

# Spotfire Server and Environment - Quick Start

*Software Release 14.6 LTS (14.6.0)*



# Contents

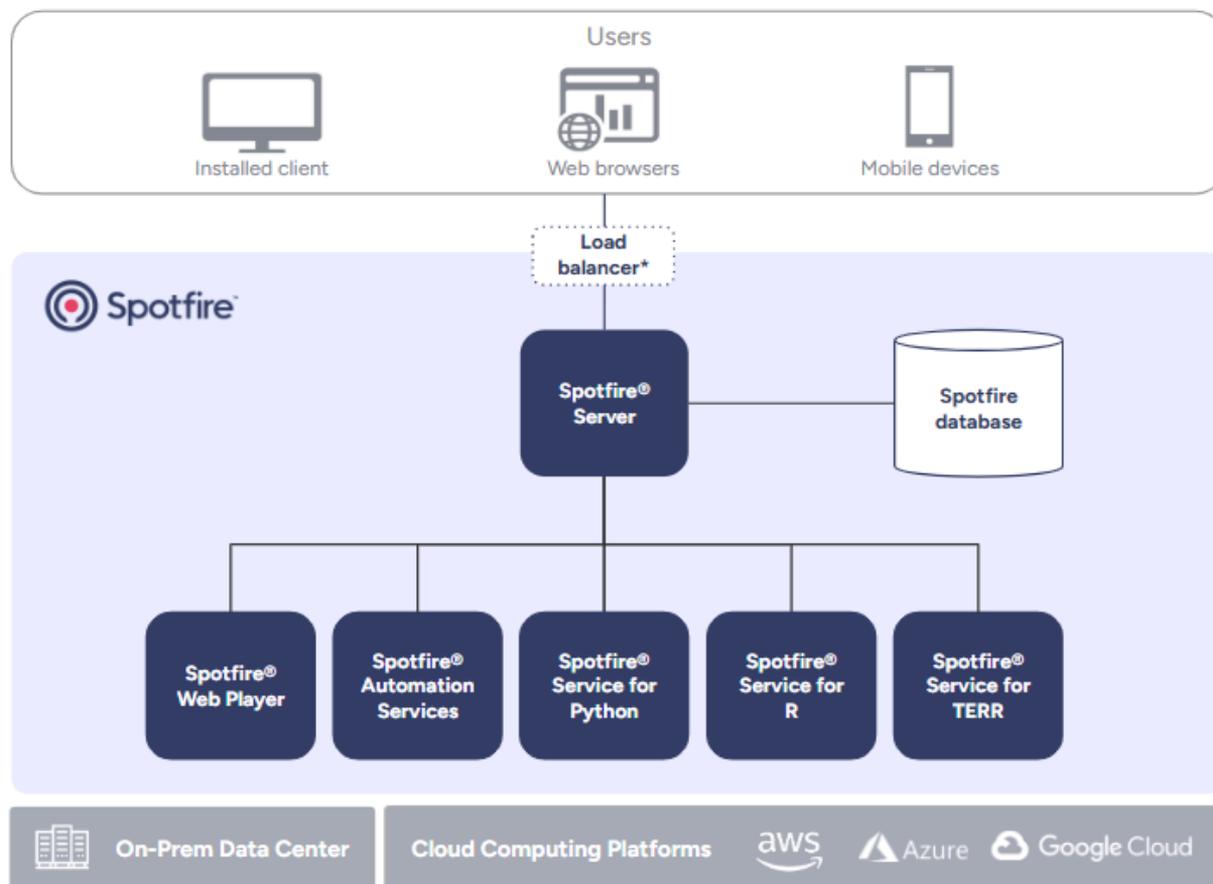
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# Introduction to the Spotfire environment

The Spotfire® environment is installed and configured to enable users to analyze their data in the Spotfire® clients.



\* The load balancer is optional but recommended when using multiple Spotfire server instances.

The following components can be a part of the Spotfire environment:

- The Spotfire® Server is the central component of the Spotfire® environment, to which the Spotfire® clients can connect. Multiple nodes can be installed and connected to Spotfire® Server.
- The Spotfire® Web Player service and the Spotfire® Automation Services service are installed on nodes to enable the use of Spotfire web clients and the running of Spotfire® Automation Services jobs.
- The data function services (the Spotfire® Enterprise Runtime for R - Server Edition (a/k/a the TERR™ service), the Spotfire® Service for R, and the Spotfire® Service for Python) enable advanced statistical analysis in the clients.
- The server is connected to a Spotfire database that contains a user directory and stores analyses and configuration files.
- Entities in the Spotfire environment can be configured and monitored from the Spotfire Server web administration pages.

You can deploy the Spotfire platform using physical servers, virtual machines or containers. This document provides the base for most common deployment and configuration scenarios.

To deploy Spotfire® using containers and Helm charts on a Kubernetes cluster you can either use the pre-built images and charts as described in the [Spotfire on Kubernetes User Guide](#), or use the recipes from [Cloud Deployment Kit for Spotfire®](#) as they are, or as the starting point for creating your own recipes.

If you are upgrading, see [Upgrading Spotfire](#) and see the [Release Notes](#) for each product and version for information about new features and other changes.

## Spotfire Server introduction

Spotfire Server is the administrative center of any Spotfire environment.

In addition to providing the tools for configuring and administering the Spotfire environment, Spotfire Server facilitates the services that make it possible for users to access, blend, and visualize their data, creating analyses that provide actionable insight. The server also enables sharing of the prepared analyses for users to use or view.

Spotfire Server has the following main functional areas and responsibilities:

Functional area	Function
Library services	Provides centralized storage of Spotfire analysis files and metadata. The library items reside in the Spotfire database.
User services	Provides user authentication and role-based authorization.
Audit services	Provides centralized collection of action logs.
Deployment services	Delivers client product upgrades.
Information Services	<p>Provides a centralized point of data access and metadata management for relational data sources. The following functions are provided by Information Services:</p> <ul style="list-style-type: none"> <li>Information links, which provide one way to access external data sources. (See also <a href="#">Data from databases</a> and the following sections in the Spotfire User Guide for more data access options.)</li> <li>Network input/output (I/O).</li> </ul>
Client connections and routing services	<p>Provides access points for all client connections.</p> <p>Routes clients (end users, scheduled jobs and Automation Services jobs) to the appropriate service instance, based on the default routing or configured routing rules.</p> <p>Continually gathers information about the state of all service instances.</p>

## Spotfire database introduction

The Spotfire database stores the information that the Spotfire Server needs to control the Spotfire environment, including users, groups, licenses, preferences, shared analyses, and system configuration data.

The Spotfire Server requires access to a relational database management server to store the Spotfire database in.

You must have a database server up and running, preferably on a dedicated computer, before installing Spotfire Server. The Spotfire environment supports a couple of different database systems. For details on which database versions are supported, see the [Spotfire Server System Requirements](#).

## Nodes and services introduction

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The installed client can be used together with the Spotfire Server directly, but the Spotfire environment also includes a number of different services that enhance your system in different ways. To enable the use of the services, you install node managers that help with the communication between the servers and the services.

The following services are available:

- Spotfire Web Player – enables users to create and view analyses in a web browser, with the Spotfire web client.
- Spotfire Automation Services – can be used to automate multi-step tasks.

The data function services can be used for additional calculations and advanced analytics, using different calculation engines:

- Spotfire Enterprise Runtime for R - Server Edition (a/k/a the TERR™ service)
- Spotfire Service for Python
- Spotfire Service for R

To enable use of any of this functionality one or more nodes must be configured, preferably on dedicated computers, virtual machines or containers.

For each node, you install and enable a service with a specified capability. A node can have the service with the Spotfire Web Player capability, the Spotfire Automation Services capability, or one of the data function services capabilities. The capabilities of the enabled services determine the functionality that the node provides to Spotfire end users via the server.



For production environments, we strongly advise that you deploy each of the different types of Spotfire services on separate, dedicated computers (physical computers, virtual machines, or containers).

If you still decide to deploy different services on the same computer (for example, for testing purposes), you must manage the resource allocation of the processes so they do not conflict with each other.

You can scale your Spotfire environment by adding or removing nodes and service instances.

## Spotfire clients introduction

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Spotfire end users connect to Spotfire Server using either an installed client or a web client.

The installed Spotfire client is a fully-featured client for working with data sources and creating complex analyses using lots of different tools and functionality. It is installed on a user's local computer.

To make it possible to view or create interactive analyses in a web browser, a Web Player service must be installed on the server. Depending on which licenses, or license features, a user has, the web client will have different capabilities. Some users can view and interact with analyses that others have created for them. Others can also create and edit analyses using the web client, even though not all of the functionality from the installed client is available. An analyst user often has access to all of the available functionality in each client, but an on-premises administrator can change the license features available to each user.

For more information about the functionality of the different Spotfire clients, see the [Spotfire User Guide](#).

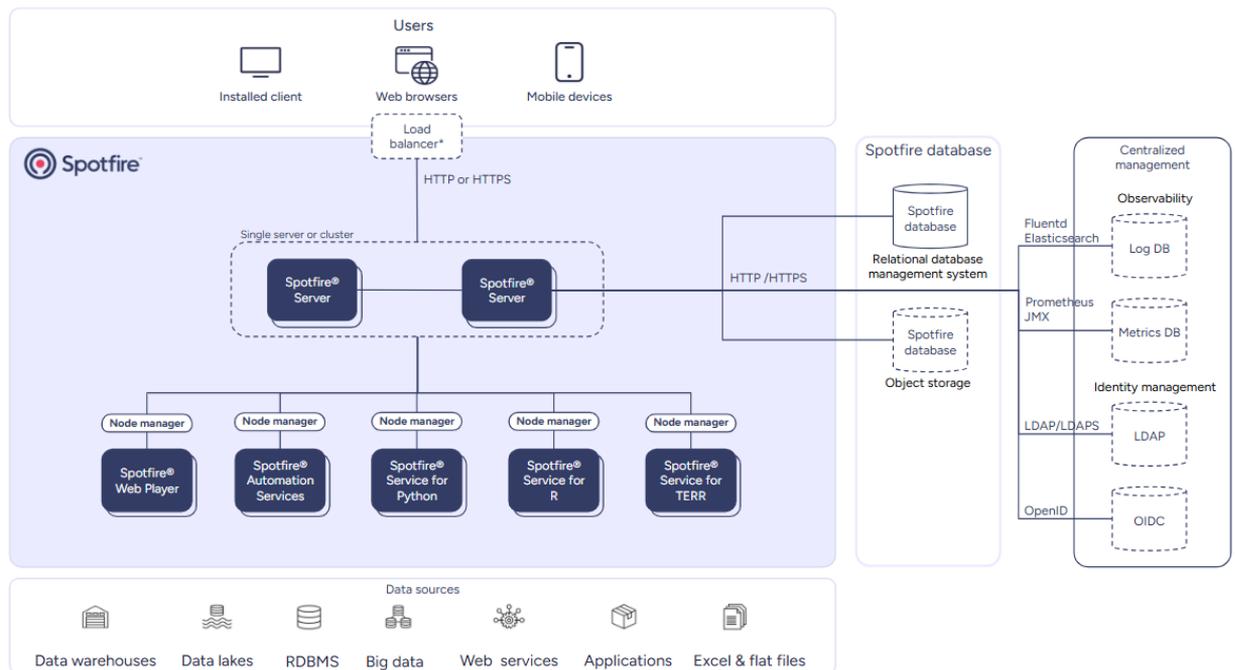
## Environment communication introduction

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All back-end communication in a Spotfire environment is secured by HTTPS/TLS, complying with current security standards and industry best practices.

Spotfire Servers listen to incoming traffic from installed clients and web clients on one HTTP or HTTPS port, the front-end communication port.

Spotfire Servers listen to traffic from services on the nodes on another HTTPS port, the back-end communication port.



The secured back-end communication is based on certificates. After an administrator has approved the new server or node, the certificates are issued automatically. Without a certificate, a server or a service on a node cannot make requests to, or receive requests from, other entities, except for when requiring a certificate.

After being installed, a node performs a join request to a specific, unencrypted HTTP Spotfire Server port that only handles registration requests. The node remains untrusted until the administrator approves the request by trusting the node. The Spotfire Server web administration pages provides the tools to add nodes to the environment by explicitly trusting them, thereby issuing the certificates. When the node receives its certificate, it can send encrypted communication over the HTTPS/TLS ports and with this it can start to send more than registration requests.

## Deployments and deployment areas introduction

To deploy Spotfire software, the administrator places software packages in a deployment area on the Spotfire Server, and assigns the deployment area to particular user groups.

If a new deployment is available when a user logs in to the installed Spotfire client, the software packages are downloaded from the Spotfire Server to the client.

Deployments are required for the following tasks:

- Setting up a new Spotfire environment.
- Installing a product upgrade or extension.
- Installing a custom tool or extension.

Administrators can create multiple deployment areas, such as "Production" and "Staging". This allows administrators to test new deployments before rolling them out to the entire client base, or to maintain different deployments for different groups of users.

# Basic installation process for Spotfire

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The following procedure describes the deployment of a basic Spotfire environment.

## Prerequisites

A database server must be up and running, preferably on a dedicated computer. The Spotfire environment supports a number of different database systems.



To view the complete system requirements, go to <http://spotfi.re/sr>.

## Procedure

### 1. Preparation

- [Plan and collect required system information](#)
- [Download installation software](#)

### 2. Install Spotfire Server and make initial configuration

- [Set up the Spotfire database](#) and [Install Spotfire Server](#) (can be done in any order)
- [Create the bootstrap.xml file](#)
- [Create and save a basic Spotfire Server configuration](#)
- [Create an administrator user](#)
- [Deploy client software packages to Spotfire Server](#)
- [Start Spotfire Server](#)
- [Set the product license model for your environment](#)



To show how many of each product license you have available to assign to users, also add the number of licenses of each type your contract includes to the Spotfire Server configuration. See [Setting the maximum license assignment](#).

### 3. Install a node manager

- [Install a node manager](#)
- [Trust the node](#)

### 4. Add a Spotfire Web Player service instance

### 5. Add a Spotfire Automation Services service instance

### 6. Add a Spotfire® Enterprise Runtime for R - Server Edition service instance (a/k/a the TERR™ service). For details, see [Spotfire® Enterprise Runtime for R - Server Edition](#).

### 7. Add a Spotfire Service for Python instance. For details, see [Spotfire® Service for Python](#).

### 8. Add a Spotfire Service for R instance. For details, see [Spotfire® Service for R](#).

## Preparation

Prepare to install the Spotfire environment by downloading the required software from the Spotfire Download site (both server and deployment software). You must also collect the required system properties, and set up the Spotfire database on your database server.



Make sure that your system fulfills the requirements listed on the [Spotfire Server System Requirements](#) page.

## Plan and collect required system information

To set up the Spotfire database, and to install and configure Spotfire Server, you must have information about the existing systems at your site.

First, you should determine which type of services you need, decide on the target operating systems, and which database to use for your Spotfire environment. After that, you must collect the required information from existing systems.

### Prerequisites

- A database server must be up and running before you can install Spotfire Server, preferably on a separate server. The Spotfire Server installer will not install a database server. The Spotfire environment supports a number of [different database systems](#).

### Procedure

1. Collect the following information about the **database server** that you will use for the Spotfire database:



You may need to contact your database administrator.

Required information	Description
Database server type	MSSQL, Oracle or PostgreSQL
Database server hostname	
Administrator user name	
Administrator password	
Connection identifier	For Oracle only

For PostgreSQL, you should also take note of the path to the bin directory of the PostgreSQL command line tools (on the computer from which you will run the scripts).

2. Decide on the following information for the **Spotfire database**:

Required information	Description
Spotfire database name	For MSSQL and PostgreSQL. The default is spotfire_server.

Required information	Description
Spotfire database user name	If the databases uses Integrated Windows authentication, note this user. If you use Integrated authentication, Spotfire Server must run as the Windows Domain user used to create the Spotfire database.
Spotfire database password	

3. Decide on the following for **Spotfire Server**:

Required information	Description
Spotfire Server front-end port	Used for communication with Spotfire clients. The default is 80. If another application on the same server uses port 80, select a different port number.
Back-end registration port	Used for key exchange to set up trusted communication between the Spotfire Server and nodes. The default is 9080. If another application on the same server uses this port, select a different port number.
Back-end communication port ( TLS)	Used for encrypted traffic between nodes. The default is 9443. If another application on the same server uses this port, select a different port number.
Operating system of the server where Spotfire Server will be installed	Windows or Linux
Spotfire Server hostname	

4. Decide on the following for **node managers and services**:

You need at least one node manager and a Web Player service to be able to use Spotfire analyses in web clients. You might also need other services. See [Introduction to the Spotfire environment](#) and [Nodes and services introduction](#) on page 6 for more information. You can always add more node managers and services later on, if needed.

Required information	Description
Operating system of the server where the node manager/service will be installed	Windows or Linux
Node manager/service hostname	

5. Collect information about the **product license model** of your commercial agreement for Spotfire. After installing Spotfire Server, you must set the license model of your environment to use the product licenses as determined by your contract; either the new product licenses (Data Science, Analytics, Analysis Consumer, Analysis Viewer) or the legacy product licenses (Analyst, Business

Author, Consumer). See [Spotfire licenses and license features](#) and [Changing the product license model](#).

Required information	Description
Product license model	New (Data Science, Analytics, Analysis Consumer, Analysis Viewer) or Legacy (Analyst, Business Author, Consumer)

## Downloading installation software

To install or update Spotfire Server you must download all of the required software components to the computer that will run the server.

### Prerequisites

You must have access to the required software on the Spotfire Download website. If you do not have access, contact your sales representative.

### Procedure

1. On the [Spotfire Download site](#), go to the Spotfire Enterprise Spotfire Enterprise with External Consumers, or Spotfire Server (for Spotfire Server software) page, or to the Spotfire Analytics, Spotfire Data Science, or Spotfire Analyst page (for Spotfire application software).



You will need both the server file and the deploy file to upgrade your environment to a new version.

2. At the bottom of the page, click **Go to download**, and log in if required.
3. On each download page, select the latest version and your platform, and select the license agreement check box.



Some Spotfire releases are designated long-term support (LTS) versions; for information about how LTS versions differ from Innovation (non-LTS) versions, see <https://spotfi.re/lts>.

4. Under **Download options**, do one of the following:
  - To download all included software, select **Full product download**, click **Download**, and then follow the instructions.
  - To download only select files, select **Individual file download**:

- **Spotfire Server installer**

On the Spotfire Enterprise, Spotfire Enterprise with External Consumers, or Spotfire Server download page, expand the **Spotfire Server Software** category, and select the

file corresponding to your operating system, `SPOT_sfired_server_version_win.zip` (Windows) or `SPOT_sfired_server_version_linux.tar` (Linux).

This file contains the server installation or upgrade files.

#### – **Deployment kit**

On the Spotfire Analytics, Spotfire Data Science, or Spotfire Analyst download page, expand the **Spotfire Analytics** or **Spotfire Application** category, and select `SPOT_sfired_deploy_version.zip`.

This file contains the client packages that your end-users will receive when connecting to the server, as well as some prerequisites scripts needed for running the web client on Linux.

#### – **Spotfire application for Windows installer**

On the Spotfire Analytics, Spotfire Data Science, or Spotfire Analyst download page, expand the **Spotfire Analytics** or **Spotfire Application** category, and select the installer package of interest. In a Spotfire environment with a Spotfire Server, use one of the installer packages labeled enterprise:

- `SPOT_sfired-app_version_enterprise_shared_computer_win.zip`
- `SPOT_sfired-app_version_enterprise_single_user_win.zip`



The enterprise installation packages require that you connect to a Spotfire Server after installation. When you use the Windows application and log in to the server, you can use the functionality that your Spotfire user is entitled to, as defined by the assigned licenses and license features.



Click **FAQ** at the bottom of the page to learn more about how to download products and components from the Spotfire Download site.

### What to do next

[Collect required information](#)

## Downloading hotfixes

It is recommended to always keep your Spotfire environment up-to-date. By always applying the latest service pack release (the third version number, e.g., 11.4.x) for your Spotfire Server version, you ensure that you get the latest bug fixes, third-party component updates, and security updates. In some situations, a version can also be provided with hotfixes that are applied separately.

Spotfire Server hotfixes can be applied only on the specific service pack version that they were created for.



For example, if you currently have version 10.3.1, you can only apply server hotfixes for the 10.3.1 version, such as 10.3.1 HF-001, 10.3.1 HF-002, and so on. If you want a hotfix of a different service pack level, such as 10.3.2 HF-001, you must first make sure to upgrade your Spotfire components to that service pack (10.3.2) before applying the hotfix.

### Prerequisites

- You must have access to the required software on the Spotfire Support website. If you do not have access, contact your sales representative.

For general hotfix information and links to specific information about each hotfix, see [Overview of hotfixes for Spotfire](#) in the [Community](#).

### Procedure

1. Sign in to the [Spotfire Support website](#).

2. Click **Downloads > Hotfixes**.
3. On the Available Hotfixes page, expand **AvailableDownloads > Spotfire > Server**, and the version number of interest, to see the list of available .zip and .md5 files (if you are upgrading, select the hotfixes for the new version).



The hotfixes are cumulative, so you need only the latest one.

4. Click on each .zip file that you want to download.  
The .md5 files can be used to verify the integrity of the .zip files, if required.
5. In the hierarchical list, locate and expand **AvailableDownloads > Spotfire > Clients(Analyst\_WebPlayer\_AutomationServices)** and download the latest hotfixes for your Spotfire clients.
6. If you have other components in your Spotfire environment, select the folders for the other components and download the latest hotfixes.
7. When the download is complete, unzip the contents of the folders to the server running Spotfire Server and follow the instructions in the `Installation_Instructions.htm` file.

## Spotfire database setup

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The Spotfire database is an important part of the Spotfire environment. Depending on which method you use for your installations, you configure the database before or after installing the server.

The Spotfire environment supports a number of different database systems. See [system requirements](#) for the list of supported databases.

You can set up the Spotfire database in different ways:

- If you plan to prepare the Spotfire database using the command-line command [create-db](#), then you must install Spotfire Server first to get access to the command-line configuration commands. This option is usually preferred when installation and upgrades are done using an automated process or when running the Spotfire Server in a containerized environment.
- If you plan to prepare the Spotfire database using the scripts included in the installation package, then you often do this before running the server installer. This option can be used when the person installing the Spotfire Server is not the same person as the database administrator. See the subsection for your specific database for details.
- To create and configure the Spotfire databases in a containerized environment, use the [Cloud Deployment Kit for Spotfire on GitHub](#) or the prebuilt container images. See [create-db](#) for details and examples on how to use the command with the different database types.
- You can also use the configuration tool to create the database schemas as a [part of your installation](#) or upgrade process.



When configuring the databases for various managed databases in cloud services (GCP Postgres, AWS Postgres RDS, and so on) using Helm charts, additional parameters and configuration is required.

This is an overview of the various supported systems and the parameters needed for configuration:

## PostgreSQL

The driver class is always `org.postgresql.Driver` for PostgreSQL databases.

Database	Url used by create-db	Url for bootstrapping	Additional parameters
PostgreSQL	<code>jdbc:postgresql://databasehost:databaseport/</code>	<code>jdbc:postgresql://databasehost:databaseport/databasename</code>	
Amazon RDS for PostgreSQL	<code>jdbc:postgresql://databasehost:databaseport/databasename</code>	<code>jdbc:postgresql://databasehost:databaseport/databasename</code>	<code>doNotCreateUser = true</code>
Amazon Aurora with PostgreSQL compatibility	<code>jdbc:postgresql://databasehost:databaseport/databasename</code>	<code>jdbc:postgresql://databasehost:databaseport/databasename</code>	<code>doNotCreateUser = true</code>
Azure Database for PostgreSQL	<code>jdbc:postgresql://databasehost:databaseport/databasename</code>	<code>jdbc:postgresql://databasehost:databaseport/databasename</code>	<code>doNotCreateUser = true</code>
Google Cloud PostgreSQL	<code>jdbc:postgresql://databasehost:databaseport/</code>	<code>jdbc:postgresql://databasehost:databaseport/databasename</code>	<code>doNotCreateUser = true</code>

## Microsoft SQL Server

The driver class is always `com.microsoft.sqlserver.jdbc.SQLServerDriver` for Microsoft SQL Server databases.

Database	Url used by create-db	Url for bootstrapping	Additional parameters
Microsoft SQL Server	<code>jdbc:sqlserver://databasehost:databaseport</code>	<code>jdbc:sqlserver://databasehost:databaseport; DatabaseName=databasename</code>	
Amazon RDS for Microsoft SQL Server	<code>jdbc:sqlserver://databasehost:databaseport</code>	<code>jdbc:sqlserver://databasehost:databaseport; DatabaseName=databasename</code>	<code>variant = rds</code>
Azure SQL Database	<code>jdbc:sqlserver://databasehost:databaseport</code>	<code>jdbc:sqlserver://databasehost:databaseport; DatabaseName=databasename</code>	<code>variant = azure</code>
Google Cloud SQL for Microsoft SQL Server	<code>jdbc:sqlserver://databasehost:databaseport</code>	<code>jdbc:sqlserver://databasehost:databaseport; DatabaseName=databasename</code>	<code>variant = google</code>

## Oracle

The driver class is always `oracle.jdbc.OracleDriver` for Oracle databases.

Database	Url used by create-db	Url for bootstrapping	Additional parameters
Oracle	<code>jdbc:oracle:thin:@//databasehost:databaseport/service</code>	<code>jdbc:oracle:thin:@//databasehost:databaseport/service</code>	<code>oracleRootFolder, oracleTablespacePrefix</code>
Amazon RDS for Oracle	<code>jdbc:oracle:thin:@databasehost:databaseport/ORCL</code>	<code>jdbc:oracle:thin:@databasehost:databaseport/ORCL</code>	<code>variant = rds</code>

## Setting up the Spotfire database (Oracle)

There are multiple ways to set up an Oracle server for storing the Spotfire database, as discussed in previous sections. This topic lists more information about some parameters you must provide, and detailed steps for setting up the database using the provided scripts.

As discussed on [Spotfire database setup](#), you can create a Spotfire database with the configuration tool or using the CLI command `create-db`. To use the `create-db` command, you must first have installed the Spotfire Server. Also note that when using Oracle from a cloud database provider, [additional parameters and configuration is required](#).

To create and configure the Spotfire databases in a containerized environment, use the [Cloud Deployment Kit for Spotfire on GitHub](#) or the prebuilt container images.

To use the provided scripts to set up the database, follow the steps below.

### Prerequisites

- Download and unzip the Spotfire Server installation kit from the Spotfire Download site. For instructions, see [Downloading installation software](#).
- The command-line database tool `sqlplus` must be installed in the system when configuring the database server using scripts.
- You have access to an Oracle database server.

### Procedure

1. Configure the following settings on the Oracle database server computer.
  - User name and password authentication.
  - National Language Support (NLS) to match the language of the data you will bring into Spotfire.



If the database server NLS cannot be set to match the language of your data, Oracle provides other methods of setting NLS to a specific database or user. For more information, consult your database administrator or see the Oracle database documentation.

2. Go to the `scripts/oracle_install` directory in the downloaded installation kit and locate the `create_databases` script for your platform.

For details about the available scripts, see [The Spotfire database scripts](#).

You might need assistance from your database administrator to copy the `install` directory to the database, and to provide the database details for the script.

3. The script supports the variables described in the table below. The script will prompt you for any required variable that is not set in your environment or in the script.

If desired, you can provide the variables before running the script using one of these methods:

- a. Set the variables as environment variables.
- b. Open and edit the script to define the variables in the section under `Uncomment` to set variables.

Variable	Description	Default
SPOTFIREDB_ROOTFOLDER	<p>Location where the tablespaces are created. This must be a directory that is writable for the Oracle instance.</p> <p>Example: <code>&lt;oracle install dir&gt;/oradata/SID</code> or <code>&lt;oracle install dir&gt;/oradata/PDBNAME</code>.</p> <p> Do not add a slash or backslash after the <code>&lt;SID&gt;</code>.</p> <p> This variable is not applicable for the Amazon RDS <code>create_databases</code> scripts.</p>	–
DBSERVER_CONNECTIDENTIFIER	<p>Oracle TNS name/SID of the database/service name.</p> <p>Example: <code>ORCL</code> or <code>//&lt;database server address&gt;/&lt;database name&gt;</code>.</p>	
DBSERVER_ADMIN_USERNAME	<p>Name of a user with Oracle Database administrator privileges for the database identified in the <code>DBSERVER_CONNECTIDENTIFIER</code>.</p> <p>Example: <code>system</code>.</p>	
DBSERVER_ADMIN_PASSWORD	<p>Password of the <code>DBSERVER_ADMIN_USERNAME</code>.</p> <p> This is visible in clear text. Delete the script after use.</p>	–
SPOTFIREDB_USERNAME	Name of the user to create to set up the Spotfire Server database.	spotfire
SPOTFIREDB_PASSWORD	Password for <code>SPOTFIREDB_USERNAME</code> .	–
SPOTFIREDB_DATA_TABLESPACE	Name of the tablespace to create.	SPOTFIRE_DATA
SPOTFIREDB_TEMP_TABLESPACE	<p>Name of the temporary tablespace to create.</p> <p> Conflicting tablespaces can occur if you are creating the Spotfire tablespaces on a database server that is already hosting a previous version of Spotfire Server. Make sure that you do not select any names for the new tablespaces and users that conflict with the already hosted tablespaces and users.</p>	SPOTFIRE_TEMP

## Result

The required Spotfire user and database table schemas are created in your database.

The log file `log.txt` file is created in the working directory. If the execution should fail, then the log file contains information about the failure. If the execution succeeds, then information about the changes made to the database is available in the log file.



The scripts contain sensitive information so remove them after your Spotfire environment is installed.

### What to do next

[Install Spotfire Server](#), or if you have done that already, proceed to [Initial configuration](#).

## Setting up the Spotfire database (SQL Server)

There are multiple ways to set up a SQL Server database server for storing the Spotfire database, as discussed in previous sections. This topic lists more information about some parameters you must provide, and detailed steps for setting up the database using the provided scripts.

As discussed on [Spotfire database setup](#), you can create a Spotfire database with the configuration tool or using the CLI command `create-db`. To use the `create-db` command, you must first have installed the Spotfire Server. Also note that when using SQL Server from a cloud database provider, [additional parameters and configuration is required](#).

To create and configure the Spotfire databases in a containerized environment, use the [Cloud Deployment Kit for Spotfire on GitHub](#) or the prebuilt container images.



If you plan to configure Integrated Windows authentication (IWA) between Spotfire Server and the Spotfire database in SQL, see [Setting up the Spotfire database \(SQL Server with Integrated Windows authentication\)](#).

To use the provided scripts to set up the database, follow the steps below.

### Prerequisites

- Download and unzip the Spotfire Server installation kit from the Spotfire Download site. For instructions, see [Downloading installation software](#).
- You must have access to a SQL server database server.
- The following settings must be configured on the SQL Server:
  - TCP/IP communication listening on a port (the default is 1433).
  - Case-insensitive collation (at least for the Spotfire database).



If your installation of SQL Server uses a case-sensitive collation by default, or your data uses a different collation than `Latin1_General_CI_AS`, you must edit the `create_server_db.sql` script before running the `create_databases_ia.bat` script. See [Defining the SQL Server collation](#) for details.

- The command-line database tool `sqlcmd` must be installed in the system you are going to use to configure the database server.



To reduce the likelihood of encountering issues like `Transaction (Process ID 68) was deadlocked on lock resources with another process and has been chosen as the deadlock victim`. Rerun the transaction, apply MVCC/Row versioning mode by using the setting `READ_COMMITTED_SNAPSHOT`.



By default, the Microsoft JDBC driver for SQL Server requires a valid, not self-signed, server certificate to be set up on the Microsoft SQL Server. For more information see [Fixing Microsoft SQL Server JDBC driver-related issues](#).

### Procedure

1. Optionally, if you want to set up Spotfire Server to [authenticate with a SQL Server database instance using Kerberos](#), there is additional preparation needed. See [Running the database preparation scripts for Kerberos configuration](#).

- Go to the `scripts/mssql_install` directory in the downloaded installation kit and locate the `create_databases` script for your platform.

For details about the available scripts, see [The Spotfire database scripts](#).

- The script supports the variables described in the table below. The script will prompt you for any required variable that is not set in your environment or in the script.

If desired, you can also provide the variables using one of these methods:

- Set the variables as environment variables.
- Open and edit the script to define the variables in the section under `Uncomment to set variables`.

Variable	Description	Default
<code>DBSERVER_CONNECTIDENTIFIER</code>	<p>This variable is composed of the <code>&lt;DBSERVER_ADDRESS&gt;</code> (listed as <code>&lt;SERVER&gt;</code> in the script) and the <code>&lt;MSSQL_INSTANCENAME&gt;</code>.</p> <ul style="list-style-type: none"> <li>Replace the script variable <code>&lt;SERVER&gt;</code> with the database server address of the server running the SQL Server instance.</li> <li>Replace the script variable <code>&lt;MSSQL_INSTANCENAME&gt;</code> with the name of the SQL Server instance.</li> </ul> <p>The syntax for this variable is <code>DBSERVER_CONNECTIDENTIFIER = &lt;DBSERVER_ADDRESS&gt;\&lt;MSSQL_INSTANCENAME&gt;</code>.</p> <div style="border: 1px solid #0070C0; padding: 5px; margin-top: 10px;">  <p>The default installation of SQL Server creates an unnamed instance of the SQL Server. If your SQL Server is a new installation, delete the <code>MSSQL_INSTANCENAME</code> part of the line and enter only the database server address (for <code>SERVER</code>) . This causes the connection to be made to the unnamed instance.</p> </div>	-
<code>DBSERVER_ADMIN_USERNAME</code>	<p>Name of a user with SQL database administrator privileges.</p> <p>Default: <code>sa</code>.</p>	<code>sa</code>
<code>DBSERVER_ADMIN_PASSWORD</code>	<p>Password of the <code>DBSERVER_ADMIN_USERNAME</code>.</p>	-
<code>SPOTFIREDB_DBNAME</code>	<p>Name of the Spotfire database that will be created.</p> <p>Default: <code>spotfire_server</code>.</p>	<code>spotfire_server</code>
<code>SPOTFIREDB_USERNAME</code>	<p>Name of the user created to set up the Spotfire database.</p> <p>Example: <code>spotfire</code></p>	<code>spotfire</code>
<code>SPOTFIREDB_PASSWORD</code>	<p>Password for <code>SPOTFIREDB_USERNAME</code>.</p>	-

- Open a command prompt and go to the directory where you copied the installation scripts. At the prompt, run the script.

## Result

The required Spotfire user and database table schemas are created in your database.

The log file `log.txt` file is created in the working directory. If the execution should fail, then the log file contains information about the failure. If the execution succeeds, then information about the changes made to the database is available in the log file.



The scripts contain sensitive information so remove them after your Spotfire environment is installed.

## What to do next

Install [Spotfire Server](#), or if you have done that already, proceed to [Initial configuration](#).

## Setting up the Spotfire database (SQL Server with Integrated Windows authentication)

If you plan to use Integrated Windows authentication between Spotfire Server and the Spotfire database in SQL, follow these steps.



Alternatively, you can create a Spotfire database using the CLI command [create-db](#). To use the create-db command, you must first have installed the Spotfire Server. Also note that when using SQL Server from a cloud database provider, [additional parameters and configuration is required](#).

### Prerequisites

- Download and unzip the Spotfire Server installation kit from the Spotfire Download site. For instructions, see [Downloading installation software](#).
- You must have access to a SQL server database server.
- The following settings must be configured on the SQL Server:
  - TCP/IP communication listening on a port (the default is 1433).
  - Case-insensitive collation (at least for the Spotfire database).



If your installation of SQL Server uses a case-sensitive collation by default, or your data uses a different collation than `Latin1_General_CI_AS`, you must edit the `create_server_db.sql` script before running the `create_databases_ia.bat` script. See [Defining the SQL Server collation](#) for details.

- The command-line database tool `sqlcmd` must be installed in the system you are going to use to configure the database server.



Set up your database server for encrypted connections, with a valid, not self-signed, server certificate. For more information see [Fixing Microsoft SQL Server JDBC driver-related issues](#).

With this type of configuration, the Spotfire database will use Windows accounts for authentication. The current user who is running the scripts to create the database must have administrative privileges on the database server, but the Spotfire process should run as a different user when connecting at runtime. Therefore, the scripts have been designed to set up the database using a different Windows account than the one the Spotfire Server will use to access the database. This user is assigned to the variable `WINDOWS_LOGIN_ACCOUNT`. Note that the user who runs the scripts to create the database will get database owner permissions (dbo) to the database and will be able to administer the Spotfire database using integrated authentication.

If the user assigned to the `WINDOWS_LOGIN_ACCOUNT` variable already exists as a login on the database server, the `create_server_user_ia.sql` script must be edited. The following rows should then be commented out:

```
use master
GO
CREATE LOGIN [$(WINDOWS_LOGIN_ACCOUNT)] FROM WINDOWS WITH
DEFAULT_DATABASE=[$(SPOTFIREDB_DBNAME)],DEFAULT_LANGUAGE=[us_english]
GO
ALTER LOGIN [$(WINDOWS_LOGIN_ACCOUNT)] ENABLE
GO
DENY VIEW ANY DATABASE
TO [$(WINDOWS_LOGIN_ACCOUNT)]
```

As mentioned above, for security reasons, the Spotfire server process should connect as a different user than the user that runs this script. If you really want to use the same account then you must comment out the following lines from `create_server_user_ia.sql`:

```
CREATE USER [$(SPOTFIREDB_USERNAME)] FOR LOGIN [$(WINDOWS_LOGIN_ACCOUNT)]
GO
```

## Procedure

1. Optionally, if you want to set up Spotfire Server to [authenticate with a SQL Server database instance using Kerberos](#), there is additional preparation needed. See [Running the database preparation scripts for Kerberos configuration](#).

2. Go to the `scripts/mssql_install` directory in the downloaded installation kit and locate the `create_databases_ia.bat` script.

For details about the available scripts, see [The Spotfire database scripts](#).

3. The script supports the variables described in the table below. The script will prompt you for any required variable that is not set in your environment or in the script.

If desired, you can also provide the variables using one of these methods:

- a. Set the variables as environment variables.
- b. Open and edit the script to define the variables in the section under `Uncomment to set variables`.

Variable	Description
DBSERVER_CONNECTIDENTIFIER	<p>Replace <code>&lt;SERVER&gt;</code> with the name of the server running the SQL Server instance, and replace <code>&lt;MSSQL_INSTANCENAME&gt;</code> with the name of the SQL Server instance.</p> <p> The default installation of SQL Server creates an unnamed instance of the SQL Server. If your SQL Server is a new installation, delete the "MSSQL_INSTANCENAME" part of the line and enter only the SERVER name. The connection will be made to the unnamed instance.</p>
WINDOWS_LOGIN_ACCOUNT	The Windows Login Account that should be created as a login on the database server. The server process must run as this user.
SPOTFIREDB_DBNAME	Name of the Spotfire database that will be created; <code>spotfire_server</code> is the default.
SPOTFIREDB_USERNAME	Name of the user that will be created for the Spotfire database, associated with the <code>WINDOWS_LOGIN_ACCOUNT</code> .

4. Save the file and run the script `create_databases_ia.bat`.

## Result

The required Spotfire user and database table schemas are created in your database.

The log file `log.txt` file is created in the working directory. If the execution should fail, then the log file contains information about the failure. If the execution succeeds, then information about the changes made to the database is available in the log file.



The scripts contain sensitive information so remove them after your Spotfire environment is installed.

## What to do next

[Install Spotfire Server](#), or if you have done that already, proceed to [Initial configuration](#).

## Setting up the Spotfire database (PostgreSQL)

There are multiple ways to set up a PostgreSQL server for storing the Spotfire database, as discussed in previous sections. This topic lists more information about some parameters you must provide, and detailed steps for setting up the database using the provided scripts.

As discussed on [Spotfire database setup](#), you can create a Spotfire database with the configuration tool or using the CLI command `create-db`. To use the `create-db` command, you must first have installed the Spotfire Server. Also note that when using PostgreSQL from a cloud database provider, [additional parameters and configuration is required](#).

To create and configure the Spotfire databases in a containerized environment, use the [Cloud Deployment Kit for Spotfire on GitHub](#) or the prebuilt container images.

PostgreSQL can be deployed on a variety of systems. The default settings for a PostgreSQL database are generally suited for a smaller system. Tune the settings to match the anticipated load before using PostgreSQL for the Spotfire database.



For example, increasing `shared_buffers` (e.g., to 2 GB) can have a large impact on performance. You might also want to tune things like the `work_mem`, `maintenance_work_mem` and `effective_cache_size`. You can search for information about how you can tune your PostgreSQL server and find tips from PostgreSQL or external sources like, for example, [this page](#).

To use the provided scripts to set up the database, follow the steps below.

### Prerequisites

- Download and unzip the Spotfire Server installation kit from the Spotfire Download site. For instructions, see [Downloading installation software](#).
- The command-line database tool `psql` must be installed in the system when configuring the database server using scripts.
- You have access to a PostgreSQL database server.

### Procedure

1. Go to the `scripts/postgres_install` directory in the downloaded installation kit and locate the `create_databases` script for your platform.  
For details about the available scripts, see [The Spotfire database scripts](#).
2. The script supports the variables described in the table below. The script will prompt you for any required variable that is not set in your environment or in the script.

If desired, you can provide the variables before running the script using one of these methods:

- a. Set the variables as environment variables.
- b. Open and edit the script to define the variables in the section under `Uncomment to set variables`.

Variable	Description	Default
<code>PGHOST</code>	Name of the server running the PostgreSQL database server.	-
<code>PGPORT</code>	Port used by the PostgreSQL database server.	5432
<code>PGDATABASE</code>	The name of the PostgreSQL database to connect to.	postgres (usually)

Variable	Description	Default
DBSERVER_ADMIN_USERNAME	Name of an existing user with PostgreSQL database server administrator privileges.	postgres (usually)
DBSERVER_ADMIN_PASSWORD	Password for the <i>DBSERVER_ADMIN_USERNAME</i> user.	-
SPOTFIREDB_DBNAME	Name of the Spotfire Server database to create.  According to the PostgreSQL standards, use lower case characters for the <i>SPOTFIREDB_DBNAME</i> and the <i>SPOTFIREDB_USERNAME</i> parameters.	spotfire_server
SPOTFIREDB_USERNAME	Name of the user to create to configure the Spotfire Server database.	spotfire
SPOTFIREDB_PASSWORD	Password for the <i>SPOTFIREDB_USERNAME</i> user.	-
PSQL_PATH	The path to the <code>bin</code> directory of the PostgreSQL command line tools (only for Windows script). Example: <code>&lt;PostgreSQL installation directory&gt;/&lt;version number&gt;/bin.</code>	-

- Open a command prompt and go to the directory where you copied the installation scripts. At the prompt, run the script.

### Result

The required Spotfire user and database table schemas are created in your database.

The log file `log.txt` file is created in the working directory. If the execution should fail, then the log file contains information about the failure. If the execution succeeds, then information about the changes made to the database is available in the log file.



The scripts contain sensitive information so remove them after your Spotfire environment is installed.

### What to do next

[Install Spotfire Server](#), or if you have done that already, proceed to [Initial configuration](#).

# Spotfire Server Installation

There are several different options available to install Spotfire Server.



Spotfire Server should run in an English (United States) language setting, as stated on the [Spotfire Server System Requirements](#) page.

The Spotfire Server installer includes three major components: A Java environment (a Java Development Kit), a Tomcat application server, and a Spotfire Server web application.

The JAVA\_HOME of the Apache Tomcat is set to the path of the installed Java Development Kit.

Depending on the method you choose to [set up the database](#), you will run the server installation before or after you create the database. The database must be set up before you run the bootstrap command.

Select the appropriate installation procedure depending on your target operative system and provide the required parameters as indicated below.

## Installation parameters

Parameter	Description	Default
INSTALLDIR	[Only applicable for Windows installations.] The installation directory.	
SPOTFIRE_WINDOWS_SERVICE	[Only applicable for Windows installations.] The available options are <code>Create</code> and <code>DoNotCreate</code> .	
SERVER_FRONTEND_PORT	Used for communication with Spotfire clients.	80
SERVER_BACKEND_REGISTRATION_PORT	Used for key exchange to set up trusted communication between the Spotfire Server and nodes.	9080
SERVER_BACKEND_COMMUNICATION_PORT	Used for encrypted traffic between nodes.	9443
NODEMANAGER_HOST_NAMES	[Only applicable for Windows installations.] A comma-separated list of IP addresses, hostnames, and FQDN names that can be used by back-end trust. These should be for the interfaces on the computer where the node manager is installed.  <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> </div> <div>Valid hostnames can only contain alphabetic characters, numeric characters, hyphens and periods.</div> </div> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> </div> <div>If you do not enter any values, the Windows installer automatically provides values. After installation, confirm that these are correct in the following file: <code>&lt;node manager installation dir&gt;\nm\config\nodemanager.properties.</code></div> </div>	

## Installing the Spotfire Server files (interactively on Windows)

You can install the Spotfire Server files interactively on Windows, using the installation wizard.



For security and product performance reasons, it is recommended that you install Spotfire Server on a different computer than the database.

## Procedure

1. In the server installation kit that you downloaded from the Spotfire Download site, double-click `setup-win64.exe`.



If you are using integrated Windows authentication, make sure that you configure the Spotfire Server service to run as the correct user as defined in [Setting up the Spotfire database \(SQL Server with Integrated Windows authentication\)](#), in the `services.msc`, and that this user has permission to write to the installation folder. Also make sure that Spotfire Server always runs as this domain user. Confirm with the logs that Spotfire Server starts.

2. Follow the steps in the installation wizard and provide the requested information. Make sure that no ports specified are in use by other programs.

See details about the installation parameters on [Installation of Spotfire Server](#) if needed.



To check whether a port is in use, open a command prompt, type `netstat -na`, and press Enter.



The ports selected during installation for front-end, back-end communication, and back-end registration ports must be open in the firewall. See [Ports and firewall configuration](#) for defaults and details.

3. When the installation is completed, select **Launch the configuration tool** to open the configuration tool, or **Launch the upgrade tool** if you are upgrading.

## Installing the Spotfire Server files (RPM Linux) [Deprecated]

You can install the Spotfire Server files on Linux using the RPM-based installer.

### Prerequisites

You must have `sudo` access to the host.



For security and product performance reasons, it is recommended that you install Spotfire Server on a different computer than the database.



This installation method is deprecated and will be removed in a future release (innovation, LTS, or service pack). If possible, use the [tarball](#) method instead.

### Procedure

1. Copy the Spotfire Server installation software package from its download directory to a temporary directory on the target host.  
For example, `/temp/`.
2. Open a terminal and go to the directory that contains the server installation file.
3. Enter the following command to install the server:

```
sudo rpm -ivh spotfireserver-<version_number>.x86_64.rpm
```

A successful execution of the command produces text similar to this:

```
Verifying...
Preparing...
Updating / installing...
spotfireserver-<version>-<version>-1
You must now execute /opt/spotfire/spotfireserver/<version number>/configure to complete
the configuration.
```

By default, the server is installed in the following directory: `/opt/spotfire/spotfireserver/<version number>/`.

- Execute the `configure` script, specifying the values for the different parameters.



Alternatively, you can run the script without any parameters. In this case you will be prompted for the missing information.

```
<server installation dir>/<version_number>/configure -s <SERVER_FRONTEND_PORT> -r
<SERVER_BACKEND_REGISTRATION_PORT> -b <SERVER_BACKEND_COMMUNICATION_PORT>
```



Include only those parameters whose default values you are changing. The default values are listed in the table below.

See details about the installation parameters on [Installation of Spotfire Server](#) if needed.

If successful, text similar to the following is shown on the command line:

```
Post install configuration of Spotfire Server <version number> was successful.
```

## Installing the Spotfire Server files (tarball Linux)

You can install the Spotfire Server files on Linux using the tarball installer.

- For security and product performance reasons, install Spotfire Server on a different computer than the database.
- You might need to configure Security-Enhanced Linux in your system, if enabled, to install the Spotfire Server using the tarball. Check the corresponding documentation for your operating system.

### Procedure

- Copy the Spotfire Server installation software package from its download directory to a temporary directory on the target host.  
For example, `/temp/`.
- Create a destination directory for the Spotfire Server.



The directory must contain the string `spotfireserver` for start and stop scripts to work.

Example:

```
mkdir -p /opt/spotfire/spotfireserver/<version_number>
```

- From the destination directory, unpack the package.  
Example:

```
cd /opt/spotfire/spotfireserver/<version_number>
tar xzf /temp/spotfireserver-<version_number>.x86_64.tar.gz
--strip-components 1
```

The Spotfire Server is unpacked into the specified directory.

- In the directory that you unpack the tarball to in step 3, execute the `configure` post-installation script, specifying the values for the parameters.  
Example:

```
cd /opt/spotfire/spotfireserver/<version_number>
./configure -s <SERVER_FRONTEND_PORT> \
-r <SERVER_BACKEND_REGISTRATION_PORT> \
```

```
-b <SERVER_BACKEND_COMMUNICATION_PORT>
```



- To be prompted to provide the values, run the `./configure` command with no parameters (`./configure`).
- To provide specific parameter values, run the `./configure` command with explicit values for the parameters (for example, `./configure -s 81 -r 9081 -b 9444`).

See details about the installation parameters on [Installation of Spotfire Server](#) if needed.

Text similar to the following is shown on the command line:

```
Post install configuration of Spotfire Server <version_number> was successful.
```

5. Configure Spotfire Server to start when the computer starts by running this command:

```
sudo ./configure-boot
```

Text similar to the following is shown on the command line.

```
Spotfire Server <version_number> has been successfully configured to start on system boot.
```



Running the `configure-boot` script changes the installation directory ownership to user `spotfire` and restricts other users from performing actions on the installation directory.

## Customizing your installation

You can make your tarball installation more streamlined by using commands as in the following example:

```
SERVER_VERSION=<version>
mkdir -p /opt/spotfire/spotfireserver/${SERVER_VERSION}
tar xvf spotfireserver-${SERVER_VERSION}.x86_64.tar.gz \
  --strip-components=1 \
  --directory=/opt/spotfire/spotfireserver/${SERVER_VERSION}

/opt/spotfire/spotfireserver/${SERVER_VERSION}/configure \
  -s "${SERVER_FRONTEND_PORT:-8080}" \
  -r "${SERVER_BACKEND_REGISTRATION_PORT:-9080}" \
  -b "${SERVER_BACKEND_COMMUNICATION_PORT:-9443}"

/opt/spotfire/spotfireserver/${SERVER_VERSION}/configure-boot
```

## Database drivers

---

Spotfire Server ships with the following database drivers.

- Microsoft SQL Server driver
  - PostgreSQL driver
  - Additional drivers to access data from JDBC-compliant data sources with Information Services
- Spotfire also supports the Oracle driver, which is available from the Oracle website.

### Installing the Oracle database driver for the Spotfire database

---

If your implementation uses Oracle Database server, you can use the Oracle driver available from the Oracle website.

#### Procedure

1. Download the database driver from the Oracle website.
2. Place the driver in the following directory: `<installation dir>/tomcat/custom-ext`.



If you want to use Oracle as the Spotfire database and you want to access data with information services (regardless of whether you want to access Oracle data), you must add the same Oracle jar file in both directories `<installation dir>/tomcat/custom-ext` and `<installation dir>/tomcat/custom-ext-informationservices`.

# Initial configuration

---

It is recommended that Spotfire administrators configure a successful basic installation of Spotfire Server before configuring more advanced implementations.



Multiple configurations can be stored in the Spotfire database, but only one can be active.

## Configuration using the configuration tool

---

The Spotfire Server configuration tool is a Java application included in the Spotfire Server installation package, and its user interface provides a guided path for a basic installation, including creation of the database schemas.

The configuration tool must be run by a Spotfire administrator. If the Spotfire administrator does not have access to the computer running Spotfire Server, or if the server cannot display graphics, the configuration tool can be run from a local computer.

## Running the configuration tool

---

You can use the Spotfire Server configuration tool for the initial configuration of your Spotfire implementation, or for updating your configuration later on.

There are three ways to start the configuration tool:

- Select the **Launch the Configuration Tool** check box on the last screen of the Spotfire Server installation wizard.
- On the computer running Spotfire Server, from the Windows start menu, search for **Configure Spotfire Server**.
- Run the `uiconfig.bat` file (`uiconfig.sh` on Linux). These files are located in the `<installation dir>\tomcat\spotfire-bin` directory.



If you cannot run the configuration tool on the Spotfire Server computer, see [Running the configuration tool on a local computer](#).

## Running the configuration tool on a local computer

If running the configuration tool on the Spotfire Server computer is impossible or inconvenient, you can run the tool on a local computer.

### Prerequisites

The Java runtime specified in the [System Requirements](#) must be installed on the local computer.

### Procedure

1. From the computer where Spotfire Server is installed, copy the `<installation dir>/tomcat/webapps/spotfire/tools/spotfireconfigtool.jar` file to the local computer.



If Spotfire Server is up and running, you can also download the `spotfireconfigtool.jar` file from the **Server Tools** page in the web administration pages.

2. On the local computer, unpack the .jar file by double-clicking the `spotfireconfigtool.jar` file. If your system does not recognize the file type, follow these steps instead:
  - a. On the local computer, open a command prompt and go to the directory that contains the `spotfireconfigtool.jar` file.
  - b. On the command line, enter the following command:

```
java -jar spotfireconfigtool.jar
```

A `spotfireconfigtool` directory is created in the same directory as the .jar file.

3. In the newly-created directory, double-click `uiconfig.bat` (Windows) or `uiconfig.sh` (Linux) to open the configuration tool.

## Creating the bootstrap.xml file

The `bootstrap.xml` file contains basic information that the server needs to connect to the Spotfire database and retrieve its configuration. It also contains identity information for the server. If more than one server is connected in a cluster, then each server will have its own bootstrap file.

### Prerequisites

Spotfire Server is installed.



For Integrated Windows authentication (IWA) between Spotfire Server and the Spotfire database, see [Setting up the Spotfire Server bootstrap file for Integrated Windows authentication](#).

### Procedure

1. If the configuration tool is not open, open it; for instructions see [Opening the configuration tool](#). The configuration tool opens to the System Status page, which lists the necessary configuration steps.
2. Click **Create new bootstrap file**. The Bootstrap page is displayed.
3. If you do not have [set up a Spotfire database](#) already (using scripts or the `create-db` command), click **Create a new Spotfire Server database** and enter the required information in the opened dialog.



If you select the **Create Spotfire user** option in the Create Database dialog, this creates a new Spotfire user in the database. When creating a Spotfire database using PostgreSQL from a managed cloud service provider, this check box must be cleared.

Choose the database variant you have access to; either a regular (installed) database, or a database from a managed cloud service provider. For more information about the different database variants available, see the [system requirements](#) and the [Spotfire database setup](#) page.

You can use the **Test connection** button to verify the administrator connection to the database.

Otherwise, enter the following information directly in the fields on the **Bootstrap** tab:

<b>Path</b>	You can leave the default path as is.
<b>Driver template</b>	Select a template that is compatible with your database server.
<b>Hostname</b>	The Spotfire database host name (the address of the computer on which the database is installed).
<b>Port</b>	The Spotfire database port.

<b>Identifier (SID/database/service)</b>	The Server ID (for Oracle) or the database name (for MS SQL and PostgreSQL) of the Spotfire database that was created; <code>spotfire_server</code> is the default.
<b>Username</b>	The name of the database account used by Spotfire Server to connect to the Spotfire database. In the <code>create_databases.bat</code> file, this is the value for <code>SPOTFIREDB_USERNAME</code> .
<b>Password</b>	The password of the database account. Enter correct database login details, as specified earlier. In the <code>create_databases.bat</code> file, this is the value for <code>SPOTFIREDB_PASSWORD</code> .
<b>URL</b>	The JDBC connection URL. This field is pre-populated from selections made, but it can be edited when needed.
<b>Driver class</b>	This field is pre-populated from selections made, and cannot be edited. To be able to select Oracle, you must also download the JDBC driver.
<b>Configuration tool password</b>	<p>Enter a configuration tool password of your choice. This will be used to protect the server configuration from unauthorized access.</p>  <p>The configuration tool password will be required when running the configuration tool.</p>
<b>Server alias</b>	Enter any unique name for the Spotfire Server.
<b>Encryption password (optional)</b>	Enter an encryption password of your own choice. This will be used for encrypting other passwords stored in the Spotfire database. The passwords are encrypted with a static key if no encryption password is specified here.
<b>Addresses</b>	<p>These values should match actual hostnames, fully qualified domain names (FQDN), and IP addresses (IPv4 or IPv6) at which the Spotfire Server can be reached by other Spotfire Servers and nodes.</p> <p>If any of these values do not describe the server, or are on a network that will not be used for backend communication, you should remove them.</p> <p>If you changed the hostname, domain, or IP address, add the new values.</p>  <p>Valid hostnames can only contain alphabetic characters, numeric characters, hyphen and period.</p>
<b>Site</b>	For a basic installation, leave <b>Default</b> as the selection.

#### 4. Click **Save Bootstrap**.

The configuration tool checks that database drivers are installed and that the database is running. It also checks that the database accepts the given credentials. A message indicates whether the bootstrap file was successfully created. After it is created, the Configuration page of the configuration tool is displayed.

## Setting up the Spotfire Server bootstrap file for Integrated Windows authentication

To configure Integrated Windows authentication (IWA) between Spotfire Server and the Spotfire database in SQL, follow these steps.

### Prerequisites

You have followed the steps in [Setting up the Spotfire database \(SQL Server with Integrated Windows authentication\)](#).

## Procedure

1. Change the login for the service to use the Windows account that has login rights to the Spotfire database.
2. In the bootstrap command, described in the "Command-line reference" section in the Spotfire Server and Environment Installation and Administration help, use the following database connection string, substituting actual values for <db\_server>, <port>, and <instance>:

```
jdbc:sqlserver://<db_server>:<port>;DatabaseName=<instance>;integratedSecurity=true
```

## Saving basic configuration data (authentication towards Spotfire database)

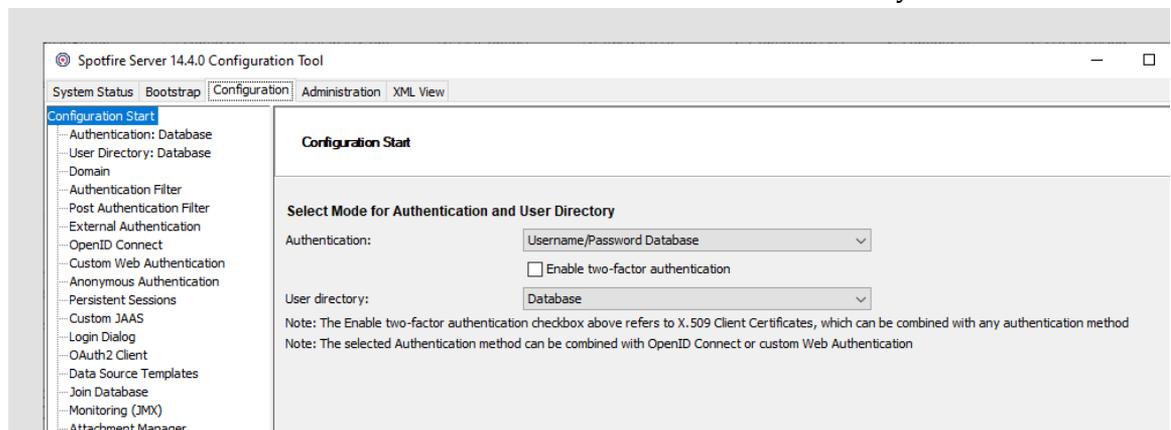
The Configuration page of the configuration tool shows the authentication type and the user directory for your installation. These instructions are for using the Spotfire database to authenticate users.

### Prerequisites

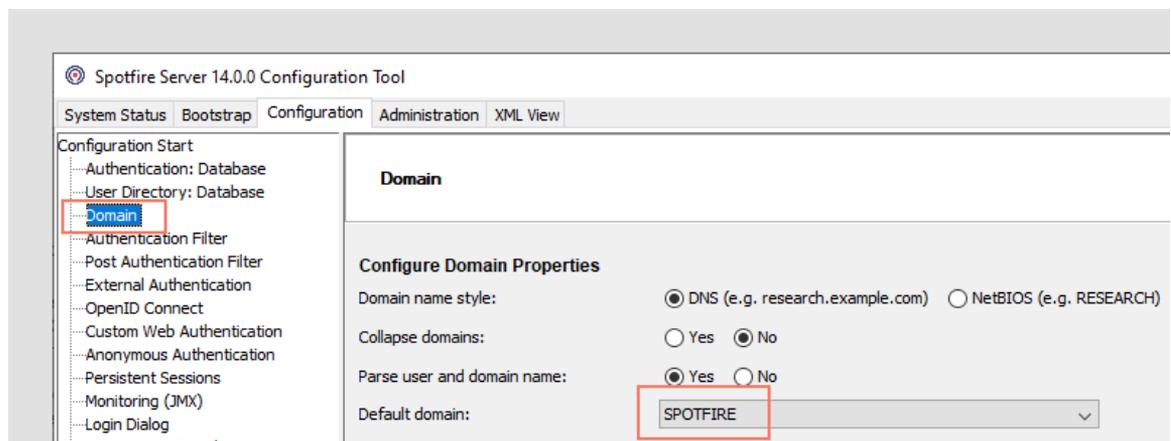
A `bootstrap.xml` file has been successfully saved (for instructions, see [Creating the bootstrap.xml file](#)).

### Procedure

1. On the Configuration page of the configuration tool, verify that **Username/Password Database** is selected for **Authentication** and that **Database** is selected for **User directory**.



2. In the left panel of the page click **Domain**, and then verify that **SPOTFIRE** is selected next to **Default domain**.



3. At the bottom of the page, click **Save configuration**.  
The Save configuration wizard is displayed. **Database (recommended)** is the pre-selected option, used to immediately apply the new configuration.
4. Click **Next**.
5. Enter a comment about the changes done to the configuration, and then click **Finish**.

## Creating an administrator user

---

To continue the installation process, the administrator must create an administrator user who has access to all the functionality in the Spotfire implementation.

### Prerequisites

Basic configuration data—the authentication mode and user directory for the system—have been saved on the **Configuration** tab of the configuration tool.

### Procedure

1. On the Administration page of the configuration tool, under **Create new user**, enter a username and password, and click **Create**.  
The new user is displayed in the Users field.
2. Select the new user name and then click **Promote** to add that user to the Administrators group.  
The user is moved to the Administrators field.

## Start or stop Spotfire Server

---

You must start or restart the Spotfire Server to load a new or updated configuration.

For example, you must start the server after completing the initial configuration, before deploying any client packages, or restart the server to load configuration changes applied from the configuration tool or command line. The restart makes the server retrieve a fresh copy of the `configuration.xml` file from the database.

### Starting or stopping Spotfire Server (as a Windows service)

---

If you installed the Spotfire Server as a Windows service, you can manage it as a standard Windows service.

#### Prerequisites

You have successfully completed the initial configuration steps so that the System Status page of the configuration tool shows check marks before the following steps:

- Connect to Database
- Specify Configuration
- Configure Spotfire Server Settings
- Specify Server Administrator

#### Procedure

1. Log in to the Spotfire Server computer as an administrator.
2. Go to **Control Panel > Administrative Tools > Services** and then, in the Services dialog, locate and select the service called **Spotfire Server**.
3. To the left of the services list, click **Start** in the phrase "Start the service".



To stop the service, click **Stop** to the left of the services list.

#### Result

The Status is changed to "Running".

#### What to do next

If you are doing an initial installation, [deploy the latest client packages to Spotfire Server](#).

### Starting or stopping Spotfire Server (Windows, no service)

---

If you did not install a Windows service you must start Spotfire Server manually.

#### Prerequisites

You have successfully completed the initial configuration steps.

#### Procedure

1. Log in to the Spotfire Server computer as an administrator.
2. Open a command prompt and go to the following folder: `<installation_dir>/tomcat/bin`.
3. Run the `startup.bat` file.

**Result**

Spotfire Server starts.



The server will stop running if you close the command prompt or log off from the computer.

**What to do next**

If you are doing an initial installation, [deploy the latest client packages to Spotfire Server](#).

## Starting or stopping Spotfire Server (Windows, service exists, Integrated Authentication for SQL Server)

---

If your database server uses Integrated Windows Authentication (IWA) for SQL Server, your Spotfire Server must run as a Windows Domain user that has permission to use the Spotfire database.

**Prerequisites**

You have successfully completed the initial configuration steps.

**Procedure**

1. Go to **Control Panel > Administrative Tools > Services**.
2. Double-click the service called **Spotfire Server**.  
The Properties dialog opens.
3. In the Properties dialog, click the **Log On** tab.
4. Click the **This account** radio button and enter the user credentials of the Domain User that was set up with the database preparation script `create_databases_ia.bat`.
5. Make sure the necessary file permissions are assigned to the service account.  
See the [Spotfire® Server and Environment Security](#) guide for more details.
6. Click **OK**.
7. Start or stop the service.

**What to do next**

If you are doing an initial installation, [deploy the latest client packages to Spotfire Server](#).

## Starting or stopping Spotfire Server (Windows, no service, Integrated Authentication for SQL Server)

---

If your database server uses Integrated Windows Authentication (IWA) for SQL Server, your Spotfire Server must run as a Windows Domain user that has permission to use the Spotfire database.

**Prerequisites**

You have successfully completed the initial configuration steps.

**Procedure**

1. Log in to the Spotfire Server computer as the Domain User that was set up with the database preparation script `create_databases_ia.bat`.
2. Open a command prompt and go to the following folder: `<installation_dir>/tomcat/bin`.
3. Run the `startup.bat` file.

## Result

Spotfire Server starts.



The server will stop running if you close the command prompt or log off from the computer.

## What to do next

If you are doing an initial installation, [deploy the latest client packages to Spotfire Server](#).

## Starting or stopping Spotfire Server (Linux)

---

Follow these steps to start or stop Spotfire Server on a Linux system.

### Prerequisites

- You can run commands as root.
- You have successfully completed the initial configuration steps.

To start the Spotfire Server service, enter the following command:

```
sudo systemctl start spotfireserver-<version-number>
```

To stop the Spotfire Server service:

```
sudo systemctl stop spotfireserver-<version-number>
```

### What to do next

- Deploy the latest client package to Spotfire Server. For instructions, see [Deploying client packages to Spotfire Server](#).

# Deploying client packages to Spotfire Server

To install and use the the installed Spotfire client, Automation Services and Spotfire web clients, you must first deploy the `Spotfire.Dxp.sdn` (which includes files for the installed client and Windows web clients & Automation Services) and, optionally, the `Spotfire.Dxp.netcore-linux.sdn` (which includes support for Linux web clients & Automation Services) distribution file to the server. The client packages are also required for licenses to be shown in the administration interface.

## Prerequisites

- A Spotfire Server administrator has been created. For instructions, see [Creating an administrator user](#).
- You have downloaded the deployment kit containing the `Spotfire.Dxp.sdn` and `Spotfire.Dxp.netcore-linux.sdn` files from the Spotfire Download site. For details, see [Downloading installation software](#).

## Procedure

1. On the System Status page of the configuration tool, at the bottom of the list, click **Deploy client packages**.
2. In the Deploy Client Packages dialog, click **Browse**, and locate the previously downloaded file or files that are suitable for your system (deploy both files if you have node managers on both Windows and Linux hosts, and you want to support updates to the installed Spotfire client):
  - For node managers running on Windows, and to support updates of the installed Spotfire client, click `Spotfire.Dxp.sdn`.
  - For node managers running on Linux, click `Spotfire.Dxp.netcore-linux.sdn`.



If you want web client users to be able to run built-in data functions you must have the [Spotfire Service for Python](#) installed in your environment. See also the [system requirements for the Spotfire application in a web browser](#).

Because some of the calculations can take some time to finish, you might also need to adjust the [engine timeout](#) settings for the Python service.

3. Click **Open** to add the selected file.
4. In the Deploy Client Packages dialog, click **Deploy**.



To run Web Player or Automation Services on Linux, there are additional prerequisites that must be fulfilled. See [Running Web Player or Automation Services on Linux](#) on page 43 for more information.

## What to do next

[Start Spotfire Server](#)

# Node manager installation

To deploy Spotfire services (like Spotfire Web Player, Spotfire Automation Services, and the data function services) on a host, you must first install the node manager software to manage the service.



For production environments, we strongly advise that you deploy each of the different types of Spotfire services on separate, dedicated computers (physical computers, virtual machines, or containers).

If you still decide to deploy different services on the same computer (for example, for testing purposes), you must manage the resource allocation of the processes so they do not conflict with each other.

The Spotfire Server supports the following services. All of the services are supported on Windows and Linux. For more information, see [System Requirements](#).

- Spotfire® Web Player
- Spotfire® Automation Services
- Spotfire® Enterprise Runtime for R - Server Edition (a/k/a the TERR™ service)
- Spotfire® Service for Python
- Spotfire® Service for R

## Installation parameters

Parameter	Description	Default
INSTALLDIR	The node manager installation directory.	
NODEMANAGER_REGISTRATION_PORT	<p>Node manager registration port: nodemanager.properties: nodemanager.cleartext.port</p> <ul style="list-style-type: none"> <li>• Port used for initial setup of internal secure communication channels.</li> <li>• Needs only be accessible from Spotfire Servers.</li> </ul> <p> The port should not conflict with other existing ports in use in the computer. For more information about Spotfire ports and how they are used, see <a href="#">Ports and firewall configuration</a> on page 51.</p>	9080
NODEMANAGER_COMMUNICATION_PORT	<p>Node manager communication port (TLS): nodemanager.properties: nodemanager.port</p> <ul style="list-style-type: none"> <li>• Port used for secure (TLS) internal communication within the environment.</li> <li>• Needs only be accessible from Spotfire Servers.</li> </ul> <p> The port should not conflict with other existing ports in use in the computer. For more information about Spotfire ports and how they are used, see <a href="#">Ports and firewall configuration</a> on page 51.</p>	9443

Parameter	Description	Default
SERVER_NAME	<p>nodemanager.properties: nodemanager.supervisor</p> <ul style="list-style-type: none"> <li>Must match the host name of the Spotfire Server.</li> </ul>  Valid hostnames can only contain alphabetic characters, numeric characters, hyphens, and periods.	
SERVER_BACKEND_REGISTRATION_PORT	<p>Server backend registration port: nodemanager.properties: nodemanager.supervisor.cleartext.port</p> <ul style="list-style-type: none"> <li>Must match the registration port specified in the Spotfire Server installation.</li> </ul>	9080
SERVER_BACKEND_COMMUNICATION_PORT	<p>Server backend communication port (TLS): nodemanager.properties: nodemanager.supervisor.port</p> <ul style="list-style-type: none"> <li>Must match the backend communication port specified in the Spotfire Server installation.</li> </ul>	9443
NODEMANAGER_HOST_NAMES	<p>A comma-separated list of IP addresses, hostnames, and FQDN names that can be used by backend trust. These should be for the interface(s) on the computer where the node manager is installed.</p>  Valid hostnames can only contain alphabetic characters, numeric characters, hyphens and periods.  If you do not enter any values, the installer automatically provides values. After installation, confirm that these are correct in the following file: <node manager installation dir>\nm\config\nodemanager.properties.	
NODEMANAGER_HOST	The computer where the node manager is installed.	

For more information, see [Nodes and services introduction](#).

## Installing a node manager (interactively on Windows)

You can install a node manager interactively on Windows, using the installation wizard.



We strongly advise that you install each Spotfire node manager on a separate computer (physical computer, virtual machine or container).

The installation of the Spotfire node manager on Windows creates a Windows service that runs as the LocalSystem account.



If you change the node manager service account, make sure that the account is a local administrator and that it has read and write access to the node manager installation directory and subdirectories.

### Prerequisites

- Spotfire Server is installed and running.
- You have read/write access to the host computer.
- In the firewall of the computer on which you are installing the node manager, open the ports that will be used for the node manager and the services. The default ports are listed in the Installation parameters table under [Node manager installation](#).

## Procedure

1. Copy the node manager installation software to a temporary location on the target host.
2. Double-click `nm-setup.exe`.



You might be prompted to install .NET at this point.

3. On the installation wizard Welcome page, click **Next**.
4. On the License page, read the agreement, select **I accept**, and then click **Next**.
5. On the Destination Folder page you can change the location if you want to, and then click **Next**.
6. On the Node Manager Ports page, enter the port numbers that the node manager should use (or leave the defaults):
  - **Node Manager registration port**—The port that is used to set up secure internal communication channels. The default is 9080.
  - **Node Manager communication port (TLS)**—The port that is used for secure (TLS) communication within the implementation. The default is 9443.



The selected ports must be available and not blocked by a firewall.



To check whether a port is in use, on a command line enter `netstat -na`.

See the Installation parameters table on [Node manager installation](#) for detailed information about the available parameters.

For more information about ports and how they are used, see [Ports and firewall configuration](#).

7. Click **Next**.  
The Spotfire Server page opens.
8. On the Spotfire Server page, enter the following information, and then click **Next**.



These values must match the values you used when installing the Spotfire Server.

- **Server name**—The hostname of Spotfire Server.
    - Valid hostnames can only contain alphabetic characters, numeric characters, hyphens, and periods.
  - **Server backend registration port**—The registration port that you specified during Spotfire Server installation.
  - **Server backend communication port (TLS)**—The backend communication port that you specified during Spotfire Server installation.
9. On the Network Names page, select the computer names that can be used by backend trust. In general you can leave all the listed names as they are.
  10. On the Ready to Install page, click **Install**.
  11. Click **Finish** when done.

## What to do next

After the installation wizard finishes running, you must start the new node manager manually; see [Starting or stopping a node manager \(as a Windows service\)](#).

## Installing a node manager (RPM Linux) [Deprecated]

You can install a node manager on Linux using the RPM-based installer.



```
-n <NODEMANAGER_HOST_NAMES>
```



Include only those parameters whose default values you are changing, in addition to the server name.

- To use the default parameter values, run the `./configure` command, specifying the parameters without a value (`./configure -r -s -b`).



- To be prompted to provide the values, run the `./configure` command with no parameters (`./configure`).
- To provide specific parameter values, run the `./configure` command with explicit values for the parameters (for example, `./configure -s 81 -r 9081 -b 9444`).

See the Installation parameters table under [Node manager installation](#) for detailed information about the available parameters.

For more information about ports and how they are used, see [Ports and firewall configuration](#).

If successful, text similar to the following is shown on the command line:

```
Post install configuration of Spotfire Server Node Manager <version number> was
successful.
```

### What to do next

After installation, start the new node manager; see [Starting or stopping a node manager \(Linux\)](#).

If you intend to use the node manager with a Web Player or Automation Services service, you must also install some required packages. Read more in [Running Web Player or Automation Services on Linux](#) on page 43.

## Installing a node manager (tarball Linux)

You can install a node manager on Linux using the tarball installer.



You might need to configure Security-Enhanced Linux in your system, if enabled, to install the node manager using the tarball. Check the corresponding documentation for your operating system.



We strongly advise that you install each Spotfire node manager on a separate computer (physical computer, virtual machine or container).

### Prerequisites

- Spotfire Server is installed and running.
- You must have sudo access to the host.
- The commands `zip` and `unzip` are installed.
- In the firewall of the computer on which you are installing the node manager, open the ports that the node manager and the services use. The default ports are listed in the Installation parameters table under [Node manager installation](#).

### Procedure

1. Copy the node manager installation software package from its download directory to a temporary directory on the target host.  
For example, `/temp/`.

2. Create a destination directory for the node manager. The path should not contain any whitespace characters (as per Linux naming best practices).

Example:

```
mkdir -p /opt/spotfire/nodemanager/<version number>
```

3. From the destination directory, unpack the package.

Example:

```
cd /opt/spotfire/nodemanager/<version number>
tar xzf /temp/spotfirenodemanager-<version number>.x86_64.tar.gz
--strip-components 1
```

The node manager is installed in the destination directory.

4. In the node manager installation directory, execute the `configure` post installation script, specifying the values for the parameters.

Example:

```
./configure -m <NODEMANAGER_REGISTRATION_PORT> \
-c <NODEMANAGER_COMMUNICATION_PORT> \
-s <SERVER_NAME> \
-r <SERVER_BACKEND_REGISTRATION_PORT> \
-b <SERVER_BACKEND_COMMUNICATION_PORT> \
-n <NODEMANAGER_HOST_NAMES>
```



- To be prompted to provide the values, run the `./configure` command with no parameters (`./configure`).
- To provide specific parameter values, run the `./configure` command with explicit values for the parameters (for example, `./configure -s SPOTFIRE_SERVER.example.com -r 9081 -b 9444`).

See the Installation parameters table under [Node manager installation](#) for detailed information about the available parameters.

For more information about ports and how they are used, see [Ports and firewall configuration](#).

The following message is displayed on the command line.

```
Post install configuration of Spotfire Server Node Manager <version number> was
successful.
```

5. To configure the node manager to start when the computer starts, from the directory containing the `configure-boot` file, run the following command.



You must have root user access to the computer to run the following script.

```
./configure-boot
```

The following message is displayed on the command line.

```
Spotfire Server Node Manager <version number> has been successfully configured to start
on system boot.
```



Running the `configure-boot` script changes the installation directory ownership to user `spotfire` and restricts other users from performing actions on the installation directory.

## Customizing your installation

You can make your tarball installation more streamlined by using commands as in the following example:

```
SERVER_VERSION=<version>
mkdir -p /opt/spotfire/nodemanager/$SERVER_VERSION
tar xvf spotfirenodemanager-$SERVER_VERSION.x86_64.tar.gz --strip-
components=1 --directory=/opt/spotfire/nodemanager/$SERVER_VERSION

/opt/spotfire/nodemanager/$SERVER_VERSION/
configure -s "${SERVER_FRONTEND_PORT:-8080}" -
r "${NODEMANAGER_REGISTRATION_PORT:-9080}" -b
"${NODEMANAGER_COMMUNICATION_PORT:-9443}"
/opt/spotfire/nodemanager/$SERVER_VERSION/configure-boot
```

## What to do next

After installation, start the new node manager. You can start and stop the node manager from the command line. See [Starting or stopping a node manager \(Linux\)](#) or [Manually starting the node manager process \(tarball Linux\)](#). The second procedure does not require root user privileges.

If you intend to use the node manager with a Web Player or Automation Services service, you must also install some required packages. Read more in [Running Web Player or Automation Services on Linux](#) on page 43.

## Running Web Player or Automation Services on Linux

If you install a node manager on a Linux host with the intention to use it for a Spotfire Web Player or Automation Services service, there are a few additional things required. You should also be aware of some differences that your end users might encounter when opening analyses on clients running on different operating systems (for example, if the authors of the analyses use the installed Spotfire client (on Windows), and the end users run a web client from a Web Player service on Linux).

### Prerequisites

- You have reviewed the [system requirements](#) to make sure you use a supported Linux distribution.
- You have installed and trusted a node manager on your Linux host. For instructions, see [Installing a node manager \(tarball Linux\)](#) on page 41 or [Installing a node manager \(RPM Linux\)](#) [Deprecated] on page 39 and [Trusting a node](#).

Before adding the Web Player or Automation services instance to the node, follow the steps below to install required packages and fonts on the Linux node manager host.



New versions of the worker hosts might require updated prerequisites packages so this step is also needed on upgrades.

### Procedure

1. Make sure that the [required .NET version](#) is installed on your node manager host.  
For example, see [Install .NET on Debian](#), [Install .NET on Ubuntu](#), or other resources.
2. In the installation software for the deployment (see [Downloading installation software](#)) locate the file `SPOT_sfire_deploy_version.zip`, unzip it, and find the prerequisites script for your Linux distribution (from version 14.5 and forward).  
For example, if you want to use Debian: `prerequisites-debian12.sh`.

3. Run the script corresponding to your distribution, for example:

```
sh prerequisites-debian12.sh
```

This will install required system dependencies and recommended font packages on the host.

4. Optional: To use data connectors that require an ODBC driver, install the `unixodbc` package and `odbcinst`.
5. Optional: To use the Apache Drill connector, you must create a driver entry on the Linux host with the expected Windows name. See [Connector for Apache Drill](#) in the *Drivers and data sources in Spotfire* document for more information.
6. Optional: To use the Oracle, Teradata, or Vertica connectors, you must package the DLL files from NuGet packages and create an SPK file to deploy separately on the deployment area. See the information about [Oracle](#), [Teradata](#) and [Vertica](#), respectively, in the *Drivers and data sources in Spotfire* document, for details about the required DLLs. See also the *Developer Documentation* for information about [how to build packages](#).

## Result

When the steps have been completed, you can add a [Spotfire Web Player instance](#) or an [Automation Services instance](#) to the node. You must also add `Spotfire.Dxp.netcore-linux.sdn` to a deployment area on the Spotfire Server. For instructions, see [Deploying client packages to Spotfire Server](#).

When this is done, it is possible for end users to create and open analyses running on the Linux node.

Review the notes below for additional information.

There are some differences when using Web Player or Automation Services on Linux, compared to Windows.

- **Formatting of numbers and dates** can have minor differences (for example, [rounding](#) to a specific number of decimals is handled slightly differently on Linux and Windows).
- Available **fonts** can differ when running on Linux and Windows. Suitable fonts must be installed on the Web Player host to be able to show the same fonts in a Linux environment as those you have when creating analyses with the installed Spotfire client. By running the script in the steps below, you get some common fonts on both systems, but, to be able to use, for example, a specific company font, you must install that font separately on the Linux host. Rendering of fonts might still be different on the different systems. An administrator can specify [preferred fonts](#) as a preference, to help authors choose appropriate fonts.
- **Analyses with linked data** to files might be complex to handle on Linux due to differences in file paths and case-sensitivity on Linux and Windows. However, as an administrator you can add one or more aliases to provide both a Windows and a Linux path to the shared files in the [AllowedFilePath](#) setting of the `Spotfire.Dxp.Worker.Host.dll.config` file.
- **Custom extensions** must be compiled for the target framework, which differs in Linux and Windows. This means that extensions developed for services on Windows will not work when running the service on Linux, unless they are recompiled for the Linux target framework (due to differences in the .NET requirements). If using both operating systems, custom extensions must be compiled for both target frameworks. See *Building packages that work with the Web Player on Linux* in the [Developer Documentation](#) for more information.
- The information available from **certificates** when running on Windows and Linux is slightly different.



The following capabilities are not supported on Linux.

- **Kerberos** is not supported on Linux.
- Some **data connectors** are not supported on Linux: SAP BW, Oracle Essbase, and Microsoft SQL Server Analysis Services (SSAS)
- The two Automation Services tasks "Set Data Source Credentials" and "Set Credentials for External Connection" are not supported on Linux.
- Windows Metafiles (WMF & EMF) are not supported in visualizations when running on Linux.
- The scheduled updates cache is not available when running a Web Player service on Linux. This means that if a Linux node running scheduled updates is restarted, scheduled updates will need to load the data from the sources again, rather than reading data from the cache on disk.
- Data functions using the discontinued TIBCO Spotfire® Statistics Services server are not supported in Web Player or Automation Services on Linux. To use data functions on Linux, make sure to instead use the Spotfire Statistics Services. See the [Migration Guide](#) for more information.



## Starting or stopping a node manager (as a Windows service)

---

Start or stop a node manager Windows service from the Control Panel on the node manager computer.

### Procedure

1. Log in as an administrator to the computer on which the node manager is installed.
2. Go to **Control Panel > Administrative Tools > Services** and then, in the Services dialog, locate and select the service called **Spotfire Node Manager**.
3. To the left of the services list, click **Start** in the phrase "Start the service" to start the node manager Windows service.



To stop the service, click **Stop** to the left of the services list.

### Result

"Running" appears in the Status column.

### What to do next

After starting a node manager for the first time, you must indicate to the server that you "trust" it. See [Trusting a node](#).

## Trusting a node

---

After installing a node manager, add it in the Spotfire Server as a trusted node.

### Prerequisites

- You have followed the appropriate procedure in the [Node manager installation](#) section.
- Both Spotfire Server and the newly-installed node manager are running.

## Procedure

1. Log in to the Spotfire Server web administration pages and click **Nodes & Services**. (For instructions on accessing the server, see [Opening the Spotfire Server administration pages](#) on page 47.)
2. Under **Nodes & Services** in the navigation panel to the left, click **Untrusted nodes**.
3. On the Untrusted nodes page, select the check box next to the new node manager and then click **Trust**.
4. In the Trust node dialog, click **Proceed**.

## Result

After a while, the new node can be seen on the Network page.

## What to do next

[Service installation on a node](#) on page 48

## Opening the Spotfire Server administration pages

---

You can access the Spotfire Server administration pages through a browser on any computer in the domain.

There are two ways to open the administration pages:

- On the computer running Spotfire Server, click **Start**, go to the Spotfire Server folder, and click **Spotfire Server**.
- On any computer in the domain, go to `http://servername:port/spotfire`.



If you work in a clustered environment, it does not matter which server in the cluster you use. Changes made to one server are stored in the Spotfire database and are available to all servers. If your clustered deployment includes a load balancer, use the load balancer hostname in place of `servername` in the second method.

## Service installation on a node

---

After installing and trusting a node manager, you must deploy a Spotfire service and an instance on the node.

For each service you install on the node, select a capability, and the number of instances for that service.



The data function services can have only one service instance each.

For more information about installation of the various services, see its documentation:

- [Adding Spotfire Web Player instances](#)
- [Adding Spotfire Automation Services instances](#)

The data function services:

- [Spotfire® Enterprise Runtime for R - Server Edition](#)
- [Spotfire® Service for Python](#)
- [Spotfire® Service for R](#)

## Adding Spotfire Web Player instances

---

After installing and trusting a node manager, you create the Spotfire Web Player service and add the number of Spotfire Web Player instances that you want to make available. The Spotfire Web Player instances can then be accessed on any computer in the network.

### Prerequisites

- You have installed and trusted a node manager. For instructions, see [Installing a node manager interactively](#) and [Trusting a node](#).
- You have deployed client packages corresponding to the operating system of your node manager host to Spotfire Server. For instructions, see [Deploying client packages to Spotfire Server](#).
- If you are running the Web Player instance on a Linux host, you have installed the required additional packages as described on [Running Web Player or Automation Services on Linux](#) on page 43.
- The Spotfire Server and the node manager are up and running.



For production environments, we strongly advise that you deploy each of the different types of Spotfire services on separate, dedicated computers (physical computers, virtual machines, or containers).

If you still decide to deploy different services on the same computer (for example, for testing purposes), you must manage the resource allocation of the processes so they do not conflict with each other.

### Procedure

1. Log in to the Spotfire Server web administration pages and click **Nodes & Services**.
2. On the **Network** page, under **Node managers**, click the node manager to which you want to add the Spotfire Web Player service. There should be a green circle with a check mark next to the selected node manager.
3. In the **Services** pane (lower-right), click **Create new service**.

4. Make your selections in the Create new service dialog:
  - a) Under **Deployment area**, select the area you are using.
 

 Administrators generally create a Test deployment area to use as a staging server.
  - b) Under **Capability**, select **Web Player**.
  - c) Under **Configuration**, select the service configuration that you want to apply to the service.
  - d) Enter a **Service name**.
  - e) Under **Number of instances**, enter the number of instances of the service that you want to make available. For more information, see [Multiple service instances on one node](#).
  - f) Enter an **Instances name**.
  - g) Under **Port**, you can change the default of 9501.
 

 You will need different port numbers if you are adding more instances in the same Spotfire node.
  - h) Determine whether to use a **Resource pool**.
5. Click **Create service**.  
To view the progress of the installation, see the **Activity** page (under **Nodes & Services** in the navigation panel to the left).

#### What to do next

- If applicable, install Spotfire Automation Services.
- For information on the remaining setup tasks, see "Post-installation steps" in the Spotfire Server help.
- To use external actions with TIBCO Cloud™ Integration, or to access TIBCO Cloud™ Data Streams on the service, see "Configuring Spotfire Web Clients for OAuth2 with TIBCO Cloud™" in the Spotfire Server help.

## Multiple Web Player instances on one node

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Adding more than one Spotfire Web Player instance could be beneficial, particularly on large computers with NUMA architecture.

For failover reasons, it is recommended to have more than one instance in your environment. It is possible to have several instances in the same node, but it is recommended to distribute the instances along different nodes for high availability.

There are two main reasons for adding more service instances on the same node:

- If there are unstable analyses that are suspected to result in issues for the process, these analyses can be routed to one dedicated service instance using file routing rules. This isolates the analyses from other instances.
- A very large .NET heap may lead to long running garbage collections, blocking normal execution. By distributing analyses that lead to a large .NET memory footprint over more than one service instance, the .NET heap becomes smaller, which leads to quicker garbage collections.

There are some reasons to avoid using too many service instances:

- Each service instance requires some overhead, mostly in terms of memory usage but also some CPU usage.
- There is no data or document sharing between service instances.

- When using containerized Web Player services, you want to limit the number of processes within each container. In this case, you would use one Web Player instance per container image. This way, it is faster and easier to spin up/down containers for auto scaling or balancing within the K8s cluster.

You may want to experiment with fewer or more service instances, especially on large computers.

## Adding Spotfire Automation Services instances

After installing and trusting a node manager, you can create the Spotfire Automation Services and add the number of instances of this service that you want to make available. Spotfire Automation Services can then be accessed on any computer in the network.

### Prerequisites

- You have installed and trusted a node manager. For instructions, see [Installing a node manager](#) and [Trusting a node](#).
- You have deployed the client packages corresponding to the operating system of your node manager host to Spotfire Server. For instructions, see [Deploying client packages to Spotfire Server](#).
- If you are running the Automation Services instance on a Linux host, you have installed the required additional packages as described on [Running Web Player or Automation Services on Linux](#) on page 43.
- Spotfire Server and the node manager are up and running.

For production environments, we strongly advise that you deploy each of the different types of Spotfire services on separate, dedicated computers (physical computers, virtual machines, or containers).

If you still decide to deploy different services on the same computer (for example, for testing purposes), you must manage the resource allocation of the processes so they do not conflict with each other.

### Procedure

1. Log in to the Spotfire Server web administration pages and click **Nodes & Services**.
2. On the **Network** page, under **Node managers**, click the node manager to which you want to add the Spotfire Automation Services service. There should be a green circle with a check mark next to the selected node manager.
3. In the **Services** pane (lower-right), click **Create new service**.
4. Make your selections in the Create new service dialog:
  - a) Under **Deployment area**, select the area you are using.
 

Administrators generally create a Test deployment area to use as a staging server.
  - b) Under **Capability** select **Automation Services**.
  - c) Under **Configuration**, select the service configuration that you want to apply to the service.
  - d) Enter a **Service name**.
  - e) Under **Number of instances**, enter the number of instances of the service that you want to make available. For more information, see [Multiple service instances on one node](#).
  - f) Enter an **Instances name**.
  - g) Under **Port**, you can change the default of 9501 if you want to.

5. Click **Create service**.

To view the progress of the installation, see the **Activity** page (under **Nodes & Services** in the navigation panel to the left).

**What to do next**

For information on the remaining setup tasks, see "Post-installation steps" in the Spotfire Server help.

## Ports and firewall configuration

These are the main ports used by Spotfire. The following table indicates their function, the default port number, firewall requirements and, for internal ports, how to change the port when Spotfire has already been installed and configured.

Ports through which Spotfire receives communication (inbound ports) must be opened in any active firewall.

Ports through which Spotfire sends communication (outbound ports) are open by default unless they match a firewall rule that blocks them.

### Internal ports

The following ports are used for communication between Spotfire components.

Name of port	Function	Default	Firewall requirements	How to change port
 Public HTTP port The HTTP connector port and the HTTPS connector port are configured independently. You can use either of them or, in some cases, both.	Used for non-secure communication with installed and web clients.	80	On computers running Spotfire Server, these ports must be open.  Computers running installed Spotfire clients and web browser clients must have access to these ports.  Proxies, and load balancers in front of servers, also require access to these ports.	In the <code>server.xml</code> file, edit the relevant <code>Connector port</code> parameter.
HTTPS connector port	Used for secure communication with installed and web clients.	443		
Server back-end registration port	Used for setting up trust between the Spotfire Server and nodes.	9080	On computers running Spotfire Server, these ports must be open.	
Server back-end communication port	Spotfire Server listens to secure traffic from services on the nodes.  Used for secure traffic between nodes.	9443	Computers running node managers must have access to these ports.	

Name of port	Function	Default	Firewall requirements	How to change port
Information Services communication port	Used for communication with Information Services.  Information Services runs in its own sub-process on the Spotfire Server.	9445	On computers running Spotfire Server, this port must be open. No firewall configuration needed.	Run the command line reference <code>config-external-information-services-process --port=&lt;value&gt;</code>
Node manager registration port	Used for setting up trust between node managers and Spotfire Server.	9080	Computers running Spotfire Server must have access to these ports, and computers running node manager must open these ports and have access.  For example, if you run a service such as the Python service on one node and the Web Player on another node, then the Web Player must have access to the Python service through its communication port.	Edit the following file: <code>&lt;node manager installation dir&gt;\nm\config\nodemanager.properties</code>
Node manager communication port	Used for secure communication within the environment.	9443		
Service communication port	Used by Spotfire Web Player instances and Automation Services instances for secure communication and basic functionality.	9501	Computers running Spotfire Server must have access to these ports, and computers running node manager must open these ports and have access.  For example, if you run a service such as the Python service on one node and the Web Player on another node, then the Web Player must have access to the Python service through its communication port.	In the Spotfire Server web administration pages, under <b>Nodes &amp; Services</b> , on the Network page, select a service instance on the left, and then click <b>Edit</b> in the upper-right pane.
Spotfire Enterprise Runtime for R – Server Edition communication port	Used by the Spotfire Enterprise Runtime for R –Server Edition for secure communication and basic functionality.	9502		
Spotfire Service for Python communication port	Used by the Spotfire Service for Python for secure communication and basic functionality.	9503		
Spotfire Enterprise Runtime for R – Server Edition engine ports	Used by the Spotfire Enterprise Runtime for R engines running under the Spotfire Enterprise Runtime for R – Server Edition service.	61000-62000	No firewall configuration needed.	For information about changing the Spotfire Enterprise Runtime for R engine ports, see <a href="#">TERR service configuration properties</a> .
Spotfire Service for Python engine ports	Used by Python engines running under the Spotfire Service for Python.	62001-63000	No firewall configuration needed.	For information about changing the Python engine ports, see <a href="#">Spotfire® Service for Python configuration properties</a> .

Name of port	Function	Default	Firewall requirements	How to change port
Spotfire Service for R engine ports	Used by the R engines running under the Spotfire Service for R.	63001-64000	No firewall configuration needed.	For information about changing the R engine ports, see <a href="#">Spotfire® Service for R configuration properties</a> .
Clustering port	Used for secure communication within the environment. This port is the same for all servers in the cluster.	5701	These ports must be open between all the Spotfire Servers in the cluster.	Use the Spotfire configuration tool to change the port for the clustered servers.  On the Configuration page, click <b>Clustering</b> in the left pane.
Second clustering port	A second clustering port, used by Apache Ignite.	5702 		This port number is equal to the first clustering port number plus one.
Third clustering port	A third clustering port, used by Apache Ignite.	5703 		This port number is equal to the first clustering port number plus two.
Fourth clustering port	A fourth clustering port, used by Apache Ignite.	5704 		This port number is equal to the first clustering port number plus three.
JMX RMI port	If JMX RMI access is enabled, Spotfire Server opens a separate port for this purpose.	1099	Computers running monitoring clients must have access to this port.	
JMX RMI port ( Information Services)	If JMX RMI access is enabled, Information Services opens a separate port for this purpose.	1100	Computers running monitoring clients must have access to this port.	

### Outbound ports on the server

Spotfire Server uses the following ports to communicate with programs outside of Spotfire. To facilitate this communication, firewalls must allow outgoing traffic through these ports.

Type of port	Function	Default	Firewall requirements
Database communication port	The Spotfire database server listens to this port.	Oracle database: 1521 SQL Server: 1433 PostgreSQL: 5432	Computers running Spotfire Server must have access to this port.
LDAP port	An optional number indicating the TCP port that the LDAP service is listening on.	When using LDAP over TLS, the port number defaults to 389.  When using the LDAPS protocol, the port number defaults to 636.	
Global Catalog LDAP port	Active Directory LDAP servers also provide a Global Catalog containing forest-wide information, instead of domain-wide information only.	LDAP: 3268 LDAPS: 3269	
TIBCO Enterprise Message Service (EMS)	This service can be used to trigger scheduled updates. EMS listens to this port.	Non-secure connection: 7222 Secure connection: 7243	
Data connectors For information on available connectors, see 'Supported data sources' in the <a href="#">Spotfire User Guide</a> .	Data connectors listen to these ports.	Varies	
Kerberos/GSSAPI	Used by the Kerberos authentication method, as well as when authenticating to LDAP server using the GSSAPI method.	Fixed port 88 on the Active Directory domain controllers	
Microsoft Net Logon, SMB, and CIFS	Used by the NTLM v2 authentication method.	Fixed port 445 on the Active Directory domain controllers	
Open ID Connect providers	Used by the web authentication method.	443	
SMTP port	Used by Automation Services.	25, 2525, or 587 Secure SMTP: 465, 25, or 587	
Databases and other services used by Information Services	JDBC-compliant data sources and other services used by Information Services listen to these ports.	Oracle database: 1521 SQL Server: 1433 Netezza: 5480 Otherwise, it varies.	
JMX RMI port	If JMX RMI access is enabled, Spotfire Server opens a separate port for this purpose.	1099	Computers running monitoring clients must have access to this port.

Type of port	Function	Default	Firewall requirements
JMX RMI port (Information Services)	If JMX RMI access is enabled, Information Services opens a separate port for this purpose.	1100	Computers running monitoring clients must have access to this port.

# Spotfire Documentation and Support Services

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For information about the Spotfire® products, you can read the documentation, contact Spotfire Support, and join the Spotfire Community.

## Spotfire Documentation

The documentation for all Spotfire products is available on the [Spotfire Documentation](#) page. This page takes you directly to the latest version of each document.

To see documents for a specific Spotfire product or version, see 'All Spotfire products' at the end of the page, find your product and click the 'Release notes and previous versions' link of the product. On the product page, choose your version from the top right selector.

The website is updated frequently and is more current than any other documentation included with the product.

## Release Version Support

Some release versions of Spotfire products are designated as long-term support (LTS) versions. LTS versions are typically supported for up to 36 months from release. Defect corrections will typically be delivered in a new release version and as hotfixes or service packs to one or more LTS versions. See also <https://spotfi.re/lts>.

## How to Contact Support for Spotfire Products

You can contact the Support team in the following ways:

- For accessing the Support Knowledge Base and getting personalized content about products you are interested in, visit the support portal at <https://spotfi.re/support>.
- For creating a Support case, you must have a valid maintenance or support contract with Cloud Software Group, Inc. You also need a user name and password to log in to <https://spotfi.re/support>. If you do not have a user name, you can request one by clicking **Register** on the website.

## System Requirements for Spotfire Products

For information about the system requirements for Spotfire products, visit <https://spotfi.re/sr>.

## How to join the Spotfire Community

The Spotfire Community is the official channel for Spotfire customers, partners, and employee subject matter experts to share and access their collective experience. The Community offers access to Q&A forums, product wikis, and best practices. It also offers access to extensions, adapters, solution accelerators, and tools that extend and enable customers to gain full value from Spotfire products. In addition, users can submit and vote on feature requests from within the [Ideas Portal](#). For a free registration, go to <https://spotfi.re/community>.

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