Installing Solr on Red Hat-type Systems

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Oct 21, 2011, revised Apr 20, 2012

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Solr is a search server that runs inside a servlet container. This article describes how to install Solr on Red Hat-type systems using Jetty as the servlet container.

The server hosting Solr must be configured with the following capabilities:

- a current Java runtime environment
- secure shell access
- have cURL installed
- allow access to port 8983

It is assumed that you have some understanding of Solr and have determined what changes need to be made to the Solr configuration files.

Configuration and Start-up Files

The configuration files for Solr and Jetty are as follows:

Table 1. Configuration files

File	Description	Destination
jetty.sh	jetty init script	/etc/init.d/jetty
jetty	jetty configuration file	/etc/default/jetty
jetty-logging.xml	jetty logging config file	/opt/apache-solr-3.6.0/*app_name*/etc/
schema.xml	Solr configuration file	/opt/apache-solr-3.6.0/*app_name*/solr/conf
solrconfig.xml	Solr configuration file	/opt/apache-solr-3.6.0/*app_name*/solr/conf

The Solr Jetty website has copies of the Jetty configuration files and start up script. Get the Jetty init script and the logging configuration files from this site. The main Jetty configuration file will be created from scratch.

The two Solr configuration files can be created by editing the files found in the `example` Solr application. If you haven't already created these files you'll need to untar the Solr file as described in the section called "Installing Solr". Copy the Solr configuration files to the `/var/tmp` directory on the machine hosting Solr.

The Jetty Config Files

Check the location of the java executable on the machine that will be hosting the Solr server:

```
shell> which java
/usr/bin/java
```

Create a file named `jetty` with the following entries:

```
JAVA_HOME=/usr/bin/javaJAVA_OPTIONS="-Dsolr.solr.home=/opt/apache-solr-3.6.0/app_name/solr
   $JAVA_OPTIONS"
JETTY_HOME=/opt/apache-solr-3.6.0/app_name
JETTY_ARGS="etc/jetty.xml etc/jetty-logging.xml"< /div>
JETTY_LOGS=/opt/apache-solr-3.6.0/app_name/logs
```

Change the Solr home directory (`app_name`) to a suitable value and adjust `JAVA_HOME` if the output of **which java** differs from what's shown above.

The Jetty logging file doesn't need changing and nor should the Jetty initialization script, `jetty.sh`.

Copy these files to `/var/tmp` on the server hosting Solr.

Installing Solr

Go to the command line on the server hosting Solr, navigate to `/var/tmp` and download the latest Solr build from the Apache website. Expand the archived file:

```
shell> tar zxf apache-solr-3.6.0.tgz
```

This creates the `apache-solr-3.6.0` directory. Move this directory to `/opt`:

```
shell> mv apache-solr-3.6.0 /opt
```

Navigate to the `example` directory:

```
shell> cd /opt/apache-solr-3.6.0/example/
```

You can ensure Solr works by issuing the following command:

```
shell> java -jar start.jar
```

You should see output such as the following:

```
2011-07-06 09:20:14.979:INFO::Logging to STDERR via org.mortbay.log.StdErrLog
2011-07-06 09:20:15.376:INFO::jetty-6.1-SNAPSHOT
2011-07-06 09:20:15.478:INFO::Extract file:/opt/apache-solr-3.3.0/example/webapps/solr.war to
 /opt/apache-solr-3.3.0/example/work/Jetty_0_0_0_8983_solr.war__solr__k1kf17/webapp
Jul 6, 2011 9:20:16 AM org.apache.solr.core.SolrResourceLoader locateSolrHome
INFO: JNDI not configured for solr (NoInitialContextEx)
Jul 6, 2011 9:20:16 AM org.apache.solr.core.SolrResourceLoader locateSolrHome
INFO: solr home defaulted to 'solr/' (could not find system property or JNDI)
Jul 6, 2011 9:20:16 AM org.apache.solr.core.SolrResourceLoader <init>
...
Jul 6, 2011 9:20:19 AM org.apache.solr.servlet.SolrUpdateServlet init
INFO: SolrUpdateServlet.init() done
Jul 6, 2011 9:20:19 AM org.apache.solr.handler.component.SpellCheckComponent$SpellCheckerListener
newSearcher
INFO: Loading spell index for spellchecker: default
2011-07-06 09:20:19.100:INFO::Started SocketConnector@0.0.0.0:8983
Jul 6, 2011 9:20:19 AM org.apache.solr.core.SolrCore registerSearcher
INFO: [] Registered new searcher Searcher@154e4e31 main
```

At this point nothing has been indexed by Solr but you can query the server by opening another console window and issuing the command: **`curl http://localhost:8983/solr/select/?q=*:*`**.

You should receive an XML response similar to the following:

```
<?xml version="1.0" encoding="UTF-8"?>
<response>
  <lst name="responseHeader">
  <int name="status">0</int>
  <int name="QTime">4</int>
  <lst name="params">
  <str name="q">*:*</str></lst></lst><result name="response" numFound="0" start="0"/>
</response>
```

Return to the original console window and shut down the jetty server using `Control-c`. You should see a shutdown message such as the following:

```
2011-07-06 09:23:04.123:INFO::Shutdown hook executing
2011-07-06 09:23:04.124:INFO::Graceful shutdown SocketConnector@0.0.0.0:8983
2011-07-06 09:23:07.202:INFO::Graceful shutdown
org.mortbay.jetty.webapp.WebAppContext@47503458{/solr,
file:/opt/apache-solr-3.6.0/example/webapps/solr.war}
2011-07-06 09:23:08.208:INFO::Stopped SocketConnector@0.0.0.0:8983
2011-07-06 09:23:08.275:INFO::Shutdown hook complete
```

This confirms that Solr works with the default configuration.

Move Configuration Files

Navigate to `/var/tmp` where the configuration files are and copy the Jetty configuration files to their proper locations:

```
shell> cp jetty /etc/default
shell> cp jetty-logging.xml /opt/apache-solr-3.6.0/example/etc
```

Copy and rename the init script, jetty.sh:

```
shell> cp jetty.sh /etc/init.d/jetty
```

Make sure that the script is executable:

```
shell> chmod +x /etc/init.d/jetty
```

Navigate to `/opt/apache-solr-3.6.0/` and change the `example` directory to `app_name` where `app_name` is the name you want to assign to the Solr home directory:

```
shell> mv example app_name
```

Navigate to the `app_name/solr/conf` directory: and overwrite the `schema.xml` file in this dir:

```
shell> cp /var/tmp/schema.xml ./
```

Do the same with the `solrconfig.xml` file:

```
shell> cp /var/tmp/solrconfig.xml ./
```

Again, you can confirm that your configuration files are correct by starting up Jetty:

```
shell> cd /opt/apache-solr-3.6.0/app_name/
shell> java -jar start.jar
```

Use **Control-c** to shut down the server.

Starting Solr Automatically

You can use chkconfig to ensure that Jetty starts on reboot. Since the `jetty` start up file has already been added to the `/etc/init.d` directory you can configure it to restart on reboot in the following way:

```
shell> chkconfig --add jetty
shell> chkconfig --level 345 jetty on
```

Confirm that the service has been added:

```
shell> chkconfig --list jetty
```

Start the Jetty server now:

```
shell> service jetty start
```

Check connectivity using curl:

```
shell> curl http://localhost:8983/solr/select/?q=*:*
```

You should get a response even though the index is empty.

You may want to rotate the log files created in `/opt/apache-solr-3.6.0/app_name/logs`.

Resources

The Apache Solr website - the place to start with Solr

The Solr 1.4 Enterprise Search Server book - an excellent overview of Solr

The Solr Wiki website - lots of good material here, including configuration files

About the Author

Peter Lavin is a technical writer who has been published in a number of print and online magazines. He is the author of Object Oriented PHP published by No Starch Press and a contributor to PHP Hacks by O'Reilly Media.