

# CAARRAY 2.0 DATA PORTAL

## *Local Installation Guide*



NATIONAL<sup>®</sup>  
CANCER  
INSTITUTE

Center for Bioinformatics

*Revised February 27, 2008*


# Table of Contents

<b>INTRODUCTION .....</b>	<b>1</b>
<b>CAARRAY 2.0 SOFTWARE AND TECHNOLOGY REQUIREMENTS .....</b>	<b>2</b>
<b>Java SDK Installation .....</b>	<b>3</b>
Linux.....	3
Windows.....	4
<b>Apache Ant Installation .....</b>	<b>4</b>
<b>SETTING THE ENVIRONMENT VARIABLES.....</b>	<b>5</b>
Linux.....	5
Windows.....	6
<b>MYSQL INSTALLATION AND CONFIGURATION.....</b>	<b>8</b>
<b>INSTALLING CAARRAY 2.0 APPLICATION AND SERVICES .....</b>	<b>10</b>
<b>Downloading and Installing the UPT files .....</b>	<b>10</b>
UPT Port Usage .....	12
<b>Downloading caArray 2.0 files.....</b>	<b>12</b>
<b>Installing caArray 2.0.....</b>	<b>13</b>
caArray Port Usage .....	15
JBoss Errors During Installation .....	15
Configuring JBoss .....	15
Configuring JBoss and MySQL to Run as Services .....	16
<b>Post-Installation: Advertising the Grid Service .....</b>	<b>17</b>
<b>CONTACTING APPLICATION SUPPORT .....</b>	<b>19</b>

## Introduction

This caArray 2.0 installation Guide provides you with the instructions to install and configure the caArray 2.0 application in your environment. The caArray installation installs and configures three JBoss application servers, a grid service and creates a database on a preinstalled MySQL server.

---


 <b>NOTE</b>	<p>Published caArray development documentation can be found on the caArray page of the NCICB web site:</p> <p><a href="http://caarray.nci.nih.gov/">http://caarray.nci.nih.gov/</a></p>
---	---

### Overview of caArray Installation

The process for installing caArray includes the following tasks described in this document:

- Downloading and installing required software
- Setting environment variables
- Downloading and installing the Universal Provisioning Tool (UPT)
- Downloading caArray 2.0 files
- Configuring JBoss and MySQL
- Advertising the grid service

---

<b>Before You Proceed</b> 	<ul style="list-style-type: none"><li>• Even if you have had previous versions (1.x) of caArray, you must proceed through the pages and steps outlined in this installation guide as if it is a first-time install. It is not possible to “upgrade” an existing installation to caArray 2.0.</li><li>• Please contact us directly for 1.x data migration support: Web: <a href="http://ncicb.nci.nih.gov/NCICB/support/caarraysupport">http://ncicb.nci.nih.gov/NCICB/support/caarraysupport</a> E-mail: <a href="mailto:ncicb@pop.nci.nih.gov">ncicb@pop.nci.nih.gov</a> Telephone: 301-451-4384 Toll free: 888-478-4423</li><li>• Directions are given in this document for both Linux and Windows operating systems.</li></ul>
--	---

---

## caArray 2.0 Software and Technology Requirements

---

### Tested Environment

The caArray 2.0 installation has been tested on Linux Red Hat Enterprise Linux AS 4 64/32-bit (for AMD chipset) and the Windows XP/2003 environments. While the installation may work in other Linux and Windows environments, it has only been tested in these environments.

---

### Required Software—Not Included in caArray

Many of the servers and services that make up caArray 2.0 are automatically installed as part of this installation. However, certain tools that you must manually install and configure are listed in Table 1. The software name, version, description, and URL hyperlinks (for download) are indicated in the table.

---

You must install the following tools/versions prior to the caArray 2 installation, in the order they are listed. Follow the directions on the corresponding websites for download and installation.

<b>Required Software Name</b> <b>Version</b> <b>URL to Download</b>	<b>Description</b>
Java 2 Platform Standard Edition 5.0 Update 10 (J2SE 5.0) <a href="http://java.sun.com/products/archive/j2se/5.0_10/index.html">http://java.sun.com/products/archive/j2se/5.0_10/index.html</a>	The J2SE Development Kit (JDK) supports creating J2SE applications.
Apache Ant, 1.7.0 <a href="http://ant.apache.org/bindownload.cgi">http://ant.apache.org/bindownload.cgi</a>	Apache Ant is a Java-based build tool.
MySQL, 5.0.27 <a href="http://downloads.mysql.com/archives.php?p=mysql-5.0&amp;v=5.0.27">http://downloads.mysql.com/archives.php?p=mysql-5.0&amp;v=5.0.27</a>	MySQL is an open-source database software application.

Table 1 Required Software

---

## Java SDK Installation

To install the Java SDK, follow these steps, proceeding for your operating system as described:

---

### Linux

In Linux, follow these steps:

Step	Action
1	Download the Java SDK from <a href="http://java.sun.com/products/archive/j2se/5.0_10/">http://java.sun.com/products/archive/j2se/5.0_10/</a> . <b>Note:</b> Be sure to download the correct Java SDK for your operating environment. For example, for AMD 64, you would download <code>jdk-1_5_0_10-linux-amd64-rpm.bin</code> .
2	Login as the root user (or sudo). <b>Note:</b> To install the Java SDK in a system-wide location such as <code>/usr/local</code> , you must login as the root user to gain the necessary permissions. If you do not have root access, install the Java SDK in your home directory or a subdirectory for which you have write permissions.
3	When prompted, enter the <i>root password</i> .
4	Change to the directory where you want to install Java. For example, enter: <code>cd /usr/java</code>
5	Change the permission of the file you downloaded to be executable. For example, enter <code>chmod +x jdk-1_5_0_10-linux-amd64-rpm.bin</code> . <b>Note:</b> The name of the file will depend upon your target Linux operating system and associated chipset.
6	Unzip the Java SDK <code>bin</code> file. For example, from the command prompt, enter <code>./jdk-1_5_0_10-linux-amd64-rpm.bin</code> to unzip the file.
7	Execute the rpm installer. For example, enter: <code>rpm -iv jdk-1_5_0_10-linux-amd64.rpm</code> <b>Note:</b> The name of the file will depend upon your target Linux operating system and associated chipset.
8	Read through the license and enter <b>Yes</b> to proceed with the installation.


---

## Windows

In Windows, follow these steps:

Step	Action
1	Download the Java SDK from <a href="http://java.sun.com/products/archive/j2se/5.0_10/">http://java.sun.com/products/archive/j2se/5.0_10/</a> . <b>Note:</b> Be sure to download the correct Java SDK for your operating environment. For example, for Windows, you might download <code>jdk-1_5_0_10-windows-i586-p.exe</code> .
2	Login as a Windows Administrator.
3	Run the Java SDK installer for Windows During the installation process, you will be prompted to enter the directory where you wish to install Java. This directory will be used when <a href="#">Setting the Environment Variables</a>


## Apache Ant Installation

 <p><b>NOTE</b></p>	<p>Apache Ant, version 1.7.0, is the required build tool to install the caArray 2.0 application and services.</p>
--	---

To download and extract the Ant build tool, follow these steps:


Step	Action
1	Download Apache Ant from <a href="https://gforge.nci.nih.gov/svnroot/lsc/trunk/tools/apache-ant-1.7.0-bin.zip">https://gforge.nci.nih.gov/svnroot/lsc/trunk/tools/apache-ant-1.7.0-bin.zip</a> to a directory where you wish to install the tool. <i>Example:</i> <code>/usr/java</code>
2	Open a command prompt from the location to which you downloaded the <code>apache-ant-1.7.0-bin.zip</code> file and enter <b><code>unzip -q apache-ant-1.7.0-bin.zip</code></b> . After extracting the zip, you must set the environment variable, described in the following section, so that Ant is available in the system PATH.

## Setting the Environment Variables

<p><b>NOTE</b></p> 	<p>The purpose of setting operating system environment variables is so that the Java SDK and Ant build tool are available to run from anywhere in the system.</p>
--	---

### Linux

To set the environmental variables in Linux, follow these steps:

<p><b>NOTE</b></p> 	<p>The JAVA_HOME, ANT_HOME and PATH environment variables are set in <code>/etc/profile</code>. You may need to create the variables, or modify them if they already exist.</p>
--	---

Step	Action
1	<p>As the root user, enter the following in the <code>/etc/profile</code> file. A PATH variable should already be created in this file, so be sure to define the JAVA_HOME and ANT_HOME export before the PATH export. Replace <code>&lt;installation_directory&gt;</code> with the directory where you have installed the Java SDK and Ant.</p> <p>(The location example in the Apache Ant installation (p. 5) is <code>/usr/java</code>.)</p> <pre>export JAVA_HOME=&lt;installation_directory&gt;/jdk1.5.0_10 export ANT_HOME=&lt;installation_directory&gt;/apache-ant-1.7.0 export PATH=\$JAVA_HOME/bin:\$ANT_HOME/bin:\$PATH</pre>
2	<p>Log out and log back in so that the system recognizes your changes.</p>


## Verifying the Environment Variables in Linux

To verify that environment variables have been set correctly, follow these steps:

Step	Action
1	<p>From the command line, enter:</p> <pre>echo \$JAVA_HOME echo \$ANT_HOME</pre> <p>Both of these commands should return the location where you installed these tools.</p>
2	To verify your Java SDK installation, enter <code>java -version</code> from a command prompt. You should see <code>java version "1.5.0_10"</code> .
3	To verify your Ant installation, enter: <code>ant -version</code> from a command prompt. You should see: <code>Apache Ant version 1.7.0 compiled on December 13 2006</code> .

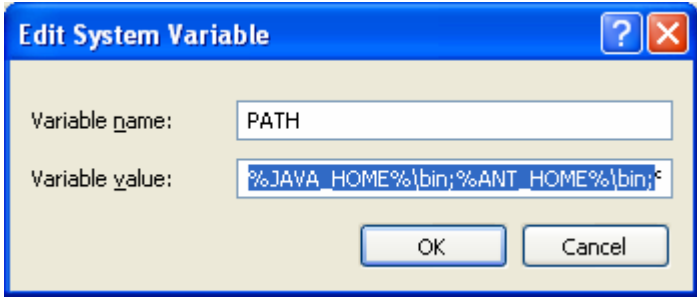
## Windows

To set the environmental variables in Linux, follow these steps:

<p><b>NOTE</b></p> 	<p>The JAVA_HOME, ANT_HOME and PATH environment variables are set in the Systems Properties.</p>
--	--

Step	Action
1	In Windows, select <b>Control Panel</b> , then select the <b>Systems</b> application. In the Systems window, select the <b>Advanced</b> tab.
2	<p>On the <b>Advanced</b> tab, click the <b>Environment Variables</b> button; to add a new system variable, select the <b>New</b> button.</p> <p>a. In the <b>Variable name</b> text box, enter <code>JAVA_HOME</code>.</p> <p>b. In the <b>Variable value</b> text box, enter the location of your Java installation.</p>
3	<p>Click the <b>New</b> button again.</p> <p>a. In the <b>Variable name</b> text box, enter <code>ANT_HOME</code>.</p> <p>b. In the <b>Variable value</b> text box, enter the location of your Java installation.</p>



Step	Action
4	<p>Select the PATH system environment variable, and select the <b>Edit</b> button. This opens the Edit System Variable dialog box, displayed here as an example.</p> 
5	<p>In the Variable value text box, enter:</p> <pre>%JAVA_HOME%\bin;%ANT_HOME%\bin;</pre>


### Verifying the Environment Variables in Windows

To verify the environment variables have been set correctly, follow these steps:

Step	Action
1	<p>From the command line, enter:</p> <pre>echo %JAVA_HOME% echo %ANT_HOME%</pre> <p>Both of these commands should return the location where you installed these tools.</p>
2	<p>To verify your Java SDK installation, enter <b>java -version</b> from a command prompt. You should see <code>java version "1.5.0_10"</code>.</p>
3	<p>To verify your Ant installation, enter <b>ant -version</b> from a command prompt. You should see: <code>Apache Ant version 1.7.0 compiled on December 13 2006</code>.</p>

## MySQL Installation and Configuration

A MySQL 5.0.27 server must be installed and running in order for the installation to work successfully. As part of the installation process, there are several built-in pre-install checks that are performed to ensure you have a valid server and connection information.

<p><b>NOTES</b></p> 	<p>As part of the installation process, the default character set is set to <code>latin1</code> for the caArray MySQL database.</p>
---	---

### Linux

After MySQL has been installed, in Linux it must be configured using the following steps:

Step	Action
1	<p><i>Lowercase Table Names in MySQL</i></p> <p>Edit the <code>/etc/init.d/mysqld</code> (or <code>mysql</code>) file as follows:</p> <ol style="list-style-type: none"> <li>Locate the <code>start()</code> section and modify the <code>mysqld_safe</code> command (do not include the ellipses):           <pre><code>/usr/bin/mysqld_safe --lower_case_table_names=1 ...</code></pre> </li> <li>Restart the MySQL service for the changes to take effect:           <pre><code>Restart /etc/init.d/mysqld</code></pre> </li> </ol>
2	<p><i>Increase the Java Memory Allocation</i></p> <p>Open the <code>/etc/my.cnf</code> and add the following (you may need to create this file, if it hasn't been created):</p> <pre><code>[mysqldump] max_allowed_packet=64M [mysqld] max_allowed_packet=64M [mysql] max_allowed_packet=64M</code></pre>

Step	Action
3	<p><i>Update the Help Desk Contact Information (SQL)</i></p> <p>The Help Desk information provided by default in the caArray database must be changed for your environment. To do this, connect to your MySQL server and the caArray database and run the following script (replacing <code>email_address</code> with a return email address that is accessible at your location).</p> <pre>update config_parameter set raw_value = '[email_address]' where param = 'REG_EMAIL_TO';  update config_parameter set raw_value = '[email_address]' where param = 'EMAIL_FROM';</pre>

## Windows


After MySQL has been installed (see page 8), in Windows it must be configured using the following steps:

Step	Action
1	<p><i>Increase the Java Memory Allocation</i></p> <ol style="list-style-type: none"> <li>Open the [MySQL installation directory]/my.ini file and add the following: <pre>[mysqldump] max_allowed_packet=64M [mysqld] max_allowed_packet=64M [mysql] max_allowed_packet=64M</pre> </li> <li>Restart the MySQL Windows service for the changes to take effect. Use <b>Administrator Tools Services</b></li> </ol>
2	<p><i>Update the Help Desk Contact Information (SQL)</i></p> <p>The Help Desk information provided by default in the caArray database must be changed for your environment. To do this, connect to your MySQL server and the caArray database and run the following script (replacing <code>email_address</code> with a return email address that is accessible at your location).</p> <pre>update config_parameter set raw_value = '[email_address]' where param = 'REG_EMAIL_TO';  update config_parameter set raw_value = '[email_address]' where param = 'EMAIL_FROM';</pre>

## Installing caArray 2.0 Application and Services

To install the caArray 2.0 application and services, follow the steps in this section:

- [Downloading and Installing the UPT files](#)
- [Download caArray 2.0 files from GForge](#)
- [Configuring JBoss and MySQL to Run as Services](#)
- [Post-Installation: Advertising the Grid Service](#)

<p><b>NOTES</b></p> 	<ul style="list-style-type: none"> <li>• In the <code>caarray2-install.properties</code> file, any property value marked with <u>uppercase</u> <code>REPLACE_*</code> must be manually updated with the appropriate value.</li> <li>• In each <code>*-install.properties</code> file, any property value marked with <u>lowercase</u> <code>replace_*</code> may be optionally updated with the appropriate value.</li> <li>• In many of the steps below, there is reference to a <code>database.system.user</code> for your MySQL server. To determine which users are have full privileges to create and managed other databases, type <b><i>show grants</i></b> from a MySQL prompt to determine the correct level of privileges.</li> </ul>
---	---

## Downloading and Installing the UPT files


To download and install the **UPT 3.2** files, follow these steps:

Step	Action
1	<p>The installation file for UPT 3.2 is over 30MB.</p> <p>From the <a href="https://gforge.nci.nih.gov/svnroot/lsc/trunk/dist/">https://gforge.nci.nih.gov/svnroot/lsc/trunk/dist/</a> directory in GForge, download the <code>upt_distribution_[version].zip</code> file.</p> <p>Remember the download location as you will be using this file to run the installation in the steps that follow. This location will later be referred to as the <code>&lt;installation_directory&gt;</code>.</p>
2	<p>From the directory where you downloaded the <code>upt_distribution_[version].zip</code> file, open a command prompt extract this file to a temporary location. For example, you may enter a command such as <code>unzip -q upt_distribution_[version].zip</code> (you must have a ZIP tool installed). This location will be referred to as the <code>&lt;installation_directory&gt;</code> henceforth.</p> <p><b>Note:</b> You must give the proper permissions to the <code>upt_distribution_[version].zip</code> file in order to extract it (for example, <code>chmod</code> in Linux).</p>

Step	Action
3	<p>If you need to modify the default properties, open the <code>&lt;installation_directory&gt;/upt/upt-install.properties</code> file and modify the values for your environment and save the file. At a minimum, you will need to modify the following values:</p> <ul style="list-style-type: none"> <li>• <code>upt.home</code> <ul style="list-style-type: none"> <li>○ The location to which you are going install UPT (your <code>&lt;application_root_directory&gt;</code>). For example, in Windows, the <code>&lt;application_root_directory&gt;</code> can be <code>C:/apps/upt</code>. Linux users can use <code>/apps/upt</code> or any other folder to which you have write permissions.</li> </ul> <p><b>Important:</b> <code>&lt;application_root_directory&gt;</code> must be different than <code>&lt;installation_directory&gt;</code> or the installation will fail.</p> </li> <li>• <code>database.system.user</code> <ul style="list-style-type: none"> <li>○ This value should correspond to a MySQL username that has been given full database privileges. For example, <code>uptadmin</code> may be a good name for this user.</li> </ul> </li> <li>• <code>database.system.password</code> <ul style="list-style-type: none"> <li>○ This value <u>must</u> correspond to the password for the <code>database.system.user</code> user.</li> </ul> </li> <li>• <code>database.server</code> <ul style="list-style-type: none"> <li>○ This value <u>must</u> correspond to the domain name of machine that hosts the MySQL server.</li> </ul> </li> <li>• <code>database.port</code> <ul style="list-style-type: none"> <li>○ This value <u>must</u> correspond to the port for the <code>database.server</code>. 3306 is the default port, but check with your database administrator to be certain.</li> </ul> </li> <li>• <code>database.name</code> <ul style="list-style-type: none"> <li>○ Choose a name for the UPT MySQL database.</li> </ul> </li> <li>• <code>database.user</code> <ul style="list-style-type: none"> <li>○ Choose a username to access <code>database.name</code>. This can be any valid name that you choose, but it must be different than <code>database.system.user</code>.</li> </ul> </li> <li>• <code>database.password</code> <ul style="list-style-type: none"> <li>○ Choose a password to access <code>database.name</code> for the username identified in <code>database.user</code></li> </ul> </li> </ul> <p><b>Note:</b> You shouldn't need to modify the other defaults values as we have chosen unique ports to reduce the risk of other applications using the same values. However, be sure to check the <code>upt-install.properties</code> to verify that the ports in this file are not being used by other applications, otherwise you will experience problems.</p>

Step	Action
4	Navigate to <code>&lt;installation_directory&gt;/upt</code> and type <b>ant</b> . This will run the installation. You will verify UPT installation after <a href="#">Installing caArray 2.0</a> .
5	After successfully installing UPT, make a backup of <code>&lt;installation_directory&gt;/upt/upt-install.properties</code> for future reference.

## UPT Port Usage

 <p><b>NOTE</b></p>	<p>Verify that default port values defined in <code>upt-install.properties</code> files are not in use on your system by running <code>netstat -a</code> from the command line. If the ports are in use prior to installation, you will likely experience problems with your installation.</p>
--	--

## Downloading caArray 2.0 files

To download the caArray 2.0 files, follow these steps:

Step	Action
1	<p>The installation file for caArray 2.0 is over 300MB.</p> <p>From the <code>https://gforge.nci.nih.gov/svnroot/lsd/trunk/dist/</code> directory in GForge, download the <code>caarray_distribution_[version].zip</code> file.</p> <p>Remember the download location as you will be using this file to run the installation in the steps that follow.</p>
2	<p>These server components are installed and configured as part of the caArray2 installation. You do not need to do anything further to download or install these components.</p> <ul style="list-style-type: none"> <li>• JBoss 4.0.4 (hosts the caArray grid service)</li> <li>• JBoss 4.0.5 (hosts the caArray application)</li> <li>• JEMS installer 1.0.2 GA – supports EJB 3.0 specification</li> </ul>

## Installing caArray 2.0


To install caArray 2.0, follow these steps:

Step	Action
1	<p>From the directory where you downloaded the <code>caarray_distribution_2_0_0.zip</code> from <a href="#">Downloading caArray 2.0 files</a>, open a command prompt extract this file to a temporary location. For example, you may enter a command such as <code>caarray_distribution_2_0_0.zip</code> (you must have a ZIP tool installed). For example, use <code>unzip -q caarray_distribution_2_0_0.zip</code>. This location will be referred to as the <code>&lt;installation_directory&gt;</code> henceforth. Once you unzip this file, it creates a directory called <code>caarray</code> which is a directory below the <code>&lt;installation_directory&gt;</code></p>
2	<p>To modify the default properties, open the <code>&lt;installation_directory&gt;/caarray/caarray2-install.properties</code> file, modify the values for your environment and save the file. At a minimum, you will need to modify the following values:</p> <ul style="list-style-type: none"> <li>• <code>caarray2.home</code> <ul style="list-style-type: none"> <li>○ The location to which you are going to install caArray (your <code>&lt;application_root_directory&gt;</code>). For example in Windows, the <code>&lt;application_root_directory&gt;</code> can be <code>C:/apps/caarray2</code>. Linux users can use <code>/apps/caarray2</code> or any other folder to which you have write permissions.</li> </ul> <p><b>Important:</b> <code>&lt;application_root_directory&gt;</code> must be different than <code>&lt;installation_directory&gt;</code> or the installation will fail.</p> </li> <li>• <code>database.system.user</code> <ul style="list-style-type: none"> <li>○ This value should correspond to a MySQL username that has been given full database privileges. For example, <code>caarrayadmin</code> may be a good name for this user.</li> </ul> </li> <li>• <code>database.system.password</code> <ul style="list-style-type: none"> <li>○ This value <u>must</u> correspond to the password for the <code>database.system.user</code> user.</li> </ul> </li> <li>• <code>database.server</code> <ul style="list-style-type: none"> <li>○ This value <u>must</u> correspond to the domain name of machine that hosts the MySQL server.</li> </ul> </li> <li>• <code>database.port</code> <ul style="list-style-type: none"> <li>○ This value <u>must</u> correspond to the port for the <code>database.server</code>. 3306 is the default port, but check with your database administrator to be certain.</li> </ul> </li> <li>• <code>database.name</code> <ul style="list-style-type: none"> <li>○ Choose a name for the caArray MySQL database.</li> </ul> </li> </ul>


Step	Action
	<ul style="list-style-type: none"> <li>• <code>database.user</code> <ul style="list-style-type: none"> <li>◦ Choose a username to access <code>database.name</code>. This can be any valid name that you choose, but it must be different than <code>database.system.user</code>.</li> </ul> </li> <li>• <code>database.password</code> <ul style="list-style-type: none"> <li>◦ Choose a password to access <code>database.name</code> for the username identified in <code>database.user</code></li> </ul> </li> <li>• <code>mail.smtp.host</code> <ul style="list-style-type: none"> <li>◦ This value <u>must</u> correspond to an SMTP server available in your network.</li> </ul> </li> <li>• <code>mail.smtp.port</code> <ul style="list-style-type: none"> <li>◦ This value <u>must</u> correspond to the SMTP server. The default is 25, but this may be different in your environment.</li> </ul> </li> </ul> <p><b>Note:</b> You shouldn't need to modify the other defaults values as we have chosen unique ports to reduce the risk of other applications using the same values. However, be sure to check the <code>caarray2-install.properties</code> to verify that the ports in this file are not being used by other applications.</p>
3	<p>From the <code>&lt;installation_directory&gt;/caarray</code> directory, enter <b><code>ant</code></b> from the command prompt. This initiates the installation process. The anticipated duration is anywhere 1-15 minutes depending on your system's speed, power and memory.</p> <p>The installer will create a caArray database on your MySQL server, start and configure two JBoss servers and start up a grid service for the caArray application.</p> <p>To verify UPT installation, go to:  <a href="http://&lt;jboss.server.hostname&gt;:&lt;jboss.server.port&gt;/upt">http://&lt;jboss.server.hostname&gt;:&lt;jboss.server.port&gt;/upt</a>. To access caArray, open your web browser to <a href="http://&lt;jboss.server.hostname&gt;:&lt;jboss.server.port&gt;/caarray">http://&lt;jboss.server.hostname&gt;:&lt;jboss.server.port&gt;/caarray</a>.</p> <p><b>Note:</b> <code>jboss.server.hostname</code> and <code>jboss.server.port</code> are values in the <code>&lt;installation_directory&gt;/caarray/caarray2-install.properties</code> and the <code>&lt;installation_directory&gt;/upt/upt-install.properties</code> files. The default Administrator name is <b><code>superadmin</code></b> and the password is <b><code>changeme</code></b>.</p>
4	<p>To verify that the application was installed correctly, enter <b><code>caarrayadmin</code></b> as the user and <b><code>caArray2!</code></b> as the password.</p>
5	<p>After successfully installing UPT, make a backup of <code>&lt;installation_directory&gt;/caarray/caarray2-install.properties</code> for future reference.</p>




## caArray Port Usage

<p><b>NOTE</b></p> 	<p>Verify that default port values defined in <code>caarray2-install.properties</code> files are not in use on your system by running <code>netstat -a</code> from the command line. If the ports are in use prior to installation, you will likely experience problems with your installation.</p>
--	---

## JBoss Errors During Installation

<p><b>NOTE</b></p> 	<p>You may receive an error such as Exception in thread "main" <code>java.lang.NoClassDefFoundError: org/jboss/Shutdown</code>. This should not be a problem as the installer attempts to remove previously installed servers to prevent problems during the installation. If this is your first time installing caArray, you may receive and disregard this error message.</p>
--	---

## Configuring JBoss


<p><b>NOTE</b></p> 	<p>For optimal performance, you must modify your JBoss 4.0.5 configuration to increase the amount of available memory for the caArray application. Directions for doing this in Windows are in the following step 1.</p>
--	--

To configure JBoss in **Windows**, follow these steps:


Step	Action
1	<p>Add the following entry to the JBoss <code>run.bat</code> file. For example, the <code>run.bat</code> will be located at <code>&lt;application_root_directory&gt;/jboss-4.0.5.GA/bin/run.bat</code>.</p> <pre>-server -Xms2048m -Xmx2048m -XX:ThreadStackSize=128 - XX:SurvivorRatio=10 -XX:PermSize=128m -XX:MaxPermSize=128m - Dsun.rmi.dgc.client.gcInterval=3600000 - Dsun.rmi.dgc.server.gcInterval=3600000 - Djava.awt.headless=true</pre>
2	<p>Restart your JBoss 4.0.5 server for the changes to take effect.</p>

JBoss memory is configured through the `jboss.java.opts` property in `caarray2-install.properties`.

## Configuring JBoss and MySQL to Run as Services

<p><b>NOTE</b></p> 	<p>Both MySQL and the three JBoss servers that make up caArray must run continually as services. The instructions in this section cover all of these scenarios. For caArray 2.0, there are a total of four servers:</p> <ul style="list-style-type: none"> <li>• JBoss for UPT</li> <li>• JBoss 4.0.4 (for Grid services)</li> <li>• JBoss 4.0.5 (for caArray application)</li> <li>• MySQL 5.0.27</li> </ul>
--	---

## Running JBoss as a service


<p><b>NOTE</b></p> 	<p>The default caArray installation runs JBoss as a command line process using the user currently logged on. Therefore, when you log out as this user, JBoss will no longer be available for caArray. For that reason, it is recommended that you configure your JBoss servers to run as a Linux or Windows service. The instructions are contained in this section.</p>
--	--

To run JBoss as a service, follow these steps:

Step	Action
1	<p><b>Linux</b></p> <p>See <a href="http://wiki.jboss.org/wiki/Wiki.jsp?page=StartJBossOnBootWithLinux">http://wiki.jboss.org/wiki/Wiki.jsp?page=StartJBossOnBootWithLinux</a>.</p>
2	<p><b>Windows</b></p> <p>To run an existing JBoss command line installation as a service, follow the directions for creating a user-defined service at <a href="http://support.microsoft.com/kb/137890/EN-US/">http://support.microsoft.com/kb/137890/EN-US/</a></p> <p><b>Note:</b> You need to have access to the Windows Resource Kit.</p>

## Running MySQL as a service

---

<b>NOTE</b> 	It is assumed that your MySQL server was installed as a service. If it was not, follow these recommendations for installing this server as a service.
--	---

---

To run MySQL as a service, follow these steps:

Step	Action
1	<b>Linux</b>  See <a href="http://www.redhat.com/docs/manuals/enterprise/RHEL-AS-2.1-Manual/cluster-manager/s1-service-mysql.html">http://www.redhat.com/docs/manuals/enterprise/RHEL-AS-2.1-Manual/cluster-manager/s1-service-mysql.html</a> .
2	<b>Windows</b>  When installing MySQL server on Windows, choose the option to run MySQL as a Windows service.

---

## Post-Installation: Advertising the Grid Service

To advertise your caArray grid service, you must take the following steps, then restart the JBoss 4.0.4 server instance. You can check if your grid service is advertised correctly at <http://cagrid-portal.nci.nih.gov/web/guest/home>.

Step	Action
1	<p><b>web.xml</b></p> <p>The <code>web.xml</code> file contains the port and protocol your grid service will be advertised as. Change this file if your service is on a port other than the default port of 18080 and/or the default protocol of http</p> <pre> &lt;init-param&gt;   &lt;param-name&gt;defaultProtocol&lt;/param-name&gt;   &lt;param-value&gt;http&lt;/param-value&gt; &lt;/init-param&gt; &lt;init-param&gt;   &lt;param-name&gt;defaultPort&lt;/param-name&gt;   &lt;param-value&gt;18080&lt;/param-value&gt; &lt;/init-param&gt; </pre> <p><b>File Locations:</b></p> <pre> \${caarray2.home}/jboss- 4.0.4.GA/server/default/deploy/wsrf.war/WEB-INF </pre>
2	<p><b>server-config.wsdd</b></p> <p>Make sure your container is publishing the right host name. Your service must register with a publicly accessible address or DNS-resolvable host name, so the Index Service (and other clients) can connect to it. Add the following lines to this file if you want your service to have a specific name or if your service is trying to register a private IP address which is not allowed. You should see errors in your JBoss 4.0.4 log if you are trying to register a private IP address.</p> <pre> &lt;parameter name="logicalHost" value="somehost.cagrid.org"/&gt; &lt;parameter name="publishHostName" value="true"/&gt; </pre> <p><b>File Location:</b></p> <pre> \${caarray2.home}/jboss- 4.0.4.GA/server/default/deploy/wsrf.war/WEB- INF/etc/globus_wsrf_core </pre>

Step	Action
3	<p><b>serviceMetadata.xml</b></p> <p>This file contains the service's contact information. The two sections to update are at the top and bottom of the file.</p> <p><b>Top of file under &lt;ns2:pointOfContactCollection&gt;:</b></p> <pre>&lt;ns3:PointOfContact affiliation="" email="" firstName="" lastName="" phoneNumber="" role="" xmlns:ns3="gme://caGrid.caBIG/1.0/gov.nih.nci.cagrid.metadata.common"/&gt;</pre> <p><b>Bottom of file under &lt;ns1:hostingResearchCenter&gt;:</b></p> <pre>&lt;ns14:PointOfContact affiliation="" email="" firstName=" " lastName=" " phoneNumber="" role=" "/&gt;</pre> <p><b>File Location:</b></p> <pre>\${caarray2.home}/jboss- 4.0.4.GA/server/default/deploy/wsrf.war/WEB- INF/etc/caGrid_CaArraySvc</pre>
4	<p><b>CaArraySvc_registration.xml</b></p> <p>This file has the URL to the Index Server where you can see if your service is advertised. Ensure this file contains the following index server:</p> <pre>&lt;wsa:Address&gt;http://cagrid- index.nci.nih.gov:8080/wsrf/services/DefaultIndexService&lt;/wsa:Address&gt;</pre> <p><b>File Location:</b></p> <pre>\${caarray2.home}/jboss- 4.0.4.GA/server/default/deploy/wsrf.war/WEB- INF/etc/cagrid_CaArraySvc/</pre>
5	<p>After making these changes, restart the JBoss 4.0.4 server (this hosts the grid service).</p>
	<p>For more troubleshooting information :  <a href="http://www.cagrid.org/mwiki/index.php?title=CaGrid:How-To:TroubleshootIndexService">http://www.cagrid.org/mwiki/index.php?title=CaGrid:How-To:TroubleshootIndexService</a></p>

## Contacting Application Support

NCICB <http://ncicb.nci.nih.gov/NCICB/support>  
Application Support Telephone: 301-451-4384  
Toll free: 888-478-4423