



# FirstSpirit™

*Unlock Your Content*

## Technical Datasheet

### FirstSpirit™ Version 5.2

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e-Spirit

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# 1 Introduction

The existing Technical Datasheet is valid for FirstSpirit™ Version 5.2.

FirstSpirit™ has been designed as an enterprise content management system for application in complex IT landscapes, and supports various operating systems, Java runtime environments, and databases. To guarantee high software quality and to ensure that FirstSpirit™ runs in all supported configurations, regular tests are carried out within the scope of quality assurance.

Due to the extremely large number of different versions or patch levels of supported third party products (e.g. by the second quarter 2012, there were already 33 version for approximately 9 operating systems for Oracle Java JDK 1.6.0, often in 32-bit and 64-bit versions), it is unfortunately not possible, even with the most advanced software test methods, to regularly and completely test all the supported software configurations (see *FirstSpirit Whitepaper*, section 10.2 "Test complexity").

However, to guarantee the planning security required for introducing FirstSpirit, e-Spirit defines a variety of **reference** configurations whose functionality is regularly tested. The chosen variety of reference configurations displays a selection of already used FirstSpirit installations which have been adapted and extended over time.

Frequently, in a real scenario (especially with an existing system infrastructure), certain deviations from the reference configurations will exist. To provide planning security for the company introducing new software for this case too, a far more extensive number of system configurations are defined as being "supported" (as defined by "**Actively supported**", see definition of term in Chapter 1.1 page 4). Unlike the reference configurations, not all "actively supported" system configurations are regularly tested for functionality. However, e-Spirit assures that if problems occur with a configuration defined as being "actively supported", measures will be taken to correct the situation. In addition, there is also a range of "**passively supported**" system configurations, which are not actively tested by e-Spirit, but are successfully in use by our customers or partners or were supported in previous versions of FirstSpirit.

In a few cases, incompatibilities in certain system configurations have been noticed. These system configurations are defined as "**Not supported**".

With regard to previous FirstSpirit versions, we try to ensure that at least one actively supported system configuration of the last released version of FirstSpirit always continues to be supported in FirstSpirit 5.2 (see also *FirstSpirit Technical Data Sheet, Version 5.1*). Configurations, which will not be "actively supported" in a subsequent FirstSpirit version, are designated as being



"removed from maintenance".



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## 1.1 Concepts

This results in the following term definitions used in this document:

- **"Reference"**: In this reference system configuration, FirstSpirit is released without any restrictions. e-Spirit carries out regular tests for this system configuration to ensure that any incompatibility is usually detected prior to delivery. If necessary, mechanisms which avoid occurring errors in third party products and, thus, prevent problems during interaction with FirstSpirit will be integrated into FirstSpirit for reference system configurations.

For information about reference versions of third party products with automatic update management (e.g. Google Chrome) see also Chapter 1.2 page 6.

- **"Actively supported"**: This (or a very similar) system configuration has been tested by e-Spirit and assessed as being functional. However, due the time required, the relevant tests are carried out regularly but cannot be completely performed with each release (unlike "reference"). But we maintain the necessary infrastructure in house, so that we can quickly perform our own tests and if necessary debugging.

Prerequisites for error elimination are:

- Reproducibility of the problem
- Current maintenance contract with system configuration option (if necessary, incl. remote maintenance access to production and test systems as well as a license assignment for third party products)

If error elimination is not possible (e.g. for technical reasons), the system configuration will be defined as "Not supported" in the next version of the Technical Datasheet.



- **"Passively supported"**: This (or a similar) system configuration is / has been successfully operated by a customer / partner and reported as being functional; however, this statement has not been checked by e-Spirit. In general, a corresponding system configuration does not exist at e-Spirit, so that internal tests are not possible.  
e-Spirit can take debugging steps on the basis of error messages (if a current software maintenance agreement exists); however, only within a limited timeframe – but the customer has no claim to this. Especially within the scope of the further development of FirstSpirit, new product functions of FirstSpirit can result in system configurations that were previously "passively supported" being declared explicitly "not supported", although an adjustment of FirstSpirit to the passively supported system configuration would be technically feasible.
- **"Not supported"**: A list of system configurations which are known to lead to problems or which are expected to cause problems. e-Spirit will NOT take measures to eliminate possibly occurring problems. If a system configuration is not listed here, it does not mean that it is supported, but only that there is no specific information at present.
- **"Removed from maintenance"**: Configurations with this designation were supported in a previous FirstSpirit version, but with effect from the current FirstSpirit version, tests are no longer performed to see whether they still function correctly with new implemented features in FirstSpirit. Customers have NO claim to debugging for these configurations. However, all previous FirstSpirit versions can basically be run without limitation with these configurations removed from maintenance. To a certain extent, we also try to enable new functions of the current FirstSpirit version runnable with configurations removed from maintenance; however, there is no guarantee of this.



## 1.2 Use of third party products with automatic update management

The current product maintenance situation of many software manufacturers is that an increasing number of fully-automatic, partly mandatory (i.e. cannot be circumvented by the user or system administration, or only with great difficulty) software updates are performed. Examples: Google Chrome (there the software version is even largely concealed from the user) as well as (to a limited extent) Mozilla Firefox and even Adobe Flash / Reader or Oracle Java. This may appear useful for security aspects, but from the perspective of ensuring interoperability it is problematic, as at any time software update of a third party product can cause incompatibility with FirstSpirit without e-Spirit, as a manufacturer, having any opportunity to react to it in advance.

With FirstSpirit Version 5.0, use of Google Chrome has been enabled for the ContentCreator. Unlike other products (e.g. Microsoft Internet Explorer), Chrome is not only updated fully automatically, but also older Chrome versions are not available at all to download and can therefore also not be used as a "reference version". Therefore, with Version 5.0, e-Spirit has been introduced an explicit procedural model for software with forced auto-update (currently only Google Chrome and Mozilla Firefox, in future possibly Microsoft Internet Explorer too): The release tests for the current FirstSpirit version always take place with the current versions of the third party products – therefore, there is NO reference system configuration! If problems occur during the tests, they will either be removed before the release of the FirstSpirit version (which could lead to time delays in the release plan) or the incompatibility will be explicitly pointed out in the release notes. We will then aim to remove the problem for the following FirstSpirit release.

But this procedure does NOT apply to FirstSpirit versions, which are under long-term or medium-term maintenance! The release tests are also performed with the current version of the third party product, but there is no claim to debugging, i.e. if a FirstSpirit version is required, which is compatible with the respective current version of the relevant third party product, then the current FirstSpirit version must also be used. Customers for whom the FirstSpirit long-term or medium-term maintenance is relevant can therefore not use any third party products with automatic update or must implement mechanisms for controlling or circumventing the automatic update management of the third party product.



Note about automatic update of Oracle Java: Oracle has announced that all Java 7 users will be automatically updated to Java 8 at the start of 2015. From April 2015, version 7 of Java will only be supplied to Oracle customers who have taken out support contracts<sup>1</sup>.

FirstSpirit is always released for specific main versions of a JDK. FirstSpirit version 5.1 was released for Oracle Java 7 and Oracle Java 6, for example, but not for Oracle Java 8. If the version of FirstSpirit you are using is not compatible with the latest version of Java, automatic updates for Java must be deactivated appropriately.

FirstSpirit 5.2 is released for use with Oracle Java 7 and Oracle Java 8 – both on the client side (see chapter 3.1.3, page 13) and on the server side (see chapter 3.3.3, page 21).

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[www.java.com/de/download/help/java\\_update.xml](http://www.java.com/de/download/help/java_update.xml)

[www.java.com/de/download/faq/release\\_dates.xml](http://www.java.com/de/download/faq/release_dates.xml)

[www.oracle.com/technetwork/topics/security/alerts-086861.html](http://www.oracle.com/technetwork/topics/security/alerts-086861.html)





## 2 System requirements: Short overview

This chapter resumes the most important system requirements for FirstSpirit. Detailed information about references, recommendations and restrictions etc. will follow in Chapter 3.

### 2.1 FirstSpirit Server

#### **Operating systems (each in 64-bit variant only):**

- Microsoft Windows Server 2012 R2
- Linux (Red Hat / SUSE / Debian or similar)
- Oracle Solaris 10 / 11, IBM AIX 6.1 / 7.1

#### **Hardware:**

- Server systems on the basis of Intel/AMD, Oracle SPARC or IBM Power PC
- The usage of a current multi-core system with a high performing hard disk system and at least 16 GB RAM.
- The use of virtualization software is feasible for the operation of the FirstSpirit server in fact, but e-Spirit disadvises this principally (see Chapter 4.3, "Application of virtualization software").

#### **Java (each in 64-bit variant only):**

- Oracle Java JDK 7 or 8 for Windows / Linux / Solaris
- IBM JDK 1.7 for AIX 6 / 7

Other JDKs will principally not be supported by e-Spirit.

#### **Databases:**

- MySQL 5.5 / 5.6
- Microsoft SQL Server 2012 / 2014
- Oracle 11g / 12c
- IBM DB2 9.5+ / 10.5
- PostgreSQL 9.x

#### **(optional) HTTP / Application server:**

- Apache 2.4
- Microsoft Internet Information Server (IIS) 8.0 / 8.5
- Apache Tomcat 7 and 8



## 2.2 FirstSpirit SiteArchitect / FirstSpirit ServerManager

### Operating systems:

- Microsoft Windows 7
- Microsoft Windows 8
- Linux Desktop
- Mac OS X 10.10

### Hardware:

- Performance class Intel C2D/E6600 or higher with at least 768 MB main storage free for SiteArchitect
- In combination with the function "Integrated Preview" the requirements will increase: in this case, >1GB free main storage and a multi-core system from performance class Intel Core-i Series and a monitor with high definition (>1440px width) are recommended.

### Java:

- Oracle Java JRE 7 / 8

### Restrictions:

**Integrated preview:** For technical reasons, it is generally preferable to use a 32-bit JRE under Windows. In our experience, a 32-bit JRE will also operate without problems on 64-bit operating systems. The Integrated Preview on the basis of Microsoft products (Internet Explorer, Office, Windows Media Player) is only available on Windows platforms. The OpenOffice integration is currently in BETA test phase.

**Linux Desktop and Mac OS X:** The complex graphical user interface of the SiteArchitect is in some details different or restricted under Linux / Mac OS (e.g. program menu under Mac OS, Drag & Drop). For the Integrated Preview only the Mozilla Firefox engine is available under Linux and Mac OS X. The OpenOffice integration is not available under Mac OS X and still instable under Linux. AppCenter applications are not supported under Mac OS and Linux!



## 2.3 FirstSpirit ContentCreator

### Operating systems:

- Microsoft Windows 7
- Microsoft Windows 8
- Linux Desktop
- Mac OS X 10.10

### Web browsers:

- Microsoft Internet Explorer 10 / 11
- Mozilla Firefox
- Google Chrome

### Hardware:

- at least 512 MB main storage free for ContentCreator



## 3 System requirements for FirstSpirit

This chapter describes the system configurations in which FirstSpirit is able to run in detail. The individual product components of different system configurations are described for this.

### 3.1 FirstSpirit SiteArchitect and FirstSpirit ServerManager

Both FirstSpirit SiteArchitect and FirstSpirit ServerManager require a Java Runtime Environment in order to run on the client system.

The following options are available for starting FirstSpirit ServerManager and FirstSpirit SiteArchitect:

- Via Java Web Start (default option): If the applications are started using Java Web Start, the Oracle Java Runtime Environment (JRE) is required, as this contains Java Web Start. Java Web Start is used to pass FirstSpirit product software updates to client systems automatically when started. Among other things, the required permissions (e.g., file creation rights) must be configured at system or user level. All HTTP proxy servers used must be configured so that changes to objects are detected and handled appropriately. This applies not only if you are using Java Web Start to start SiteArchitect but also for the preview function and the ContentCreator.
- Via the FirstSpirit Launcher: The Launcher does not require a pre-installed Java environment but is only available for Windows systems. For instructions on how to install and configure the FirstSpirit Launcher and information about its restrictions, see the *FirstSpirit Installation Instructions* and the *FirstSpirit Manual for Administrators*.
- Via another Java start system: You can use the `startpage.webstart.url` parameter in the `fs-server.conf` file to configure your own Java start system for the purpose of starting the applications. For more information, see the *FirstSpirit Manual for Administrators*

#### 3.1.1 Operating system

- **Reference:**
  - Microsoft Windows 7 (64 bit)
  - Mac OS X 10.10



- **Actively supported:**
  - Microsoft Windows 7 (32 or 64 bit)
  - Microsoft Windows 8 (32 or 64 bit)
  - Mac OS X 10.9
  - Mac OS X 10.10
- **Passively supported:**
  - Ubuntu 12.04 LTS with Unity (with limitations, see below)
- **Removed from maintenance:**
  - Microsoft Windows XP
  - Microsoft Windows Vista
  - Mac OS X 10.8
  - Mac OS X 10.7
  - Mac OS X 10.6
  - Mac OS X 10.5
- **Not supported:** Microsoft Windows 95, Windows 2000, Mac OS X 10.5



*The FirstSpirit SiteArchitect and the FirstSpirit ServerManager can be operated both on 32-bit and on 64-bit platforms. Operating in 64-bit environments may result in higher administrative efforts because the use of the Integrated Preview in the SiteArchitect still requires native 32-bit applications at the moment.*

Notes about using Microsoft Windows 7: If Microsoft Windows 7 is used, the NTLM login module, via which the NTLM authentication is made at the FirstSpirit server, can only be used if the Windows 7 security settings are lowered. Login via Kerberos-Ticket (integrated Windows login) is possible in combination with Mozilla Firefox, Microsoft Internet Explorer and Google Chrome and in this context is the preferred variant.

Notes about using Mac OS X and Linux: Mac OS X and Linux are officially supported, however, with restrictions: Only the basic FirstSpirit functions are regularly tested under these two operating systems within the scope of our quality assurance, which continues to focus on Microsoft Windows. Especially under Linux, there are a large number of interfaces (window managers), for which a complete functional test involves a great deal of time and effort. Therefore, more operating-system related problems can occur during regular work with Mac OS X and Linux than under Microsoft Windows, however, as far as technically possible, these will be



removed within the scope of the software maintenance. Due to serious differences to Windows-based systems (especially with respect to interface libraries), there are also, e.g. restrictions in drag and drop functions and with regard to the integration of native applications, e.g. in the Integrated preview.



*The functionality of AppCenter applications under **Mac OS** and **Linux** can not be guaranteed. For this reason, these platforms are not supported for AppCenter applications.*

Operation of the SiteArchitect under other Java systems such as GNU Java or Apache Harmony is not supported.

### 3.1.2 Hardware

- Performance class "Intel C2D/E6600" or higher
- 768 MB main memory or more available for the FirstSpirit SiteArchitect
- In combination with the function "Integrated Preview" the requirements will increase: in this case, >1GB free main storage and a multi-core system from performance class Intel Core-i Serie and a monitor with high definition (>1440px width) are recommended.
- Note about using Oracle Java 8: Use under Oracle Java 8 requires significantly more main memory than Java 7. This should be taken into account when allocating resources.

### 3.1.3 Java environment

- **Reference:**
  - Oracle Java 7u79 (CPU) / 7u80 (PSU) (32 bit)
  - Oracle Java 8u31 (32 bit)
- **Actively supported:**
  - Oracle Java 7 (32 or 64 Bit, the 64 bit variant with restrictions when using with the Integrated preview (see Chapter 3.1.4 page 14))
  - Oracle Java 8 (32 or 64 bit, die 64 bit variant with restrictions when using with the Integrated preview (see Chapter 3.1.4 page 14))



- **Removed from maintenance:**
  - Oracle JDK 1.6
- **Not supported:**
  - Oracle JDK 1.5, Oracle JDK 1.6 below Update 19 (1.6.0\_19), OpenJDK 5, OpenJDK 6, Java implementations of other manufacturers (e.g. IBM)

Note about using Oracle Java 8: Use under Oracle Java 8 requires significantly more main memory than Java 7. This should be taken into account when allocating resources.

Incompatibilities with specific Java versions: FirstSpirit is released for a main version of a JDK, e.g. Oracle Java 7. Regular updates of JDK are issued as part of the debugging in JDK; these updates are checked within the scope of quality assurance to ensure they are compatible with FirstSpirit. In very rare cases, incompatibilities can occur due to errors in JDK, which cannot be handled in programming terms. This is not a FirstSpirit error! In this case we recommend falling back on an older JDK version or – if available – using a newer JDK version. Please contact the FirstSpirit Technical Support if you have any questions about known problems.

### 3.1.4 System requirements for the Integrated preview

The "integrated preview" function in SiteArchitect uses the following third-party software:

1. To display the HTML preview: special browser engine integrated into SiteArchitect (Mozilla Firefox, Microsoft Internet Explorer, or Google Chrome)
2. To use AppCenter applications: special browser engine integrated into the SiteArchitect (Mozilla Firefox, Microsoft Internet Explorer, or Google Chrome) (similar to HTML preview)
3. Internet Explorer only: PDF and Adobe Flash type media from the FirstSpirit Media Store are displayed via the corresponding plug-in (e.g., Adobe Acrobat Reader or Adobe Flash Player)
4. To display DOC, XLS, and PPT type media from the FirstSpirit Media Store, as well as OpenOffice files: corresponding Microsoft Office or OpenOffice application (although OpenOffice integration is currently still at the BETA test stage!)

The editor chooses which web browser to use for **1., 2., and 3.** in SiteArchitect itself (there is no option to choose a browser under Mac OS and Linux). In the case of Mozilla Firefox and Google Chrome (see below), a special version of the browser has been integrated into SiteArchitect,



which means that the browser does not have to be installed locally on the workstation. To use Microsoft Internet Explorer, this browser (32-bit or 64-bit version) must be installed and available on the workstation.

Known restrictions for Google Chrome:

- The integration of Chrome is based on a special application. It does not use the local version of Google Chrome that is installed on the workstation, or any of its user data. Automatic updates are not performed.
- Plug-ins cannot be installed.
- Google Chrome is supplied in both a conventional 32-bit version and a native 64-bit version. This means that is now possible in theory to support 64-bit JREs in conjunction with the integrated preview. However, this requires 64-bit code throughout, which some component suppliers are not yet able to provide at the current time. In these cases, the integrated preview may be subject to restrictions.

If you are using Mozilla Firefox: At the current time, the JRE must always be a 32-bit application, so that the integrated preview will function (see also chapter 3.1.3, page 13).

The display of the file formats listed under 1., 2., and 3. is not platform-dependent and as such is available under Linux and Mac OS (although only in the 32-bit version). However, it cannot be guaranteed that all browser plug-ins will function correctly with the integrated preview in all operating systems. However, problems have not been experienced with plug-ins from known manufacturers such as Adobe Flash and Adobe Acrobat Reader.

Note: The application is integrated based on the existing web browser integration (the Microsoft Internet Explorer, Mozilla Firefox, or Google Chrome browser) in FirstSpirit SiteArchitect. Due to its inherent design, you may encounter restrictions when using web browser integration in SiteArchitect, e.g., because some of the integrated applications are not fully compatible with all platforms or bit counts (32 or 64 bits). We recommend using Internet Explorer version 8 or higher. Internet Explorer does not support Base64 decoding before version 8. This can lead to problems when injecting image elements in the context of application integration (e.g., when displaying the FS\_BUTTON component in the integrated preview or when integrating an image database).

The display of media, as described under 4. (so-called "Integrated preview for media") is, on the other hand, only possible under Windows. The application matching the format of the selected medium is used each time, i.e., e.g. Microsoft Word for media of the type DOC, OpenOffice Writer for media of the type ODT (the OpenOffice integration is currently in the BETA test stage!), etc. For this aim, the relevant application must be installed on the workstation computer. A 64-bit





JRE can also be used in principle (see also Chapter 3.1.3 page 13), but then the Integrated preview will not be available.

**Note:** Using the Integrated preview for media with Microsoft Office in parallel with the Microsoft Office desktop application (started via Windows) can lead to problems under certain conditions. This is no warranted product feature of the FirstSpirit integration. Either the Integrated preview for office documents in FirstSpirit **or** the Microsoft Office desktop application should be used but **no** mixed operation.

The following table gives a summary breakdown of the compatibilities of operating systems and applications that can be used for the Integrated preview:

	Mozilla Firefox	Internet Explorer	Google Chrome	Preview of PDF, SWF, etc.	Microsoft Office applications
Windows 32 bit	+	+	+	+	+
Windows 64 bit	/ only 32Bit JRE	+	+	/ only 32Bit JRE	+
Mac OS	-	-	+	/	-
Linux	+	-	+	/	-

**Legend:**      + compatible      /with limitations      - not compatible

### 3.1.5 Note about the use of virus scanners

When operating the FirstSpirit SiteArchitect (in the HTTP mode) in system environments with activated internet virus scanner delays in the communication between SiteArchitect and FirstSpirit Server could be observed (arisen with older versions of NOD V4.0 64-bit under Windows 7). In the socket mode, no delays have been observed, so far. In case of problems you should optionally:

- start the SiteArchitect in the socket mode
- change the configuration of the virus scanner
- use a new virus scanner.



## 3.2 FirstSpirit ContentCreator

The FirstSpirit ContentCreator is a purely web-based application which sometimes places high demands on the used web browser.

The utilization of special browser extensions, e.g. Active-X components or other plug-ins is not required. The activation of Java script is mandatory when using the ContentCreator.

For dynamic web applications it might, in certain cases, be necessary to carry out special cache settings in the Microsoft Internet Explorer or in the used proxy server. In addition to this, all the used HTTP proxy servers have to be configured in a way that ensures that changed objects are recognized and treated as such. For detailed information, please refer to the *FirstSpirit Manual for Administrators*.

### 3.2.1 Web browsers

- **Reference:**

- Microsoft Internet Explorer 10
- Mozilla Firefox 38
- Google Chrome 43

- **Actively supported:**

- Microsoft Internet Explorer 10 and 11
- Mozilla Firefox (auto update version, see Chapter 1.2 page 6)
- Google Chrome (auto update version, see Chapter 1.2 page 6)

- **Passively supported:**

- Safari

- **Removed from maintenance:**

- Microsoft Internet Explorer 8 and 9
- Mozilla Firefox 3.5, 3.6 and 4

- **Not supported:** Microsoft Internet Explorer 6 and 7, other web browsers, e.g. Opera

Note: Due to varying implementations, current web browsers may have functional differences in some aspects and provide different feature sets. Generally, FirstSpirit ContentCreator can be used in all supported web browsers. However, certain advanced functionality or functional



alternatives may not be available in all browsers. Such functional limitations are caused by vendor and version-specific implementation differences of feature sets and are beyond e-Spirit's control.

Note: Depending on the selected authentication model, the FirstSpirit Server might ask the web browser for NTLM authentication. Full transparent support is only provided for this protocol in the Microsoft Internet Explorer. If Microsoft Windows 7 is used, the NTLM login module, via which the NTLM authentication is made at the FirstSpirit server, can only be used if the Windows 7 security settings are lowered. Login via Kerberos-Ticket (integrated Windows login) is possible in combination with Mozilla Firefox, Microsoft Internet Explorer and Google Chrome and in this context is the preferred variant.

### 3.2.2 Hardware

- Performance class "Intel C2D/E6600" and higher
- 512 MB or more main memory available for ContentCreator



### 3.3 FirstSpirit Server

The actual FirstSpirit Server is a pure Java application which, apart from a Java Development Kit (JDK), does not require any additional software products. The utilization of a pure Java runtime environment (JRE) is insufficient for the FirstSpirit Server, since FirstSpirit requires functions which are only included in JDK.

#### 3.3.1 Operating system



*On the Server side, only 64-bit variants of operating systems are supported!*

- **Reference:**
  - Microsoft Windows Server 2012 R2
  - Solaris 11
  - IBM AIX 7.1
  - RedHat Enterprise Linux 7
  - Debian GNU/Linux 7
- **Actively supported:**
  - Microsoft Windows Server 2012 R2
  - Microsoft Windows Server 2012
  - Debian GNU/Linux 7
  - Debian GNU/Linux 8
  - Red Hat Enterprise Linux 6
  - Red Hat Enterprise Linux 7
  - Solaris 11
  - Solaris 10
  - IBM AIX 7.1
  - IBM AIX 6.1
- **Passively supported:**
  - Microsoft Windows Server 2008 R2
  - Microsoft Windows Server 2008
  - Microsoft Windows 2003 R2
  - Debian GNU/Linux 5/6
  - Suse Linux Enterprise Server 11
  - Suse Linux Enterprise Server 10



- Ubuntu 12.04 LTS
- Solaris 9

Note on 64-bit x86 CPU architectures: Only AMD64 and the compatible Intel64 (also known as EMT64) are supported.

- **Removed from maintenance:**

- Microsoft Windows 2003
- Microsoft Windows 2003 R2
- Debian GNU/Linux 4
- Red Hat Enterprise Linux 5
- Solaris 9

- **Not supported:** IBM AIX 5.1, operating systems on the basis of IA-64<sup>2</sup>.

Note when using the FirstSpirit Server in 32-bit environments: On the Server side, only 64-bit operating systems are supported! Use of 32-bit operating systems is technically possible, but is not supported by e-Spirit and should be used for testing purposes only. It has to be taken into account that 32-bit operating systems usually limit the maximum process size to 2 GB (e.g. Windows and Linux). Furthermore, it might (especially under Windows) be possible that not even the main memory provided to the process by the operating system is used due to limitations of the VM implementation. Therefore, approximately 1.6 GB heap memory can usually be used for the VM in a 32-bit environment under Windows. If it is foreseeable that more memory will be required, plan to change to a 64-bit platform in due time (if possible, right from the start). When dimensioning the main memory in a 64-bit environment, it has to be observed that, compared to a 32-bit environment, the main memory requirements of the application can increase by the factor 1.8.

### 3.3.2 Hardware

- Performance class 2x Dual Core AMD Opteron or Intel Xeon or higher
- 4 GB main storage or more available for FirstSpirit Server

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<sup>2</sup> 64 bit always refers to AMD64 / EMT64 and not IA64 here.



### 3.3.3 Java environment



*On the Server side, only JDKs in 64-bit variant are supported!*

- **Reference:**
  - Oracle JDK 7u79 (64 Bit) / 7u80 (64 Bit)
  - Oracle JDK 8u31 (64 Bit)
- **Actively supported:**
  - under Microsoft Windows, Linux and Solaris: Oracle Java 7<sup>3</sup>
  - under Microsoft Windows, Linux and Solaris: Oracle Java 6
  - only under AIX: IBM JDK 1.7
- **Passively supported:**
  - OpenJDK 7 (only for FirstSpirit Server)
  - OpenJDK 8 (only for FirstSpirit Server)
  - Azul VM
- **Removed from maintenance:**
  - Oracle Java 6 (JDK 1.6)
- **Not supported:** Oracle Java 5 (JDK 1.5), Oracle Java 6, OpenJDK 6, Java implementations of other manufacturers (e.g. IBM JDK on Linux or Microsoft Windows, Apple JDK on Mac OS X for FirstSpirit Server), JDK under IA64

Note about using Oracle Java 8: Use under Oracle Java 8 requires significantly more main memory than Java 7. This should be taken into account when allocating resources.

Incompatibilities with specific Java versions: FirstSpirit is released for a main version of a JDK, e.g. Oracle Java 7. Regular updates of JDK are issued as part of the debugging in JDK; these updates are checked within the scope of quality assurance to ensure they are compatible with FirstSpirit. In very rare cases, incompatibilities can occur due to errors in JDK, which cannot be handled in programming terms. This is not a FirstSpirit error! In this case we recommend falling

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<sup>3</sup> 64-bit always refers to AMD64 / EMT64 and not IA64 here and in the following.



back on an older JDK version or – if available – using a newer JDK version. Please contact the FirstSpirit Technical Support if you have any questions about known problems.

### 3.4 Web and servlet engine / application server

The FirstSpirit Server is a conventional Java application which does not operate on an application server. The standard server services required for the FirstSpirit Server are included in the standard scope of the installation. "Eclipse Jetty", the open-source product integrated in FirstSpirit, provides a web server and a JSP/servlet engine which run as part of the FirstSpirit Server in the same VM. The integrated Jetty web server is being updated to version 9 with FirstSpirit version 5.2 (see FirstSpirit release notes for version 5.2).

It may be necessary to integrate external software packages in order to migrate certain FirstSpirit services to the existing infrastructure.

A servlet engine integrating version 3.0 of the servlet API is required in order to use the FirstSpirit web application. Version 3.0 of the servlet API is supported by WebSphere application servers version 8.0 and higher (see also [https://en.wikipedia.org/wiki/IBM\\_WebSphere\\_Application\\_Server#Version\\_history](https://en.wikipedia.org/wiki/IBM_WebSphere_Application_Server#Version_history)).

Note: Although the web applications of the FirstSpirit modules are essentially based on version 3.0, certain module features may deviate from this.

FirstSpirit is compatible with the following products:

#### HTTP/Application Server:

- **Reference:**
  - Apache HTTP Server 2.4
  - Apache Tomcat 7 (subject to restrictions, see below)
  - Microsoft Internet Information Server (IIS) 8.5
  - Eclipse Jetty 9 (integrated)
- **Actively supported:**
  - Apache HTTP Server 2.2 / 2.4
  - Apache Tomcat 7 (subject to restrictions, see below)
  - Apache Tomcat 8 (subject to restrictions, see below)
  - Microsoft Internet Information Server (IIS) 8.0 / 8.5
  - Eclipse Jetty 9 (integrated)



- **Passively supported:**
  - Microsoft Internet Information Server (IIS) 7.0 / 7.5
  - Other application servers at least with Java 7 and servlet API 3.0: WebSphere Application Server 8.5.5, WebSphere Application Server 8.5
- **Removed from maintenance:**
  - Apache Tomcat 5.5
  - Apache Tomcat 6
  - Microsoft Internet Information Server (IIS) 6
  - WebSphere Application Server 7
- **Not supported:**
  - WebSphere Application Server 6
  - JBoss Application Server 5

Note for use with Apache Tomcat 7 under Java 8: The use of Apache Tomcat 7 under Oracle Java 8 requires Apache Tomcat version 7.0.57 or higher. Older versions of Apache Tomcat do not offer sufficient support for Java 8.

Note for use with Apache Tomcat 8: The use of Apache Tomcat version 8.0.20 or higher is strongly recommended. Earlier versions increase starting times significantly due to modified parsing behavior.

## 3.5 Databases

The FirstSpirit Server provides an imbedded Apache Derby database which is immediately available after server installation.



*This Apache Derby database is not suitable for productive use and should therefore be used for tests only.*

Depending on the application scenario, it might be desired to integrate one (or more) external database system(s) via JDBC.

The following databases can be used with FirstSpirit:





**MySQL:**

- **Reference:**
  - MySQL 5.5.23
- **Actively supported:**
  - MySQL 5.5 (Linux and Windows)
  - MySQL 5.6 (Linux and Windows)
- **Removed from maintenance:**
  - MySQL 5.1

**Microsoft SQL Server**

- **Reference:**
  - Microsoft SQL Server 2012 (only for Windows servers)
  - Microsoft SQL Server 2014 (only for Windows servers)
- **Actively supported:**
  - Microsoft SQL Server 2012 (only for Windows servers)
  - Microsoft SQL Server 2014 (only for Windows servers)
- **Passively supported:**
  - Microsoft SQL Server 2005 (only for Windows servers)
  - Microsoft SQL Server 2008 (only for Windows servers)

**Oracle**

- **Reference:**
  - Oracle 11.2.0.1
- **Actively supported:**
  - Oracle 12c (Solaris, Linux and Windows)
  - Oracle 11g R2 (Solaris, Linux and Windows)
- **Passively supported:** -



- **Removed from maintenance:**
  - Oracle 10.x (Solaris, Linux and Windows)
  - Oracle 9 (Solaris and Linux)

## IBM DB2

- **Reference:**
  - IBM DB2 10.5
- **Actively supported:**
  - IBM DB2 9.5+
  - IBM DB2 10.5
- **Removed from maintenance:**
  - IBM DB2 9.4
- **Not supported:** Versions below 9.4

## PostgreSQL

- **Reference:**
  - PostgreSQL 9.3
- **Actively supported:**
  - PostgreSQL 9.x (Linux and Windows)
- **Passively supported:**
  - PostgreSQL 8.4 (Linux and Windows)
  - PostgreSQL 8.3 (Linux and Windows)
- **Removed from maintenance:**
  - PostgreSQL 8.0 to 8.3



## 4 Appendix

### 4.1 Recommendations for the system configuration

The FirstSpirit architecture supports a variety of system configurations in the software and hardware area. This section describes some system configurations which are often used and whose utilization is not expected to lead to specific problems:

**Operating system (Server):** Red Hat Enterprise Linux or Debian GNU/Linux (AMD64/Intel64), Solaris 11 (SPARC)

**Java (Server):** Oracle JDK 8 64 bit

**Data base:** PostgreSQL Database Server 9.3 under Linux

**Operating system (Client):** Microsoft Windows 7 32-bit or 64-bit, but with 32-bit JRE

**Java (Client):** Oracle Java JRE 8 32 bit

**Web browser (ContentCreator):** Microsoft Internet Explorer 10

### 4.2 Notes on hardware dimensioning

The FirstSpirit Server has been designed for application in a multiprocessor system and uses the available processors or computing cores efficiently. The application of multiprocessor systems is, therefore, always recommended. Application in 64-bit-capable hardware is also highly recommended, even though it is not required at first (if a 32-bit operating system is being used).

Since the FirstSpirit Server manages almost all the data in a very efficient, file-based repository, it has to be ensured that a high-performance hard disk subsystem is used. In practical use, the best performance is achieved with Fibre Channel RAID systems with a large cache RAM (2 GB cache) and a large RAID6 group in the SAN. Internal RAID systems are also possible. Application of NAS systems and NFS should only occur in individual cases and after a very accurate planning and performance analysis.



It has to be observed that the network bandwidth between the individual server systems is sufficient, especially when using FirstSpirit in a distributed system.

Some "common" FirstSpirit hardware configurations are provided with notes on the expected performance below. It goes without saying that during real application greater deviations may arise.

**"Small" FirstSpirit Server:** Approx. 3-5 projects (< 50,000 pages and < 5 GB media) with approx. 25-50 editors working in parallel:

- 1 Server with 4 CPU cores (AMD Opteron or Intel Xeon)
- 8-16 GB main memory
- Internal RAID with 6 disks
- Recommended disk storage: 1 TB

**"Medium" FirstSpirit Server:** Approx. 5-10 projects (< 1,000,000 pages and < 50 GB media) with approx. 250-300 editors working in parallel:

- 2 servers with 4-8 CPU cores each (AMD Opteron or Intel Xeon) for FirstSpirit master server, FirstSpirit preview system and, if required, generation slave
- 16-32 GB main memory
- external RAID, 2GB cache RAM, 12 disks
- Recommended disk storage: 5 TB

**"Big" FirstSpirit Server:** More than 10 projects (> 1,000,000 pages and > 50 GB media) with approx. 500-1000 editors working in parallel:

- 2x Oracle midrange multipath server SPARC Enterprise M serie or Oracle Sun x86 server each with 64-128 GB RAM (e.g. serie M4xxx SPARC or Serie X48xx XEON) for FirstSpirit master server and generation slave
- 2x Oracle Entry-Level multipath server each with 32 GB RAM (e.g. Oracle SPARC T3-2 server) for FirstSpirit preview system
- External storage system on SAN basis, > 2 GB cache RAM, > 24 disks
- Recommended disk storage: > 10 TB

Note on dimensioning of the Java heap size of the FirstSpirit Server and preview system: For larger system configurations it is generally sensible to only commit around 50 % of the main memory for FirstSpirit. For system configurations with more than 32 GB RAM, the usable main storage capacity for FirstSpirit is therefore more than 16 GB. But at present, the practicable maximum size of a Java process based on the standard Oracle VM is also around 16 GB. From a main memory capacity of 64 GB and higher, for improved scaling, it is therefore recommended



that more than one FirstSpirit Java process be used. This can be achieved, for example, by swapped out frontend servicer for the preview calculation and the ContentCreator in a separate application server or through separate FirstSpirit processes for the generation and the backup.

Note about using Oracle Java 8: Use under Oracle Java 8 requires significantly more main memory than Java 7. This should be taken into account when allocating resources.

### 4.3 Application of virtualization software

If FirstSpirit should be used in any kind of virtualization environment (VMware vSphere, Microsoft Virtual PC, XEN and so on), please consider that problems (e.g. Performance problems) caused by the additional system complexity can't be excluded. The selected configuration should be evaluated extensively before use – especially in production systems. The optimal solution is to evaluate the configuration in cooperation with e-Spirit. This is particularly recommended if the used virtualization product is not available to e-Spirit.

A FirstSpirit installation for test and evaluation purposes based on virtualization solutions is possible, but e-Spirit does not provide configuration and optimization support for any problems (caused by virtualization products). The reproduction of bugs can be problematic.

