

# CAAMEL 1.6

## *Local Installation Guide*



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Center for Bioinformatics

Revised October 24, 2007

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## Introduction

The *caAMEL 1.6 Local Installation Guide* is intended for systems administrators who want to install caAMEL, a web-based application that facilitates working with MAGE\_ML documents. This guide contains instructions to deploy, and access the caAMEL application. For those who wish to become members of the development community, or need to extend caAMEL to meet their special needs, Appendix A includes instructions to create caAMEL from source.

Most of the examples and screenshots included in this document are Windows specific. If you are using a different platform, then modify the information as appropriate for your system.

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### Overview of caAMEL

caAMEL is a web-based application that validates MAGE-ML documents, and more importantly, loads the data contained within valid MAGE-ML documents into a caArray repository. The caAMEL project, as well as the caArray project that it is targeted to enhance, is sponsored by the National Cancer Institute Center for Bioinformatics (NCICB). caAMEL, like caArray, is an open source project, and the source code and APIs are available in the NCICB download website: <http://ncicb.nci.nih.gov/download/index.jsp>.

#### NOTE:



The caAMEL project is maintained on NCI's GForge site at <http://qforge.nci.nih.gov/projects/caamel/>. Technical documentation and additional assets can be found there, along with ways to communicate defects and feature requests.

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### caAMEL's Relationship to caArray

caAMEL emerged as a complete product because caArray 1.3.1 did not support the validation and importing of MAGE-ML files. It was intended to "fill the gap" so that researchers can conveniently upload valid MAGE-ML into caArray. Using caAMEL integrated with caArray is its intended use, however, it is also possible to install caAMEL without integrating with an existing caArray system for the purpose of MAGE validation only.

<b>Overview of caAMEL Installation</b>	<p>The process for installing caAMEL includes the following steps:</p> <ol style="list-style-type: none"> <li>1. Decide which way you would like to install caAMEL. We recommend the complete caAMEL Binary.</li> <li>2. Confirm you meet the minimum requirements to install caAMEL.</li> <li>3. Download, install, and configure required software.</li> <li>4. Download and extract caAMEL files.</li> <li>5. Configure JBoss.</li> <li>6. Configure caAMEL.</li> <li>7. Deploy caAMEL.</li> <li>8. Launch the caAMEL application to confirm installation.</li> </ol>
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## System Requirements

**Minimal System Requirements** caAMEL has been tested on various platforms, and the table below represents what are considered to be minimal system requirements for the application server that hosts it. Note that the minimal requirements for caAMEL are NOT the same as for caArray.

- **CPU:** 1 x Intel® Xeon™ Processor 2.80GHz
- **Memory:** 2 GB
- **Disk Space:** Approximately 150 MB for the application plus a variable additional amount that is sufficient to hold uploaded files.
- **Operating System:** Red Hat Enterprise Linux 3 or Microsoft Windows XP

## Required Software

**Required Software—Not included in caAMEL** Table 1 provides a complete set of software, not included in the caAMEL distribution files, which must be downloaded and/or installed before caAMEL can run. The software name, version, description, and URL hyperlinks (for download) are indicated in the table. Where appropriate, apply patches to the installed applications.

<p><b>NOTE</b></p> 	<p>Most installations of caAMEL will be configured to work with an instance of caArray. In those deployments, caArray should already have been installed and configured.</p> <p>When caAMEL is to be deployed as a MAGE validation-only application, caArray 1.6 is not required.</p>
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<b>Required Software Name</b> <b>Version</b> <b>URL to Download</b>	<b>Binary</b>	<b>Source</b>
JBoss Version: 4.0.4 <a href="http://labs.jboss.com/portal/jbossas/download">http://labs.jboss.com/portal/jbossas/download</a>	X	X
Java Software Development Kit (SDK): Java 2 Standard Edition (J2SE) 1.5.0_06 <a href="http://java.sun.com/products/archive/j2se/5.0_06/index.html">http://java.sun.com/products/archive/j2se/5.0_06/index.html</a>	X	X
Apache Ant 1.6.5 <a href="http://archive.apache.org/dist/ant/binaries/">http://archive.apache.org/dist/ant/binaries/</a>		X
caArray 1.5 (installed and configured, including Oracle database) <a href="http://ncicb.nci.nih.gov/download/index.jsp">http://ncicb.nci.nih.gov/download/index.jsp</a>	X	X


Table 1 - Required Software

**caAMEL  
Distribution  
Files**

The distribution files listed in Table 2 must be downloaded from for successful deployment of caAMEL. For more information, see the following section.

<b>Binary Distribution</b>	<b>Source Distribution</b>
caamel-1.6.zip (Windows) caamel-1.6.tar.gz (Linux)	caamel-1.6-src.zip (Windows) caamel-1.6-src.tar.gz (Linux)

Table 2 - caAMEL Distribution Files to Download

  <b>BEFORE YOU BEGIN</b>	<p>caAMEL has been tested with the operating systems and hardware specified in this guide. We cannot guarantee that caAMEL will work if you are using variations of these operating systems and/or hardware.</p>
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## Installation Procedures

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### Downloading and Extracting caAMEL Files

Complete the following steps to download the appropriate caAMEL distribution file, and extract its contents.

Step	Action
1	Create or choose a temporary folder for the caAMEL files to be downloaded, such as C:\temp.
2	Go to the NCICB download web site <a href="http://ncicb.nci.nih.gov/download/index.jsp">http://ncicb.nci.nih.gov/download/index.jsp</a> .
3	Provide your email, name, and institution. Click <b>Enter the Download Center</b> .
4	Select <b>caAMEL</b> , agree to the caAMEL software license by selecting <b>Checking this box indicates that you agree to the above terms</b> , and click <b>Download</b> .
5	Select the caAMEL distribution files listed in Table 2 based on the kind of installation you are performing and save them to the temporary directory you created. The binary distribution is the easiest to install and is recommended for most installations.
6	Unzip the contents of the downloaded distribution file to the same folder.

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## Installing caAMEL

### Configuring caAMEL

Perform the following steps to configure caAMEL for your environment:


Step	Action
1	<p>Create a directory to be used as the caAMEL home directory. This directory will be used to store uploaded MAGE-ML files, so ensure that there is sufficient disk space available in the location you choose.</p> <p>The recommended directory to create and use is <code>{JBOSS_HOME}/caarray/caamel</code>.</p> <p>Make a note of the directory you have chosen as your caAMEL home directory, as it will be referred to later in the installation instructions</p>
2	Copy <code>caamel.properties</code> from the “etc” directory in the unpacked caAMEL distribution to your caAMEL home directory.
3	Open the <code>caamel.properties</code> file in your caAMEL home directory for editing
4	<p>Edit the global properties in the <code>caamel.properties</code> file:</p> <ul style="list-style-type: none"> <li>• Set <code>caamel.url</code> to the URL that users will open to access caAMEL (e.g. <a href="http://myserver.myinstitution.org:8080/caamel">http://myserver.myinstitution.org:8080/caamel</a>). If caAMEL is installed in HTTPS mode, the URL will be similar to <a href="https://myserver.myinstitution.org:443/caamel">https://myserver.myinstitution.org:443/caamel</a>.</li> <li>• Set <code>email.sender.address</code> to the email address that caAMEL should use when sending notification emails. This email address will be displayed as the “from” address in notification emails.</li> <li>• Set <code>email.sender.name</code> to the name that should be used as the “from” name in notification emails.</li> </ul>

**NOTE:**



The caAMEL home directory created in Step 1 above and the `caamel.properties` copied there in Step 2 are essential for caAMEL to function properly. If you are having trouble accessing the application after installation, ensure that the caAMEL home and `caamel.properties` are properly configured. If ever you need to manually delete files in this directory, do so with caution and make sure you do not delete the `caamel.properties` file.

Perform the following steps to configure caAMEL's caArray server integration properties.


 <p><b>NOTE:</b></p>	<p>If you are installing caAMEL for MAGE-ML validation only, and not caArray integration, skip the next set of steps and instead comment out all of the properties that start with "caarray" at the end of the <code>caamel.properties</code> file.</p> <p>To comment out these properties place a "#" character at the start of each line that begins with "caarray".</p>
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Step	Action
1	<p>Make the following edits to the caArray server properties found at the bottom of the <code>caamel.properties</code> file:</p> <ol style="list-style-type: none"> <li>a. Set <code>caarray.name</code> to a brief descriptive name for your caArray installation. This name will be displayed in the login form.</li> <li>b. Set <code>caarray.hostname</code> to the fully-qualified DNS name of your caArray server, for example, <b><i>caarray.myorganization.org</i></b>.</li> <li>c. If the JBoss server that caArray is running on uses a JNDI port other than the default, change <code>caarray.jndi.port</code> to the correct port value.</li> <li>d. Set <code>caarray.experiment.data.dir</code> to the path that caArray uses to store experiment data files. This directory can be found in your caArray configuration within <code>conf/caarray.properties</code> as the value <code>experimentDataFilesDirectory</code>.</li> <li>e. Set <code>caarray.arraydesign.files.dir</code> to the path that caArray uses to store array design MAGE-ML files. This directory can be found in your caArray configuration within <code>conf/caarray.properties</code> as the value <code>arrayDesignMAGEMLFileDirectory</code>.</li> </ol> <p><b>NOTE:</b> If caArray is running on a different host, it is necessary for this path to be visible from the caAMEL server, via an NFS share or other remote directory access path. Also, if caArray and caAMEL are deployed to separate JBoss servers, the caAMEL JBoss server user must have read and write access to the two directories configured above.</p>




## Configuring JBoss

Perform the following steps to configure JBoss to work with your caAMEL installation.

Step	Action
1	<p>JBoss comes with two files in the <code>JBoss/bin</code> directory that are used to start JBoss, <code>run.bat</code> (Windows) and <code>run.sh</code> (UNIX). Edit the JVM option for the JBoss runtime in <code>jboss/bin/run.bat</code> or <code>run.sh</code> starting with <code>-Xmx2048m</code> and incrementally increase it according to the amount of data you handle. If this is already set to this or a higher value you may skip this step.</p> <div data-bbox="444 562 1398 730" style="border: 1px solid black; padding: 5px;"> <p><b>NOTE:</b>  By setting the JVM (Java Virtual Machine) option to <code>-Xmx2048m</code>, you are increasing the heap size used by the virtual machine so large amounts of data can be used. You will have to experiment with the amount of heap you allocate, because each user may have different data requirements.</p> </div> <p><b>Unix:</b></p> <ul style="list-style-type: none"> <li>In the <code>run.sh</code> file, the section should appear as follows: <pre># Setup JBoss specific properties</pre> </li> </ul> <p><b>Windows:</b></p> <ul style="list-style-type: none"> <li>In the <code>run.bat</code> file, the line should appear as follows: <pre>set JAVA_OPTS=%JAVA_OPTS% -Xms128m -Xmx2048m</pre> </li> </ul>
2	<p><i>(Optional: Only necessary if caAMEL installation includes caArray integration)</i></p> <p>Deploy and configure the caAMEL data source.</p> <ol style="list-style-type: none"> <li>Copy the file <code>caamel-oracle-xa-ds.xml</code> from the <code>etc</code> directory of the caAMEL distribution to your JBoss server's deploy directory, for example, <code>{JBOSS_HOME}/server/{JBOSS_SERVER_NAME}/deploy</code>.</li> <li>Edit the deployed copy of <code>caamel-oracle-xa-ds.xml</code> to access your caArray server's Oracle database. Edit the following elements in this file based on the location and authentication information for the caArray database instance: <pre>&lt;xa-datasource-property name="URL"&gt;jdbc:oracle:thin:@caarray.myorganization.org:1521 :caarray&lt;/xa-datasource-property&gt; &lt;xa-datasource-property name="User"&gt;caarrayop&lt;/xa- datasource-property&gt; &lt;xa-datasource-property name="Password"&gt;password&lt;/xa- datasource-property&gt;</pre> </li> </ol>

Step	Action
3	<p>Configure the JBoss properties-service.xml to include caamel.home.</p> <ol style="list-style-type: none"> <li>Open the file <code>properties-service.xml</code> found in your JBoss deploy directory for editing (e.g. <code>{JBOSS_HOME}/server/{JBOSS_SERVER_NAME}/deploy/properties-service.xml</code>).</li> <li>Add the following property to the <code>SystemPropertiesService</code> section of this file, replacing <code>&lt;caamel_home_directory&gt;</code> with the directory you created initially as the caAMEL home directory: <pre data-bbox="506 575 1094 659"> &lt;attribute name="Properties"&gt;   caamel.home=&lt;caamel_home_directory&gt; &lt;/attribute&gt; </pre> </li> <li>An example <code>properties-service.xml</code> file containing only the <code>caamel.home</code> property can be found in the <code>etc</code> directory of the caAMEL distribution. Review this file for reference if necessary.</li> </ol> <p><b>Windows Users:</b> Note that forward slashes (/) must be used in the path to <code>caamel.home</code> in this property in place of back slashes (\).</p>
4	<p>Configure the JBoss descriptor <code>mail-service.xml</code> to send email via SMTP.</p> <ol style="list-style-type: none"> <li>Open the file <code>mail-service.xml</code> found in your JBoss deploy directory for editing (e.g. <code>{JBOSS_HOME}/server/{JBOSS_SERVER_NAME}/deploy/properties-service.xml</code>).</li> <li>Provide the name of a valid SMTP mail server as the value for the property named <code>"mail.smtp.host"</code>.</li> </ol>
5	<p>Configure the JBoss descriptor <code>jbossmq-destinations-service.xml</code>.</p> <ol style="list-style-type: none"> <li>Open the file <code>{JBOSS_HOME}/server/{JBOSS_SERVER_NAME}/deploy/jms/jbossmq-destinations-service.xml</code> for editing.</li> <li>Copy the Topic and Queue entries found in the caAMEL distribution file <code>etc/jbossmq-destinations-service.xml</code> into the JBoss JMS descriptor file.</li> <li><b>NOTE:</b> If the JBoss descriptor file has never been edited before, you can simply replace JBoss's copy of <code>jbossmq-destinations-service.xml</code> with the copy found in the caAMEL distribution.</li> </ol>

<p><b>NOTES</b></p> 	<ul style="list-style-type: none"> <li>By default, only 64MB is allocated for JBoss runtime; that is insufficient for caAMEL.</li> <li>If your computer is running in 32 bit mode, you cannot set the heap size at more than 4 g. If this seems to be a problem, set the <code>-Xmx</code> at 1024.</li> <li>If your computer is running in 64 bit mode and you want to use 4 gigs, add the term <code>-d64</code> in the command line as follows:  <pre>set JAVA_OPTS=%JAVA_OPTS% -d64 -Xms128m -Xmx4096m</pre> </li> </ul>
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## Deploying caAMEL

Perform the following steps to deploy caAMEL to your JBoss server.

Step	Action
1	<p>Copy caamel.ear from the bin subdirectory of your caAMEL distribution to your JBoss server's deploy directory (e.g. {JBOSS_HOME}/server/{JBOSS_SERVER_NAME}/deploy).</p> <p><b>NOTE:</b> If you are building from the source distribution, caamel.ear will be found in the target subdirectory after building. See Appendix A for instructions on building from the source distribution.</p>
2	<p><b>NOTE:</b> This step is only necessary if the caArray application (caarray.ear) is not deployed on the same JBoss server as caAMEL.</p> <p>Copy caarray_client.jar from the bin subdirectory of the caAMEL distribution to your JBoss server's deploy directory.</p>

## Launching caAMEL

Perform the following steps to access the caArray application.

Step	Action
1	Run {JBOSS_home}/bin/run.sh (UNIX) or {JBOSS_home}/bin/run.bat (Windows) to start JBoss.
2	Open an Internet Explorer (IE) browser and type following URL to access the caArray web application: <a href="http://{SERVERNAME}:8080/caamel">http://{SERVERNAME}:8080/caamel</a> . If caAMEL is configured to run under HTTPS, the url will be <a href="https://{SERVERNAME}:443/caamel">https://{SERVERNAME}:443/caamel</a> .
3	<p>If you can not access the caArray web application, perform the following:</p> <ol style="list-style-type: none"> <li>Enter <a href="http://{SERVERNAME}:8080">http://{SERVERNAME}:8080</a> to make sure JBoss is running.</li> <li>Check the log file {JBOSS_home}/server/{JBOSS_SERVER_NAME}/logs/server.log for any error messages.</li> </ol>

## Contacting Application Support

NCICB  
Application  
Support

<http://ncicbsupport.nci.nih.gov/sw/>

Telephone: 301-451-4384

Toll free: 888-478-4423

## Appendix A: Building caAMEL From Source

This appendix describes how to build the caAMEL application from source code. Most users will not need to do this, and instead are encouraged to simply use the latest binary release of caAMEL.

Change location to the build subdirectory found in the directory where you unpacked the caAMEL source distribution (e.g., `cd /temp/caamel_1.0/build`).

Execute ant:

➤ `ant`

Ant will automatically build the `caamel.ear` file, placing it in the target subdirectory using the `build.xml` file provided.

When finished, continue the steps described in ***Deploying caAMEL*** to configure and deploy caAMEL.