

RSUITE CMS 5.0

INSTALLATION GUIDE

04/10/2019

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- [Orbis Technologies, Inc. Enterprise Content Management](#)
- [RSuite support \(log-in required\)](#)

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About This Book

RSuite[®] CMS is a robust content management application, especially suited to ingesting, storing, managing, transforming, and exporting XML documents, all within the context of a publishing enterprise. It includes a rich content model, support for reuse with containers, a search utility, and out-of-the-box workflow features.

This book details how to install or upgrade to the current release of RSuite 5 and provides guidance for back-up and recovery.



Terminology

container

A notional device for grouping content in the RSuite CMS user interface, in some ways similar to a folder in a file system. Containers “contain” other containers, [managed objects \(MO\)](#), and [container nodes](#).

What the UI shows as MOs and containers in a container are actually references to objects in the repository. However, a container node is part of a container. Thus,

- a particular MO or container can be in more than one container, but a container node can be in only one container
- if a container is deleted, its container nodes are also deleted, whereas the MOs and containers it refers to are unchanged

Containers can be assigned a type: art, audio, book, chapter, configuration, contracts, folder, media, part, photos, template, video, work collection, or a custom type. Types have distinctive icons and principally serve to help users organize material; however, they can be configured to define a default child type and customized to restrict the content.

container node

A notional device for grouping references to [managed objects](#) within a [container](#) or container node. A container node exists only in the context of a container and is deleted when the parent container or container node is deleted. It is presented in the UI like

this: 

extension point

A place declared by RSuite for adding function.

extension provider

The code that provides the function of the extension. It is typically a Java® class definition or an XML declaration. It is delivered to RSuite in a plugin jar.

managed object (MO)

A content entity stored by RSuite that is individually retrievable.

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Record information you need during the RSuite installation

Print this form or cut-and-paste it into a text editor. As you install server components, record URLs and other information that is required by the RSuite installation wizard. The RSuite and MarkLogic sections also have places to record information to be obtained or decisions you can make before you begin the installation.

Legend

- Bold-face values in the form are default values in the wizard. Make a note if you are using a different value, like a different data base name, and enter it during the installation.
- The installation guide uses "*rsuite-home*" to indicate the local directory where RSuite is installed. By default it is "C:\RSuite\" in Windows and "/opt/rsuite/" in Linux. These are the same values that are typically given to the system variable RSUITE_HOME.

For an upgrade, the installation wizard needs only the path of the current version's installation directory.

RSuite

Determine this information for the RSuite installation before you begin.

License owner	
License key	
RSuite Server (your workstation): Host IP address or name	e.g., localhost
Suggested RSuite installation path Install RSuite directly at the root directory. This manual refers to this path as <i>rsuite-home</i> .	For instance: Windows: C:\RSuite Linux: /opt/rsuite
Data Directory Location, where RSuite can write temp files and store non-XML assets	The field is filled in with the default: <i>rsuite-home</i> \RSuite-Data where you have entered <i>rsuite-home</i> in a previous step.
SMTP settings, to enable RSuite to send e-mails.	<u>RSuite mail host</u> : e.g., smtp.gmail.com <u>RSuite mail port</u> : default is 25



Is mail authentication enabled?: Select **Yes** if the mail server requires user name and password. The default is **No**.

SMTP setup

Entering a server address and port number and selecting True for "Is mail authentication enabled?" puts these properties into the `rsuite.properties` file:

```
rsuite.mail.host=address
rsuite.mail.port=port_num
rsuite.mail.auth.enabled=false
```

If `rsuite.mail.auth.enabled=true`, `rsuite.properties` must include

```
rsuite.mail.user=user_name
rsuite.mail.password=password
```

User Data: User Authentication

Use either Active Directory/Open LDAP or a local file; the latter is recommended for development environments.

When the Local File option is selected during installation

When you select the Local File option, the installation wizard creates or modifies three configuration files in the `rsuite-home\conf` directory: `rsuite.properties`, `role-mapping.properties`, and `rsuite.users.dat`.

1. These properties are added to `rsuite-home\conf\rsuite.properties`. Values are examples.

```
rsuite.auth.providers=file,local
rsuite.auth.type=file
rsuite.authentication.file=C:\\RSuite\\conf\\rsuite.users.dat
```

2. These rulesets are added to `rsuite-home\conf\role-mapping.properties`:

```
rulesets=AdministratorRule,NonAdministratorRule

ruleset.AdministratorRule.roles=RSuiteAdministrator
ruleset.AdministratorRule.rule.1=include user admin

ruleset.NonAdministratorRule.roles=RSuiteUser
ruleset.NonAdministratorRule.rule.1=include user nonadmin
```

3. The `rsuite-home\conf\rsuite.users.dat` file is created for authentication information.

You should define at least one user with administrator authority and one user without administrator authority. For example:

```
version:2
admin:adminpass:The Administrator:admin@yourcompany.com:RSuiteAdministrator
nonadmin:passw0rd:The Non Administrator:user@yourcompany.com:RSuiteNonAdmin
```

**Table 1: User definitions in user.dat file**

User name			
Password			
Full name			
E-mail address			
Roles	RsuiteAdministrator	e.g., RSuiteUser Editor	

When the Active Directory/Open LDAP option is selected during installation

1. These properties are added to *rsuite-home*\conf\rsuite.properties. Values are examples.

```
rsuite.auth.providers=activedirectory,local
rsuite.auth.type=activedirectory
rsuite.auth.ldap.protocol=ldap
rsuite.auth.ldap.host=86.7.5.309
rsuite.auth.ldap.port=389
rsuite.auth.ldap.root-dn=cn=Users,dc=paris_u,dc=edu
rsuite.auth.ldap.username=cn=Jean Buridan,cn=Users,dc=paris_u,dc=edu
rsuite.auth.ldap.password=plain:xxxxxxx
```

2. These properties are added to *rsuite-home*\conf\role-mapping.properties, with "ldapGroup" specified as shown:

```
rulesets=AdministratorRule
ruleset.AdministratorRule.roles=RSuiteAdministrator
ruleset.AdministratorRule.rule.1=include ldapGroup editors
```

Table 2: Information for LDAP

Host	
Port	389
Base DN (A distinguished name, generally of the form: dc=YourCompany, dc=com)	
User name (A distinguished name, such as cn=RSuiteApplication, ou=Applications, dc=YourCompany, dc=com)	
Password	



Java JDK

RSuite can use the Oracle® JDK or OpenJDK.

Enter the JDK installation path:

MarkLogic

Table 3: Information needed during the MarkLogic configuration.

Licensee	
License key	
MarkLogic admin ID	admin
MarkLogic admin password	admin
Forest name	rsuite (by convention)
Data base	rsuite (by convention)
XDBC server name	localhost , but <i>databasename-xdbc</i> is recommended
Server port	8003
Root path to modules directory	If you use the suggested RSuite installation path:
The MarkLogic configuration requires an entry, although you haven't installed RSuite yet. The module directory is <i>rsuite-home/modules_1_0</i> .	Windows: C:\RSuite\modules_1_0 Linux: opt/rsuite/modules_1_0

MySQL

Table 4: JDBC Connection to MySQL

MySQL installation directory	
Data base name	rsuite
Server host	localhost
Server port	3306
MySQL user name	



Password	
----------	--



Chapter 1

RSuite CMS server initial set-up

Topics:

- [Introduction: installing RSuite CMS](#)
- [RSuite CMS system requirements](#)
- [Server components](#)
- [Install the Java Development Kit \(JDK\)](#)
- [Install and configure the MarkLogic server](#)
- [Install and configure MySQL](#)
- [Prepare LDAP integration](#)
- [Install RSuite CMS](#)
- [Copy group-to-role-mapping file to proper location](#)

This chapter has instructions for doing a new installation of RSuite CMS 5.0. If you are upgrading to RSuite CMS 5.0, see Chapter 2.

The RSuite CMS software prerequisites are in [Server components](#) on page 15. Before you begin the installation, you need to record configuration decisions and information that are required by the RSuite installation wizard (see the list at [Install RSuite CMS](#) on page 20). There is a form for noting the information at [Record information you need during the RSuite installation](#) on page 7.

Filepath notation: "*rsuite-home*" is the directory where RSuite is installed. The suggested directory is `rsuite-home="C:\RSuite\"` in Windows and `rsuite-home="opt/rsuite/"` in Linux. These are the same values that are typically given to the system variable `RSUITE_HOME`.

The installation process for the RSuite CMS server comprises these high-level steps:

1. Install an Oracle Java[®] 7 or Java 8 Development Kit (JDK) or a complete OpenJDK 1.8 or later.
2. Install and configure a MarkLogic[®] server. If you have a MarkLogic server, you can configure a new database for RSuite's use.
3. Install and configure MySQL[™]. Some systems, such as Red Hat[®] Linux, usually have MySQL installed by default.
4. Install and configure your LDAP server, if you are using one.
 - Users are defined on an LDAP server, or within an RSuite configuration file, or both.
 - RSuite CMS has been tested with Active Directory[®] and OpenLDAP[®].
5. Run the RSuite CMS installer.



6. Start RSuite and access it using a web browser.
7. If necessary, define users in `rsuite-home/conf/rsuite.users.dat`.

Introduction: installing RSuite CMS

The RSuite CMS architecture integrates third-party components with the base RSuite components to form a complete server. The server is exposed as a J2EE application using standard application server mechanisms.

Since there is no single installer for all components, this installation guide takes you through the steps for installing the various components, configuring them individually, and then hooking them all up to create a working server. All the software components are cross-platform and are available for Windows[®] and Linux[®].

End users—the authors, editors, production managers, and other staff who interact with RSuite to perform their jobs—access RSuite through the browser-based interface. There is no RSuite-specific software installation required for these users. There is an administration interface available through the browser, and for administrators and developers there is a command-line administration client. Instructions for installing and running the client are in *Introduction to RSuite Architecture*.

RSuite CMS system requirements

Supported Operating Systems

RSuite CMS runs on these operating systems:

- Microsoft[®] WindowsServer[®] 2008 (x86), Microsoft Windows 2003 Server (x86)
- Microsoft Windows Server 2008 (x64), Microsoft Windows 2003 Server 64-bit Edition (x64), Windows Server 2012 R2
- Red Hat[®] Enterprise Linux[®] 5.0, 6.0, and 7.0 (x86 and x64)

Memory

These estimates assume all RSuite CMS components, including the MarkLogic[®] database, are installed on the same server. Distributed installations could reduce requirements for a given machine.

- A minimum of 8 GB is required.
- 32 GB or more is recommended for production environments.
- Apache Tomcat[®] is configured by default to relatively high JVM heap settings. This may need to be tuned further for a given environment.



Disk Space

As a first approximation for allocating space:

- For XML—At least 5 times the expected XML content size to be managed
- For Non-XML—At least 2 times the expected binary content size (to accommodate version history storage)

However, disk space requirements are usually increased by these factors:

- Versions of content objects in RSuite (both XML and non-XML)
- Layered metadata usage
- Managed object definitions and frequency
- Frequency of document updates
- MarkLogic index selections
- RSuite text extraction settings for Word and PDF files

In addition to the primary space for content, you need space for maintaining backups. See [Standard practice](#) on page 31. Orbis Technologies, Inc. Enterprise Content Management recommends early prototyping with representative content and use cases to determine accurate sizing estimates.

Browsers

RSuite CMS supports

On Windows systems:

- Microsoft® Internet Explorer® 10 and 11 on Windows 7
- Microsoft Edge on Windows 10
- Mozilla® Firefox®'s latest release on Windows 7 and 10
- Google Chrome™'s latest release on Windows 7 and 10

On Apple® iOS® systems:

- Google Chrome's latest release on iOS 10 and 11
- Safari®'s latest release

On Apple® OS X® systems:

- Safari®
- Firefox
- Chrome

On Linux systems:



Chrome
Firefox

W3C compliance

RSuite CMS adheres to W3C standards and thus operates correctly in many unsupported browser environments. However, RSuite Support is not able to assist with unsupported browsers; customers must deal with consequent problems.

Supported browser releases

- Internet Explorer 10 or 11
- Firefox browser, latest official release
- Chrome, latest official release
- Safari, latest official release

Server components

These are the third-party components required for the RSuite CMS installation.

Table 5: Required Software

Product	Version Required	Supplier	Comments
Oracle JDK	1.7 or 1.8	oracle.com	
OpenJDK	1.8 or later	https://www.azul.com/downloads/zulu/zulu-windows/	Use Oracle® JDK or OpenJDK.
MarkLogic	8, 9 (see note)	http://www.marklogic.com	If you purchased MarkLogic through Orbis Technologies, Inc., use the MarkLogic license key provided by Orbis to activate the software.
Note: MarkLogic 9 is compatible with RSuite 5.0.5 and later.			
MySQL	5.6.4 or later release of version 5	http://www.mysql.com	Use of any other RDBMS requires a separate support arrangement with Orbis Technologies, Inc.
LDAP Server	LDAP 3	Active Directory, OpenLDAP	Use of LDAP is optional.



Install the Java Development Kit (JDK)

1. Install the full package:

Oracle: JDK 7 or JDK 8, stand-alone JRE, source code.

OpenJDK:

- Windows installations use OpenJDK 1.8 or later. Download the OpenJDK installer from <https://www.azul.com/downloads/zulu/zulu-windows/>, since it includes the JRE etc.
 - Ubuntu, Red Hat Enterprise Linux, and CentOS installations use the OpenJDK version delivered with the operating system.
 - OpenJDK 1.8 has been validated with RSuite back to release 5.4.0.
2. Note the installation path, e.g., C:\Program Files\Java\jdk1.8.0_192

Install and configure the MarkLogic server

This procedure describes setting up the simplest RSuite configuration with MarkLogic Server on the same Windows machine as the RSuite CMS Server.

1. Install MarkLogic Server following MarkLogic installation instructions.
2. Ensure that the MarkLogic service is started.
 - a) If it needs to be started, select: **Start > MarkLogic Server > Start MarkLogic Server**
3. To open the MarkLogic administration center, select: **Start > MarkLogic Server > Admin MarkLogic Server > Right click > Run As Administrator**

If the MarkLogic license has not been registered, there is a subdued “License key not entered” link in the page's header bar. Depending on your licensing arrangement, the key came from MarkLogic or Orbis Technologies, Inc. The MarkLogic license key is not the same as the one you get from Orbis Technologies, Inc. with RSuite.

The license information looks like this:

- Licensee: *name*
 - Key: *xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xxxx* (alphanumeric characters)
4. Click on the link and enter the licensee name and license key.
 5. Press Enter.



MarkLogic completes some one-time processes.

6. Set up the MarkLogic administrator ID and password.
 - a) Make a note of the user ID and password.
The RSuite installation wizard asks for these as the “XDBC user name and password”.

7. Create a forest:
 - a) Go to **Configure > Forests > Create tab**.
 - b) Enter the forest name.

The simplest configuration is one forest and one database with the same name. The convention is to name the forest "rsuite".

- c) Click on **OK**
8. Determine the storage space required by the new database.
9. Decide where you want the database to be.

If you do not specify the data directory, the forest is created in the default forest directory.

10. To use a location other than the default, specify the data directory.

11. Create a database:
 - a) Go to **Configure > Databases > Create tab**.
 - b) Enter the database name.
You can use the same name as the forest.

The convention is to name the database "rsuite". However, RSuite can connect to any MarkLogic database. RSuite can have several databases on a single MarkLogic server, in which case the database names typically indicate the content.

- c) Set the merge timestamp to zero, to turn off MarkLogic's point-in-time versioning.
 - d) Click on **OK** to accept all the defaults.
12. Attach the forest to the database:
 - a) Go to **Configure > Databases > *your database name* > Forests > Configure tab**.
 - b) Under “Configure Forests in a Database”, select the **Attached** check box for the forest created above.
 - c) Click on **OK** to complete the attachment.
13. Create an XDBC connection:



- a) Go to **Configure > Groups > Default > AppServers > Summary tab**.
- b) Look in the Port column and note which ports are in use.
You need an unused port for the XDBC connection. Usually, port 8003 is used if it is available.
- c) Select the **Create XDBC** tab.
We recommend a name for the XDBC server in the form *dbname-xdbc*, but anything is acceptable.
- d) Enter a name for the XDBC server, e.g., *rsuite-xdbc*.
The path to the directory containing the RSuite CMS XQuery modules is required. If you haven't installed RSuite yet, the RSuite modules directory is *rsuite-home\modules_1_0*, e.g., in Windows, C:\RSuite\modules_1_0.
- e) In the root field, enter the path to the modules directory containing the RSuite CMS XQuery modules.
- f) Set the port to an unused value.
Port 8003 is usually available and used by convention.
- g) In the database drop-down list, select the database you configured earlier, e.g., **rsuite**.
- h) In the default XQuery language version drop-down list, select **1.0-m1**.
- i) Click on **OK** at the top of the page to save the settings.

14. Configure element range indexes and word queries in MarkLogic as needed.
For details, see the *RSuite Configuration Reference*.

MarkLogic is ready for use by the RSuite server.

Install and configure MySQL

1. Install MySQL.
2. Make a note of the user name and root password, as you need to specify them in the RSuite installation process.
3. Start the MySQL command console, e.g. **Start > MySQL > MySQL Server 5 > MySQL Command Line Client**.
4. Create the database *name* by issuing the command

```
create database name;
```
5. Make a note of the data base name.
You will enter the name during the RSuite installation.



The MySQL database is configured and ready for use by the RSuite CMS. The RSuite CMS server configures the schema at the initial start-up of the system.

Prepare LDAP integration

You can configure RSuite to map LDAP groups to user-defined roles in RSuite. RSuite roles are mostly used in designing process definitions for workflows; tasks can be assigned to roles. Roles are also used in context rules, which can be used to present actions (forms, workflows, or custom actions) in the user interface context menu.

1. Identify the names of roles to use in RSuite. Only one role is required: RSuiteAdministrator. All other roles are user-defined. If you are trying to install RSuite quickly and have not identified all roles, you can start with RSuiteAdministrator and add others later.

Note: If you are not using group-to-role mappings, you must create an LDAP group named "RSuiteUser" and each RSuite user must be in that group, in addition to any other group he is in.

2. Identify or create LDAP groups and users that will be mapped to RSuite roles. If you have not identified all RSuite roles, you can map LDAP groups or users to the RSuiteAdministrator role to get started.
3. If you are mapping LDAP groups to RSuite roles, create a group-to-role-mapping file. See [Copy group-to-role-mapping file to proper location](#) on page 22 in this guide for more information on the mapping file. You will need this mapping file after the RSuite CMS has been installed.

The simplest mapping file for setting up the RSuiteAdministrator role and getting RSuite started looks like this:

```
rulesets=Admin
ruleset.Admin.roles=RSuiteAdministrator
ruleset.Admin.rule.1=include user user_name
```

where *user_name* is replaced with the user name mapped to the RSuiteAdministrator role. A rule can also map a group:

```
ruleset.Admin.rule.1=include ldapGroup group_name
```

where *group_name* is the name of the LDAP group.

4. Make a note of the LDAP server information you need during the RSuite installation process:



ldap_username: Full distinguished name of a user authorized to connect (e.g., cn=RSuiteApplication, ou=ApplicationUsers, dc=somedomain, dc=companyname, dc=com)

ldap_password: password of the LDAP user

ldap_dc: base distinguished name (e.g., dc=rsidomain, dc=rsi, dc=com)

ldap_host: host name or IP where LDAP server resides

ldap_port: port number

Install RSuite CMS

To recap, before installing RSuite, you must:

- Have JDK installed: Oracle JDK 1.7, Oracle JDK 1.8, or OpenJDK 1.8 or later.
- Have MarkLogic and MySQL installed and configured
- Have your LDAP server installed
- Be logged into the server machine as a user with administrator privileges
- Have ready this information needed by the RSuite installation wizard:
 - RSuite license information: license owner and license key
 - RSuite installation directory path
 - RSuite server name: host and data directory
 - The installation path for the JDK you are using, Oracle or OpenJDK
 - MarkLogic: user name, password, server host name, and server port
 - MySQL: installation directory path, user name, password, server host name, and server port
 - User directory information (ActiveDirectory or OpenLDAP): full distinguished name of a user authorized to connect to the server, password, base distinguished name (DN), host name or IP address of LDAP server, and port

The RSuite installer is provided as a Java jar file that can be run from anywhere.

1. Run the RSuite installation jar: In Windows you may be able to double-click on the jar file; otherwise, execute it in the command window.

```
path>java -jar RSuite-5.0.0-setup.jar
```

or

```
[user@server path]$ java -jar RSuite-5.0.0-setup.jar
```

The RSuite CMS Installer starts and presents the language selection panel (currently only English is supported).



2. Complete the installation process.

In most large-scale production environments, RSuite and MarkLogic are not installed on the same server, and MarkLogic must be restarted.

3. If RSuite is installed on a different server from MarkLogic, restart MarkLogic after the RSuite installation is done.

Plug-ins delivered by the RSuite installation wizard

RSuite uses plug-ins for configuration and customization. A plug-in is a jar file containing configuration files, Java classes, user interface extensions, static reference files, and any other code or content needed for your system application. Most plug-ins are add-ons, but some are basic parts of RSuite's CMS application (the user interface). Default versions of all plug-ins are installed at *rsuite-home*\plugins, from which they are automatically deployed.

Start RSuite CMS

After completing the installation program, start RSuite.

On Linux

1. Copy *sample-rsuite-init.sh* to */etc/init.d/*, giving it a new name, such as "rsuite-init", with no ".sh" extension.

```
- cd rsuite-home/bin  
- cp sample-rsuite-init.sh /etc/init.d/newname
```

2. Modify the *newname* script as needed
3. Use the service to start and stop RSuite:

```
/sbin/service newname start  
/sbin/service newname stop
```

On Windows

Double-click on *rsuite-home*\bin\startup.bat or run it from the command prompt:

```
C:\>cd rsuite-home\bin  
C:\rsuite-home\bin>startup.bat
```

[Set up a Windows service for RSuite](#) on page 26 describes how to set up a Windows service for starting the RSuite server.



Start the browser client

Once the RSuite CMS web application is set up and the RSuite server has been restarted (or the web application otherwise activated), you can access the RSuite CMS Web user interface.

From a web browser, access the RSuite CMS user interface. The URL is in the form

`http://server:port/rsuite-cms`

Copy group-to-role-mapping file to proper location

If LDAP is enabled, RSuite does not implicitly use LDAP groups as proxies for RSuite roles, that is, assigning an LDAP group to a user does not assign RSuite roles to the user unless the group is mapped to the roles.

To map LDAP groups to RSuite roles, place the group-to-role-mapping file in either the local configuration directory or the user's home directory after RSuite is installed. The file can be copied and edited while RSuite is running.

1. Create the group-to-role-mapping file, `role-mappings.properties`, as described in the security chapter of *Introduction to RSuite Architecture*.
2. In a QA or production deployment of RSuite, copy the group-to-role-mapping file into `local_config/role-mappings.properties`, where `local_config` is the local configuration directory specified by the `rsuite.conf.alternate.dir` property in the `rsuite.properties` file:

```
rsuite.conf.alternate.dir=/opt/rsuite-data/yourcompany/local_conf
```

or

```
rsuite.conf.alternate.dir=C:\rsuite-data\yourcompany\local_conf
```

3. In a development environment, which might have many RSuite instances configured, copy the group-to-role-mapping file into `user_home/role-mappings.properties`, where `user_home` is the value of the Java System Property named "user.home".

Typical file paths for a user named "johnsmith" are:

Windows	C:\Users\johnsmith
Linux/Unix	/home/johnsmith
Mac OS X	/Users/johnsmith



Chapter 2

Upgrading to RSuite 5.0

Topics:

- [Estimating the effort required by an upgrade](#)
- [Upgrading to RSuite 5.0](#)

Use this chapter to upgrade to RSuite 5.0 from RSuite 3.7.x, RSuite 4.0.x, or RSuite 4.1.x. If you are upgrading from a release earlier than 3.7, see the [RSuite 4.1 Installation Guide](#)

Workflows and RSuite 5.0.0

- The workflow engine inside RSuite has been changed from JPBM to Activiti. Orbis Technologies, Inc. Enterprise Content Management is developing a migration tool to convert the workflow SQL database to the correct format. General documentation for the migration will be provided with the migration tool.
- You might also require manual changes to your workflow implementation configuration. Contact support if you need more information about migration. Tell your account manager if you want assistance executing the upgrade.
- The workflow plug-in does not apply to RSuite 5.0.0. Consequently, DITA processing that depends on workflows will not be available until the workflow upgrade is complete.

File path notation: "*rsuite-home*" is the directory where RSuite is installed. The suggested directory is `rsuite-home="C:\RSuite\"` in Windows and `rsuite-home="opt/rsuite/"` in Linux. These are the same values that are typically given to the system variable `RSUITE_HOME`.

Estimating the effort required by an upgrade

Many factors influence the time and effort required to upgrade to a newer version of RSuite. Your estimate of how much time an upgrade will take should take into account:

- How familiar with RSuite customizations is the person performing the upgrade? If he is not familiar with RSuite customizations, allow time to evaluate the code to identify where code must be updated.
- Whether new features being implemented? Refactoring code to implement new features adds scope. For example, are you converting container nodes to containers of a specific type?
- Whether any special migration processing is necessary, as there is for workflows in RSuite 5.0.
- Whether there are extensive user interface customizations? User interface customizations can take longer than expected to revise.



- Whether any code points use deprecated interfaces and classes? Deprecated interfaces and classes allowed in your current release might have been removed in the development to RSuite 5.0
- How much custom code needs evaluation for possible updating, based on new features in RSuite?

Upgrading to RSuite 5.0

Use this procedure to upgrade to RSuite 5.0.

When you upgrade to a new version, the installer makes a backup copy of your current installation. It is not necessary, but is a good idea to make your own backup in case unrecoverable errors occur during the upgrade.

Note: In an upgrade, the installation wizard needs only the path of the current version's installation directory. You do not need to enter configuration information about components as you do in a new installation.

1. Make a backup of your current installation.

Installing plug-ins, RSuite 5.4.1 and later: Beginning with 5.4.1, default versions of all plug-ins are installed at *rsuite-home*\plugins, from which they are automatically deployed. Before 5.4.1, plug-ins were delivered to *rsuite-home*\developer\plugins and had to be copied to the plug-in directory. If you have customized plug-ins, they must be backed up so they can be reinstalled.

2. Make a note of the directory where you are installing the new version. The RSuite installation wizard asks for this information.
3. Start the RSuite 5.0 installer. See also [Install RSuite CMS](#) on page 20

```
path>java -jar RSuite-5.0.0-setup.jar
```

or

```
[user@server path]$ java -jar RSuite-5.0.0-setup.jar
```

4. Select the **Yes, this is an upgrade** option and proceed through the installation steps
5. For Linux, you must chown the install tree to the user designated in the start-up script. Assuming the user is "rsuite", the procedure is:

```
$ cd /opt/rsuite  
$ chown rsuite:rsuite -R *
```



6. If you have installed the new version of RSuite into a new directory, change your MarkLogic configuration to update a reference to the *rsuite-home/modules* directory.
7. After the installation is complete, start RSuite 5.0 and verify that the installation works as expected:

On Windows

Double-click on *rsuite-home\bin\startup.bat*, or run *startup.bat* from the command prompt:

```
C:\>cd rsuite-home\bin
C:\rsuite-home\bin>startup.bat
```

See also [On Windows](#) on page 21 in [Start RSuite CMS](#) on page 21

On Linux

1. Copy the *sample-rsuite-init.sh* to */etc/init.d/* and rename it, perhaps as *rsuite.sh*.

```
- cd rsuite-home/bin
- cp sample-rsuite-init.sh /etc/init.d/newname.sh
```

2. Modify *newname.sh* as needed and save it to */sbin/service*.
3. Use the service to start and stop RSuite:

```
/sbin/service newname start

/sbin/service newname stop
```

8. Review the resulting RSuite directory to ensure that configuration files were copied back from the previous installation directory.
9. Manually upgrade and deploy any UI extensions to work with the 5.0 design.
10. Upgrade your plug-in XML descriptors (*rsuite-plugin.xml* files) to match the annotated example in the [Annotated RSuite Plug-in Descriptor \(rsuite-plugin.xml\) for RSuite 4](#).
11. Reinstall customized plug-ins to *rsuite-home\plugins*.



Chapter 3

Set up a Windows service for RSuite

Topics:

- [Use the Tomcat service application](#)

The Windows Services application starts, stops, and restarts the RSuite Windows service. The Tomcat Service application configures, starts, stops, and restarts the RSuite service.

For more information about setting up a Windows service with Apache Tomcat, see the Apache Tomcat 7 Windows service how-to [Web page](https://tomcat.apache.org/tomcat-7.0-doc/windows-service-howto.html) (<https://tomcat.apache.org/tomcat-7.0-doc/windows-service-howto.html>).

The [Tomcat service application](#), tomcat7w.exe, presents a GUI for managing the service.

Perform these steps to set up a Windows service for RSuite.

1. Copy the Tomcat installation ZIP file from the Apache Archive [download site](#) into a temporary location.
The latest tested Tomcat release is <http://archive.apache.org/dist/tomcat/tomcat-7/v7.0.91bin/apache-tomcat-7.0.91-windows-x64.zip>. This is the one delivered during the RSuite installation process. However, we expect any 7.0.x release to be compatible.
2. Copy the executables, tomcat7.exe, tomcat7w.exe, and service.bat from the ZIP archive to the *rsuite-home*\tomcat\bin directory

In the next step, *servicename* is the name of the service; it is used with the "tomcat7" and "net" commands to control and configure the service. *servicename* can be anything, for example "TomcatRSuite4-1" or "TomcatRSuite5".

3. If this is an upgrade, remove the old service. In the Windows command prompt enter

```
C:\>cd rsuite-home\tomcat
\bin
rsuite-home\tomcat\bin>tomcat7 //DS//servicename
```

4. At the Windows command prompt, run service.bat, for example,

```
C:\>cd rsuite-home\tomcat\bin\
rsuite-home\tomcat\bin\>service.bat install servicename
```

The service appears in the Windows services viewer as, for instance, "Apache Tomcat 7.0 TomcatRSuite5".



Some common methods of setting memory do not work for starting a service. For instance, memory settings in `setenv.bat` or `catalina.bat` are ignored. As well as the command line method shown here, you can use the Tomcat GUI—see [Configure Java memory](#) on page 27.

5. At the command prompt, allocate memory for the Java VM:

```
rsuite-home\tomcat\bin>tomcat7 //US//servicename --JvmMs=256 --  
JvmMx=2048 --JvmSs=2048M
```
6. Click on **Start > Control Panel > Administrative Tools > Services** to open the Windows Services dialogue.
7. Right-click on the newly created service—e.g., "Apache Tomcat 7.0 RSuite5"—and select **Properties**
8. In the Start-up type: field, select either **Automatic** or **Manual**.
"Automatic" ensures the service starts when the server machine is restarted.
Or use the Tomcat service—see [Configure how the service starts](#) on page 28.
9. Under Service Status, select **Start** or **Stop > Start**.
10. Click on **OK**.
11. Go to [Use the Tomcat service application](#) on page 27 and follow the instructions to set the path to the Java Virtual Machine.
12. Test the newly started service:
 - a) Try to connect to RSuite.
 - b) Check the server log file, `rsuite-home\logs\rsuite-server.log`.

Use the Tomcat service application

After the RSuite service has been created, use the Tomcat GUI application to configure the Java virtual machine's memory allocation and to start, stop, and restart the RSuite service.

Configure Java memory

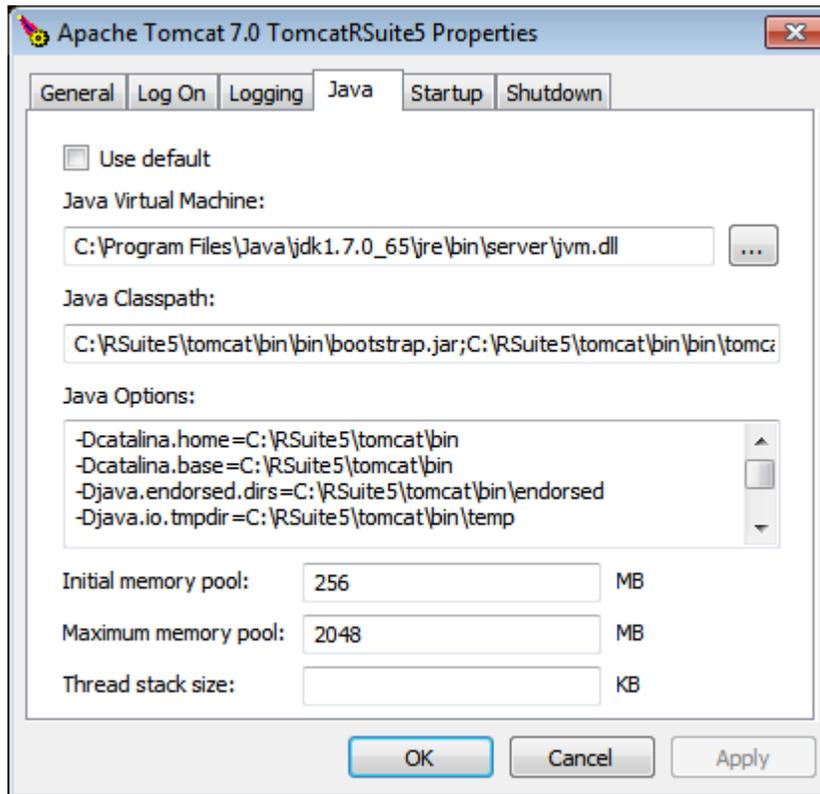
1. To open the Tomcat GUI application, at the command prompt, enter

```
C:\>cd rsuite-home\tomcat\bin  
rsuite-home\tomcat\bin>tomcat7w.exe //ES//TomcatRSuite5
```

The Apache Tomcat 7.0 Properties dialogue for the TomcatRSuite5 service appears.



2. Select the Java tab.



3. On the Java tab, set the path in the Java Virtual Machine field:
 - a) Clear the Use Default box.
 - b) Browse to the Java Virtual machine DLL.
For example: C:\Program Files\Java\jdkv.r.r_pp\jre\bin\server\jvm.dll
 - c) Select jvm.dll and click on Open.
4. In the Initial Memory Pool field, enter 256.
5. In the Maximum Memory Pool field, enter 2048.
6. Click on OK.

Configure how the service starts

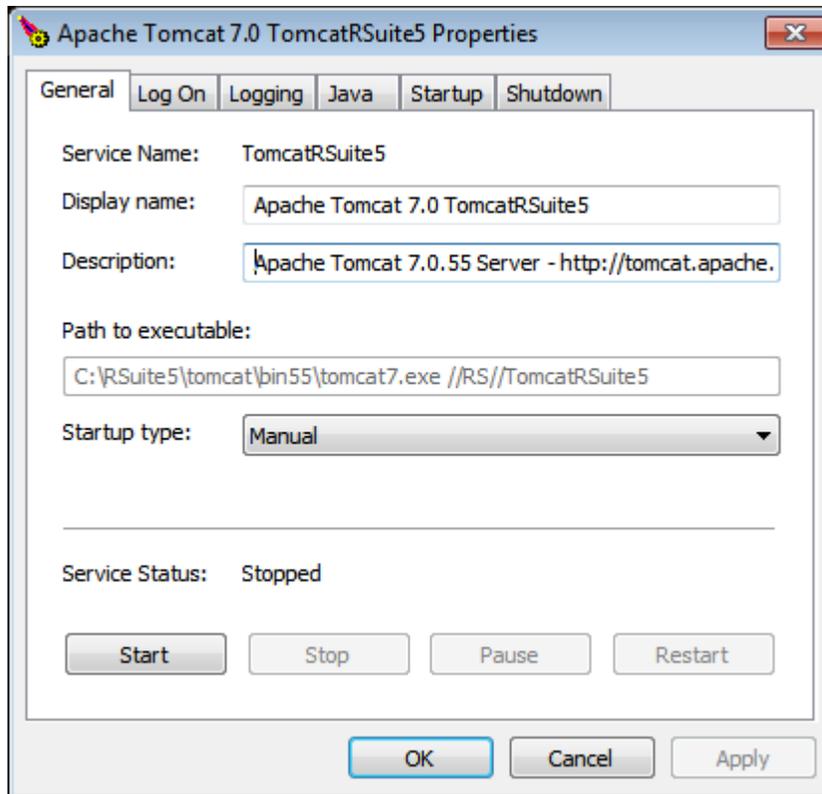
1. At the command prompt, enter

```
C:\>cd rsuite-home\tomcat\bin>
rsuite-home\tomcat\bin>tomcat7w.exe //ES//TomcatRSuite5
```



The Apache Tomcat 7.0 Properties dialogue for the TomcatRSuite5 service appears.

2. Select the General tab.



3. In the Startup type: field, select **Manual** or **Automatic**.
4. Click on **OK**.



Chapter 4

RSuite disaster recovery

Topics:

- [Built-in backup and recovery feature](#)
- [Backup](#)

This chapter advises IT groups implementing backup and recovery procedures for an RSuite installation, using available and preferred tools.

Built-in backup and recovery feature

RSuite includes a backup and restore service, controlled from the admin console. It is adequate for only basic scenarios, since it has these limitations:

- While the schedule service is disabled during the backup, all other means of modifying data remain available, including the CMS UI and workflows.
- The RSuite, MarkLogic and MySQL processes must all have access to the specified backup location.
- The MarkLogic database name must not contain hyphens.
- If the MarkLogic backup fails, the failure is not reported in the Admin UI.
- The service does not include all product configuration files (e.g., role-mappings.properties).
- It does not include custom configuration and data files included in the RSuite data stores.

When the backup is successful, it includes:

- A copy of the non-XML data store
- A point-in-time backup of the MarkLogic database, created by the MarkLogic process. MarkLogic configuration files are included.
- A backup of the MySQL database, created by mysqldump
- Some of RSuite's configuration files

Backup

Backups should always include data files; it is advisable to include configuration files; and it is sometimes desirable to include application files. This discussion focuses on the data and configuration files. It assumes that your recovery procedures can restore an environment's operating system and application files before they restore the data and configuration files from the backup.



Standard practice

Regardless of the specifics of your SLA, Orbis Technologies, Inc. Enterprise Content Management recommends this basic regimen:

- Daily hot backups
- Weekly cold backups
- Integrating with the organization's tape backup process, or equivalent
- Testing the backup and recovery procedures periodically in each RSuite environment to ensure that they are still valid and to keep operators familiar with the process.
- Backing up these classes of files, as discussed below:
 - Custom files
 - Hot folders
 - Log files
 - MarkLogic files
 - MySQL files
 - Non-XML content
 - RSuite data and configuration files
 - Workflow data directory
- Creating backups on file systems other than the production storage
- Having the two most recent hot backups and last cold backup available without going to tape

The last two items have storage implications, and need to be taken into consideration when planning how much storage to present to each server, and how that storage is presented.

Hot backups and data inconsistencies

Data inconsistencies may exist between the data stores of a hot backup, since data may be changing while the backup is being created. And even though the recommended means to backup the MarkLogic database creates a point-in-time backup, this is not necessarily true for the other data stores. In most cases, these inconsistencies are inconsequential and acceptable to the business. Nonetheless, this detail needs to be known by the stakeholders. One can minimize the number and significance of inconsistencies by scheduling the backup when there is little system activity. Consider background processes as well, such as any that add files to the hot folders, workflow processes, and scheduled jobs.

Cold backups

A cold backup ensures consistency between the data stores. This type of backup requires that the RSuite process be stopped. Workflow process instances processing an automated step are interrupted and do not resume until RSuite is restarted. These workflow process instances restart at the beginning of the automated step that was interrupted. Workflow designers are to keep this behavior in mind. This is a reason why an automated step should not take hours to finish. Orbis Technologies, Inc. recommends cold backups in production at least weekly.



Once scripted, neither backup requires manual intervention. System monitoring should be used to ensure the backups are successful, and adequate space is available for the next one.

A bare-bones backup procedure

A basic scripted backup should proceed along these lines. Change the details to meet local contingencies.

1. If you are including hot folders in the backup, disable the hot folders.
2. If a cold backup, stop the RSuite process. Leave MarkLogic and MySQL running.
3. Initiate the non-XML backup.
4. Initiate the MarkLogic backup (always hot; see below).
5. Initiate the MySQL backup.
6. Copy configuration files into the backup.
7. Copy the workflow data directory into the backup.
8. Account for log files. In particular, the workflow log directory should be included in the backup (details below).
9. Backup any custom configuration and data files not included above, including hot folders if you are saving them.
10. If you disabled hot folders for the backup, enable them.
11. If a cold backup, start the RSuite process after everything is copied into the backup. It is OK to start the RSuite process before the MarkLogic backup process is complete.

Data and configuration files

These data and configuration files must be included in a backup.

RSuite Files

RSuite has several configuration files. Typically, they are located in *rsuite-home/conf* and include:

rsuite.properties

RSuite's primary configuration file.

In addition to backing this file up, check it for instances of the `rsuite.conf.auxiliary.file.list` property. The property may identify custom resources that should be included in the backup.

role-mappings.properties

For RSuite instances integrated with LDAP, this file maps LDAP groups and roles to RSuite roles. Include this file in backups.

rsuite.users.dat

This file is associated with a third means to configure users in RSuite. It is used in development environments and should not be in a production environment. If the RSuite instance is dependent on this file, include the file in the backup.

dita-open-toolkits.properties



Identifies (for the system) and describes the DITA Open Toolkit plug-ins.

If additional RSuite configuration files are introduced or modified, include them in the backup. These directories, at least, should be checked:

- *rsuite-home/tomcat/conf*
- *rsuite-home/tomcat/webapps/rsuite/WEB-INF/classes*

MarkLogic Files

MarkLogic's backup and restore capabilities should be used for its data and configuration. Other techniques, such as making a snapshot of the file systems, may not be supported by MarkLogic and therefore not by Orbis Technologies, Inc. Enterprise Content Management.

The MarkLogic process must be running before, during, and after the backup. Typically, one schedules these backups from MarkLogic's Admin console. The backup schedule should match that of RSuite's other data stores.

The backup contains the data in the database at the point in time that the backup is initiated.

If you have several MarkLogic databases, the backup for each must be scheduled. Alternative approaches include:

- Scheduling one or several MarkLogic jobs to initiate the MarkLogic database backups.
- Initiating the backup from the same script that is responsible for backing up the rest of RSuite.

MarkLogic's configuration files are included in the backups. However, by design these configuration files are not applied during the restore process.

A restore procedure should include a step to compare MarkLogic's current configuration files with those in the backup.

MySQL Files

The "mysqldump" command is able to create a backup of a MySQL database. This is the recommended method. When the MySQL data is on the same server as RSuite, typically one script is responsible for creating a backup containing RSuite's MySQL database, the non-XML data, and RSuite's configuration files.

Any non-data changes made to MySQL after installation should be included in the backup.

Workflow Data Directory

Closely associated with the MySQL database, the workflow data directory should also be included in the backup. This directory is identified by the `rsuite.workflow.baseworkfolder` property. Within could be data that active workflows are dependent on. This is where, for example, RSuite copies files from the hot folders. When the RSuite process is started, RSuite restarts workflow processes which were between transitions when the last RSuite process



stopped. This is a normal condition, and resumed instances may require data in this directory. Workflow designers are to be cognizant of this behavior.

This directory may also include obsolete data. A separate process should be configured to maintain this directory.

Hot Folders

The contents of hot folders can be included in a backup, although it is not usually done. (After all, files rarely stay in the hot folders very long.) So long as the RSuite process is healthy and the hot folder is not disabled, RSuite copies files from the hot folder to the workflow data directory soon after they are copied to the hot folder. If these files are critical or difficult to replace, you might want to include them in the backup.

Non-XML content

In addition to XML, RSuite can manage non-XML content, including rich media. This content is represented in MarkLogic, but it is not stored there. The `rsuite.nonxml.dir` property identifies the location of RSuite's primary non-XML directory. This content should always be included in a backup.

Besides the primary non-XML directory, RSuite allows one to configure directories to spread this data store over several file systems. These are known as storage buckets. This is a good idea when RSuite manages a large amount of non-XML content, as it makes file systems more manageable and can reduce backup and recovery times (increased parallelism). These locations are not defined by properties. Rather, RSuite's Groovy API is typically used to configure them. Each storage bucket should be included in a backup.

How one makes a backup of this data store may vary by size. For some, it may be quick enough to create a compressed file. For others, a tool such as `rsync` makes more sense. With the latter, make sure you have a complete copy associated with each viable recovery point, as opposed to continuously synchronizing to a single copy.

Log Files

Decide which log files are desired in the backup, even if those log files are not part of the recovery procedure.

The workflow log directory should be included in the backup and restored by the recovery procedure. Otherwise, workflow processes started since the backup reuse the associated workflow logs, which is confusing to those referring to those log files.

Custom Files

Custom configuration and data files may become part of the solution, before and after the initial production rollout. It is important to keep track of these, include them in the backup, and list them in the backup and recovery procedures. They can include but are not limited to:

- Custom relational databases



- Custom configuration and data files