FirstSpirit™
Unlock Your Content

Migration from Jetty to web server scenarios for productive use
FirstSpirit 2018-10

Version	**1.2**
Status	**RELEASED**
Date	**2018-10-24**
Department	FS-Core
Copyright	2018 e-Spirit AG

e-Spirit

Table of contents

First Spirit ™

1   Introduction

"Eclipse Jetty", the open-source product made available in FirstSpirit, provides a web server and a JSP/servlet engine which run as part of the FirstSpirit Server in the same VM.

The use of this web server is **only intended for test purposes** so that partners and customers can use FirstSpirit directly with web server functionality without first having to install an external web server and connect it.

For more complex configuration requirements (for example adjustments to the memory size, time outs, number of threads per deployed application...), the **use of an external web server is recommended** (specifically Apache Tomcat).

1.1   Discontinuation of "integrated web server" (internal Jetty)

Support for the functionality "integrated web server" ("internal Jetty") was dropped as of the FirstSpirit release 2018-08.

With a following FirstSpirit release, use of the "integrated web server" will no longer be possible; functions connected to the "integrated web server" (preview, etc.) will not longer run (see "Effects of lack of migration").

This is why changing to an external web server (specifically Apache Tomcat) is required for productive systems.

The "integrated web server" (internal Jetty) is replaced with the "Jetty web server" functionality. This is also based on "Eclipse Jetty". This web server should only be used for development purposes or as fallback and therefore only has the basic configuration options.

1.2   Migration of a web server

To enable partners and customers to easily switch to more long-term solutions, FirstSpirit 2018-08 provided new options for configuring web servers that can be used in production. With FirstSpirit 2018-09, additionally an assistant was implemented with which the web applications can be easily migrated with GUI support from one web server to another ("FirstSpirit ServerManager / Server properties / Web server", "Migration" button, see also "FirstSpirit

documentation for administrators").

A few possible application and migration scenarios are described in the following.

1.3   Note about required migration

If the "integrated web server" ("internal Jetty") is still configured on a FirstSpirit Server for one or several web applications, FirstSpirit administrations are shown a corresponding note with the current release on the start page of the FirstSpirit Server:

```
Use(s) of the internal Jetty detected...
```

1.4   Effects of lack of migration

The "integrated web server" ("internal Jetty") will be removed from FirstSpirit in one of the following releases (expected end of 2018). From this point in time, it can no longer be used to deliver web applications.

This means that, in the respective FirstSpirit versions, all web applications configured on the "internal Jetty" can no longer be used. If the FirstSpirit start page is delivered via the "internal Jetty", this means that the FirstSpirit Server is no longer available.

FirstSpirit Server start is canceled with an error message (FATAL).

At the moment, an emergency strategy is being worked out to reset an incorrectly configured FirstSpirit Server into a state in which it can be restarted.

2   Application scenarios with one web server

In the following, you will see a list with various application scenarios showing how the web applications of FirstSpirit can be operated. Should you not find the configuration you use, please contact our technical support for a corresponding migration.

2.1   Integrated web server (˝internal Jetty˝)

Not recommended for use in production environments

For this configuration, all web applications are hosed via the web server previously integrated in First Spirit ("internal Jetty"). To do so, the internal servlet engine ("internal Jetty") was activated in the `fs-server.conf` configuration file via the `INTERNAL_SERVLET_ENGINE=1` parameter and configured via the corresponding port (`HTTP_PORT=8000`)

Is migration necessary?

Production operation: For this configuration, you *must* change to another web server. Please proceed as described in section "(Recommended) Migration to Apache Tomcat (dedicated host)".

No production operation: For this configuration, you *must* change to another web server. Please proceed as described in section "Installation of the FirstSpirit Jetty Server".

2.2   Jetty web server

Not recommended for use in production environments.

For this configuration, the web server is configured via the "FirstSpirit Jetty Server" module. The port is defined via the configuration of the respective service (ServerManager: "Server properties"/ "Modules" / "FirstSpirit Jetty Server" / "JettyService" / "Configure").

Is migration necessary?

Production operation: For this configuration, *we strongly recommend* changing to another web server. Proceed as described in section "(Recommended) Migration to Apache Tomcat (dedicated host)".

No production operation: No changes are necessary when using this configuration.

2.3 Apache Tomcat (Tomcat servlet engine)

No longer recommended for use in production environments.

For this configuration, the web server (here: Apache Tomcat) is configured so that it uses the FirstSpirit web directory `<FirstSpiritROOT>/web`.

Is migration necessary?

For this configuration, you *should* change to another web server. Please proceed as described in section "(Recommended) Migration to Apache Tomcat (dedicated host)".

Should, contrary to this recommendation, the previous solution be kept, proceed as described in the section "Installation of an external web server with unpacked web applications".

2.3.1 Special case: Apache Tomcat with specifically-configured WEB_DIR

Using the `fs-server.conf` configuration file, the web directory can be configured in which the web application should be rolled out. (`WEB_DIR` and `WEBAPP_<interner-Name>_<(NAME|PATH|URL)>` parameters).

If the specified default configuration is not used here, but a specially-configured WEB_DIR is used instead, the following applies:

▪ If only the paths and/or the URL are changed, the process is as described above (see "Apache Tomcat (Tomcat servlet engine)"), whereby the respective values have to be adopted into the configuration of the external web server.

It may be necessary to configure several "**external web servers**".

2.4   (Recommended) Apache Tomcat (on dedicated host)

Recommended for use in production environments.

For this configuration, the web server (here: Apache Tomcat) is either operated on the same computer as FirstSpirit or on another computer. Using the Tomcat manager and the "manager script" roll, FirstSpirit is given the option of deploying WAR files directly onto Tomcat.

Is migration necessary?

No changes are necessary when using this configuration.

2.5   External web server which uses the web directory of FirstSpirit

No longer recommended for use in production environments.

For this configuration, any external web server is configured so that it uses the FirstSpirit web directory `<FirstSpiritROOT>/web`.

Is migration necessary?

For this configuration, you *should* change to another web server. Please proceed as described in section "(Recommended) Migration to Apache Tomcat (dedicated host)".

Should, contrary to this recommendation, the previous solution be kept, proceed as described in the section "Installation of an external web server with unpacked web applications".

2.6   (Recommended) External web server which contains the web applications via WAR files

Recommended for use in production environments.

For this configuration, the web server is either operated on the same computer as FirstSpirit or on another computer. Using the configuration of the external web server, FirstSpirit is given the option of deploying WAR files directly onto the web server.

Is migration necessary?

No changes are necessary when using this configuration.

<u>Recommendation:</u> Updating the web applications can presumably be automated via the "external" web server type. Proceed according to section "Installation of an external web server with unpacked web applications". Contrary to the description, the "As WAR file in the web directory" installation type must be selected.

3 Application scenarios with several web servers

In the following configurations, there are extensions of the application scenarios presented in chapter 2.

3.1 External web server with upstream Apache HTTP server

In this scenario, another web server ("Apache HTTP server") is connected upstream of the external web server (Apache Tomcat or other) which takes over external communication and forwards it to the external web server.

Is migration necessary?

Normally no adjustments are necessary for the upstream Apache HTTP web server, provided the port of the web server does not change.

Recommendations for migrating the external web server (Apache Tomcat or other) can be found in the respective description in chapter 2.

3.2 External web server with "internal Jetty" fallback

In this scenario, the "integrated web server" ("internal Jetty") is used as a fallback in addition to the external web server (Apache Tomcat or other) (e.g. to ensure continued access to the FirstSpirit start page if the external web server fails).

Is migration necessary?

For this configuration, you *must* replace the "internal Jetty" with the "Jetty web server" (or another web server). Then an "aggregating web server" must be configured into which the actual web server and its fallback (here the "Jetty web server") is to be integrated.

Please first proceed according to section "Installation of the FirstSpirit Jetty Server" (to change to the "Jetty web server"). Then proceed according to section "(Recommended) Migration to

Apache Tomcat (dedicated host)" (to change to the Apache Tomcat).

3.2.1 Special case: All web applications on both web servers

In special cases in which all web applications:

- global web applications
  (in ServerManager under "Server properties"/ "Web applications")
- as well as project-local web applications
  (in ServerManager under "Project properties"/"Web applications")

Are needed on both servers, the following steps are necessary:

For this configuration, you *must* replace the "internal Jetty" with the "Jetty web server" (or another web server). Please first proceed according to section "Installation of the FirstSpirit Jetty Server" (to change to the "Jetty web server").

Then an "aggregating web server" must be configured into which the actual web server and its fallback (here the "Jetty web server") is to be integrated. Proceed according to section "(Recommended) Migration to Apache Tomcat (dedicated host)" (to change to the Apache Tomcat).

Migration to the new "aggregating web server" type is then necessary. Please proceed as described in section "Transfer of web applications". As the target web server, use the "aggregating web server" in which you joined the individual web servers.

3.3 Several web servers which each host different FirstSpirit web applications

For this configuration, several web servers must be configured separately. Individual web applications are hosted on one of these web servers.

Is migration necessary?

For this configuration, every web server must be migrated individually.

Recommendations for migrating the web servers can be found in the respective description in chapter 2.

To transfer the web applications to the new web server, if necessary, please proceed according

to section "Transfer of web applications". Individual web applications can also be adjusted manually.

3.4   Several web servers which each host other FirstSpirit web applications with "internal Jetty" fallback

In this scenario, the "integrated web server" ("internal Jetty") is used as a fallback in addition to several, separately configured web servers (e.g. to ensure continued access to the FirstSpirit start page if the external web servers fail).

Is migration necessary?

For this configuration, every web server must be migrated individually.

Recommendations for migrating the web servers can be found in the respective description in chapter 2.

Then, for every combination for which a corresponding fallback is to be used, an "aggregating web server" must be configured into which the actual web server and its fallback (typically the "Jetty web server") is to be integrated.

To transfer the web applications, to the new web server, if necessary, please proceed according to section "Transfer of web applications".

3.5   (Recommended) Several web servers for load distribution

For this configuration, recommended for live use, the web applications are hosted on an individual web server. The files are either transported from there to other web servers or the web servers share a file system. A load balancer is connected upstream of the web server, which ensures that the sessions are distributed on the individual web servers.

Is migration necessary?

No changes are necessary when using this configuration.

If the WAR files cannot be downloaded manually, to get a clearer view, a unique web server configuration can be defined for every application server which is then joined via an "aggregating web server".

In this case, all web applications on this "aggregating web server" must be adjusted.

Corresponding instructions can be found in section "Transfer of web applications".

4 Migration scenarios

4.1 (Recommended) Migration to Apache Tomcat (dedicated host)

As a web server configuration for productive use, e-Spirit recommends using an Apache Tomcat (corresponding to the "Tomcat servlet engine on dedicated host" configuration from the "Documentation for administrators").

The "Start page" and "ServerMonitoring" web applications should be installed manually on a "aggregating web server" type in which the Apache Tomcat and the "Jetty Web Server" are combined (see chapter 4.2), whereby the Tomcat web server is defined as the default web server.
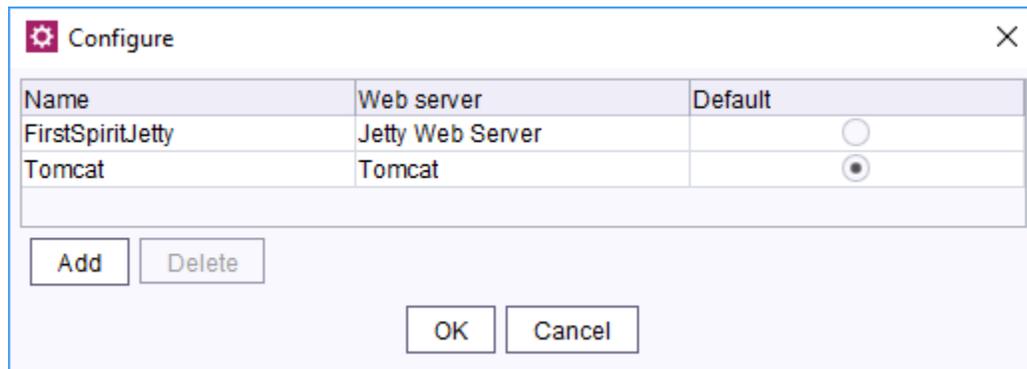
All other web applications are only installed on the Apache Tomcat.

This configuration ensures that the web applications are delivered stably via the Apache Tomcat. Independent of the Tomcat, the start page and ServerMonitoring is always available via the Jetty web server so that the FirstSpirit Server remains configurable even if there are problems with the Tomcat (or if it is downloaded as planned).

The other web applications are migrated to the Tomcat (if necessary) according to section "Transfer of web applications", whereby the Apache Tomcat is selected as the target web server.

4.2   Installation of the FirstSpirit Jetty Server

For **non-productive use** (e.g. development environment, test system), the FirstSpirit Jetty Web Server can be used.

Proceed as follows:

- Start the ServerManager and, when there, open:
  "Server properties" / "Modules" / "FirstSpirit Jetty Web Server"

- Configure the JettyService (execute Http port and/or Https configuration) there. As the port, select a free port of the system.

  Then, under "Server properties" / "Web server", select a new web server of the "Jetty Web Server" type. Further configuration is not necessary.

To transfer the web applications to the new web server, please proceed according to section "Transfer of web applications" at the end of this chapter. Select the newly-created web server as the target web server.

4.2.1   Note on migrating from "internal Jetty" to the "Jetty web server"

The "Jetty web server" must be used during migration with a port other than the integrated web server ("internal Jetty"). After migration of all web applications, the port of the "Jetty web server" can be changed to the port of the "internal Jetty" as follows:

In the ServerManager under: "Server properties" / "Modules"/ "Jetty web server" "JettyService" / Configure" as HTTP port or HTTPS port, enter the port which the "internal Jetty" uses (i.e. the port under which the FirstSpirit start page was previously available).

Do not restart the JettyService when doing so!

Via ServerMonitoring under "FirstSpirit"/ "Configuration" / "Server" in the `fs-server.conf` configuration file, change the value of the `INTERNAL_SERVLET_ENGINE` parameter from `1` to `0`. This configuration deactivates the "internal Jetty" during the next FirstSpirit restart so that the port can then be used by the "Jetty web server".

Now restart the FirstSpirit Server (e.g. via ServerMonitoring under "FirstSpirit" / "Control" / "Server restart"). Then the "Jetty web server" with all web applications is available under the

same URL as previously with the "internal Jetty".

Just like the previously available "internal Jetty", the "Jetty web server" **is not recommended for use in production environments.**.

This is why changing to an external web server (specifically Apache Tomcat) is required for productive systems.

4.3 Installation of an external web server with unpacked web applications

Open the "Web server" area in the ServerManager under "Server properties".

There, create a new web server of the "external web server" type. Configure this web server and specify the absolute path of the directory `<FirstSpiritROOT>/web` as the web directory.

Tip: Unless other reasons speak against it, it makes sense to use another directory. In this case, the web server which delivers the web applications must be unconfigured. This action can help prevent possible problems with the (additional) rolling out of all web applications for the "internal Jetty".

Select the "Unpacked in web directory" option for "Installation of the web application".

For the web server URL, specify the URL under which the web server can be made available.

To transfer the web applications to the new web server, please proceed according to section "Transfer of web applications".

4.4 Transfer of web applications

When migrating a web server (source web server) onto a new web server (target web server), the available web applications must be transferred to the new target web server. Using the "Migrate" function (in the ServerManager under "Server properties" / "Web server"), all affected web applications can be transferred to the target web server (see "Documentation for administrators" - "Migrating a web server").

After selecting a source and target server in the second dialog box (migration assistant - step 2), the migration assistant shows a list of all installed web applications of the source web server.

Clicking on the "Finish" button starts the transfer of the web applications to the target web server. In doing so, the web applications are uninstalled from the source web server and then

installed on the target web server.

The progress of the entire transfer and the status of the individual transfer steps are shown via a log window. In the event of problems, the `fs-server.log` or the log file of the respective web server must be checked to identify the source of the problem.

If the FirstSpirit start page is affected by the web server move, the following applies: Under certain conditions (when starting the FirstSpirit ServerManager via HTTP or HTTPS), the start page is migrated but not uninstalled. In this case, the start page on the previous web server (source web server) can be uninstalled. To do so, the ServerManager is started on the target web server and selected under the "Start page" tab under "Server properties" / "Web applications". The source web server is selected there and the web application is removed by clicking on the "Uninstall" button.

Note: If the start page is moved to a web server of the "aggregating web server" type and the previous (source) web server is part of this "aggregating web server",

- The connection of the ServerManager is lost in the last migration step. However, migration is stopped simultaneously and the start page can be reached again shortly thereafter.
- The start page should not be uninstalled. The start page is otherwise no longer available until the next FirstSpirit start via the corresponding web server.

From this moment on, the FirstSpirit Server is no longer available via the previous web server.

Recommended: **After completing the transfer, the FirstSpirit Server must be restarted.**

The source web server can then be deactivated.

Example: If the source web server is an "internal Jetty" web server, the value of the `INTERNAL_SERVLET_ENGINE` parameter in the `<FirstSpiritROOT>/conf/fs-server.conf` configuration file of `1` can be changed to `0`.