype` | Unsupported for all relevant subcommands. Use `--restype` instead. |
| `--retrievefile` | Obsolete for the `export-http-lb-config` subcommand. |
| `--setenv` | Obsolete for the `start-instance` subcommand. |
| `--target` | Obsolete only for the following subcommands:<br>• `create-connector-connection-pool`<br>• `create-resource-adapter-config`<br>• `delete-connector-connection-pool`<br>• `delete-connector-security-map`<br>• `delete-jdbc-connection-pool`<br>• `delete-resource-ref`<br>Replaced by an operand in the `list-custom-resources` subcommand and the `list-jndi-entries` subcommand: |

# Applications That Use Java DB

The directory location of Java DB in GlassFish Server 4.0 has changed from its location in previous installations. Suppose that you have deployed applications that use Java DB databases in your previous server installation, and you upgrade your existing installation to GlassFish Server 4.0. If you run the `asadmin start-database` command and successfully start Java DB, you could run into problems while trying to run applications that were deployed on your previous server installation.

To solve this problem, you can copy the `databases` directory from your previous installation to as-install`/databases`. Make sure the database is not running when you do this.

Alternatively, you can perform these steps:

1. Use the `asadmin start-database` command with the `--dbhome` option pointing to the `databases` directory in the older version of Java DB. For example:

```
asadmin start-database --dbhome c:\glassfish\databases
```

1. After upgrade, start GlassFish Server 4.0.

# Applications That Use Persistence

GlassFish Server 4.0 and 3.0.1, and Sun GlassFish Enterprise Server v3 use the persistence provider EclipseLink, while earlier versions used TopLink Essentials.

An application that uses the container to create an `EntityManager` or `EntityManagerFactory` and that used Toplink Essentials as its provider will work in GlassFish Server 4.0. The container creates an `EntityManager` if the application uses the `@PersistenceContext` annotation to inject an `EntityManager`, as in the following example:

```
@PersistenceContext
EntityManager em;
```

The container creates an `EntityManagerFactory` if the application uses the `@PersistenceUnit` annotation to inject an `EntityManagerFactory`, as in the following example:

```
@PersistenceUnit
EntityManagerFactory emf;

EntityManager em = emf.createEntityManager();
```

When the application is loaded, GlassFish Server 4.0 will translate the provider to EclipseLink and will also translate `toplink.*` properties in the `persistence.xml` to corresponding EclipseLink properties. (The actual `persistence.xml` file remains unchanged.)

Under certain circumstances, however, you may have to modify the `persistence.xml` file or your code:

- If your application uses Java SE code to create the `EntityManagerFactory`, you will need to change your `persistence.xml` file for both the `provider` element and for any `toplink.*` properties to use the EclipseLink equivalents. An application uses Java SE code if it uses the `javax.persistence.Persistence` class to create the `EntityManagerFactory`, as in the following example:

```
EntityManagerFactory emf =
    javax.persistence.Persistence.createEntityManagerFactory("Order");
EntityManager em = emf.createEntityManager();
```

In this case, change the `provider` element to specify the following:

```
<provider>org.eclipse.persistence.jpa.PersistenceProvider</provider>
```

- If the application itself contains any TopLink Essentials-specific code and therefore contains casts to `oracle.toplink.*`, you must change the code to cast to `org.eclipse.persistence.*`. You can use the package renamer tool described on the Eclipse wiki (`http://wiki.eclipse.org/EclipseLink/Examples/MigratingFromOracleTopLink#Rename_Packages`) to do this. This tool is not provided with GlassFish Server 4.0, however, so you must obtain it from the EclipseLink project download site.

# HTTP Service to Network Service Changes

In GlassFish Server 4.0, most HTTP Service settings are defined in the Network Service configuration that was introduced in Sun GlassFish Enterprise Server v3.

The changes are described in the following sections.

- Changes to Dotted Names
- Changes to `asadmin` Subcommands
- Remapping of HTTP Service Attributes and Properties
- New Network Service Elements and Attributes

## Changes to Dotted Names

The dotted name hierarchy for the HTTP Service configuration in GlassFish Server 4.0 is shown below. Elements that are no longer supported are `request-processing`, `keep-alive`, `connection-pool`, `http-protocol`, `http-file-cache`, and `http-listener`. During the upgrade process, these discontinued elements are remapped to the new configuration automatically and then deleted.

```
config
    http-service
        access-log
        request-processing
        keep-alive
        connection-pool
        http-protocol
        http-file-cache
        http-listener
            ssl
            property
        virtual-server
            http-access-log
            property
        property
    thread-pools
        thread-pool
```

The dotted name hierarchy for the GlassFish Server 4.0 Network Service and HTTP Service configurations is shown below. The `network-config` element and all its children are new except for `ssl`.

```
config
    network-config
        transports
            selection-key-handler
            transport
        protocols
            protocol
                http
                    file-cache
                port-unification
                    protocol-finder
                protocol-chain-instance-handler
                    protocol-chain
                protocol-filter
                ssl
        network-listeners
            network-listener
    http-service
        access-log
        virtual-server
            http-access-log
            property
        property
    thread-pools
        thread-pool
```

The following example compares the commands for setting a listener port for Sun GlassFish Enterprise Server v3 and GlassFish Server 4.0. Note that the configuration for Enterprise Server v3 also applies to all earlier Enterprise Server 2.x releases.

- Command for Sun GlassFish Enterprise Server v3 and earlier:

```
asadmin set server-config.http-service.http-listener.http-1.listenerport=4321
```

- Command for GlassFish Server 4.0:

```
asadmin set server-config.network-config.network-listeners.network-\
listener.http-1.listenerport=4321
```

## Changes to `asadmin` Subcommands

To accommodate the move of HTTP Service into the new Network Service configuration, `asadmin` subcommands are changed as follows:

- The `create-ssl` subcommand has a new `--type` parameter value, `network-listener`.
- The `create-virtual-server` SUBcommand has a new parameter, `--networklisteners`.
- The `create-http-listener` subcommand adds a `network-listener` element to the domain configuration. The syntax and options of this commands are unchanged.

## Remapping of HTTP Service Attributes and Properties

The following tables describe how attributes and properties in the HTTP Service configuration for GlassFish Server 4.0 are remapped to attributes in the Network Service configuration for older product releases. If you use a configuration from a Sun GlassFish Enterprise Server v2 or v3 release, this remapping happens automatically and then discontinued elements are deleted.

Table 1-3 `com.sun.grizzly` Property Remapping

| `com.sun.grizzly` **Property** | **New Owning Element** | **New Attribute Name** |
|---|---|---|
| `selector.timeout` | `transport` | `selector-poll-timeout-millis` |
| `displayConfiguration` | `transport` | `display-configuration` |
| `enableSnoop` | `transport` | `snoop-enabled` |
| `readTimeout` | `transport` | `read-timeout-millis` |
| `writeTimeout` | `transport` | `write-timeout-millis` |

Table 1-4 `connection-pool` Attribute Remapping

| `connection-pool` **Attribute** | **New Owning Element** | **New Attribute Name** |
|---|---|---|
| `queue-size-in-bytes` | `thread-pool` | `max-queue-size` |
| `max-pending-count` | `transport` | `max-connections-count` |
| `receive-buffer-size-in- bytes` | `http` | `request-body-buffer-size- bytes` |
| `send-buffer-size-in-bytes` | `http` | `send-buffer-size-bytes` |

Table 1-5 `http-file-cache` Attribute Remapping

| `http-file-cache` **Attribute** | **New Owning Element** | **New Attribute Name** |
|---|---|---|
| `file-caching-enabled` | `file-cache` | `enabled` |
| `max-age-in-seconds` | `file-cache` | `max-age-seconds` |
| `medium-file-space-in-bytes` | `file-cache` | `max-cache-size-bytes` |
| `max-files-count` | `file-cache` | `max-files-count` |
| `globally-enabled` | none | not supported |
| `medium-file-size-limit-in-bytes` | none | not supported |
| `small-file-size-limit-in-bytes` | none | not supported |
| `small-file-space-in-bytes` | none | not supported |
| `file-transmission-enabled` | none | not supported |
| `hash-init-size` | none | not supported |

Table 1-6 `http-listener` Attribute Remapping

| `http-listener` **Attribute** | **New Owning Element** | **New Attribute Name** |
|---|---|---|
| `id` | `network-listener` | `name` |
| `address` | `network-listener` | `address` |
| `port` | `network-listener` | `port` |
| `enabled` | `network-listener` | `enabled` |
| `acceptor-threads` | `transport` | `acceptor-threads` |
| `security-enabled` | `protocol` | `security-enabled` |
| `default-virtual-server` | `http` | `default-virtual-server` |
| `server-name` | `http` | `server-name` |
| `redirect-port` | `http` | `redirect-port` |
| `xpowered-by` | `http` | `xpowered-by` |
| `external-port` | none | not supported |
| `family` | none | not supported |
| `blocking-enabled` | none | not supported |

Table 1-7 `http-listener` Property Remapping

| `http-listener` **Property** | **New Owning Element** | **New Attribute Name** |
|---|---|---|
| `maxKeepAliveRequests` | `http` | `max-connections` |
| `authPassthroughEnabled` | `http` | `auth-pass-through-enabled` |
| `compression` | `http` | `compression` |

| http-listener Property | New Owning Element | New Attribute Name |
|---|---|---|
| compressableMimeType | http | compressable-mime-type |
| noCompressionUserAgents | http | no-compression-user-agents |
| compressionMinSize | http | compression-min-size-bytes |
| restrictedUserAgents | http | restricted-user-agents |
| cometSupport | http | comet-support-enabled |
| connectionUploadTimeout | http | connection-upload-timeout- millis |
| disableUploadTimeout | http | upload-timeout-enabled |
| chunkingDisabled | http | chunking-enabled |
| uriEncoding | http | uri-encoding |
| traceEnabled | http | trace-enabled |
| rcmSupport | http | rcm-support-enabled |
| jkEnabled | network-listener | jk-enabled |
| crlFile | ssl | crl-file |
| trustAlgorithm | ssl | trust-algorithm |
| trustMaxCertLength | ssl | trust-max-cert-length-bytes |
| tcpNoDelay | transport | tcp-no-delay |
| bufferSize | transport | buffer-size-bytes |
| use-nio-direct-bytebuffer | transport | byte-buffer-type |
| proxyHandler | none | not supported |
| proxiedProtocols | none | not supported |
| recycle-objects | none | not supported |
| reader-threads | none | not supported |
| acceptor-queue-length | none | not supported |
| reader-queue-length | none | not supported |
| connectionTimeout | none | not supported |
| monitoring-cache-enabled | none | not supported |
| monitoring-cache-refresh-in- millis | none | not supported |
| ssl-cache-entries | none | not supported |
| ssl3-session-timeout | none | not supported |
| ssl-session-timeout | none | not supported |

Table 1-8 http-protocol Attribute Remapping

| `http-protocol` **Attribute** | **New Owning Element** | **New Attribute Name** |
|---|---|---|
| `version` | `http` | `version` |
| `forced-response-type` | `http` | `forced-response-type` |
| `default-response-type` | `http` | `default-response-type` |
| `dns-lookup-enabled` | none | not supported |
| `ssl-enabled` | none | not supported |

Table 1-9 `http-service` Property Remapping

| `http-service` **Property** | **New Owning Element** | **New Attribute or Property Name** |
|---|---|---|
| `accessLoggingEnabled` | `http-service`, `virtual-server` | `access-logging-enabled` attribute |
| `ssl-cache-entries` | `http-service` | unchanged property |
| `ssl3-session-timeout` | `http-service` | unchanged property |
| `ssl-session-timeout` | `http-service` | unchanged property |
| `proxyHandler` | `http-service` | unchanged property |
| `connectionTimeout` | `http-service` | unchanged property |
| all other properties | none | not supported |

Table 1-10 `keep-alive` Attribute Remapping

| `keep-alive` **Attribute** | **New Owning Element** | **New Attribute Name** |
|---|---|---|
| `max-connections` | `http` | `max-connections` |
| `timeout-in-seconds` | `http` | `timeout-seconds` |
| `thread-count` | none | not supported |

Table 1-11 `request-processing` Attribute Remapping

| `request-processing` **Attribute** | **New Owning Element** | **New Attribute Name** |
|---|---|---|
| `thread-count` | `thread-pool` | `max-thread-pool-size` |
| `initial-thread-count` | `thread-pool` | `min-thread-pool-size` |
| `header-buffer-length-in-bytes` | `http` | `header-buffer-length-bytes` |
| `request-timeout-in-seconds` | `http` | `request-timeout-seconds` |
| `thread-increment` | none | not supported |

Table 1-12 `ssl` Attribute Changes

| Previous Attribute or Property | Previous Owning Element | New `ssl` Attribute |
|---|---|---|
| none | none | `key-store` |
| none | none | `trust-store` |
| `crlFile` property | `http-listener` | `crl-file` |
| `trustAlgorithm` property | `http-listener` | `trust-algorithm` |
| `trustMaxCertLength` property | `http-listener` | `trust-max-cert-length-bytes` |
| all other `ssl` attributes | `ssl` | unchanged |

Table 1-13 `thread-pool` Attribute Changes

| Previous Attribute | Previous Owning Element | New `thread-pool` Attribute |
|---|---|---|
| none | none | `classname` |
| none | none | `max-queue-size` |
| `thread-pool-id` | `thread-pool` | `name` |
| `idle-thread-timeout-in-seconds` | `thread-pool` | `idle-thread-timeout-seconds` |
| `num-work-queues` | `thread-pool` | not supported |
| all other `thread-pool` attributes | `thread-pool` | unchanged |

Table 1-14 `virtual-server` Attribute Changes

| Previous Attribute or Property | Previous Owning Element | New `virtual-server` Attribute |
|---|---|---|
| `http-listeners` attribute | `virtual-server` | `network-listeners` |
| `accessLoggingEnabled` property | `http-service` | `access-logging-enabled` |
| `sso-enabled` property | `virtual-server` | `sso-enabled` |
| `ssoCookieSecure` property | `virtual-server` | `sso-cookie-secure` |
| all other `virtual-server` attributes | `virtual-server` | unchanged |
| all other `virtual-server` properties | `virtual-server` | unchanged, still properties |

## New Network Service Elements and Attributes

The following tables describe the Network Service elements and attributes that were introduced in Sun GlassFish Enterprise Server v3. For attributes and properties remapped from discontinued elements to new elements, see Remapping of HTTP Service Attributes and Properties.

The new `file-cache` element has no new attributes. All of its attributes are remapped from the `http-file-cache` element. For details, see Table 1-5.

Table 1-15 New `http` Attributes

| Attribute | Default | Description |
|---|---|---|
| `adapter` | `com.sun.grizzly.tcp.StaticResourcesAdapter` | (Optional) Specifies the class name of the static resources adapter. |
| `max-post-size-bytes` | `2097152` | (Optional) Specifies the maximum size of `POST` actions. |

For remapped `http` attributes, see Table 1-4, Table 1-6, Table 1-7, Table 1-8, Table 1-10, and Table 1-11.

Table 1-16 New `network-listener` Attributes

| Attribute | Default | Description |
|---|---|---|
| `protocol` | none | Specifies the `name` of the `protocol` associated with this `network-listener`. Although this attribute is required, a `protocol` is automatically created with the same `name` as the `network-listener` when you use `asadmin create-http-listener` to create a `network-listener`. |
| `thread-pool` | none | (Optional) Specifies the `name` of the `thread-pool` associated with this `network-listener`. |
| `transport` | none | Specifies the `name` of the `transport` associated with this `network-listener`. Although this attribute is required, the default `transport` is used when you use `asadmin create-http-listener` to create a `network-listener`. |

For remapped `network-listener` attributes, see Table 1-6.

Table 1-17 New `port-unification` Attributes

| Attribute | Default | Description |
|---|---|---|
| `name` | none | Specifies a unique name for the `port-unification`. |
| `classname` | none | Specifies the class name of the `port-unification` implementation. |

Table 1-18 New `protocol` Attributes

| Attribute | Default | Description |
|---|---|---|
| `name` | none | Specifies a unique name for the `protocol`. |

For remapped `protocol` attributes, see Table 1-6.

Table 1-19 New `protocol-chain` Attributes

| Attribute | Default | Description |
|---|---|---|
| `name` | none | Specifies a unique name for the `protocol-chain`. |
| `classname` | none | Specifies the class name of the `protocol-chain` implementation. |
| `type` | `STATELESS` | Specifies the type of protocol chain. |

Table 1-20 New `protocol-chain-instance-handler` Attributes

| Attribute | Default | Description |
|---|---|---|
| `name` | none | Specifies a unique name for the `protocol-chain-instance-handler`. |
| `classname` | none | Specifies the class name of the `protocol-chain-instance-handler` implementation. |

Table 1-21 New `protocol-filter` Attributes

| Attribute | Default | Description |
|---|---|---|
| `name` | none | Specifies a unique name for the `protocol-filter`. |
| `classname` | none | Specifies the class name of the `protocol-filter` implementation. |

Table 1-22 New `protocol-finder` Attributes

| Attribute | Default | Description |
|---|---|---|
| `name` | none | Specifies a unique name for the `protocol-finder`. |
| `classname` | none | Specifies the class name of the `protocol-finder` implementation. |

| Attribute | Default | Description |
|---|---|---|
| protocol | none | Specifies the name of the protocol associated with this protocol-finder. |

Table 1-23 New selection-key-handler Attributes

| Attribute | Default | Description |
|---|---|---|
| name | none | Specifies a unique name for the selection-key-handler. |
| classname | none | Specifies the class name of the selection-key-handler implementation. |

Table 1-24 New ssl Attributes

| Attribute | Default | Description |
|---|---|---|
| key-store | none | (Optional) Specifies a key store. |
| trust-store | none | (Optional) Specifies a trust store. |

For remapped ssl attributes, see Table 1-12.

Table 1-25 New thread-pool Attributes

| Attribute | Default | Description |
|---|---|---|
| classname | com.sun.grizzly.http.StatsThreadPool | (Optional) Specifies the class name of the thread-pool implementation. |
| max-queue-size | -1 | (Optional) Specifies the maximum number of messages that can be queued until threads are available to process them. A value of -1 specifies no limit. |

For remapped thread-pool attributes, see Table 1-4, Table 1-11, and Table 1-13.

Table 1-26 New transport Attributes

| Attribute | Default | Description |
|---|---|---|
| name | none | Specifies a unique name for the transport. |

| Attribute | Default | Description |
|---|---|---|
| `classname` | `com.sun.grizzly.TCPSelectorHandler` | (Optional) Specifies the class name of the `transport` implementation. |
| `selection-key-handler` | none | (Optional) Specifies the `name` of the `selection-key-handler` associated with this `transport`. |
| `idle-key-timeout-seconds` | `30` | (Optional) Specifies the idle key timeout. |

For remapped `transport` attributes, see Table 1-3, Table 1-4, Table 1-6, and Table 1-7.

# NSS Cryptographic Token Support

GlassFish Server 4.0 does not support Network Security Services (NSS) cryptographic tokens. When upgrading to GlassFish Server 4.0 from Enterprise Server v2.x, additional manual configuration steps must be performed. These steps are explained later in this guide, in Upgrading Installations That Use NSS Cryptographic Tokens.

# 2 Upgrading an Installation of Application Server or GlassFish Server

The Upgrade Tool that is bundled with GlassFish Server 4.0 replicates the configuration of a previously installed server in the target installation. The Upgrade Tool assists in upgrading the configuration and applications from an earlier version of the Application Server or GlassFish Server to GlassFish Server 4.0.

In addition to Upgrade Tool, there are three Update Center tools that can be used to perform an in-place upgrade to GlassFish Server 4.0 from GlassFish Server 3.1.1, 3.1, 3.0.1, and Enterprise Server v3. These three Update Center tools are:

- Update Tool
- Software Update Notifier
- The `pkg` command-line utility

Upgrade Tool and the three Update Center tools are explained later in this chapter.

To view a list of the older versions from which you can upgrade, see Supported Releases for Upgrade to GlassFish Server 4.0.

The following topics are addressed here:

- Upgrade Overview
- Performing a Side-By-Side Upgrade With Upgrade Tool
- Performing an In-Place Upgrade With the Update Center Tools
- Upgrading Installations That Use NSS Cryptographic Tokens
- Upgrading Clusters and Node Agent Configurations
- Correcting Potential Upgrade Problems

## Upgrade Overview

The subsections that follow provide information that you will need when you perform an upgrade.

The following topics are addressed here:

- Upgrade Paths
- Upgrade Terminology
- Summary of Upgrade Tools and Procedures

- Supported Releases for Upgrade to GlassFish Server 4.0
- Upgrading From Version 8.x or Older Product Releases
- Upgrading GlassFish Server Inside a Closed Network

## Upgrade Paths

There are two general paths you can use when upgrading to GlassFish Server 4.0:

**Side-by-Side**

A side-by-side upgrade means that the new GlassFish Server release is installed in a different directory than the release from which you are upgrading.
In this scenario, you perform the following steps:

1. Perform a basic installation of GlassFish Server 4.0 in a location other than the one being used for the older product.
2. Use Upgrade Tool to migrate the old configurations and applications to the new GlassFish Server 4.0 directories.
3. Test the new GlassFish Server installation to make sure everything is working properly.
4. When you are satisfied that the new installation works properly, modify your production environment to use the new installation.
   The side-by-side upgrade path is typically used for live production environments because it allows you to thoroughly test the new GlassFish Server installation before bringing it into production.

**In-Place**

An in-place upgrade means that the new GlassFish Server release is installed directly over and into the same directory as the previous product release. The existing configuration is reused in the updated installation.
In this scenario, you simply use Update Tool, the `pkg` utility, or the Update Notifier in your old installation to overwrite the old installation with the new GlassFish Server 4.0 product.
Performing an in-place upgrade is easier than performing a side-by-side upgrade, but you lose the ability to switch back and forth between the old and new installations. There is also no way to revert an in-place upgrade back to the previous product version. Because of these limitations, in-place upgrades are typically only used by developers and for non-production GlassFish Server deployments.
Note also that it is only possible to perform an in-place upgrade when upgrading from GlassFish Server 3.1.1, 3.1, 3.0.1, or v3. If you are upgrading from product versions prior to 3x, you must perform a side-by-side upgrade.

For a more detailed overview, see Summary of Upgrade Tools and Procedures.

## Upgrade Terminology

The following are important terms related to the upgrade process.

**Source Domain Directory**

The directory of the server domain from which you are upgrading to the new version (for example, `c:\glassfish\domains\domain1`).

**Target Root Domain's Directory**

The directory where domains are created on the server to which you are upgrading (for example, `c:\glassfish3\glassfish\domains`).

**Master Password**

The SSL certificate database password used in operations such as GlassFish Server startup. This term refers to the master password of the installation from which you want to upgrade. You need to specify this password if you have changed it from the default value of `changeit`.

## Summary of Upgrade Tools and Procedures

There are several tools you can use to upgrade from an earlier GlassFish Server or Enterprise Server installation to GlassFish Server 4.0. The general procedures for upgrading to GlassFish Server 4.0 vary depending on which tool you use and the product version from which you are upgrading.

The following topics are addressed here:

- Summary of Tools for Performing an Upgrade
- Summary of Procedure for Upgrading With Upgrade Tool
- Summary of Procedure for Upgrading With Update Tool
- Summary of Procedure for Upgrading With the Software Update Notifier
- Summary of Procedure for Upgrading With the `pkg` Utility

### Summary of Tools for Performing an Upgrade

There are several tools you can use to perform an upgrade to GlassFish Server 4.0 are described below.

- Upgrade Tool
- Update Tool and the `pkg` Utility
- Software Update Notifier

### Upgrade Tool

The GlassFish Server Upgrade Tool is tended solely for performing side-by-side upgrades from any compatible older product version to GlassFish Server 4.0.

Upgrade Tool provides a number of features that aid in the migration of older configurations and applications to a new GlassFish Server 4.0 installation. These features are described in more detail in Upgrade Tool Functionality.

In GlassFish Server 4.0 Upgrade Tool is installed in the as-install`/bin` directory.

> Note:
>
> Upgrade Tool is the only tool you can use when upgrading to GlassFish Server 4.0 from product versions prior to GlassFish Server 3.0.1 or Enterprise Server v3.

See Summary of Procedure for Upgrading With Upgrade Tool for an overview of the general procedure for performing an upgrade with Upgrade Tool.

### Update Tool and the `pkg` Utility

The GlassFish Server Update Tool is a graphical utility that is typically used for the day-to-day maintenance of GlassFish Server components and additional features. For example, Update Tool can be used to update GlassFish Server components or install additional features such as OSGi Admin Console.

The command-line counterpart to Update Tool is the `pkg` utility. While the `pkg` utility does not provide exactly the same set of features as Update Tool, for the purposes of upgrading to GlassFish Server 4.0, the `pkg` utility and Update Tool feature sets are almost identical.

In addition to day-to-day maintenance tasks, Update Tool and the `pkg` utility can be used to perform an in-place upgrade of an entire GlassFish Server 3.0.1 or Enterprise Server v3 installation to the GlassFish Server 4.0 or later release.

In GlassFish Server 4.0 Update Tool is installed in the as-install-parent`/bin` directory.

> Note:
>
> It is not possible to use Update Tool to upgrade from GlassFish Server or Enterprise Server versions prior to 3x. For these older versions, you must use the Upgrade Tool, described in Upgrade Tool.

See Summary of Procedure for Upgrading With Update Tool for an overview of the general procedure for performing an upgrade with Update Tool. For more information about Update Tool in general, see "Update Tool" in GlassFish Server Open Source Edition Administration Guide.

Software Update Notifier

The GlassFish Server Software Update Notifier is similar to Update Tool and the `pkg` utility in that it enables you to perform an in-place upgrade from GlassFish Server 3.1.1, 3.1, 3.0.1, or Enterprise Server v3. As with Update Tool and the `pkg` utility, you cannot use the Software Update tool to upgrade from product releases prior 3.0.1 and v3.

The Software Update Notifier is distributed as a configuration option during GlassFish Server 4.0, 3.0.1, and Enterprise Server v3 installation. If installed and enabled, the Software Update Notifier monitors your installation and pops up a notification balloon when updates or upgrades are available for your product.

See Summary of Procedure for Upgrading With the Software Update Notifier for an overview of the general procedure for performing an upgrade with the Software Update Notifier. For more information about the Update Notifier, refer to the Update Tool online help.

### Summary of Procedure for Upgrading With Upgrade Tool

The general procedure for using Upgrade Tool to perform an upgrade to GlassFish Server 4.0 from any compatible older version of GlassFish Server or Enterprise Server comprises the following steps:

1. Download GlassFish Server 4.0 and perform a Standard Installation, as described in "To Install GlassFish Server Using the Self-Extracting File" in GlassFish Server Open Source Edition Installation Guide.
2. Copy any custom or third-party libraries from the older installation to their corresponding locations in the new GlassFish Server 4.0 installation directories. Note that you should only copy custom or third-party libraries here. Do not copy an libraries from the actual domain that will be upgraded.
3. Run the `asupgrade` command from the new GlassFish Server 4.0 as-install`/bin` directory.
4. Start the new GlassFish Server 4.0 DAS with the `asadmin start-domain` subcommand.

This procedure is described in more detail in Performing a Side-By-Side Upgrade With Upgrade Tool.

### Summary of Procedure for Upgrading With Update Tool

The general procedure for using Update Tool to perform an upgrade to GlassFish Server 4.0 from GlassFish Server 3.0.1 or Enterprise Server v3 comprises the following steps:

1. Manually stop all server instances and the domain.
2. Launch Update Tool by using the as-install-parent`/bin/updatetool` command in the older product

directory.

3. In Update Tool, select and install the latest GlassFish Server product release. This updates your server to the 4.0 release.
4. Upgrade the domain by running the `asadmin start-domain --upgrade` subcommand. This performs the upgrade and then shuts down the DAS.
5. Restart the DAS normally with the with the `asadmin start-domain` subcommand.

This procedure is described in more detail in To Upgrade Using the Update Tool GUI.

#### Summary of Procedure for Upgrading With the Software Update Notifier

The general procedure for using the Software Update Notifier to perform an upgrade to GlassFish Server 4.0 from GlassFish Server3.0.1 or Enterprise Server v3 comprises the following steps:

1. Wait for the Software Update Notifier to pop up a notification balloon informing you that updates are available.
2. Click the balloon prompt to launch the Software Update GUI.
3. Manually stop all server instances and the domain.
4. Use the Software Update GUI to perform the upgrade. This updates your server to the 4.0 release.
5. Upgrade the domain by running the `asadmin start-domain --upgrade` subcommand. This performs the upgrade and then shuts down the DAS.
6. Restart the upgraded DAS normally with the with the `asadmin start-domain` subcommand.

This procedure is described in more detail in To Upgrade Using the Software Update Notifier.

#### Summary of Procedure for Upgrading With the `pkg` Utility

The general procedure for using the `pkg` utility to perform an upgrade to GlassFish Server 4.0 from GlassFish Server3.0.1 or Enterprise Server v3 comprises the following steps:

1. Manually stop all server instances and the domain.
2. Run the as-install-parent`/bin/pkg` command with the desired options in the older product directory. This updates your server to the 4.0 release.
3. Upgrade the domain by running the `asadmin start-domain --upgrade` subcommand. This performs the upgrade and then shuts down the DAS.
4. Restart the upgraded DAS normally with the with the `asadmin start-domain` subcommand.

This procedure is described in more detail in To Upgrade From the Command Line Using the `pkg` Utility.

## Supported Releases for Upgrade to GlassFish Server 4.0

Upgrades to GlassFish Server 4.0 are supported from the following earlier GlassFish Server product releases:

- Sun GlassFish Enterprise Server v2.1.1
- Sun GlassFish Enterprise Server v3
- GlassFish Server Open Source Edition 3.0.1
- GlassFish Server Open Source Edition 3.1
- GlassFish Server Open Source Edition 3.1.1

## Upgrading From Version 8.x or Older Product Releases

It is not possible to upgrade to GlassFish Server 4.0 directly from Sun GlassFish Enterprise Server 8.x or older product releases.

To upgrade from a product release that is older than any of those listed in Supported Releases for Upgrade to GlassFish Server 4.0, you must first upgrade your older product release to one of the releases that are supported for upgrade to GlassFish Server 4.0.

For example, to upgrade from any Enterprise Server 8.x release, you first need to upgrade that older release to Enterprise Server 2.1.1. That is, your upgrade path would be as follows:

Enterprise Server 8.x ⇒ Enterprise Server 2.1.1 ⇒ GlassFish Server 4.0

Sun GlassFish Enterprise Server 2.1.1 is available for download from the GlassFish Community Downloads (`http://glassfish.java.net/public/downloadsindex.html`) page. Instructions for upgrading to Enterprise Server 2.1.1 are provided in Sun GlassFish Enterprise Server 2.1.1 Upgrade Guide (`http://docs.oracle.com/cd/E19879-01/821-0180/index.html`).

After upgrading your older Enterprise Server installation to Enterprise Server 2.1.1, you can proceed normally with the instructions in this guide to complete the upgrade to GlassFish Server 4.0.

## Upgrading GlassFish Server Inside a Closed Network

For instructions on upgrading a GlassFish Server installation in an environment where Internet access is not available, see "Extending and Updating GlassFish Server Inside a Closed Network" in GlassFish Server Open Source Edition Administration Guide.

# Performing a Side-By-Side Upgrade With Upgrade Tool

This section explains how to use Upgrade Tool to perform a side-by-side upgrade to GlassFish Server 4.0 from any compatible older product release.

The following topics are addressed here:


- Upgrade Tool Summary
- Upgrade Tool Functionality
- To Upgrade From the Command Line Using Upgrade Tool
- To Upgrade Using the Upgrade Tool Wizard


## Upgrade Tool Summary

The Upgrade Tool upgrades your domain configurations and deployed applications. When you use the Upgrade Tool, the source server and the target server are normally installed on the same machine, but under different install locations. Both server file systems must be accessible from the system on which you perform the upgrade.

To perform the upgrade, the user who runs the upgrade needs to have read permissions for the source and target directories and write permission for the target directory.

You can perform an upgrade using Upgrade Tool in the following ways:

- To Upgrade From the Command Line Using Upgrade Tool
- To Upgrade Using the Upgrade Tool Wizard

## Upgrade Tool Functionality

The Upgrade Tool migrates the configurations and deployed applications from an earlier version of Sun Java System Application Server or Sun GlassFishEnterprise Server to the current version. Database migrations or conversions are not part of this upgrade process.

Briefly, the Upgrade Tool performs the following steps:

- Copies the older source domain directory to the new target `domains` directory.
- Calls the `asadmin start-domain --upgrade` command to migrate the source configurations to the new target GlassFish Server installation.

- Sends all `asadmin` command output to the screen and to the `upgrade.log` file, and sends all server output to the `server.log` file.

Additional Upgrade Tool functions are explained in the following sections:

- Migration of Deployed Applications
- Upgrade of Clusters
- Upgrade Verification

### Migration of Deployed Applications

Application archives (EAR files) and component archives (JAR, WAR, and RAR files) that are deployed in the source server do not require any modification to run on GlassFish Server Open Source Edition 4.0. Components that may have incompatibilities are deployed on GlassFish Server 4.0 with the `compatibility` property set to `v2` and will run without change on GlassFish Server 4.0. You may, however, want to consider modifying the applications to conform to Java EE 6 requirements.

The Java EE 6 platform specification imposes stricter requirements than Java EE 5 did on which JAR files can be visible to various modules within an EAR file. In particular, application clients must not have access to EJB JAR files or other JAR files in the EAR file unless they use a `Class-Path` header in the manifest file, or unless references use the standard Java SE mechanisms (extensions, for example), or use the Java EE `library-directory` mechanism. Setting the `library-directory` property to `v2` removes these Java EE 6 restrictions.

Applications and components that are deployed in the source server are deployed on the target server during the upgrade. Applications that do not deploy successfully on the target server must be deployed manually on the target server by the user.

If a domain contains information about a deployed application and the installed application components do not agree with the configuration information, the configuration is migrated unchanged, without any attempt to reconfigure the incorrect configurations.

### Upgrade of Clusters

When upgrading from a clustered configuration, the older cluster information is retained in a new `domain.xml` file in the GlassFish Server 4.0 installation directories. However, it is still necessary to manually re-create the server instances that are contained in the clusters. This procedure is explained in Upgrading Clusters and Node Agent Configurations.

**Upgrade Verification**

An upgrade log records the upgrade activity. The upgrade log file is named `upgrade.log` and is created in the working directory from which the Upgrade Tool is run. Additional information is recorded in the server log of the upgraded domain.

You can also use the `asadmin version` subcommand after starting the upgraded domain to verify the new GlassFish Server product version; for example:

```
asadmin> version
Version = Oracle GlassFish Server 3.1 (build 42)
Command version executed successfully.
```

## To Upgrade From the Command Line Using Upgrade Tool

This procedure explains how to use the Upgrade Tool command line to upgrade to GlassFish Server 4.0 from any supported older product release. See Supported Releases for Upgrade to GlassFish Server 4.0 for a list of supported releases.

Before You Begin

Ensure that the domains on the source server from which you are upgrading are stopped before proceeding.

1. Download and install GlassFish Server 4.0 using the Typical Installation path.
   See "Installing GlassFish Server From a Self-Extracting Bundle" in GlassFish Server Open Source Edition Installation Guide for instructions.
2. Copy any custom or third-party libraries that may be located in the source as-install`/lib` directory to the target as-install`/lib` directory.
   Custom and third-party libraries should normally be located in the domain-dir`/lib` directory. This step is only necessary for custom or third-party libraries that may be located in the nonstandard as-install`/lib` directory.
3. Start Upgrade Tool from a command shell for your operating environment.

Note:

Use the Upgrade Tool that is located in the target GlassFish Server 4.0 installation, not the older source installation.

- On UNIX systems

```
as-install/bin/asupgrade -c
```

- On Windows systems

```
as-install\bin\asupgrade.bat -c
```

The `-c` option starts Upgrade Tool in console mode. If `-c` is omitted, Upgrade Tool starts in GUI mode, which is described in To Upgrade Using the Upgrade Tool Wizard.
If you start Upgrade Tool with only the `-c` option, the tool enters interactive CLI mode in which you are asked to supply the needed options. If you prefer to enter all options directly from the command line, you can use the following syntax:

```
asupgrade
[-c|--console]
[-V|--version]
[-h|--help]
[-s|--source source-domain-directory]
[-t|--target target-domain-directory]
[-f|--passwordfile password-file]
```

Explanations of these options are provided at the end of this procedure. 4. Follow the prompts to perform the upgrade.
If a name used for an older domain that you are upgrading already exists in the new target domains directory, Upgrade Tool will ask if you want to rename the new directory so the old directory can be copied to the new installation. * If you type `y` in response, the directory is renamed domain-name`.original`. If that name already exists, the directory will be renamed domain-name`.orginal.0`. For example, if the old domain directory is named `domain1`, it will be renamed `domain1.original`, or if that name already exists, `domain1.original.0`. * If you type `n`, you are prompted to specify a different directory name or quit.
The domain is upgraded and the results are output to the console. 5. Review the console output to verify that the upgrade proceeded correctly.
This output is also written to the `output.log` file for later review.
If there are any `SEVERE` or `WARNING` messages in the `server.log` file, the upgrade output will say `"Possible error encountered during upgrade. See server log after upgrade process completes."` 6. Start the upgraded GlassFish Server 4.0 domain.

```
asadmin start-domain domain-name
```

Log in to the Administration Console with the user name and password you used in the older server.

Note:

GlassFish Server 4.0 does not support NSS authentication. If you are upgrading from a Enterprise Profile configuration that uses NSS authentication, follow the procedure in Upgrading Installations That Use NSS Cryptographic Tokens.

1. If you are upgrading a clustered configuration or a configuration in which node agents were used, proceed with the instructions in Upgrading Clusters and Node Agent Configurations.

Example 2-1 Using the `asupgrade` Command Line

The following example shows how to use the `asupgrade` command-line utility in non-interactive mode to upgrade an existing Sun GlassFish Enterprise Server v2.1 installation to GlassFish Server 4.0. The following command should be entered on a single line.

```
asupgrade -c -s /home/glassfish/domains/domain1 -f /root/mypassword
-t /home/glassfish3/glassfish/domains
```

asupgrade Command-Line Options

Listed below are the `asupgrade` command-line options, including the short form, the long form, and a description of each option.

| Short Form | Long Form | Description |
|---|---|---|
| `-c` | `--console` | Launches the upgrade command line utility. |
| `-V` | `--version` | The version of the GlassFish Server. |
| `-h` | `--help` | Displays the arguments for launching the upgrade utility. |
| `-s` source-domain-directory | `--source` source-domain-directory | The domain-dir directory in the source (older) server installation. |
| `-t` target-domains-directory | `--target` target-domains-directory | The desired domain-root-dir directory in the GlassFish Server 4.0 target installation; default is as-install`/domains` |
| `-f` password-file | `--passwordfile` password-file | The file containing the administration password and the master password. |

Next Steps

- Browse to the URL `http://localhost:8080` to view the domain-dir`/docroot/index.html` file. This file is brought over during the upgrade. You may want to copy the default GlassFish Server 4.0 file from the `domain1.original/docroot` directory and customize it for your GlassFish Server 4.0 installation.

- To register your installation of GlassFish Server from the Administration Console, select the Registration item from the Common Tasks page. For step-by-step instructions on the registration process, click the Help button on the Administration Console.

## To Upgrade Using the Upgrade Tool Wizard

This procedure explains how to use the graphical Upgrade Tool Wizard to upgrade to GlassFish Server 4.0 from any supported older product release. See Supported Releases for Upgrade to GlassFish Server 4.0 for a list of supported releases.

Before You Begin

Ensure that the source domains from which you are upgrading are stopped before proceeding.

1. Download and install GlassFish Server 4.0 using the Typical Installation path.
   See "Installing GlassFish Server From a Self-Extracting Bundle" in GlassFish Server Open Source Edition Installation Guide for instructions.
2. Copy any custom or third-party libraries that may be located in the source as-install`/lib` directory to the target as-install`/lib` directory.
   Custom and third-party libraries should normally be located in the domain-dir`/lib` directory. This step is only necessary for custom or third-party libraries that may be located in the nonstandard as-install`/lib` directory.
3. Start the Upgrade Tool wizard from a command shell for your operating environment.

Note:

Use the Upgrade Tool that is located in the target GlassFish Server 4.0 installation, not the older source installation.

- On UNIX systems

```
as-install/bin/asupgrade
```

- On Windows systems

```
as-install\bin\asupgrade.bat
```

Tip:

You may find it faster to run the `asupgrade` command with the `s` source-domain-directory option, which will prefill the Source Domain Directory field in the next step.

1. In the Source Domain Directory field, type the domain directory of the existing installation from which to import the configuration, or click Browse.
   For example, you might type `c:\glassfish\domains\domain1`.
2. In the Target Domains Root Directory field, type the location of the GlassFish Server 4.0 installation to which to transfer the configuration, or click Browse.
   The default is the full path name of the `domains` directory of your GlassFish Server 4.0 installation (for example, `c:\glassfish3\glassfish\domains`).
3. Provide the master password of the source application server.
   The domain will be upgraded using these credentials. If you do not specify a password here, the default master password is used.

Note:

GlassFish Server 4.0 does not support NSS authentication. If you are upgrading from a Enterprise Profile configuration that uses NSS authentication, follow the procedure in Upgrading Installations That Use NSS Cryptographic Tokens.

1. Click Next.
   If a name used for an older domain that you are upgrading already exists in the new target domains directory, Upgrade Tool will ask if you want to rename the new directory so the old directory can be copied to the new installation.
   - If you click OK in response, the directory is renamed domain-name`.original`. If that name already exists, the directory will be renamed domain-name`.orginal.0`. For example, if the old domain directory is named `domain1`, it will be renamed `domain1.original`, or if that name already exists, `domain1.original.0`.
   - If you click No, you brought back to the main screen.
     The domain is upgraded and the Upgrade Results page displays the status of the upgrade operation.
2. Review the output in the Upgrade Results page to verify that the upgrade proceeded correctly.
   If there are any `SEVERE` or `WARNING` messages in the `server.log` file, the upgrade output will say `"Possible error encountered during upgrade. See server log after upgrade process completes."`
3. Click Finish to exit the Upgrade Tool when the upgrade process is complete.
4. Start the upgraded GlassFish Server 4.0 domain.

```
asadmin start-domain domain-name
```

1. If you are upgrading a clustered configuration or a configuration in which node agents were used, proceed with the instructions in Upgrading Clusters and Node Agent Configurations.

Next Steps

- Browse to the URL `http://localhost:8080` to view the domain-dir`/docroot/index.html` file. This file is brought over during the upgrade. You may want to copy the default GlassFish Server 4.0 file from the `domain1.original/docroot` directory and customize it for your GlassFish Server 4.0 installation.
- To register your installation of GlassFish Server from the Administration Console, select the Registration item from the Common Tasks page. For step-by-step instructions on the registration process, click the Help button on the Administration Console.

# Performing an In-Place Upgrade With the Update Center Tools

This section explains how to use the three Update Center tools to perform an in-place upgrade to GlassFish Server 4.0 from GlassFish Server 3.0.1 or Enterprise Server v3. Specifically, the three tools explained in this section are:

- Update Tool
- Software Update Notifier
- The `pkg` command-line utility

Note:

GlassFish Server 3.0.1 and Enterprise Server v3 are the only product releases that can be upgraded to the 4.0 release with the Update Center tools. If you are upgrading from any other product release, you must use Upgrade Tool, as described in Performing a Side-By-Side Upgrade With Upgrade Tool.

The following topics are addressed here:

- Update Center Tool Procedures
- To Upgrade Using the Update Tool GUI
- To Upgrade Using the Software Update Notifier
- To Upgrade From the Command Line Using the `pkg` Utility

## Update Center Tool Procedures

Unlike when using Upgrade Tool, when you use the Update Tool, the Software Update Notifier, or the `pkg` utility to perform a GlassFish Server 4.0 upgrade, the older source server directories are overwritten with the new target server directories, and the existing configuration and deployed applications are reused in the updated installation.

To perform the upgrade, the user who runs the upgrade needs to have read and writer permissions for the server installation directories.

You can perform an upgrade using the Update Center tools in the following ways:

- To Upgrade Using the Update Tool GUI
- To Upgrade Using the Software Update Notifier
- To Upgrade From the Command Line Using the `pkg` Utility

## To Upgrade Using the Update Tool GUI

This procedure explains how to use the graphical Update Tool to perform an in-place upgrade to GlassFish Server 4.0 from GlassFish Server 3.0.1 or Enterprise Server v3. Note that it is not possible to use this procedure with any other product releases.

1. Ensure that all domains on the source server from which you are upgrading are stopped before proceeding.
2. In a command shell for your operating environment, navigate to the as-install-parent`/bin` directory.
3. Use the `updatetool` command to start the Update Tool GUI.
   The Update Tool main window is displayed.
4. Click on Available Updates.
5. Select all items in the Available Updates list, and then click the Install button in the toolbar at the top of the Update Tool main window.
   When the upgrade is complete, exit Update Tool.
6. Upgrade the domain by starting the DAS with the `--upgrade` option.

```
as-install/bin/asadmin start-domain --upgrade domain-name
```

This upgrades the domain and then shuts down the DAS. 7. Start the DAS normally.

```
as-install/bin/asadmin start-domain domain-name
```

Next Steps

- Browse to the URL `http://localhost:8080` to view the domain-dir`/docroot/index.html` file. This file is brought over during the upgrade. You may want to copy the default GlassFish Server 4.0 file from the `domain1.original/docroot` directory and customize it for your GlassFish Server 4.0 installation.
- To register your installation of GlassFish Server from the Administration Console, select the Registration item from the Common Tasks page. For step-by-step instructions on the registration process, click the Help button on the Administration Console.

## To Upgrade Using the Software Update Notifier

This procedure explains how to use the Software Update Notifier to perform an in-place upgrade to GlassFish Server 4.0 from GlassFish Server 3.0.1 or Enterprise Server v3. Note that it is not possible to use this procedure with any other product releases.

Before You Begin

The Software Update Notifier must be installed and enabled on the GlassFish Server or Enterprise Server release from which you are upgrading. Software Update Notifier installation is typically performed during the initial GlassFish Server or Enterprise Server installation. The Software Update Notifier can also be installed later using Update Tool. For more information about the Update Notifier, refer to the Update Tool online help.

1. Wait for the Software Update Notifier to pop up a notification balloon informing you that updates are available.
2. Click the balloon prompt to open the Software Update GUI.
3. Manually stop all domains and server instances.
4. Using the Software Update GUI, select the items you want to upgrade and start the installation. Ensure that GlassFish Server 4.0 is one of the items you select for upgrade. This upgrades the server and selected components to the latest available versions.
5. Upgrade the domain by starting the DAS with the `--upgrade` option.

```
as-install/bin/asadmin start-domain --upgrade domain-name
```

This upgrades the domain and then shuts down the DAS. 6. Start the DAS normally.

```
as-install/bin/asadmin start-domain domain-name
```

Next Steps

- Browse to the URL `http://localhost:8080` to view the domain-dir`/docroot/index.html` file. This file is brought over during the upgrade. You may want to copy the default GlassFish Server 4.0 file from the `domain1.original/docroot` directory and customize it for your GlassFish Server 4.0 installation.
- To register your installation of GlassFish Server from the Administration Console, select the Registration item from the Common Tasks page. For step-by-step instructions on the registration process, click the Help button on the Administration Console.

## To Upgrade From the Command Line Using the `pkg` Utility

This procedure explains how to use the `pkg` utility to perform an in-place upgrade to GlassFish Server 4.0 from GlassFish Server 3.0.1 or Enterprise Server v3. Note that it is not possible to use this procedure with any other product releases.

1. Ensure that all domains on the source server from which you are upgrading are stopped before proceeding.
2. In a command shell for your operating environment, navigate to the as-install-parent`/bin` directory.
3. Use the `pkg image-update` command to update your entire GlassFish Server 3.0.1 or Enterprise Server v3 installation to GlassFish Server 4.0.

```
./pkg image-update
```

This upgrades the server components to the latest available versions. 4. Upgrade the domain by starting the DAS with the `--upgrade` option.

```
as-install/bin/asadmin start-domain --upgrade domain-name
```

This upgrades the domain and then shuts down the DAS. 5. Start the DAS normally.

```
as-install/bin/asadmin start-domain domain-name
```

Next Steps

- Browse to the URL `http://localhost:8080` to view the domain-dir`/docroot/index.html` file. This file is brought over during the upgrade. You may want to copy the default GlassFish Server 4.0 file from the `domain1.original/docroot` directory and customize it for your GlassFish Server 4.0 installation.
- To register your installation of GlassFish Server from the Administration Console, select the Registration item from the Common Tasks page. For step-by-step instructions on the registration process, click the Help button on the Administration Console.

# Upgrading Installations That Use NSS Cryptographic Tokens

GlassFish Server v2.x EE (Enterprise Edition) uses Network Security Services (NSS) for cryptographic software tokens. GlassFish Server 4.0 does not support NSS, so when performing an upgrade from v2.x EE to 4.0 additional manual configuration steps must be performed.

The following topics are addressed here:


- To Prepare for the Upgrade
- To Perform Post-Upgrade Configuration
- To Upgrade PKCS#11 Hardware Tokens


## To Prepare for the Upgrade

This procedure explains how to prepare for modifying an NSS-based GlassFish Server 2.x installation when upgrading to GlassFish Server 4.0.

1. Download and install GlassFish Server 4.0 using the Typical Installation path.
   Ensure that you install the new GlassFish Server 4.0 product in a directory that is different than the one used for the older installation from which you are upgrading.
   See "Installing GlassFish Server From a Self-Extracting Bundle" in GlassFish Server Open Source Edition Installation Guide for instructions.
2. Rename the new GlassFish Server 4.0 domain-dir (the default is as-install`/domains/domain1`) to a name of your choice.
   In this procedure, `31domain` is used for the renamed GlassFish Server 4.0 domain.
3. Copy the older source domain to be upgraded to the new GlassFish Server 4.0 as-install`/domains` directory.
   In this procedure, `domain1` is used for the older source domain that is copied to the new GlassFish Server 4.0 installation.

Note:

The remaining steps in this procedure are performed on the copy of your source domain that you created in this step, rather than on your original source domain. It is strongly recommended that you perform the GlassFish Server 4.0 upgrade on a copy of your old domain rather than on the original.

1. Copy the `server.policy`, `keystore.jks`, and `cacerts.jks` files from the renamed `./31domain/config` directory to the `./domain1/config` directory to be upgraded.

For example:

```
cp as-install/domains/31domain/config/server.policy as-install/domains/domain1/config
cp as-install/domains/31domain/config/keystore.jks as-install/domains/domain1/config
cp as-install/domains/31domain/config/cacerts.jks as-install/domains/domain1/config
```

This will overwrite the master password for `./domain1` with the password used in the `./31domain`. 5. Modify the `domain.xml` file for `./domain1`. 1. Add the following `jvm-options` under `server-config` and `default-config`:

```
-Djavax.net.ssl.keyStore=${com.sun.aas.instanceRoot}/config/keystore.jks
-Djavax.net.ssl.trustStore=${com.sun.aas.instanceRoot}/config/cacerts.jks
```

1. Remove the following `jvm-option` under `server-config` and `default-config`:

```
-Dcom.sun.appserv.nss.db=${com.sun.aas.instanceRoot}/config
```

1. Upgrade `./domain1` by starting the DAS in the new GlassFish Server 4.0 installation with the `--upgrade` option.

```
as-install/bin/asadmin start-domain --upgrade domain1
```

This upgrades the domain and then shuts down the DAS. 7. Start the upgraded DAS normally.

```
as-install/bin/asadmin start-domain domain1
```

## To Perform Post-Upgrade Configuration

These instructions explain the post-upgrade configuration steps that must be performed when upgrading from an NSS-based installation to GlassFish Server 4.0.

Before You Begin

Before proceeding with this procedure, complete the procedure explained in To Prepare for the Upgrade.

1. Start the GlassFish Server 4.0 domain, if it is not already running, and open the GlassFish Server Admin Console in a browser window.
   The default URL is `https://localhost:4848`

As part of the To Prepare for the Upgrade procedure, the default keystore with a default self-signed key-certificate pair with an alias named `s1as` and a keystore password `changeit` was copied into the v2.x domain before the upgrade.

2. If your default server alias in the NSS v2.x domain is not `s1as`, you can delete this entry using the following command:

```
keytool -delete -keystore keystore.jks -storepass changeit -alias s1as
keytool -delete -keystore cacerts.jks -storepass changeit -alias s1as
```

1. If the master password for the v2.x domain is not the default password `changeit`, you need to change the new keystore password to match the v2.x master password.

```
keytool -storepasswd -new v2-master-password \
-keystore keystore.jks -storepass changeit
keytool -storepasswd -new v2-master-password \
-keystore cacerts.jks -storepass changeit
```

1. Take note of all the `KeyEntries` that exist in your NSS database.
   These entries must be migrated to the `keystore.jks` in the GlassFish Server 4.0 domain. The following command can be used to list all the `KeyEntries` in the NSS database:

```
certutil -L -d $AS_NSS_DB
```

`AS_NSS_DB` should point to the `${com.sun.aas.instanceRoot}/config` for the 4.0 instance into which the v2.x domain was copied. The listing with the attribute combinations `u,u,u` are the `KeyEntries`.
For example:

```
s1as u,u,u
```

Note:

To run the `certutil` command, your `LD_LIBRARY_PATH` must point to the directory containing NSS library and DLLs.

1. For each `PrivateKey-Certificate` pair (`KeyEntry`) that exists in the v2.x NSS database, use the following commands to export them from the NSS database and import them into the newly created `keystore.jks` file.
   Make sure you use the same alias when importing the `KeyEntry` into the JKS keystore. For example, if s1as is the only alias present in the NSS database, the following command can be used:

```
> pk12util -o /tmp/s1as_pk.p12 -n s1as -d $AS_NSS_DB
>keytool -importkeystore -srckeystore /tmp/s1as_pk.p12 -destkeystore \
${com.sun.aas.instanceRoot}/config/keystore.jks -srcstoretype PKCS12 \
-deststoretype JKS -srcstorepass v2-master-password \
-deststorepass v3-master-password -srcalias s1as \
-destalias s1as -srckeypass v2-master-password \
-destkeypass v3-master-password
```

Note:

The reference to v3-master-password could be the same as v2-master-password if you intend to retain the same master password for the 4.0 domain after upgrading from v2.x.

1. If the `s1as` alias represents a `KeyEntry` with a self-signed certificate, the self-signed certificate must be copied to the `truststore`.

```
>certutil -L -n s1as -r -d $AS_NSS_DB> /tmp/s1as.der>keytool -import -keystore
cacerts.jks -storepass v3-master-password \
-file /tmp/s1as.der -alias s1as
```

1. There is a rare chance that the 2.x NSS database has some CA (Certificate Authority) certificates that are absent in the default created `truststore`. In such cases, all aliases that are missing in the `truststore` (`cacerts.jks`) need to collected.
2. `certutil -L -d $AS_NSS_DB`
   Example output:

```
verisignc1g1 T,c,c
verisignc1g2 T,c,c
verisignc1g3 T,c,c
```

1. `keytool -list -keystore cacerts.jks -storepass` v3-master-password
   Example output:

```
godaddyclass2ca, Jan 20, 2005, trustedCertEntry,
Certificate fingerprint (MD5): 91:DE:06:25:AB:DA:FD:32:17:0C:BB:25:17:2A:84:67
verisignclass1g3ca, Mar 26, 2004, trustedCertEntry,
Certificate fingerprint (MD5): B1:47:BC:18:57 1:18:A0:78:2D:EC:71:E8:2A:95:73
secomevrootca1, May 1, 2008, trustedCertEntry,
Certificate fingerprint (MD5): 22:2D:A6:01:EA:7C:0A:F7:F0:6C:56:43:3F:77:76 3
```

1. For each of the aliases from the `certutil` output in the preceding step that are required but missing in the `truststore` listing, execute the following commands to export and import them into the 4.0 domain's `truststore`.

```
>certutil -L -n verisignc1g1 -r -d $AS_NSS_DB> /tmp/verisignc1g1.der>keytool -import
-keystore cacerts.jks -storepass v3-master-password \
-file /tmp/verisignc1g1.der -alias verisignc1g1
```

Note:

Sometimes just the alias names that are used in the NSS database are different, and the same certificate is, in fact, present in the 4.0 default `truststore`.

## To Upgrade PKCS#11 Hardware Tokens

If you are using GlassFish Server v2.x Enterprise Edition with Hardware Tokens (for example, FIPS-140 compliant Sun Cryptographic Accelerator 6000 or other Sun Cryptographic Accelerators) configured by means of NSS-PKCS11, then the v2.x EE-to-4.0 upgrade solution is to directly configure the Hardware Token as a PKCS11 token using the JDK-JSSE supported mechanisms for configuring PKCS#11 tokens.

1. Set the `javax.net.ssl.keyStoreType` `jvm-options` in GlassFish Server 4.0 to PKCS11.

```
<jvm-options>-Djavax.net.ssl.keyStoreType=PKCS11</jvm-options>
```

1. Set the `javax.net.ssl.keyStore` URL should be set to l since this is a hardware token.

```
<jvm-options>-Djavax.net.ssl.keyStore=NONE</jvm-options>
```

1. Change the password for the `truststore` and the GlassFish Server `MasterPassword` to match the PIN of your `HardwareToken`.
2. Since you are using a Hardware Token, you can delete the `keystore.jks` for the migrated domain.
3. Ensure the `token-alias` for the hardware token (private key) that you intend to use as the Server's Key for SSL is mentioned in every relevant place in the `domain.xml` for the domain.
   For example, the `cert-nickname` attribute for the `<ssl/>` element under the `protocol` configuration.
4. If the Hardware Token is to act as a `TrustStore` as well, remove the `cacerts.jks` file from the domain-dir`/config` directory.
   Ensure that the following two `jvm-options` are set in the `domain.xml` file:

```
<jvm-options>-Djavax.net.ssl.trustStore=NONE</jvm-options>
<jvm-options>-Djavax.net.ssl.trustStoreType=PKCS11</jvm-options>
```

# Upgrading Clusters and Node Agent Configurations

This section explains additional steps you need to perform when upgrading cluster and node agent configurations from Application Server or Enterprise Server to GlassFish Server 4.0.

GlassFish Server 4.0 does not support node agents. As part of the upgrade process, any node agent elements in the older source configuration are transformed into `CONFIG` node elements in the `domain.xml` file for the upgraded DAS. If the source node agent configuration is incompatible with your GlassFish Server 4.0 installation, you must correct the node configuration on the upgraded DAS.

In addition, although the source cluster configuration is retained in the `domain.xml` file for the upgraded DAS, it is still necessary to install GlassFish Server 4.0 on each node host and manually re-create the server instances that are contained in the clusters.

The following topics are addressed here:

- Overview of Cluster and Node Agent Upgrade Procedures
- To Correct the Configuration of a Node After an Upgrade
- To Re-Create a Cluster

## Overview of Cluster and Node Agent Upgrade Procedures

The general steps for upgrading a cluster and node agent configuration so it will work in GlassFish Server 4.0 are as follows:

1. Perform a side-by-side upgrade of the DAS. This procedure is described in Performing a Side-By-Side Upgrade With Upgrade Tool.
2. Perform new (not upgrade) GlassFish Server 4.0 installations on each node host. GlassFish Server 4.0 installation instructions are provided in the GlassFish Server Open Source Edition Installation Guide.
3. Correct the node configuration on the upgraded DAS, if necessary. This procedure is described in To Correct the Configuration of a Node After an Upgrade.
4. Re-create the clusters and server instances on each GlassFish Server 4.0 node host. This procedure is described in To Re-Create a Cluster.

## To Correct the Configuration of a Node After an Upgrade

As part of the upgrade process, node agent elements in the DAS configuration are transformed into GlassFish Server node elements of type `CONFIG`. This transformation does not affect the node agent directories for GlassFish Server instances. To create the equivalent directories for GlassFish Server instances after an upgrade, you must re-create the instances as explained in To Re-Create a Cluster.

The name of an upgraded node is the name of the node agent from which the node is transformed.

The host that the node represents is obtained from the configuration of the original node agent or, if not specified, is not set. If the configuration of the original node agent did not specify the name of the node host, you must update the node to specify the host that the node represents.

Default values are applied to the remainder of the node's configuration data.

The default values of the following items in a node's configuration data might not meet your requirements for the upgraded installation of GlassFish Server:

- The parent of the base installation directory of the GlassFish Server software on the host, for example, `/export/glassfish3`.
  The default is the parent of the default base installation directory of the GlassFish Server 4.0 software on the DAS host. If the GlassFish Server software is installed under a different directory on the node host, you must update the node's configuration to specify the correct directory.
- The directory that will contain the GlassFish Server instances that are to reside on the node.
  The default is as-install`/nodes`, where as-install is the base installation directory of the GlassFish Server software on the host. If you require the instances to be contained in a different directory, you must update the node's configuration to specify that directory.

If you are using secure shell (SSH) for centralized administration, you must also change the type of the node to `SSH` to enable the node for remote communication.

For more information about GlassFish Server nodes, see "Administering GlassFish Server Nodes" in GlassFish Server Open Source Edition High Availability Administration Guide.

Before You Begin

Ensure that the following prerequisites are met:

- A side-by-side upgrade on the DAS has been performed. For more information, see Performing a Side-By-Side Upgrade With Upgrade Tool.
- If you are changing the type of the node to `SSH`, ensure that SSH is configured on the host where the DAS is running and on the host that the node represents. For more information, see "Setting Up SSH for Centralized Administration" in GlassFish Server Open Source Edition High Availability Administration Guide.
- If you are upgrading from an Enterprise Profile configuration that uses NSS authentication, ensure that the procedure in Upgrading Installations That Use NSS Cryptographic Tokens has been

performed. GlassFish Server 4.0 does not support NSS authentication.

1. Ensure that the DAS is running.
   Remote subcommands require a running server.
2. Update the node's configuration data to specify the correct directories and, if necessary, change the type of the node.

Note:

Only the options that are required to complete this task are provided in this step. For information about all the options for changing the node's configuration data, see the `update-node-ssh(1)` help page or the `update-node-config(1)` help page.

```
asadmin> node-update-subcommand [--installdir as-install-parent] [--nodedir node-dir]
[--nodehost node-host] node-name
```

**node-update-subcommand**

The subcommand to run to update the node.

- If you are leaving the type of the node as `CONFIG`, run the `update-node-config` subcommand on the node.
- If you are changing the type of the node to `SSH`, run the `update-node-ssh` subcommand on the node.

**as-install-parent**

The full path to the parent of the base installation directory of the GlassFish Server software on the host, for example, `/export/glassfish3`.

**node-dir**

The path to the directory that will contain GlassFish Server instances that are to reside on the node. If a relative path is specified, the path is relative to the as-install directory.

**node-host**

The name of the host that the node is to represent after the node is updated.

**node-name**

The name of the node to update. This name is the name of the node agent from which the node was transformed.

Example 2-2 Correcting the Configuration of a Node After an Upgrade

This example updates the path to the directory that will contain instances that are to reside on the

node `xk01` to `/export/home/gf/nodes`. Because this node is transformed from a node agent, the type of the node is `CONFIG`. Therefore, type of the node is not changed.

```
asadmin> update-node-config --nodedir /export/home/gf/nodes xk01
Command update-node-config executed successfully.
```

Next Steps

Re-create the cluster configuration from the older source installation in the new GlassFish Server 4.0 installation in as explained in To Re-Create a Cluster.

See Also

- "Setting Up SSH for Centralized Administration" in GlassFish Server Open Source Edition High Availability Administration Guide
- "Administering GlassFish Server Nodes" in GlassFish Server Open Source Edition High Availability Administration Guide
- `update-node-config`(1)
- `update-node-ssh`(1)

## To Re-Create a Cluster

This procedure explains how to re-create a clustered GlassFish Server or Enterprise Server configuration for GlassFish Server 4.0.

Before You Begin

Before proceeding with these instructions, ensure that you have completed the following procedures:

- Perform the standard upgrade to GlassFish Server 4.0 on the DAS, as described in Performing a Side-By-Side Upgrade With Upgrade Tool.
- Perform a new (not upgrade) installation of GlassFish Server 4.0 on each node host. See the GlassFish Server Open Source Edition Installation Guide for instructions.
- Correct the upgraded node configuration, if necessary, as described To Correct the Configuration of a Node After an Upgrade.

1. Start the upgraded DAS.

```
asadmin> start-domain domain-name
```

If the upgrade succeeded, the migrated cluster configuration exists and the `get-health` subcommand

lists the status of the clustered instances as not running. 2. Confirm that the cluster configuration exists and contains all its instances.

```
asadmin> get-health cluster-name
```

For example, for the sample `cluster1` used in this procedure:

```
asadmin> get-health cluster1
instance1 not started
instance2 not started
Command get-health executed successfully.
```

1. Re-create the clustered server instances on each instance host.
   The specific commands to use depend on your configuration.
   - If remote hosts cannot contact the DAS, export and import the instances' configuration data, as explained in "To Resynchronize an Instance and the DAS Offline" in GlassFish Server Open Source Edition High Availability Administration Guide.
   - If remote hosts can contact the DAS, create each instance individually and resynchronize the instance with the DAS, as explained in the following sections:
     - "To Create an Instance Locally" in GlassFish Server Open Source Edition High Availability Administration Guide
     - "To Resynchronize an Instance and the DAS Online" in GlassFish Server Open Source Edition High Availability Administration Guide
       Note that the node name matches that used for the node agent in the 2.x installation. If you get an error stating that some attributes do not match the values in the DAS configuration, follow the instructions in To Correct the Configuration of a Node After an Upgrade.
2. After creating the instances, manually copy the instance-dir`/imq` directory for each instance from the older source installation to the target GlassFish Server 4.0 installation.
3. If necessary, start the cluster.
   For example:

```
asadmin> start-cluster cluster1
```

This step may or may not be necessary, depending on the procedure you used to create the server instances for the cluster.

Example 2-3 Creating Two Local Instances

The following example shows how to create two local instances in a cluster.

```
host1$ asadmin --host dashost create-local-instance --node na1 --cluster cluster1
instance1
host2$ asadmin --host dashost create-local-instance --node na2 --cluster cluster1
instance2
```

`dashost`
: The name of the DAS host.

`na1`
: The name of the node host.

`cluster1`
: The name of the cluster.

`instance1`, `instance2`
: The names of the instances.

# Correcting Potential Upgrade Problems

This section addresses issues that can occur during an upgrade to GlassFish Server 4.0.

The following topics are addressed here:

- Cluster Profile Security Setting
- Cluster Profile Upgrade on Windows
- `asupgrade` Fails Without Internet Connection

## Cluster Profile Security Setting

When upgrading a clustered domain configuration from Application Server 9.1 or Enterprise Server v2 to GlassFish Server 4.0, you may encounter problems if the `admin-service` element in the DAS `domain.xml` file sets both of the following attributes:

- `security-enabled=true`
- `type=das-and-server`

The `security-enabled` attribute must be set to `false` in the `admin-service` element for the DAS when `type` is set to `das-and-server`.

You can use the `get` subcommand to determine the values for these two attributes. For example:

- To display the value for the `security-enabled` attribute:

```
asadmin> get configs.config.server-config.admin-service.jmx-connector.system.security-
enabled
```

- To display the value for the type attribute:

```
asadmin> get configs.config.server-config.admin-service.type
```

If necessary, use the `set` subcommand to set `security-enabled=false`. For example:

```
asadmin> set configs.config.server-config.admin-service.jmx-connector.system.security-
enabled=false
```

## Cluster Profile Upgrade on Windows

On Windows, when you upgrade cluster profile domains, you could encounter the following error:

```
Fatal error while backing up the domain directory
```

To resolve this error, look for and remove any hidden files in the source domain's directory and re-run Upgrade Tool.

## `asupgrade` Fails Without Internet Connection

This problem only occurs when using GlassFish Server 3.1 Upgrade Tool to perform a side-by-side upgrade on a 2.x domain without an Internet connection. It does not occur when using GlassFish Server 3.1.1.

The workaround for this issue is as follows:

1. Copy the older source domain to be upgraded to the new target domain-dir, the default for which is as-install`/domains`.
   Rename the target `domain1` directory, if one exists, before proceeding.
2. Run the upgrade.

```
asadmin> start-domain --upgrade domain-name
```