SpringSource dm Server™ User Guide

Rob Harrop
Paul Kuzan
Sam Brannen
Damilola Senbanjo
Paul Harris
Christopher Frost
Ben Hale

2.0.0.M2

Table of Contents

1. Installing

1.1 Prerequisites

The SpringSource dm Server requires Java SE 5 or later to be installed. Java is available from Sun and elsewhere.

1.2 Installing from the ZIP Download

Downloading the ZIP file

SpringSource dm Server is distributed as a ZIP file. This can be downloaded from here. Follow the instructions to obtain a username and password.

Installing

Linux

To install the SpringSource dm Server on Linux, unzip the distribution package to the desired installation directory. For example, to install into `/opt`:

```
prompt$ unzip springsource-dm-server-2.0.0.M2.zip -d /opt
```

This creates a directory called `springsource-dm-server-2.0.0.M2` under `/opt`.

SpringSource dm Server requires write access to the installation directory, in this case `/opt/springsource-dm-server-2.0.0.M2`. Typically this means it must be run as the user that installed it, or the installation directory's ownership must be changed.

Microsoft Windows

To install the SpringSource dm Server on Windows, unzip the distribution package to the desired installation directory. You should use a zip application such as 7zip, not the built-in folder decompression. Note that both Windows and Java 5 have some issues with long file names and file paths, so we recommend installing to the root directory of your chosen drive.

1.3 Post-installation steps

Set environment variable variables

JAVA_HOME

The SpringSource dm Server uses the `JAVA_HOME` environment variable to locate the `java` executable. Configure this environment variable to point to the home directory of the Java 5 or Java 6 installation on your computer.

SERVER_HOME

As a convenience it is recommended that you create an environment variable that points to the SpringSource dm Server installation directory. Note that the SpringSource dm Server does not require that such an environment variable has been set. This variable may have any name of your choosing. The SpringSource dm Server's documentation assumes that the variable is named `SERVER_HOME`.

Linux

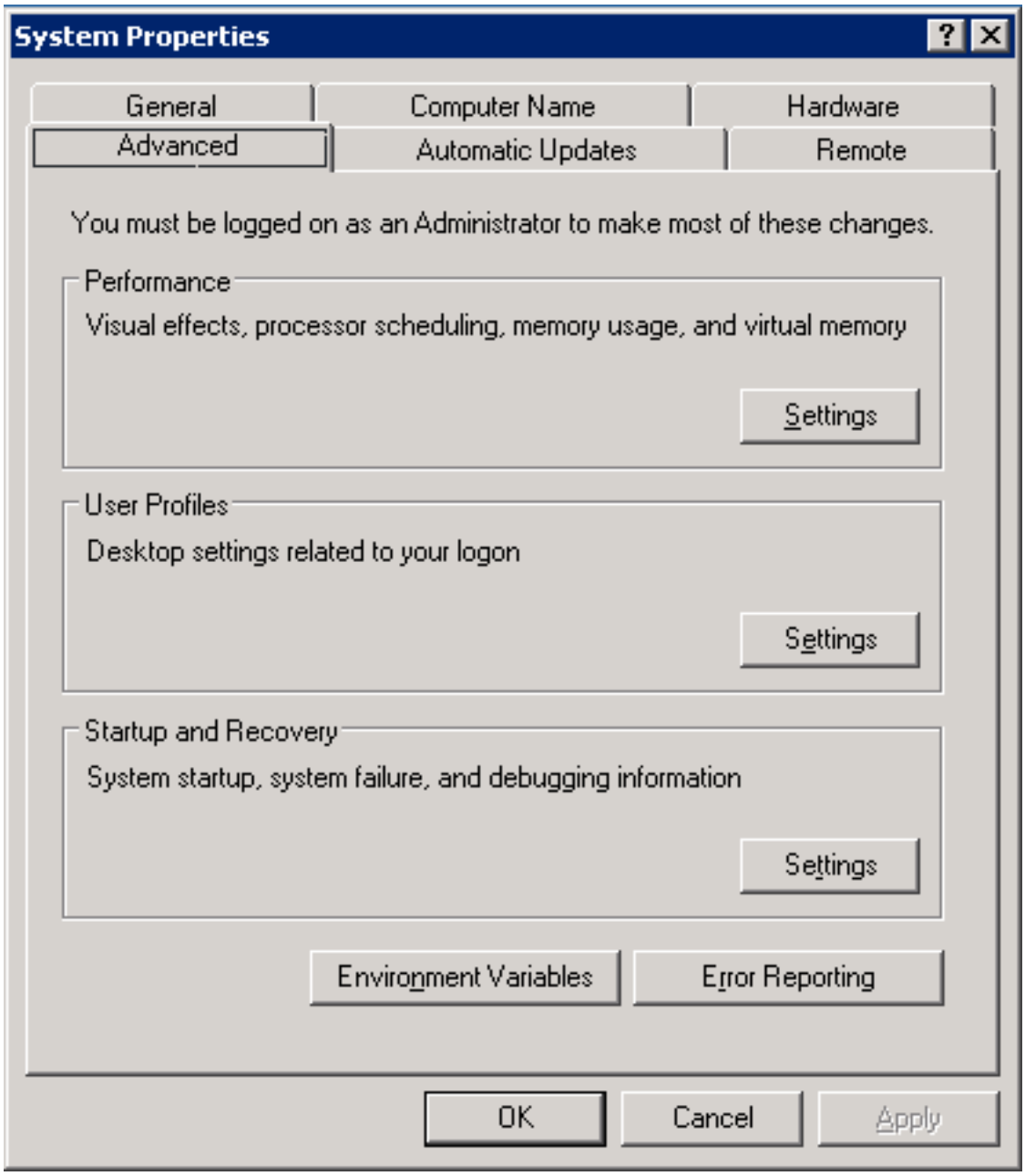
Edit the `.profile` file in your home directory to add the `SERVER_HOME` and `JAVA_HOME` environment variables. For example, if you installed into `/opt`:

```
export SERVER_HOME=/opt/springsource-dm-server-2.0.0.M2/
export JAVA_HOME=/user/java/jdk1.6.0_17
export PATH=$JAVA_HOME/bin:$PATH
```

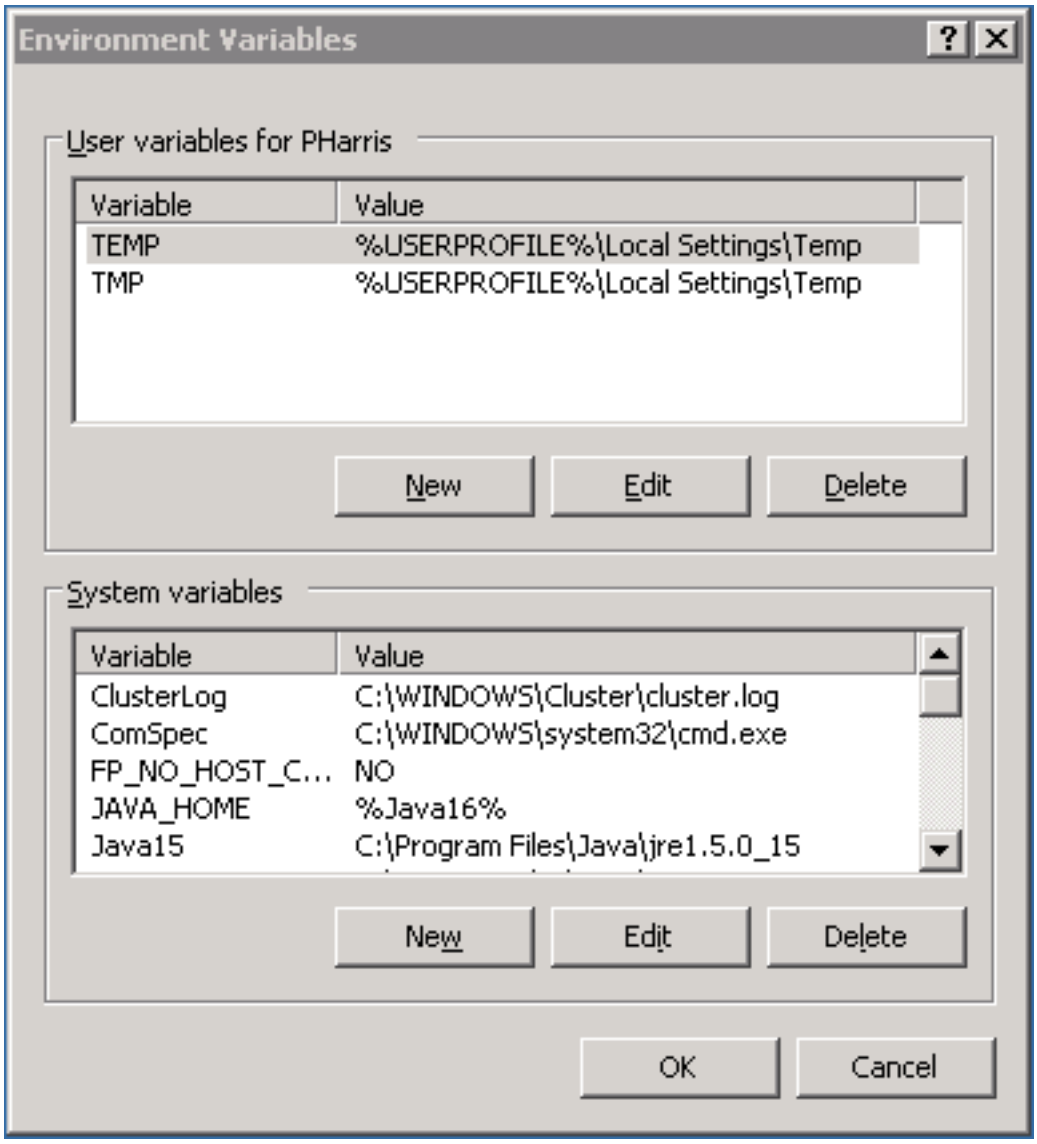
Microsoft Windows

This section shows how to add `SERVER_HOME` as a system variable on Windows. Follow the same procedure to add or update the `JAVA_HOME` environment variable.

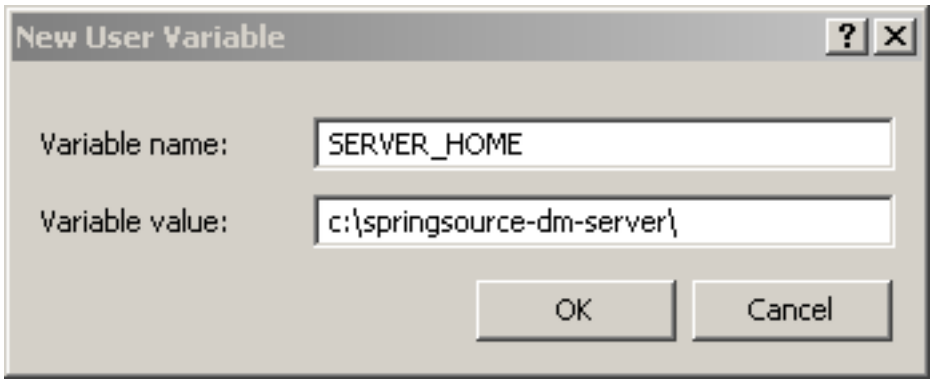
From the Start menu, open the Control Panel and double-click on 'System'.



Click the 'Advanced' tab and select 'Environment Variables'. Next, click the 'Edit' button in the 'System Variables' section.



This will display the 'Edit System Variable' window. Enter `SERVER_HOME` as the 'Variable name' and the installation directory as the 'Variable value'. Click OK.



2. Starting and Stopping SpringSource dm Server

2.1 Starting SpringSource dm Server

To start SpringSource dm Server run the `startup.sh` (Linux) or `startup.bat` (Windows) script. For both platforms, the script is located in the `SERVER_HOME/bin` directory.

Linux

To start SpringSource dm Server, open a terminal window and run `startup.sh`:

```
prompt$ cd $SERVER_HOME
prompt$ bin/startup.sh
```

Once SpringSource dm Server has started, the console will display a log message similar to the one shown below, along with other status messages:

```
[2009-03-30 12:12:12.111] Deployer Recovery <SPPM0002I> Server open for business with profile 'web'.
```

Microsoft Windows

To start SpringSource dm Server, open a command-window and run `startup.bat`:

```
prompt> cd %SERVER_HOME%
prompt> bin\startup.bat
```

Once SpringSource dm Server has started console will display a log message similar to the one shown below:

```
[2009-03-30 12:12:12.111] Deployer Recovery <SPPM0002I> Server open for business with profile 'web'.
```

2.2 Starting in Clean Mode

When you start dm Server in clean mode, the startup script removes the `SERVER_HOME/work` directory (and hence all running applications) as well as all trace, log and dump files. It leaves the `SERVER_HOME/repository` and `SERVER_HOME/pickup` directories untouched, which means that any applications previously hot deployed will be automatically reinstalled.

Linux

To start SpringSource dm Server in clean mode, open a terminal window and run `startup.sh -clean`:

```
prompt$ cd $SERVER_HOME
prompt$ bin/startup.sh -clean
```

Microsoft Windows

To start SpringSource dm Server in clean mode, open a command window and run `startup.bat -clean`:

```
prompt> cd %SERVER_HOME%
prompt> bin\startup.bat -clean
```

2.3 Starting in Debug Mode

Linux

To start SpringSource dm Server in debug mode, run `startup.sh` passing in the `-debug` argument:

```
prompt$ cd $SERVER_HOME
prompt$ bin/startup.sh -debug
```

This will start the debug agent listening on port `8000` which is the default remote debug port used by Eclipse. To start in debug mode with a specific port number, pass this in as the value for the `-debug` argument:

```
prompt$ cd $SERVER_HOME
prompt$ bin/startup.sh -debug 8001
```

This will start the debug agent listening on port `8001`. To start in debug mode and suspend the VM until a debugger attaches, pass in the `-suspend` argument along with the `-debug` argument:

```
prompt$ cd $SERVER_HOME
prompt$ bin/startup.sh -debug -suspend
```

This starts the debug agent, but prevents SpringSource dm Server from actually starting until a debugger attaches to the agent. This can be useful when trying to diagnose problems that occur

during startup.

Microsoft Windows

To start SpringSource dm Server in debug mode, run `startup.bat` passing in the `-debug` argument:

```
prompt> cd %SERVER_HOME%
prompt> bin\startup.bat -debug
```

This will start the debug agent listening on port `8000` which is the default remote debug port used by Eclipse. To start in debug mode with a specific port number, pass this in as the value for the `-debug` argument:

```
prompt> cd %SERVER_HOME%
prompt> bin\startup.bat -debug 8001
```

This will start the debug agent listening on port `8001`. To start in debug mode and suspend the VM until a debugger attaches, pass in the `-suspend` argument along with the `-debug` argument:

```
prompt> cd %SERVER_HOME%
prompt> bin\startup.bat -debug -suspend
```

This starts the debug agent, but prevents SpringSource dm Server from actually starting until a debugger attaches to the agent. This can be useful when trying to diagnose problems that occur during startup.

2.4 Starting with JMX Access Modifications

The SpringSource dm Server always starts with JMX access enabled, allowing you to use a management tool such as JConsole to attach to the dm Server instance. By default both local access and remote access over SSL with username and password authentication are provided. The default port for secure JMX access is `9875` and the default username and password are `admin` and `springsource`.

Linux

To start SpringSource dm Server with default JMX access enabled, run `startup.sh` passing in no arguments:

```
prompt$ cd $SERVER_HOME
prompt$ bin/startup.sh
```

To start JConsole, run the `jconsole.sh` script, located in the `bin` directory, as shown:

```
prompt$ cd $SERVER_HOME
prompt$ bin/jconsole.sh
```

The following image shows how to specify a local connection using JConsole.

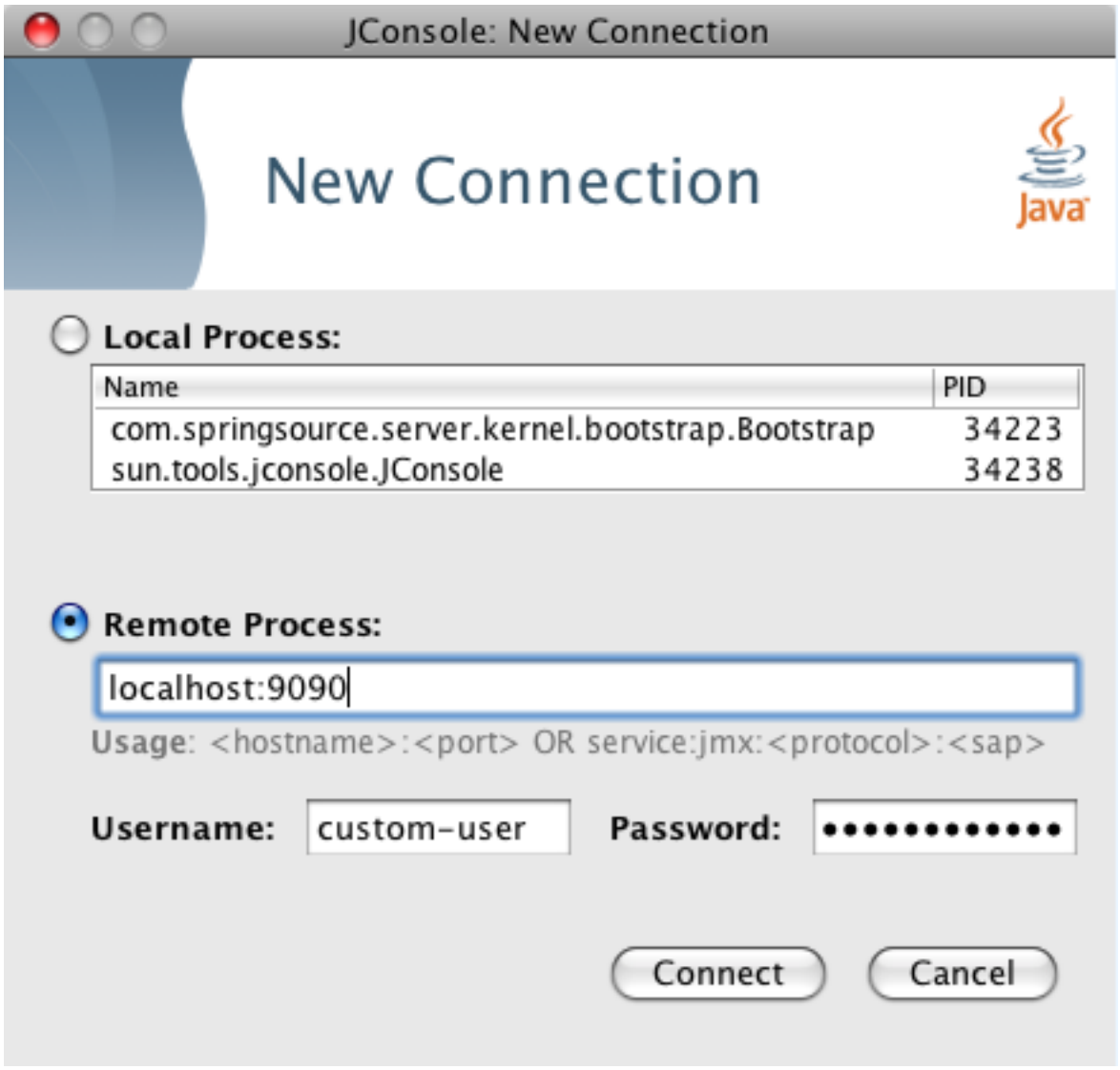
The following image shows how to specify a remote connection in JConsole that uses SSL with the default username/password (`admin/springsource` and default secure port of `9875`).

To start with the JMX remote access on a specific port number other than the default `9875`, pass this port number in as the value of the `-jmxport` argument:

```
prompt$ cd $SERVER_HOME
prompt$ bin/startup.sh -jmxport 9009
```

This will start the SpringSource dm Server with JMX enabled for remote connections on port `9009`.

To start the JMX remote access with a custom username and password edit the files located at `$SERVER_HOME/config/management/jmxremote.password` and `$SERVER_HOME/config/management/jmxremote.access`. Add the username, along with their permissions (either `readonly` or `readwrite`) to the `jmxremote.access` file. Then add a corresponding line to the `jmxremote.password` file that specifies the user's password. The specify the custom username in JConsole as shown.



To start the JMX remote access using a custom SSL certificate, edit the file located at `$SERVER_HOME/config/management/keystore`. If you wish to use a different keystore, pass this filename in as the value for the `-keystore` argument and the keystore password in as the value for the `-keystorePassword` argument:

```
prompt$ cd $SERVER_HOME
prompt$ bin/startup.sh -keystore customKeystore -keystorePassword customKeystorePassword
```

This will start the SpringSource dm Server with JMX enabled for remote connections using an SSL certificate from `customKeystore` with a password of `customKeystorePassword`.

Microsoft Windows

To start SpringSource dm Server with default JMX access enabled, run `startup.bat` passing in no arguments:

```
prompt> cd %SERVER_HOME%
prompt> bin\startup.bat
```

To start JConsole, run the `jconsole.bat` script, located in the `bin` directory, as shown:

```
prompt> cd %SERVER_HOME%
prompt> bin\jconsole.bat
```

The following image shows how to specify a local connection using JConsole.

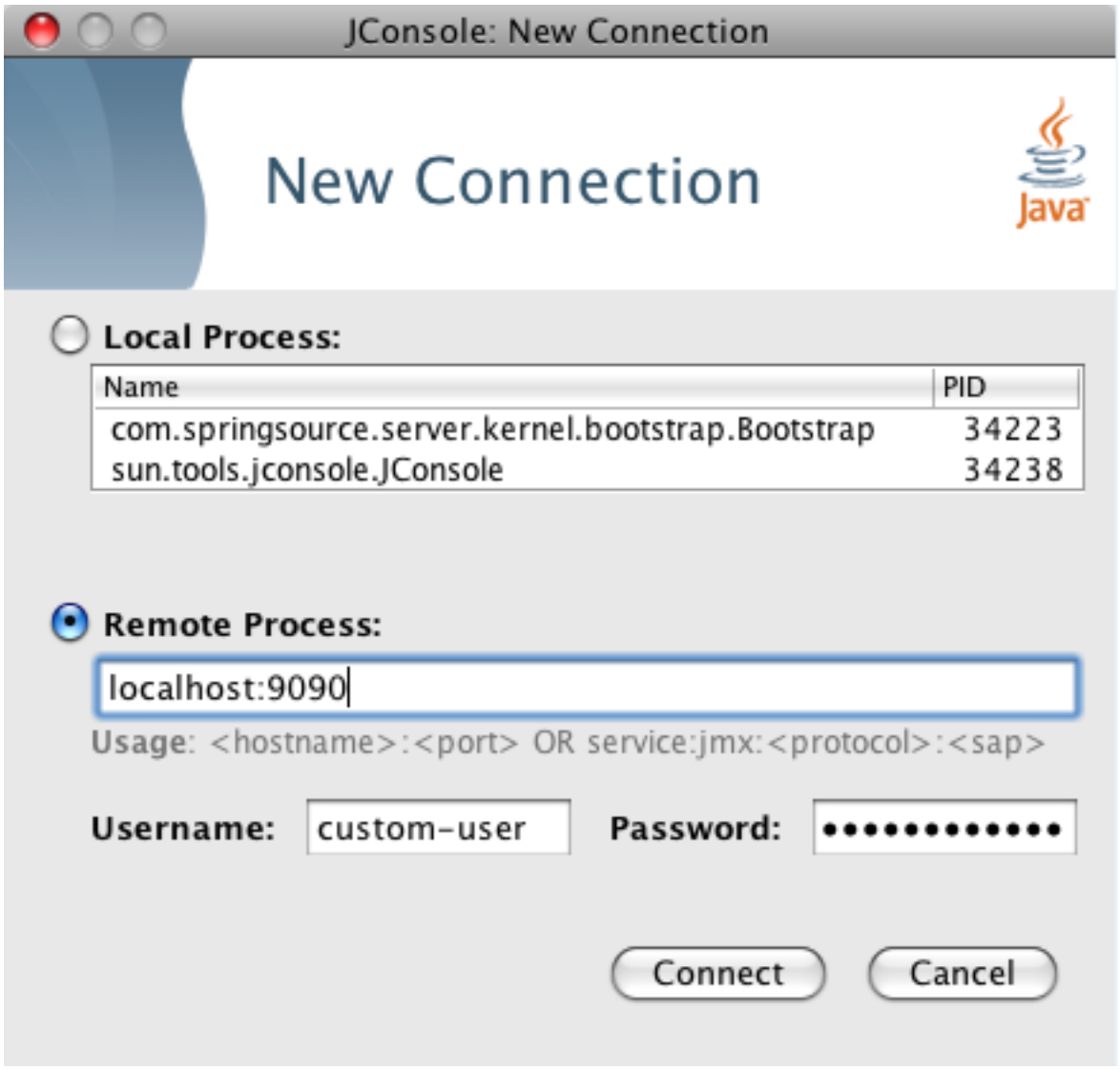
The following image shows how to specify a remote connection in JConsole that uses SSL with the default username/password (`admin/springsource` and default secure port of `9875`).

To start with the JMX remote access on a specific port number other than the default `9875`, pass this port number in as the value of the `-jmxport` argument:

```
prompt> cd %SERVER_HOME%
prompt> bin\startup.bat -jmxport 9009
```

This will start the SpringSource dm Server with JMX enabled for remote connections on port `9009`.

To start the JMX remote access with a custom username and password edit the files located at `%SERVER_HOME%/config\management\jmxremote.password` and `%SERVER_HOME%\config\management\jmxremote.access`. Add the username, along with their permissions (either `readonly` or `readwrite`) to the `jmxremote.access file`. Then add a corresponding line to the `jmxremote.password` file that specifies the user's password. The specify the custom username in JConsole as shown.



To start the JMX remote access using a custom SSL certificate, edit the file located at `%SERVER_HOME%\config\management\keystore`. If you wish to use a different keystore, pass this filename in as the value for the `-keystore` argument and the keystore password in as the value for the `-keystorePassword` argument:

```
prompt> cd %SERVER_HOME%
prompt> bin\startup.bat -keystore customKeystore -keystorePassword customKeystorePassword
```

This will start the SpringSource dm Server with JMX enabled for remote attach using an SSL certificate from `customKeystore` with a password of `customKeystorePassword`.

2.5 Starting With a Custom Configuration Directory

Use the `-configDir` option to specify an alternate `config` directory, different from the

default `SERVER_HOME/config` directory. This option allows you to use the same SpringSource dm Server installation to run multiple instances of dm Server . Simply create a config directory for each instance, specify unique port numbers, logging and tracing directories, and so on. and then specify that directory when starting SpringSource dm Server.

If you specify a relative path for the `-configDir` parameter, the startup script interprets the path as relative to the root of the SpringSource dm Server installation, and not relative to the directory from which you execute the `startup` script.

Linux

To start SpringSource dm Server using a config directory of `/config/node1`:

```
prompt$ cd $SERVER_HOME
prompt$ bin/startup.sh -configDir /config/node1
```

Windows

To start SpringSource dm Server using a config directory of `c:\config\node1`:

```
prompt> cd %SERVER_HOME%
prompt> bin\startup.bat -configDir c:\config\node1
```

2.6 Stopping SpringSource dm Server

Linux

To stop a running instance of SpringSource dm Server, start a new terminal window and the run `shutdown.sh` script:

```
prompt$ cd $SERVER_HOME
prompt$ bin/shutdown.sh
```

To stop a running instance of SpringSource dm Server immediately, bypassing normal shutdown processing, run `shutdown.sh` with the `-immediate` option:

```
prompt$ cd $SERVER_HOME
prompt$ bin/shutdown.sh -immediate
```

If, when you started the dm Server instance, you used the `-jmxport` option to specify a non-default JMX port number, then you must pass this port number to the `-port` of the `shutdown.sh` script to gracefully shut it down. For example, if you specified `9009` as the JMX port, use the following to shut down the dm Server instance:

```
prompt$ cd $SERVER_HOME
prompt$ bin/shutdown.sh -port 9009
```

```
```

Microsoft Windows

To stop a running instance of SpringSource dm Server, start a new console window and run the `shutdown.bat` script:

```
prompt> cd %SERVER_HOME%
prompt> bin\shutdown.bat
```

To stop a running instance of SpringSource dm Server immediately, bypassing normal shutdown processing, run `shutdown.bat` with the `-immediate` option:

```
prompt> cd %SERVER_HOME%
prompt> bin\shutdown.bat -immediate
```

If, when you started the dm Server instance, you used the `-jmxport` option to specify a non-default JMX port number, then you must pass this port number to the `-port` of the `shutdown.bat` script to gracefully shut it down. For example, if you specified `9009` as the JMX port, use the following to shut down the dm Server instance:

```
prompt> cd %SERVER_HOME%
prompt> bin\shutdown.bat -port 9009
```

3. The Web based Administration Console

3.1 Authentication with the Admin Console

To use the SpringSource Admin Console, start the SpringSource dm Server and then enter the following URL in your browser of choice.

```
http://localhost:8080/admin
```

Replace `localhost` with the hostname of the computer on which the SpringSource dm Server is running if it is not the same as the computer on which you are running your browser. The Admin Console uses basic authentication, therefore you will need to enter the default administration ID and password.

```
ID: admin
Password: springsource
```

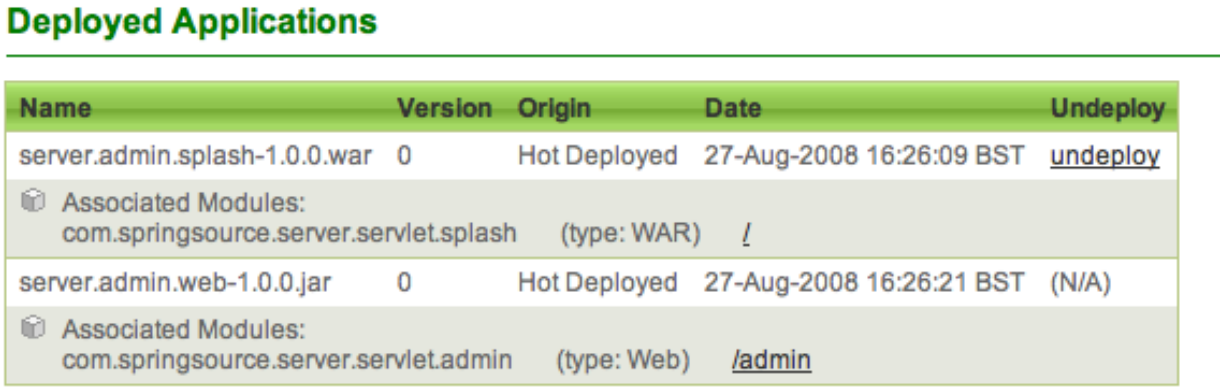
To change the ID and password for the Admin Console, update the `SERVER_HOME/config/servlet/tomcat-users.xml` file, which is in the standard Tomcat users-file format. Change the values of the `username` and `password` attributes of the `<user>` element with the `admin` role. For example, if you want change the administration username to `hamlet` with password `tobeornottobe` change the file as follows:

```
<user username="hamlet" password="tobeornottobe" roles="admin">
```

The Admin Console runs against the `admin` role, therefore this cannot be changed.

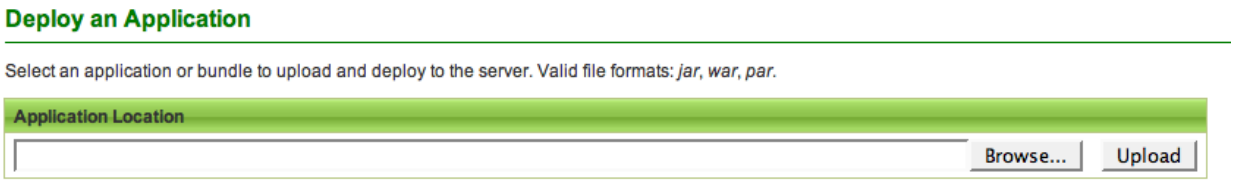
3.2 The sections of the Admin Console

The main Admin Console page displays several sections. The Deployed Applications section shows a list of all the deployed artifacts and the modules that comprise them. When you first install dm Server, there will be two artifacts deployed: the Admin Console itself and a splash screen application. As these artifacts both contain Web components, the Admin Console provides a link so you can quickly view them in your browser. The Admin Console provides a similar link for all deployed artifacts that contain Web components.



The other fields in the table give the 'Name' of the artifact, which is the name of the actual file if no specific name is supplied. The 'Origin' describes how the artifact was deployed. The possible values are `Hot Deployed` if the artifact was dropped in the `pickup` directory, `Admin Console` if deployed using the console and `Programmatic` if deployed programmatically, that is, through the integrated artifact deployer in the SpringSource dm Server Tools. The version is `0` if no specific version is supplied by the artifact. The 'Date' column shows when the artifact was last deployed to dm Server.

In the Deploy an Application section, you can upload a file that will be deployed automatically to the SpringSource dm Server. Once the artifact is deployed it will appear in the Deployed Applications table. You can use the Browse button to browse your local computer for the file. Note that the specific GUI for uploading varies according to your browser and platform.



When clicked, the 'Upload' button reloads the page. This may take a few seconds while the file is uploaded and deployed. If any problems occurred, the Admin Console outputs a status message at the top of the page. If the file deployed with no problems, the messages says `Application deployed`.

For more information on how to work with artifacts see Chapter 6, *Working with Applications*.

At the bottom of the main page, the Information section provides details of the dm Server you have accessed. This is useful for verifying that you have accessed the correct dm Server instance. The Server Properties table lists basic properties of the dm Server instance, such as the version of the embedded Tomcat server and the operation system on which the dm Server instance is running. The Serviceability Destinations table lists the locations of the dump, log, and trace files.

Server Properties

Name	Value
Default Time Zone	Europe/London
Embedded Tomcat	Version 6.0.18
Java Vendor	Apple Inc.
Java Version	1.5.0_13
Operating System	Mac OS X - 10.5.4
Pickup Directory	/opt/springsource-dm-server-1.0.0/pickup
SpringSource dm Server	1.0.0.BUILD-20080828142119
System Architecture	i386

4. Provisioning Repository

4.1 Introduction

In SpringSource dm Server, all third-party dependencies needed by your applications, such as Spring Framework and Hibernate, are stored in the provisioning repository. All of these dependencies are stored as valid OSGi bundles in the provisioning repository. Dependencies that are not valid OSGi bundles are not supported.

When an application is installed, if it has a dependency that cannot be satisfied from the bundles that have already been installed, the SpringSource dm Server will search the repository for a bundle that can satisfy that dependency. Dependencies between applications and third-party libraries are typically expressed using `Import-Package` or `Import-Library` (see Programmer's Guide).

Some third-party dependencies consist of multiple bundles but are logically one unit. To support this, the SpringSource dm Server introduces the concept of a library. A library is a collection of related bundles that can be referenced as a whole. More details on the creation and usage of libraries can be found in the Programmer's Guide.

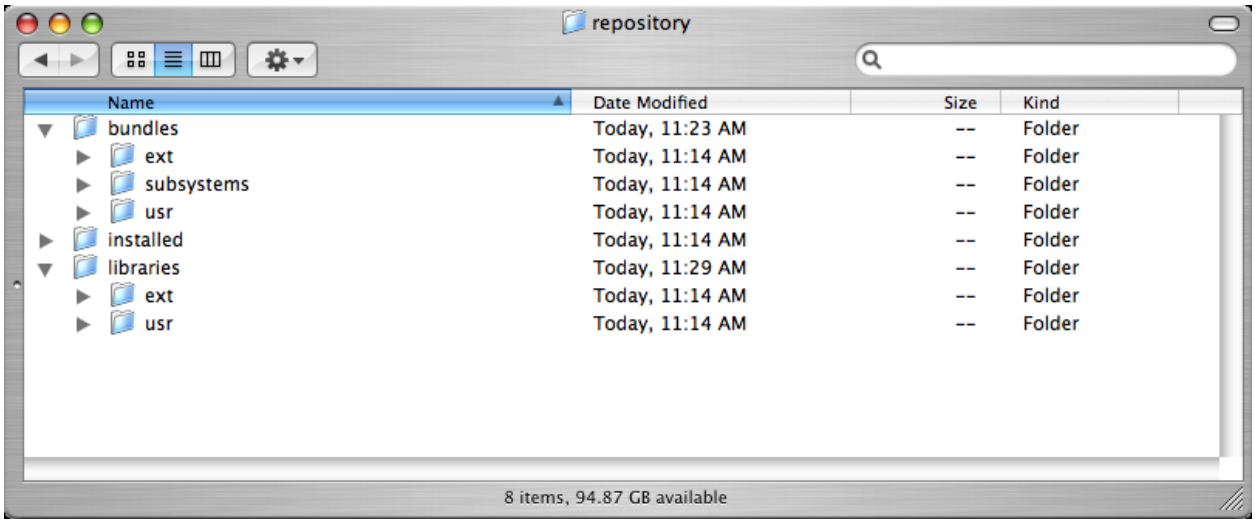
Making a third-party dependency available to your application is simply a matter of adding its bundle or library to the appropriate location in the provisioning repository.

4.2 Repository Structure

By default, the provisioning repository is located at `$SERVER_HOME/repository` and consists of three main directories: `bundles`, `libraries` and `installed`.

The `bundles` directory contains all the bundles available in the repository. The `libraries` directory contains all the library definitions. Note that libraries reference bundles that are installed elsewhere in the repository, e.g. by default under the `bundles` directory. The `installed` directory is used by the SpringSource dm Server at runtime, and should not contain used bundles or libraries.

The `bundles` directory is further subdivided into three directories: `ext`, `subsystems` and `usr`.



The `ext` and `usr` directories are intended to contain third-party bundles, with `ext` containing bundles supplied with the SpringSource dm Server and `usr` containing bundles installed by the end user. The `subsystems` directory is for internal use only.

The `libraries` directory is similarly organized, with an `ext` and `usr` directory. As with bundles, new libraries should be installed into `libraries/usr`.

4.3 Installing Bundles

To install a bundle into the bundle repository, copy it into the `$SERVER_HOME/repository/bundles/usr` directory. Bundles must have unique names so it is considered best practice to include the version number in the file name, allowing for multiple versions of the bundle to be installed.

In some cases the SpringSource dm Server manages to automatically detect changes in its provisioning repository at runtime, thereby avoiding the need to restart the dm Server.

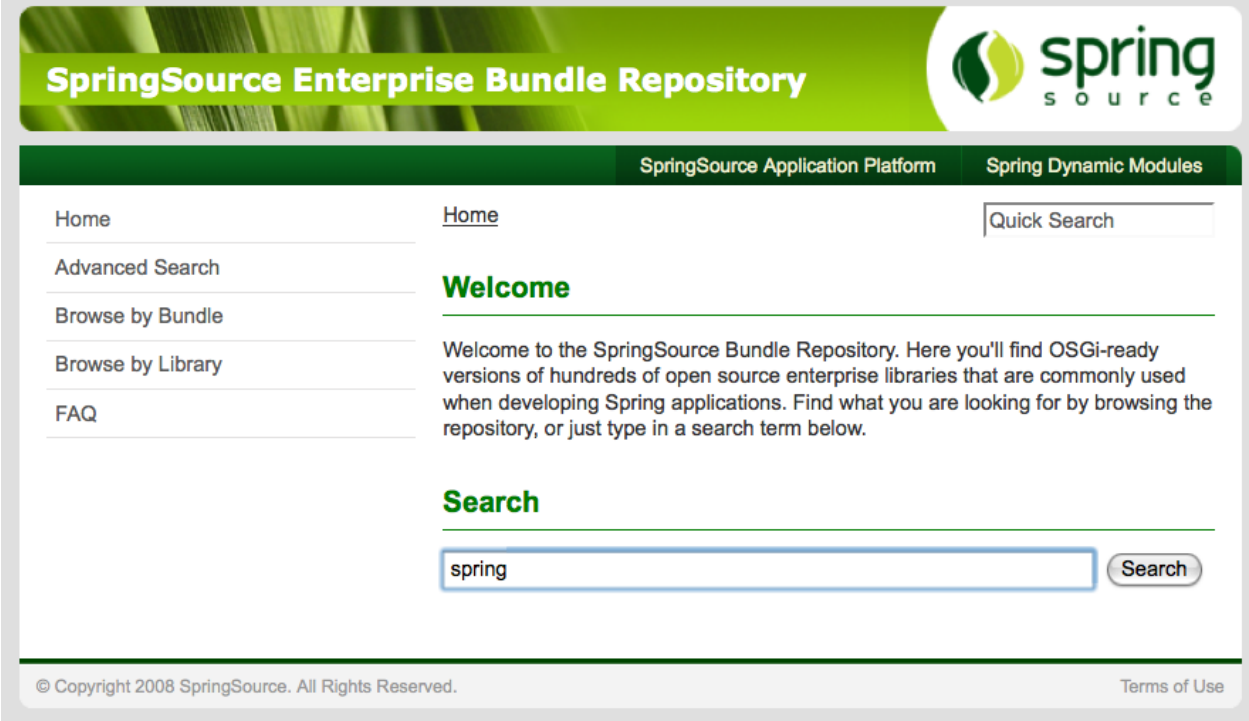
Of specific relevance during development is picking up changes to an application's direct dependencies during deployment of the application. For example, if you deploy an application and receive a message that a dependency is missing, you can simply add the dependency to the repository and then redeploy the application. The redeploy will cause the new dependency to be picked up, allowing progress to be made without restarting the dm Server. For other changes such as addition of indirect dependencies, the SpringSource dm Server must be restarted to pick up any changes to the provisioning repository.

4.4 Installing Libraries

To install a library, copy its definition into the `$SERVER_HOME/repository/libraries/usr` directory. Ensure that all referenced bundles have been installed as well.

4.5 Finding Bundles in the SpringSource Enterprise Bundle Repository

The SpringSource Enterprise Bundle Repository is located here.



You can find bundles in the repository using a number of options. You use the 'Search' facility by typing in a keyword. The matching criteria returned can be explored by name, symbolic name, class, package or resource.

There is also the option of clicking on 'Browse by Bundle'. This gives an alphabetical list of bundles. You can select the desired bundle to see details and find the download link. Finally, you can also choose to 'Browse by Library', which allows you to browse the alphabetical list of libraries in the repository.

4.6 Configuring the repository

Details of how to configure a SpringSource dm Server installation's provisioning repository can be found in the Configuration chapter.

5. Serviceability

5.1 Log Files

Log files are low-volume logs of important events in SpringSource dm Server. Each message written to a log file is accompanied by a 9-digit log code enclosed in angle brackets. An example is shown below:

```
[2008-03-08 17:25:28.007] server-dm-13 <SPSC0000I> - Creating ServletContainer on port 8080
```

For a breakdown of the code meanings, see the Section 9.1, “Log Codes”. By default, log files are stored in `$SERVER_HOME/serviceability/logs`.

5.2 Trace

The SpringSource dm Server's trace support serve two main purposes:

- It provides global trace files that capture high-volume information regarding the SpringSource dm Server's internal events. The files are intended for use by support personnel to diagnose runtime problems. The default trace file is called `SERVER_HOME/serviceability/trace/trace.log`.
- It provides application trace files that contain application-generated output. This includes output generated using popular logging and tracing APIs, as well as output generated by calls to `System.out` and `System.err`. These files are intended for use by application developers and system administrators.

Entries in trace files are of the form <timestamp> <thread-name> <source> <level> <entry-text>. For example:

```
[2008-05-15 09:09:46.940] server-dm-2 org.apache.coyote.http11.Http11Protocol I Initializing Coyote HTTP/1.1 on http-480
```

By default, trace files are stored in `$SERVER_HOME/serviceability/trace`.

Application Output

SpringSource dm Server provides advanced support for capturing and tracing application-generated output. It automatically partitions trace on a per-application basis and will also capture any `System.out` and `System.err` output and direct it to the generating application's `trace.log` file.

Per-application trace

SpringSource dm Server uses SLF4J-based implementations of both Commons Logging and Log4J to route output generated by applications using those APIs to its trace files. In addition to appending such output to the global `trace.log` it will also append it to an application-specific trace file.

SpringSource dm Server writes application-specific trace to a file in a subdirectory of the configured trace directory. As described above this directory is, by default, `SERVER_HOME/serviceability/trace`. The subdirectory's name is of the form `<application-name>-<version>`. So, for example, an application named `com.myapp` at version 1 will write its trace to a file in `SERVER_HOME/serviceability/trace/com.myapp-1/`.

You configure the levels used to filter per-application trace by specifying a header in the application's `MANIFEST.MF` file that includes a comma-separated list of package and class names. For example:

```
Application-TraceLevels: *=info,com.myapp.*=verbose
```

This sample `MANIFEST.MF` header enables info level tracing for everything except the classes in the `com.myapp` package for which verbose level tracing is enabled.

System.out and System.err

SpringSource dm Server captures, and traces, all output generated via `System.out` and `System.err`. This means that such output will be written to both the global `trace.log` file and to the trace file specific to the application that generated the output. The trace entries for `System.out` and `System.err` output are of the form:

```
[2008-05-16 09:28:45.874] server-tomcat-thread-1 System.out I Hello world!
[2008-05-16 09:28:45.874] server-tomcat-thread-1 System.err E Hello world!
```

The third column indicates where the output came from (`System.out` or `System.err`) and, as indicated by the fourth column, `System.out` is traced at the info level, and `System.err` is traced at the error level.

Roll-over of trace files

SpringSource dm Server automatically rolls-over a trace file once it reaches a size of 100MB. SpringSource dm Server retains up to four rolled-over files in addition to the `trace.log` file to which new output is appended.

5.3 Service Dumps

A service dump is triggered when one of the following events occurs:

1. A failure is detected in the SpringSource dm Server code

2. A thread deadlock is detected

A service dump contains a snapshot of all the important state from the running SpringSource dm Server instance. This snapshot is not intended for end user consumption but is useful for service personnel.

By default, service dumps are created in `$SERVER_HOME/serviceability/dump`.

6. Working with Applications

6.1 Deploying Artifacts

You can deploy artifacts to SpringSource dm Server using either the hot-deploy directory on the file system or by using the Admin Console.

Hot Deploy

To hot deploy an artifact, copy it into the pickup directory (by default `$SERVER_HOME/pickup`):

```
prompt$ cp myapp.par $SERVER_HOME/pickup
```

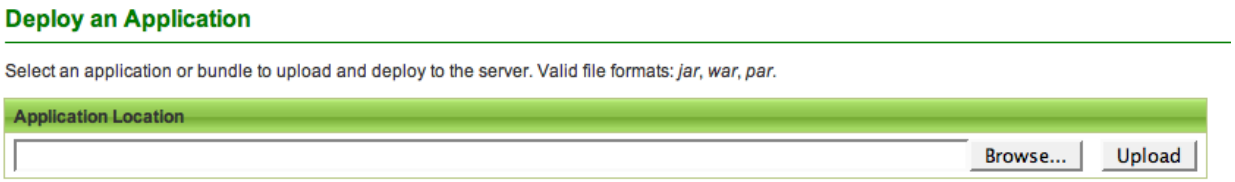
When the artifact is hot deployed, a message similar to the following appears in the log file:

```
[2009-03-08 17:00:00.000] fs-watcher   <SPDE0010I> - Deployment of 'myapp.par' version '0' completed.
```

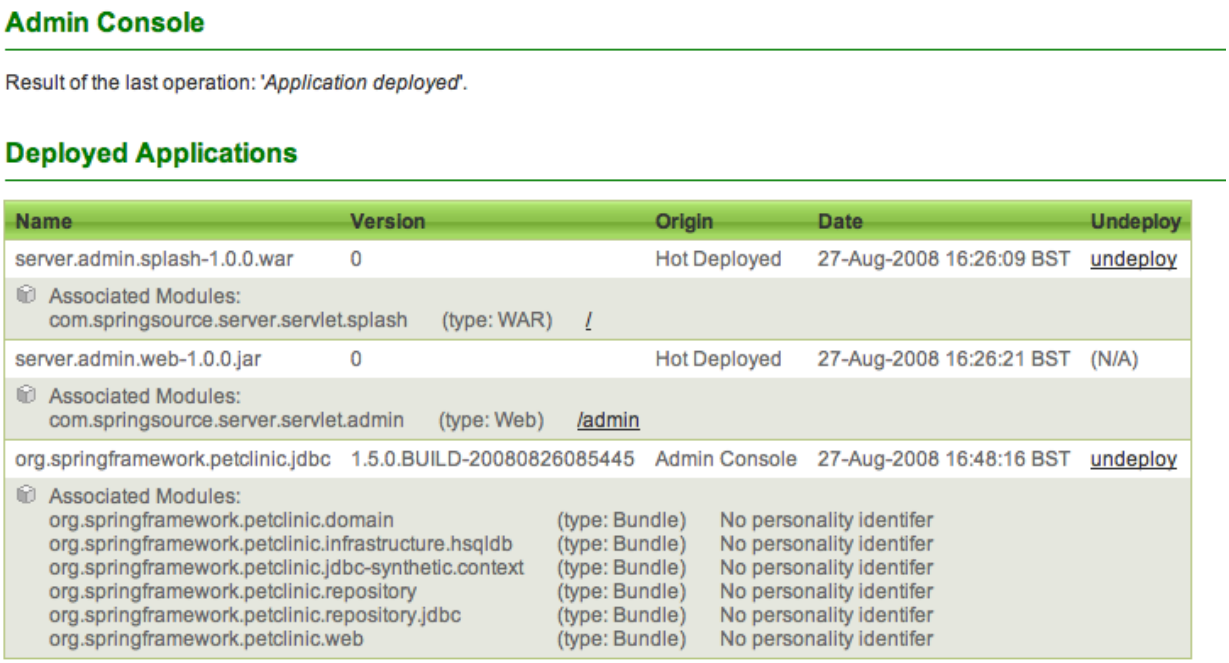
If there is a problem with the deployment the console and log both show an error message to help you with troubleshooting.

Manually Deploy

The Admin Console allows you to upload a file, which will be deployed automatically, from your local file system to the SpringSource dm Server. As soon as SpringSource dm Server deploys the artifact, it appears in the list of artifacts in the Admin Console. Note that the GUI for uploading varies according to the browser and operating system you use.



When clicked, the 'Upload' button reloads the page. This may take a few seconds while the file is transmitted and deployed. The Admin Console displays a status message at the top of the page after it completes the deployment; if there were no problems, the displayed message is `Application deployed`. The following image shows three deployed artifacts.



See Chapter 3, *The Web based Administration Console* for additional details on using the Admin Console and the meaning of the displayed information.

What Happens When You Deploy

When you deploy an artifact, either using hot-deployment or the Admin Console, dm Server copies the file to its work directory (`SERVER_HOME/work` by default) and registers it in its internal registry. The server then checks any dependencies the artifact might have to see if deployment can go ahead, and if all dependencies are resolved, SpringSource dm Server starts the artifact. Because of all these additional internal activities, you should NOT simply copy the artifact into the `work` directory and assume it will be deployed, because SpringSource dm Server will not do so.

Deployment Ordering

When deploying bundles that have dependencies, it is important that you deploy them in the correct order. SpringSource dm Server honors this ordering when it redeploys the artifacts on startup.

If you use hot deployment to deploy your artifacts, be sure to copy the corresponding files into the pickup directory one-by-one. Copying the files in one group, for example by using a single `cp` command. provides no guarantees of ordering.

Restrictions

The SpringSource dm Server does not support deploying fragment bundles.

6.2 Undeploying an Artifact

You can undeploy artifacts from SpringSource dm Server using either the hot-deploy directory on the file system, or by using the Admin Console.

Hot Undeploy

To hot-undeploy an artifact, remove the corresponding file from the pickup directory (by default `$SERVER_HOME/pickup`):

```
prompt$ cd $SERVER_HOME/pickup
prompt$ rm myapp.par
```

When SpringSource dm Server completes the undeployment of the artifact, a message similar to the following appears in the log:

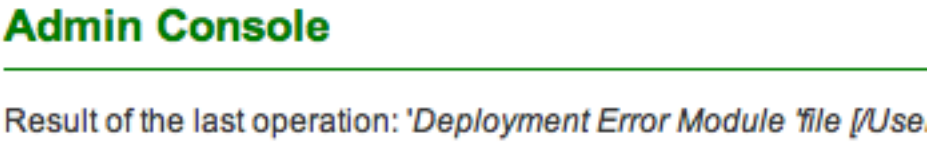
```
[2009-03-08 17:00:05.000] fs-watcher     <SPDE0012I> - Undeployment of 'myapp.war' version '0' completed.
```

Manually Undeploy

You can undeploy only whole artifacts from the Admin Console, or in other words, you cannot undeploy the separate modules or bundles that make up an artifact. Each artifact that can be undeployed has an `undeploy` link to the right of its name in the list of Deployed Applications. As soon as you click the undeploy link, the page reloads with that artifact removed from the list.

The only artifact that you cannot undeploy from the Admin Console is the Admin Console itself. If you need to undeploy this application, you must remove it from the pickup directory (by default `SERVER_HOME/pickup`); the name of the application is `com.springsource.server.servlet.admin`.

If any problems have occurred the status message at the top of the page will report the error, as shown in the following image.



7. Configuring the SpringSource dm Server

7.1 Configuring Serviceability

The serviceability subsystem of the SpringSource dm Server is configured in the `serviceability.config` file found in the `SERVER_HOME/config` directory of the dm Server installation. Any relative paths in this file are relative to the root of the installation, `SERVER_HOME`.

Configuring tracing

You can configure tracing at either a global or trickle level. Each level, in turn, provides two configurable settings. For the global level, you can set the directory to which the trace logs are written and the level of tracing (debug, error, info, and so on) for classes and packages. For the trickle level, you can set the window size of trace information as well as the level of tracing. For example:

```
"trace": {
     "global" : {
         "directory": "serviceability/trace",
         "levels": {
             "*" : "warn"
             "com.foo.*" : "verbose",
             "com.foo.TheClass" : "debug",
             "com.bar.AnotherClass" : "verbose"
         }
     },
     "trickle": {
         "windowSize": 10000,
         "levels": {
             "*" : "debug",
             "org.apache.commons.digester.*" : "warn"
          }
     }
}
```

In this example, the global tracing component will write its output to the `$SERVER_HOME/serviceability/trace` directory. The trace component provides five different levels at which trace can be output. These are, in descending order of severity: error, warn, info, debug, and verbose. The configured levels govern what trace is outputted and what trace is filtered out. Trace levels can be configured for individual classes or for entire packages and package trees. In this example, every class has info level tracing enabled except for those in the `com.foo` package and its subpackages which have verbose level tracing enabled, `com.foo.TheClass` which has debug level tracing enabled, and `com.bar.AnotherClass` which has verbose level tracing enabled. When determining what level of trace is enabled for any given class, the tracing component will use the level of the most specific match, for example, `com.foo.TheClass` is a more specific match than `com.foo.*`. Any classes that are not matched by any of the configured levels will have trace disabled.

Configuring logging

The logging component provides a single configurable setting. For example:

```
"logs": {
    "directory": "serviceability/logs"
}
```

In this example the logging component will write its output to the `$SERVER_HOME/serviceability/logs` directory.

Configuring dump files

You configure dumps using two components: the `dump` component specifies the directory in which dm Server should write the dump files and the `heapDump` component specifies whether to enable or disable the dumping of heaps when a problem with dm Server occurs. For example:

```
"dump": {
    "directory": "serviceability/dump"
},
"heapDump": {
    "enabled": false
}
```

In this example, the dump file component will write its output to the `$SERVER_HOME/serviceability/dump` directory. Additionally, heap dumps are disabled.

7.2 Configuring the Embedded Tomcat Servlet Container

The SpringSource dm Server embeds an OSGi-enhanced version of the Tomcat Servlet Container in order to provide support for deploying Java EE WARs and *Web Modules*. The embedded Servlet container can be configured via the `servletContainer.config` file located in the `$SERVER_HOME/config` directory. The following listing displays the default configuration distributed with the dm Server.

```
{
"servletContainer": {
    "version": 1.0,
    /* configDir should be either an absolute path or relative to the SERVER_HOME directory */
    "configDir": "config/servlet",
    "hostName": "localhost",
    "jvmRoute": "jvm1",
    "realm" : {
        "className" : "org.apache.catalina.realm.MemoryRealm",
        "pathname" : "tomcat-users.xml"
    },
    "listeners": [
        {
            /*
             * APR library loader.
             * Documentation at http://tomcat.apache.org/tomcat-6.0-doc/apr.html
             */
            "enabled": true,
            "className": "org.apache.catalina.core.AprLifecycleListener",
            "SSLEngine": "on"
        },
        {
            /*
             * Initialize Jasper prior to loading webapps.
             * Documentation at http://tomcat.apache.org/tomcat-6.0-doc/jasper-howto.html
             */
            "enabled": true,
            "className": "org.apache.catalina.core.JasperListener"
        }
    ],
    "connectors": [
        {
            /*
             * HTTP Connector.
```

```
             * Documentation at http://tomcat.apache.org/tomcat-6.0-doc/config/http.html
             */
            "enabled": true,
            "port": 8080,
            "protocol": "HTTP/1.1",
            "connectionTimeout": 20000,
            "maxThreads": 150,
            "emptySessionPath": false,
            "redirectPort": 8443
        },
        {
            /*
             * HTTPS Connector.
             * Documentation at http://tomcat.apache.org/tomcat-6.0-doc/config/http.html
             * and http://tomcat.apache.org/tomcat-6.0-doc/ssl-howto.html
             */
            "enabled": true,
            "port": 8443,
            "protocol": "HTTP/1.1",
            "scheme": "https",
            "connectionTimeout": 20000,
            "maxThreads": 150,
            "emptySessionPath": false,
            "clientAuth": false,
            /* keystoreFile should be a path relative to the configured value for servletContainer:configDir */
            "keystoreFile": "../../config/management/keystore",
            "keystorePass": "changeit",
            "secure": true,
            "SSLEnabled": true,
            "sslProtocol": "TLS"
        },
        {
            /*
             * AJP Connector.
             * Documentation at http://tomcat.apache.org/tomcat-6.0-doc/config/ajp.html
             */
            "enabled": true,
            "port": 8009,
            "protocol": "AJP/1.3",
            "connectionTimeout": 20000,
            "redirectPort": 8443
        }
    ],
    "logs": {
        /* accessLogDir should be either an absolute path or relative to the SERVER_HOME directory */
        "accessLogDir": "serviceability/logs/access",
        "defaultAccessLogFormat": "%h %l %u %t \"%r\" %s %b \"%{Referer}i\" \"%{User-Agent}i\"",
        "globalAccessLogging": true,
        "perApplicationAccessLogging": true
    },
    "threadPool": {
        "minSize": 25,
        "maxSize": 200,
        "keepAlivePeriod": 60000
    }
    /*
     * The next section of this file is configuration for Tomcat clustering.  By default this is disabled.
     */
    /*,
    "cluster": {
        "className": "org.apache.catalina.ha.tcp.SimpleTcpCluster",
        "channelSendOptions": 8,
        "heartbeatBackgroundEnabled": false,
        "manager": {
            "className": "org.apache.catalina.ha.session.DeltaManager",
            "expireSessionsOnShutdown": false,
            "notifyListenersOnReplication": true
        },
        "channel": {
            "className": "org.apache.catalina.tribes.group.GroupChannel",
            "membership": {
                "className": "org.apache.catalina.tribes.membership.McastService",
                "address": "228.0.0.4",
                "port": 45564,
                "frequency": 500,
                "dropTime": 3000
            },
            "receiver": {
                "className": "org.apache.catalina.tribes.transport.nio.NioReceiver",
                "address": "auto",
                "port": 4000,
                "autoBind": 100,
                "selectorTimeout": 5000,
                "maxThreads": 6
            },
            "sender": {
                "className": "org.apache.catalina.tribes.transport.ReplicationTransmitter",
                "transport": {
                    "className": "org.apache.catalina.tribes.transport.nio.PooledParallelSender"
                }
            },
```

```
            "interceptors": [
                {
                    "className": "org.apache.catalina.tribes.group.interceptors.TcpFailureDetector"
                },
                {
                    "className": "org.apache.catalina.tribes.group.interceptors.MessageDispatch15Interceptor"
                }
            ]
        },
        "valves": [
            {
                "className": "org.apache.catalina.ha.tcp.ReplicationValve",
                "filter": ""
            },
            {
                "className": "org.apache.catalina.ha.session.JvmRouteBinderValve"
            }
        ],
        "deployer": {
            "className": "org.apache.catalina.ha.deploy.FarmWarDeployer",
            "tempDir": "/tmp/war-temp/",
            "deployDir": "/tmp/war-deploy/",
            "watchDir": "/tmp/war-listen/",
            "watchEnabled": false
        },
        "clusterListeners": [
            {
                "className": "org.apache.catalina.ha.session.JvmRouteSessionIDBinderListener"
            },
            {
                "className": "org.apache.catalina.ha.session.ClusterSessionListener"
            }
        ]
    }*/
}
}
```

Disabling configuration elements

Listener and Connector configuration elements can be disabled by setting the `enabled` flag to `false`. This allows you to disable but still retain the configuration for such elements without the need to delete the configuration.

Servlet Container Configuration

The following table lists all top-level options for configuring the embedded Servlet container.

Relative paths

If the configured path to a directory or file does not represent an absolute path, it will typically be interpreted as a path relative to the `SERVER_HOME` directory.

Table 7.1. Servlet Container Configuration Values

Entry	Description	Supported Values	Default Value
`version`	The configuration schema version.	1.0	N/A
`configDir`	The path to the Servlet container's *config* directory. This directory serves as the central location for	`config/servlet`	N/A

Entry	Description	Supported Values	Default Value
	implementation-specific configuration files. The config directory also serves as the base directory for any relative-path-based configuration resources for the Servlet container. If the configured value does not represent an absolute path, it will be interpreted as a directory relative to the `SERVER_HOME` directory.		
`hostName`	The host name to use for the Servlet container's default host.	Any valid *hostname* for the system on which the dm Server is running.	`localhost`
`jvmRoute`	A unique identifier for the Servlet container instance, used to configure a JVM route for load balancing.	A unique text value, typically purely alpha-numeric.	`jvm1`
`listeners`	A list of `LifecycleListener` configuration elements. Consult the official Tomcat documentation for further information on available listeners.	N/A	N/A
`connectors`	A list of `Connector` configuration elements. See the connector configuration section for details.	N/A	N/A
`logs - accessLogDir`	The path to the *access log* directory where HTTP requests to the Servlet container will be logged. If the configured value does not represent an absolute path, it will be interpreted as a directory relative to the `SERVER_HOME` directory.	*(see description)*	`serviceability/logs/`
`logs - defaultAccessLogFormat`	The format to use for formatting the *access log*.	Any legal Tomcat log format string	`%h %l %u %t \"%r\" %s %b \"%{Referer}i\" \"%{User-Agent}i\"`

Entry	Description	Supported Values	Default Value
`logs - globalAccessLogging`	Boolean flag for enabling the global access logging for web all applications on the server.	`true` or `false`	`true`
`logs - perApplicationAccessLogging`	Boolean flag for enabling access logging on a per-application basis. Once enabled applications will still need to opt into per-application access logging using the `Web-AccessLog` manifest header.	`true` or `false`	`true`
`threadPool - minSize`	The minimum number of threads to be kept in the Servlet Container's *threadpool*.	Any positive `int`	25
`threadPool - maxSize`	The maximum number of threads to be kept in the Servlet Container's *threadpool*.	Any positive `int`	200
`threadPool - keepAlivePeriod`	The period of time, in milliseconds, that an idle thread will be kept alive in the Servlet Container's *threadpool*.	Any positive `int`	60000

Connector Configuration

The SpringSource dm Server supports JSON-based configuration of any connector supported by Apache Tomcat. See the default configuration above for syntax examples, and for further details on the configuration properties supported for various `Connector` implementations, consult the official Tomcat HTTP Connector documentation.

Configuring SSL for Tomcat

The SpringSource dm Server distribution includes a preconfigured `keystore` file which contains a single self-signed SSL Certificate. The password for this `keystore` file is `changeit`. Please note that the provided `keystore` file is intended for testing purposes only. For detailed instructions on how to configure Tomcat's SSL support, consult the official Tomcat SSL Configuration HOW-TO.

Load Balancing Configuration

The SpringSource dm Server supports JSON-based configuration of the load balancing supported by Tomcat. See the default configuration for syntax examples.

Cluster Configuration

The SpringSource dm Server supports JSON-based configuration of the clustering supported by Apache Tomcat. See the default configuration (which is disabled) for syntax examples, and for further details on the configuration properties support for `Cluster` implementations, consult the official Tomcat Clustering/Session Replication HOW-TO documentation.

Tomcat Configuration Files

In addition to the aforementioned configuration options, various parts of the embedded Tomcat Servlet container can be configured via the following files located in the Servlet container's configuration directory (see `configDir` above). The syntax and usage of each file comply with that of a standard Tomcat installation.

- **context.xml**: XML based configuration file which will be loaded for each web application `Context` deployed on the dm Server.
- **tomcat-users.xml**: XML based configuration file used to manage users, passwords, and roles for an in-memory security realm. This file is used by the dm Server to configure a `MemoryRealm` for the embedded Tomcat Servlet container.
- **web.xml**: The default `web.xml` deployment descriptor used for all web applications deployed on the dm Server. As each web application is deployed, this file is processed, followed by the `/WEB-INF/web.xml` deployment descriptor packaged with the web application itself, if present.

7.3 Configuring Equinox

You can configure the telnet console of Equinox by updating the `osgi.config` file in the `$SERVER_HOME/config` directory and editing the `enabled` and `port` entries of the `osgiConsole` component. By default the console is enabled and listens on port 2401:

```
"osgiConsole" : {
    "enabled" : true,
    "port" : 2401
}
```

7.4 Configuring Deployment

You can configure two properties of deployment: the pickup directory into which you copy applications for hot-deployment and the deployment timeout. To change either of these properties, edit the `deployer.config` file in the `$SERVER_HOME/config` directory and change the value of the `pickupDir` or `deploymentTimeoutSeconds` options. The following listing displays the default configuration distributed with the dm Server.

```
{
    "deployer" : {
        "pickupDir" : "pickup",
        "version" : 1.0,
        "deploymentTimeoutSeconds" : 300
    }
}
```

As the default configuration shows, the default pickup directory is `SERVER_HOME/pickup` and the deployment timeout is 300 seconds. If you want to disable deployment timeout, set the option to `0`.

The `version` option is for internal SpringSource dm Server use; do not change that value.

7.5 Configuring the Provisioning Repository

You configure the locations that SpringSource dm Server includes in its repository by editing the `repository.config` file in the `$SERVER_HOME/config` directory. This file inclues the following two components: `repositories` and `respositoryChain`.

The `repository` component specifies the actual directories, or searchpaths, for the different types of bundles or libraries that can live in the repository, such as sub-system bundles or user-defined libraries. Each of the searchpaths is given a name, such as `bundles-subsystems` or `libraries-user` and whether the searchpath is external or internal. The `repositoryChain` component specifies the order in which SpringSource dm Server searches the directories when it looks for dependencies. The `repositoryChain` component uses the names of the searthpaths as specified in the `repositories` component.

The default configuration is as follows:

```
"repositories" : {
   "bundles-subsystems" : {
        "type" : "external",
        "searchPattern" : "repository/bundles/subsystems/{subsystem}/{component}"
   },
   "bundles-ext" : {
         "type" : "external",
         "searchPattern" : "repository/bundles/ext/{bundle}"
   },
   "bundles-usr" : {
         "type" : "external",
         "searchPattern" : "repository/bundles/usr/{bundle}"
   },
   "libraries-ext" : {
         "type" : "external",
         "searchPattern" : "repository/libraries/ext/{library}"
   },
   "libraries-usr" : {
         "type" : "external",
         "searchPattern" : "repository/libraries/usr/{library}"
   }
},
"repositoryChain" : [
          "bundles-subsystems",
          "bundles-ext",
          "bundles-usr",
          "libraries-ext",
          "libraries-usr"
```

```
]
```

This default configuration shown above has five paths, each of which will be searched when locating entries for inclusion in the repository. The `respositoryChain` component shows the order in which the paths are searched.

SpringSource dm Server requires that you always include the `bundles-subsystem`, `bundles-ext`, and `libraries-ext` searchpaths, as shown above, in your repository configuration. You can configure the user-related paths as you wish.

Search Paths

Each search path defines a location that is included in that SpringSource dm Server's repository and will therefore be searched when looking for a library or bundle dependency. If a search path is relative its location is taken as being relative to the root of the installation, i.e. the `SERVER_HOME` directory.

Wildcards

Search paths provide support for wildcards. In the entries above, the path segments surrounded by curly braces, e.g. `{bundle}` and `{library}`, are wildcards entries for a directory with any name. Allowing wildcards to be named in this way is intended to improve the readability of search path configuration.

In addition to supporting the above-described form of wildcards, SpringSource dm Server also supports Ant-style paths, i.e. `*` and `**` can be used to represent any directory and any series of directories respectively. For example, `repository/bundles/usr/{bundle}` and `repository/bundles/usr/*` are directly equivalent.

A common usage of the `**` wildcard is to allow dependencies stored in a directory structure of varying depth, such as a local Maven repository, to be provisioned by the SpringSource dm Server.

System properties

In addition to support for wildcards, system properties can also be used within a search path. System properties are referenced as `${system.property.name}`; for example, a search path of `${user.home}/repository/bundles` will reference the `repository/bundles` directory in the user's home directory.

Example configurations

The following examples provide sample configuration that could be used for some common use cases. The examples show only the `repository` component of the `respository.config` file.

Replace bundles-usr with an Ivy cache

```
"repositories" : {
   "bundles-subsystems" : {
        "type" : "external",
       "searchPattern" : "repository/bundles/subsystems/{subsystem}/{component}"
   },
   "bundles-ext" : {
         "type" : "external",
         "searchPattern" : "repository/bundles/ext/{bundle}"
   },
   "bundles-usr" : {
         "type" : "external",
         "searchPattern" : "${user.home}/.ivy2/cache/{org}/{name}/{version}/{bundle}.jar",
   },
   "libraries-ext" : {
         "type" : "external",
         "searchPattern" : "repository/libraries/ext/{library}"
   },
   "libraries-usr" : {
         "type" : "external",
         "searchPattern" : "repository/libraries/usr/{library}"
   }
}
```

Replace bundles-usr with a Maven local repository

```
"repositories" : {
   "bundles-subsystems" : {
        "type" : "external",
       "searchPattern" : "repository/bundles/subsystems/{subsystem}/{component}"
   },
   "bundles-ext" : {
         "type" : "external",
         "searchPattern" : "repository/bundles/ext/{bundle}"
   },
   "bundles-usr" : {
         "type" : "external",
         "searchPattern" : "${user.home}/.maven/repository/**/{bundle}.jar",
   },
   "libraries-ext" : {
         "type" : "external",
         "searchPattern" : "repository/libraries/ext/{library}"
   },
   "libraries-usr" : {
         "type" : "external",
         "searchPattern" : "repository/libraries/usr/{library}"
   }
}
```

7.6 Configuring the Work Directory

SpringSource dm Server uses a work directory for internal work; by default this directory is `SERVER_HOME/work`. You can change this directory by updating the `SERVER_HOME/config/io.config` file and changing the value of the `workDirectory` option; as always, relative paths are relative to the root `SERVER_HOME` directory. The following listing show the default contents of the `io.config` file:

```
{
    "io" : {
        "workDirectory" : "work"
    }
}
```

8. Known Issues

8.1 Timeout During Startup Due to Firewall Settings

The dm Server will fail to start correctly if it is prevented from connecting to needed ports by the firewall. Typically this manifests as error `SPPM0003E` . Configuring the firewall to allow the dm Server process to bind to the necessary ports will prevent this error from occurring.

8.2 OutOfMemoryError: PermGen space running on Sun VM

As a result of Sun Java bug 4957990, the SpringSource dm Server may consume more PermGen space than expected when running with the server HotSpot compiler. This problem may be resolved by configuring the `JAVA_OPTS` environment variable to specify an increased `MaxPermSize`, for example `-XX:MaxPermSize=128M`.

9. Log Error Codes

9.1 Log Codes

Each log message is accompanied by a log code which is useful in understanding the current state of the dm Server. Log codes are of the form: `'SPXY1234L'`, where `SP` stands for *Spring Server*, `XY` stands for the subsystem code, `1234` represents the error number, and `L` conveys the level of severity of the event being logged.

Subsystem Codes

Below is the list of subsystem codes and their corresponding subsystems:

- `CC - Concurrent`
- `CN - Control`
- `CO - Config`
- `DE - Deployer`
- `FF - FFDC`
- `KB - Bootstrap`
- `KE - Kernel`
- `OP - OSGi`
- `PM - Profile`
- `SC - Servlet`
- `WE - Web`

Error Number

The error numbers start from `0000` and typically increase by 1. There is no upper limit for error numbers.

Event Severity

- E - Error
- W - Warn
- I - Info

Error denotes that there are problems in the dm Server, such as incorrect behaviour of the system. This is the most serious of the log events.

Warn denotes that errors exist, but they are not critical and may be overlooked.

Info provides information about events in the system that may be useful in diagnosing warnings and errors. Such events are not severe.

9.2 Detailed Log Codes

In each instance where they appear, %s represents a variable which will be substituted with a string, and %d represents a variable which will be substituted with a number.

Concurrent Log Codes

Table 9.1. Concurrent Log Codes

Code	Message
CC0000E	• Deadlock(s) detected. Generating dump file. See dump for more details.

Control Log Codes

Table 9.2. Control Log Codes

Code	Message
CN0000E	• The attempt to register a control MBean for the service ${service} with definition interface ${interface} failed. The cause of the failure follows:

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• service
• interface</td><td>• The service
• The definition interface</td></tr>
</table>
</td></tr>
<tr><td>CN0001E</td><td>• The class ${class} under which service reference ${reference} was registered could not be loaded from bundle ${bundle}.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• class
• reference
• bundle</td><td>• The class under which the service reference is registered
• Service reference
• The bundle where the registered class should be loaded from</td></tr>
</table>
</td></tr>
<tr><td>CN0002E</td><td>• The attempt to unregister the control MBean registered as ${mbean} failed. The cause of the failure follows:
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• mbean</td><td>• The name</td></tr>
</table>
</td></tr>
</table>

Code	Message
	<table><tr><th>Inserts</th><th>Description</th></tr><tr><td></td><td>which the control MBean is registered as</td></tr></table>
CN0003E	• Immediate shutdown initiated.
CN0004I	• Shutdown initiated.

Config Log Codes

Table 9.3. Config Log Codes

Code	Message
CO0000E	• Configuration list not found at '${path}'. <table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• path</td><td>• configuration list path</td></tr></table>
CO0001E	• Configuration map not found at path '${path}'. <table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• path</td><td>• The configuration map's path location</td></tr></table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td></td></tr>
<tr><td>CO0002E</td><td>• Configuration map at path '${path}' contained an invalid key '${key}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• path
• key</td><td>• The configuration map's path location
• The key</td></tr></table></td></tr>
<tr><td>CO0003E</td><td>• Configuration map at path '${path}' omitted the key '${key}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• path
• key</td><td>• The configuration map's path location
• The key</td></tr></table></td></tr>
<tr><td>CO0004E</td><td>• Configuration scalar not found at path '${path}'<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• path</td><td>• The configuration scalar's path location</td></tr></table></td></tr>
<tr><td>CO0005E</td><td></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>• Configuration enumeration at path '${path}' contained an invalid value '${value}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• path
• value</td><td>• The configuration enumeration's location path
• A value</td></tr></table></td></tr>
<tr><td>CO0006E</td><td>• Configuration integer at path '${path}' contained an unrecognized value '${value}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• path
• value</td><td>• The configuration integer's path location
• A value</td></tr></table></td></tr>
<tr><td>CO0007E</td><td>• Configuration integer at path '${path}'contained a value '${value}' outside the permitted range.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• path
• value</td><td>• The configuration integer's location</td></tr></table></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td></td><td>path

• A value</td></tr>
</table>
</td></tr>
<tr><td>CO0008E</td><td>• Configuration version at path '${path}' contained an unrecognized value '${value}'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• path

• value</td><td>• The configuration version's path location

• A value</td></tr>
</table>
</td></tr>
<tr><td>CO0009E</td><td>• Configuration version at path '${path}' contained a value '${value}' outside the permitted range.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• path

• value</td><td>• The configuration version's path location

• A value</td></tr>
</table>
</td></tr>
<tr><td>CO0010W</td><td>• Invalid configuration directory '${directory}'.</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• directory</td><td>• Configuration directory</td></tr></table></td></tr>
<tr><td>CO0011E</td><td>• Unrecognized configuration point '${point}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• point</td><td>• The configuration point</td></tr></table></td></tr>
<tr><td>CO0012W</td><td>• Invalid configuration filename '${filename}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• filename</td><td>• Configuration filename</td></tr></table></td></tr>
<tr><td>CO1000E</td><td>• Parser error [line=${line}, column=${column}]. Numbers should never have a leading zero.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• line
• column</td><td>• line number
• column number</td></tr></table></td></tr>
<tr><td>CO1001E</td><td>• Parser error [line=${line},</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>column=${column}]. Strings must be quoted.

<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• line

• column</td><td>• line number

• column number</td></tr></table></td></tr>
<tr><td>CO1002E</td><td>• Parser error [line=${line}, column=${column}]. Invalid exponent.

<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• line

• column</td><td>• line number

• column number</td></tr></table></td></tr>
<tr><td>CO1003E</td><td>• Parser error [line=${line}, column=${column}]. Extraneous data found at end of input.

<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• line

• column</td><td>• line number

• column number</td></tr></table></td></tr>
<tr><td>CO1004E</td><td>• Parser error [line=${line}, column=${column}]. Unexpectedly run out of data. Expecting to find '%s1'.</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• line
• column</td><td>• line number
• column number</td></tr>
</table>
</td></tr>
<tr><td>CO1005E</td><td>• Parser error [line=${line}, column=${column}]. Mismatched input '%s1' expecting '%s2'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• line
• column</td><td>• line number
• column number</td></tr>
</table>
</td></tr>
<tr><td>CO1006E</td><td>• Parser error [line=${line}, column=${column}]. Mismatched tree node: '%s1' expecting '%s2'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• line
• column</td><td>• line number
• column number</td></tr>
</table>
</td></tr>
<tr><td>CO1007E</td><td>• Parser error [line=${line}, column=${column}]. No viable alternative at input '%s1'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• line</td><td>• line number</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• column</td><td>• column number</td></tr>
</table>
</td></tr>
<tr><td>CO1008E</td><td>• Parser error [line=${line}, column=${column}]. Mismatched input '%s1' expecting set '%s2'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• line
• column</td><td>• line number
• column number</td></tr>
</table>
</td></tr>
<tr><td>CO1009E</td><td>• Parser error [line=${line}, column=${column}]. Rule '%s1' failed predicate: '%s2'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• line
• column</td><td>• line number
• column number</td></tr>
</table>
</td></tr>
<tr><td>CO1010E</td><td>• Parser error [line=${line}, column=${column}]. Required (...)+ loop did not match anything at input '%s1'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• line</td><td>• line number</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• column</td><td>• column number</td></tr></table></td></tr>
<tr><td>CO1011E</td><td>• Parser error [line=${line}, column=${column}]. Unexpected character. Expecting '%s1', got '%s2'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• line
• column</td><td>• line number
• column number</td></tr></table></td></tr>
<tr><td>CO1100E</td><td>• Parser error [line=${line}, column=${column}]. Recognition error.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• line
• column</td><td>• line number
• column number</td></tr></table></td></tr>
</table>

Deployer Log Codes

Table 9.4. Deployer Log Codes

Code	Message
DE0000E	• Application symbolic name omitted from application

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>descriptor '${descriptor}'.
<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• descriptor</td><td>• application descriptor</td></tr></table></td></tr>
<tr><td>DE0002E</td><td>• Application version '${version}' invalid in application descriptor '${descriptor}'.
<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• version
• descriptor</td><td>• application version number
• application descriptor</td></tr></table></td></tr>
<tr><td>DE0003E</td><td>• Application '${application}' version '${version}' exports the package(s) '${package}' more than once.
<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• application
• version
• package</td><td>• application name
• version number
• export package(s)</td></tr></table></td></tr>
<tr><td>DE0004E</td><td></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>• Application '${application}' version '${version}' has unsatisfied constraints: '${constraints}' more than once.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• application
• version
• constraints</td><td>• application name
• version number
• constraints</td></tr>
</table></td></tr>
<tr><td>DE0005E</td><td>• Hot deploy failed for resource '${resource}'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• resource</td><td>• resource name</td></tr>
</table></td></tr>
<tr><td>DE0006E</td><td>• Hot re-deploy failed for resource '${resource}'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• resource</td><td>• resource name</td></tr>
</table></td></tr>
<tr><td>DE0007E</td><td>• Hot un-deploy failed for resource '${resource}'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td></td><td></td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• resource</td><td>• resource name</td></tr>
</table>
</td></tr>
<tr><td>DE0008E</td><td>• Automatic re-deployment failed for resource '${resource}'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• resource</td><td>• resource name</td></tr>
</table>
</td></tr>
<tr><td>DE0009E</td><td>• Application '${name}' version '${version}' exports package '${package}' from more than one bundle: ${bundle}.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• name
• version
• package
• bundle</td><td>• application name
• version number
• export package
• export bundle</td></tr>
</table>
</td></tr>
<tr><td>DE0010I</td><td>• Deployment of '${application}' version '${version}' completed.</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• application
• version</td><td>• application name
• version number</td></tr></table></td></tr>
<tr><td>DE0011E</td><td>• Deployment failed.</td></tr>
<tr><td>DE0012I</td><td>• Undeployment of '${application}' version '${version}' completed.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• application
• version</td><td>• application name
• version number</td></tr></table></td></tr>
<tr><td>DE0013E</td><td>• Undeployment of '${application}' version '${version}' failed.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• application
• version</td><td>• application name
• version number</td></tr></table></td></tr>
<tr><td>DE0014I</td><td>• Refresh of module '${module}' of '${application}' version '${version}' completed.</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• module
• application
• version</td><td>• module name
• application name
• version number</td></tr>
</table></td></tr>
<tr><td>DE0015E</td><td>• Refresh of module '${module}' of '${application}' version '${version}' failed.<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• module
• application
• version</td><td>• module name
• application name
• version number</td></tr>
</table></td></tr>
<tr><td>DE0016E</td><td>• Application symbolic name in application descriptor '${descriptor}' has invalid syntax.<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• descriptor</td><td>• descriptor name</td></tr>
</table></td></tr>
<tr><td>DE0017W</td><td>• Discarding bundle update location '${location}' of module '${module}' of</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>'${application}' version '${version}' so it will not interfere with refresh.
<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• location
• module
• application
• version</td><td>• bundle update location
• module name
• application name
• version number</td></tr></table></td></tr>
<tr><td>DE0018E</td><td>• Unable to install application from location '${location}'. Could not satisfy constraints for bundle '${bundle}' at version '${version}'.\n ${application}.
<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• location
• bundle
• version
• application</td><td>• application location
• bundle name
• version number
• application name</td></tr></table></td></tr>
<tr><td>DE0019I</td><td>• Ignoring undeployment of artifact '${artifact}',</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>application is not currently deployed.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• artifact</td><td>• artifact name</td></tr></table></td></tr>
<tr><td>DE0020E</td><td>• Application context creation failure for bundle '${bundle}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• bundle</td><td>• bundle name</td></tr></table></td></tr>
<tr><td>DE0021E</td><td>• Artifact at URI '${uri}' cannot be deployed as application ${application} is already deployed.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• uri
• application</td><td>• uri address
• application name</td></tr></table></td></tr>
<tr><td>DE0022E</td><td>• Artifact at URI '${uri}' cannot be deployed as it has the same file or directory name '${name}' as application ${application}.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• uri</td><td>• uri address</td></tr></table></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• name
• application</td><td>• file or directory name
• application name</td></tr></table></td></tr>
<tr><td>DE0023E</td><td>• Error parsing application manifest.</td></tr>
<tr><td>DE0024E</td><td>• Error parsing Spring configuration file '${file}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• file</td><td>• configuration file name</td></tr></table></td></tr>
<tr><td>DE0025E</td><td>• Exception after module '{module}' started.</td></tr>
<tr><td>DE0026E</td><td>• Exception after module '{module}' stopped.</td></tr>
<tr><td>DE0027E</td><td>• Exception deploying module '{module}'.</td></tr>
<tr><td>DE0028E</td><td>• Exception stopping module '{module}'.</td></tr>
<tr><td>DE0029E</td><td>• Starting the bundle for module '{module}' threw an exception.</td></tr>
<tr><td>DE0030E</td><td></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>• Stopping the bundle for module '{module}' threw an exception.</td></tr>
<tr><td>DE0031E</td><td>• Updated module '{module}' has unsatisfied dependencies.</td></tr>
<tr><td>DE0032E</td><td>• Update of module '{module}' took too long and timed out.</td></tr>
<tr><td>DE0033E</td><td>• Wait for update of module '{module}' was interrupted.</td></tr>
<tr><td>DE0034E</td><td>• Exception updating module '{module}'.</td></tr>
<tr><td>DE0035E</td><td>• Deployment artifact '${artifact}' has no manifest.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• artifact</td><td>• artifact name</td></tr>
</table></td></tr>
<tr><td>DE0036E</td><td>• More than one bundle in scope '${scope}' version '${version}' has the same bundle symbolic name '${name}'.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• scope
• version
• name</td><td>• scope range
• version number
• bundle</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td></td><td>symbolic name</td></tr></table></td></tr>
<tr><td>DE0037E</td><td>• No module with bundle symbolic name '${name}' was found in application '${applcation}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• name
• application</td><td>• bundle symbolic name
• application name</td></tr></table></td></tr>
<tr><td>DE0038E</td><td>• Refresh not possible as no application is deployed at '${location}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• location</td><td>• deploy location</td></tr></table></td></tr>
<tr><td>DE0039E</td><td>• Undeployment not possible as no artifact is deployed at '${location}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• location</td><td>• deploy location</td></tr></table></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td></td></tr>
<tr><td>DE0040E</td><td>• Deployment of module '${module}' took too long and timed out.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• module</td><td>• module name</td></tr></table></td></tr>
<tr><td>DE0041E</td><td>• OSGi R4 manifest with no bundle symbolic name detected:\n ${manifest}\nfor module '${module}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• manifest
• module</td><td>• manifest name
• module name</td></tr></table></td></tr>
<tr><td>DE0042E</td><td>• Refresh of module '${module}' took too long and timed out.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• module</td><td>• module name</td></tr></table></td></tr>
<tr><td>DE0043E</td><td>• Wait for refresh of module '${module}' was interrupted.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• module</td><td>• module name</td></tr></table></td></tr>
<tr><td>DE0044E</td><td></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>• Exception refreshing module '${module}'.
<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• module</td><td>• module name</td></tr></table></td></tr>
<tr><td>DE0045E</td><td>• Artifact at '${location}' not found.
<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• location</td><td>• location name</td></tr></table></td></tr>
<tr><td>DE0046E</td><td>• Artifact at '${location}' cannot be unpackaged.
<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• location</td><td>• location name</td></tr></table></td></tr>
<tr><td>DE0047E</td><td>• Artifact at '${location}' cannot be copied.
<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• location</td><td>• location name</td></tr></table></td></tr>
<tr><td>DE1000E</td><td>• Unknown error exception received, unable to track non-Antlr exceptions [${exception}]</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• exception</td><td>• exception</td></tr></table></td></tr>
<tr><td>DE1001E</td><td>• There has been an unknown recognition error exception with the Parser, it will attempt to continue [${exception}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• exception</td><td>• exception</td></tr></table></td></tr>
<tr><td>DE1002E</td><td>• The parser could not find an expected symbol at the given input position [${position}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• position</td><td>• position</td></tr></table></td></tr>
<tr><td>DE1003E</td><td>• The parser could not find a node with the expected token type [${token}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• token</td><td>• token</td></tr></table></td></tr>
<tr><td>DE1004E</td><td>• At this decision point the parser's look-ahead could not find a viable option [${option}]</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• option</td><td>• option</td></tr></table></td></tr>
<tr><td>DE1005E</td><td>• The parser could not match a reqiured sub rule [${rule}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• rule</td><td>• rule</td></tr></table></td></tr>
<tr><td>DE1006E</td><td>• The parser has evaluated a validating semantic to false [${semantic}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• semantic</td><td>• semantic</td></tr></table></td></tr>
<tr><td>DE1007E</td><td>• The parser has failed to match a range of symbols [${symbols}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• symbols</td><td>• range of symbols</td></tr></table></td></tr>
<tr><td>DE1008E</td><td>• The parser has failed to match a set of symbols [${symbols}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td></td><td></td></tr></table></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• symbols</td><td>• set of symbols</td></tr></table></td></tr>
<tr><td>DE1009E</td><td>• The parser has failed to match the inverse of a set of symbols [${symbols}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• symbols</td><td>• set of symbols</td></tr></table></td></tr>
<tr><td>DE1025W</td><td>• Unknown warning exception received, unable to track non-Antlr exceptions [${exceptions}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• exceptions</td><td>• exceptions</td></tr></table></td></tr>
<tr><td>DE1026W</td><td>• There has been an unknown recognition warning exception with the Parser, it will attempt to continue [${exception}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• exception</td><td>• exception</td></tr></table></td></tr>
<tr><td>DE1027W</td><td>• The parser could not find an expected symbol at the given</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>input position [${position}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• position</td><td>• position</td></tr></table></td></tr>
<tr><td>DE1028W</td><td>• The parser could not find a node with the expected token type [${type}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• type</td><td>• token type</td></tr></table></td></tr>
<tr><td>DE1029W</td><td>• At this decision point the parser's look-ahead could not find a viable option [${option}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• option</td><td>• option</td></tr></table></td></tr>
<tr><td>DE1030W</td><td>• The parser could not match a required sub rule [${sub_rule}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• sub_rule</td><td>• sub rule</td></tr></table></td></tr>
<tr><td>DE1031W</td><td>• The parser has evaluated a validating semantic to false [${semantic}]</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• semantic</td><td>• semantic</td></tr></table></td></tr>
<tr><td>DE1032W</td><td>• The parser has failed to match a range of symbols [${symbols}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• symbols</td><td>• range of symbols</td></tr></table></td></tr>
<tr><td>DE1033W</td><td>• The parser has failed to match a set of symbols [${symbols}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• symbols</td><td>• set of symbols</td></tr></table></td></tr>
<tr><td>DE1034W</td><td>• The parser has failed to match the inverse of a set of symbols [${symbols}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• symbols</td><td>• set of symbols</td></tr></table></td></tr>
<tr><td>DE1050I</td><td>• Unknown info exception received, unable to track non-Antlr exceptions [${symbols}]</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• symbols</td><td>• range of symbols</td></tr></table></td></tr>
<tr><td>DE1051I</td><td>• There has been an unknown recognition info exception with the Parser, it will attempt to continue [${exception}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• exception</td><td>• exception</td></tr></table></td></tr>
<tr><td>DE1052I</td><td>• The parser could not find an expected symbol at the given input position [${position}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• position</td><td>• position</td></tr></table></td></tr>
<tr><td>DE1053I</td><td>• The parser could not find a node with the expected token type [${type}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• type</td><td>• type</td></tr></table></td></tr>
<tr><td>DE1054I</td><td>• At this decision point the parser's look-ahead could not find a viable option [${option}]</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• option</td><td>• option</td></tr></table></td></tr>
<tr><td>DE1055I</td><td>• The parser could not match a required sub rule [${sub_rule}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• sub_rule</td><td>• sub rule</td></tr></table></td></tr>
<tr><td>DE1056I</td><td>• The parser has evaluated a validating semantic to false [${semantic}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• semantic</td><td>• semantic</td></tr></table></td></tr>
<tr><td>DE1057I</td><td>• The parser has failed to match a range of symbols [${symbols}]<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• symbols</td><td>• range of symbols</td></tr></table></td></tr>
<tr><td>DE1058I</td><td>• The parser has failed to match a set of symbols [${symbols}]</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• symbols</td><td>• set of symbols</td></tr>
</table>
</td></tr>
<tr><td>DE1059I</td><td>• The parser has failed to match the inverse of a set of symbols [${symbols}]
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• symbols</td><td>• set of symbols</td></tr>
</table>
</td></tr>
<tr><td>DE1085E</td><td>• There has been an error that can't be identified by any part of the system [${error}]
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• error</td><td>• unidentified error</td></tr>
</table>
</td></tr>
</table>

FFDC Log Codes

Table 9.5. FFDC Log Codes

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td>FF0000E</td><td>• Failed to locate dump directory "${directory}"
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• directory</td><td>• dump file</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td></td><td>directory</td></tr>
</table>
</td></tr>
<tr><td>FF0001I</td><td>• Using dump directory "${directory}"
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• directory</td><td>• dump file directory</td></tr>
</table>
</td></tr>
<tr><td>FF0002I</td><td>• Wrote dump file "${file}"
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• file</td><td>• dump file name</td></tr>
</table>
</td></tr>
<tr><td>FF0003E</td><td>• Bundle '${bundle}' in Subsystem '${subsystem}' failed to start.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• bundle
• subsystem</td><td>• bundle name
• subsystem name</td></tr>
</table>
</td></tr>
</table>

Bootstrap Log Codes

Table 9.6. Bootstrap Log Codes

Code	Message
KB0001I	• Server starting.
KB0002E	• Start failed:

Kernel Log Codes

Table 9.7. Kernel Log Codes

Code	Message
KE0000I	• Boot subsystems installed.
KE0001I	• Base subsystems installed.
KE0051E	• Subsystem descriptor has a bundle element '${element}' with no bundle symbolic name. **Inserts**: • element **Description**: • bundle element

OSGi Log Codes

Table 9.8. OSGi Log Codes

Code	Message
OP0001W	• The library definition '${definition}' could not be provisioned. A library definition with the name '${definition}' and version '${version}' has already been added to the repository from

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>'${location}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• definition
• version
• location</td><td>• library definition
• library version
• library location</td></tr></table></td></tr>
<tr><td>OP0002W</td><td>• The bundle '${bundle}' could not be provisioned. A bundle with the symbolic name '${name}' and version '${version}' has already been added to the repository from '${location}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• bundle
• name
• version
• location</td><td>• bundle name
• bundle symbolic name
• bundle version
• bundle location</td></tr></table></td></tr>
<tr><td>OP0003W</td><td>• The JAR bundle '${bundle}' could not be provisioned as it appears to be corrupted. The exception encountered whilst reading the file was:</td></tr>
</table>

Code	Message
	Inserts / **Description** • bundle / • bundle name
OP0004W	• The bundle '${bundle}' could not be provisioned is its manifest is malformed. The error encountered whilst parsing the manifest was: ${error} **Inserts** / **Description** • bundle / • bundle name • error / • error

Profile Log Codes

Table 9.9. Profile Log Codes

Code	Message
PM0000I	• Installing profile '${profile}'. **Inserts** / **Description** • profile / • profile name
PM0001I	• Installed profile '${profile}'. **Inserts** / **Description**

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td><table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• profile</td><td>• profile name</td></tr></table></td></tr>
<tr><td>PM0002I</td><td>• Server open for business with profile '${profile}'.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• profile</td><td>• profile name</td></tr></table></td></tr>
<tr><td>PM0003E</td><td>• Timed out with profile '${profile}' waiting for the application context of bundle '${bundle}' to be created.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• profile
• bundle</td><td>• profile name
• bundle name</td></tr></table></td></tr>
<tr><td>PM0004W</td><td>• With profile '${profile}', bundle '${bundle}' has not started.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• profile
• bundle</td><td>• profile name
• bundle name</td></tr></table></td></tr>
</table>

Servlet Log Codes

Table 9.10. Servlet Log Codes

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td>SC0000I</td><td>• Starting the ServletContainer on port ${port}.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• port</td><td>• port</td></tr></table></td></tr>
<tr><td>SC0001I</td><td>• Starting the ServletContainer on port ${port} and SSL port ${ssl}.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• port
• ssl</td><td>• port
• ssl port</td></tr></table></td></tr>
<tr><td>SC0002I</td><td>• Shutting down the ServletContainer.</td></tr>
<tr><td>SC0003E</td><td>• Failed to start the ServletContainer.</td></tr>
<tr><td>SC0004E</td><td>• Failed to stop the ServletContainer.</td></tr>
<tr><td>SC1000I</td><td>• Creating web application ${application}.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• application</td><td>• web application</td></tr></table></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td></td></tr>
<tr><td>SC1001I</td><td>• Deploying web application ${application}.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• application</td><td>• web application</td></tr></table></td></tr>
<tr><td>SC1002I</td><td>• Removing web application ${application}.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• application</td><td>• web application</td></tr></table></td></tr>
<tr><td>SC1003E</td><td>• Failed to create web application ${application}.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• application</td><td>• web application</td></tr></table></td></tr>
<tr><td>SC1004E</td><td>• Failed to create web application ${application}: the associated web bundle \ '${bundle}' failed to publish its ApplicationContext within ${time} seconds.<table><tr><th>Inserts</th><th>Description</th></tr><tr><td>• application
• bundle</td><td>• web application</td></tr></table></td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• time</td><td>• web bundle
• time frame</td></tr>
</table>
</td></tr>
<tr><td>SC2000E</td><td>• Failed to deploy WAR ${war}.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• war</td><td>• war file</td></tr>
</table>
</td></tr>
</table>

Web Log Codes

Table 9.11. Web Log Codes

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td>WE1000E</td><td>• Failed to create web application context [${context}]: the associated web \ bundle [${bundle}] failed to publish its ApplicationContext.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• context
• bundle</td><td>• web application context
• web bundle</td></tr>
</table>
</td></tr>
<tr><td>WE1001E</td><td>• Failed to create web application context [${context}]; the associated</td></tr>
</table>

<table>
<tr><th>Code</th><th>Message</th></tr>
<tr><td></td><td>web \ bundle [${bundle}] failed to publish its ApplicationContext within \ ${time} seconds.
<table>
<tr><th>Inserts</th><th>Description</th></tr>
<tr><td>• context
• bundle
• time</td><td>• web application context
• web bundle
• time frame</td></tr>
</table></td></tr>
</table>

10. Further Reading

SpringSource dm Server Programmer Guide

Spring Framework Reference Guide

Spring Dynamic Modules Reference Guide