caARRAY 2.1.1 DATA PORTAL

Local Installation Guide

NATIONAL® CANCER INSTITUTE

Center for Biomedical Informatics
and Information Technology

Revised November 4, 2008

Table of Contents

Introduction

This *caArray 2.1.1 installation Guide* provides you with the instructions to install and configure a fresh caArray 2.1.1 application, or upgrade an existing 2.X application. The caArray installation installs and configures two JBoss application servers, a grid service and creates a caArray-specific schema within a pre-existing database on a preinstalled MySQL server. An upgrade of caArray converts an existing 2.X caArray application and associated grid service to 2.1.1 version.

Directions are given in this document for both Linux and Windows operating systems.

NOTE 	Published caArray development documentation can be found on the caArray page of the NCICB web site: http://caarray.nci.nih.gov/

Overview of caArray Installation

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

1. Downloading and installing required software
2. Setting environment variables
3. Downloading caArray 2.1.1 distribution files
4. Installing caArray:
   a. GUI Installer Method
   b. Command-Line Method
      -- Editing `install.properties` file
5. Upgrading caArray
   a. GUI Installer Method
   b. Command-Line Method
      -- Editing `upgrade.properties` file
6. Configuring JBoss servers and MySQLserver to run as a service
7. Post-Installation Tasks
   a. Updating Help-Desk info in DB using SQL
   b. Using UPT to Add caArray Users

Before You Proceed 	If you have a 1.x version of caArray installed, you must do a fresh installation as there is no way to upgrade a 1.x caArray installation to 2.1.1. Contact NCICB Application Support directly for 1.x data migration support: Web: http://ncicb.nci.nih.gov/NCICB/support/caarraysupport E-mail: ncicb@pop.nci.nih.gov Telephone: 301-451-4384 Toll free: 888-478-4423

caArray 2.1.1 Software and Technology Requirements

Tested Environment

The caArray 2.1.1 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 2.1.1 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.

Prior to the caArray 2.1.1 installation, you must download and install the following tools and recommended versions in the order they are listed in Table 1. Complete the directions for installing each, as directed on the corresponding website.

Required Software Name Version	***Description***
Java 2 Platform Standard Edition 5.0 Update 10 (J2SE 5.0) http://java.sun.com/products/archive/j2se/5.0_10/. Be sure to download the correct Java SDK for your operating environment. For example, for Linux AMD 64, you would download `jdk-1_5_0_10-linux-amd64-rpm.bin`. For Windows, you might download `jdk-1_5_0_10-windows-i586-p.exe`.	The J2SE Development Kit (JDK) supports creating J2SE applications.

Required Software Name ***Version***	***Description***
Apache Ant, 1.7.0 https://gforge.nci.nih.gov/svnroot/lsd/trunk/tools/apache-ant-1.7.0-bin.zip	Apache Ant is a Java-based build tool.
MySQL, 5.0.27 http://downloads.mysql.com/archives.php?p=mysql-5.0&v=5.0.27	MySQL is an open-source database software application.

Table 1 Required Software

IMPORTANT	As you install each application, record the installation directory path, and the hostname of your MySQL DB server, and the DB admin username/password.

Java SDK Installation

When you install the Java SDK, you will be prompted to select the installation directory. Record the path, as this directory will be used when you set the environment variables.

Apache Ant Installation

- Unzip the Apache Ant distribution files using a command line unzip tool or a zip utility, such as WinZip.
- After extracting the zip, you must set the environment variables, described in the following section, so that Ant is available in the system PATH.

Apache Ant Environment Variables

NOTE	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.

Linux

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

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

Step	Action

1	As the root user, enter the following in the `/etc/profile` 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 `<some_path>` with the correct path fragment for Java and Ant installations.
	
	`export JAVA_HOME=<some_path>/jdk1.5.0_10`
	
	`export ANT_HOME=<some_path>/apache-ant-1.7.0`
	
	`export PATH=$JAVA_HOME/bin:$ANT_HOME/bin:$PATH`

2	Log out and log back in so that the system recognizes your changes.

Verifying the Environment Variables in Linux

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

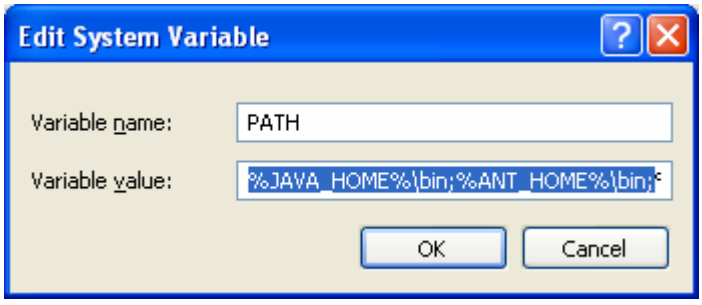
Step	Action
1	From the command line, enter: ***`echo $JAVA_HOME`*** ***`echo $ANT_HOME`*** Both of these commands should return the location where you installed these tools.
2	To verify your Java SDK installation, enter ***`java -version`*** from a command prompt. You should see `java version "1.5.0_10".`

Step	Action
3	To verify your Ant installation, enter: ***ant -version*** from a command prompt. You should see: `Apache Ant version 1.7.0 compiled on December 13 2006.`

Windows

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

NOTE	
	The JAVA_HOME, ANT_HOME and PATH environment variables are set in the Systems Properties.

Step	Action
1	In Windows, select **Control Panel**, then select the **Systems** application. In the Systems window, select the **Advanced** tab.
2	On the **Advanced** tab, click the **Environment Variables** button. To add a new system variable, select the **New** button. a. In the **Variable name** text box, enter ***JAVA_HOME***. b. In the **Variable value** text box, enter the location of your Java installation.
3	Click the **New** button again. a. In the **Variable name** text box, enter ***ANT_HOME.*** b. In the **Variable value** text box, enter the location of your Ant installation.
4	Select the PATH system environment variable, and select the **Edit** button. This opens the Edit System Variable dialog box, displayed here as an example. 

Step	Action
5	In the Variable value text box, prepend the following text in front of the text that already exists in the **Variable Value** field. ***%JAVA_HOME%\bin;%ANT_HOME%\bin;*** Click **OK**.

Verifying the Environment Variables in Windows

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

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

NOTES	
	Environment variables for caArray and, optionally, UPT are modified and set in those sections of this document: Installing a New caArray 2.1.1 on page 12 and Downloading and Installing UPT (Optional) on page 9.

MySQL Installation and Configuration

A MySQL 5.0.27 server must be downloaded, installed and running in order for the caArray installation to work successfully.

To download and install MySQL, follow the steps outlined on the MySQL website: http://downloads.mysql.com/archives.php?p=mysql-5.0&v=5.0.27

TIP 	You should consult the following three links to successfully set up secure and well-performing MySQL servers, in preparation for installing caArray:
	• MySQL Security Guide - http://dev.mysql.com/doc/refman/5.0/en/security-guidelines.html
	• Performance –
	  o General performance tuning - http://dev.mysql.com/books/hpmysql-excerpts/ch06.html
	  o InnoDB engine performance tuning - http://dev.mysql.com/doc/refman/5.0/en/innodb-tuning.html

MORE TIPS 	• Record the MySQL root username/password chosen during the MySQL installation process, as you will need to use this as your `database.system.user/ database.system.password` later in the caArray installation process. • Note the MySQL port chosen during the MySQL installation process, as you will need to use this as your `database.port` later in the installation process. • As part of the installation process, the default character set is set to `latin1` for the caArray MySQL database.

Once installed, you must configure My-SQL for caArray.

Linux

Configure MySQL in Linux using the following steps:

Step	Action
1	*Lowercase Table Names in MySQL* Edit the `/etc/init.d/mysqld (or mysql)` file as follows: a. Locate the `start()` section and modify the `mysqld_safe` command (do not include the ellipses): ***/usr/bin/mysqld_safe --lower_case_table_names=1 ...*** b. Restart the MySQL service for the changes to take effect: Restart **`/etc/init.d/mysqld`**

Step	Action
2	*Modify the MySQL parameters* Open the `/etc/my.cnf` and add the following text. ***[mysqldump]*** ***max_allowed_packet=64M*** ***[mysqld]*** ***max_allowed_packet=64M*** ***[mysql]*** ***max_allowed_packet=64M*** **Note:** If the file is not present, you will need to create it. To do so, open a text editor such as Notepad. Add the above text, name and save the file.

Windows

Configure MySQL in Windows using the following step:

Step	Action
1	*Modify the MySQL parameters* a. Locate the [`MySQL installation directory`]`/my.ini` file. Open the file in a text editor such as Notepad and add the following text: ***[mysqldump]*** ***max_allowed_packet=64M*** ***[mysqld]*** ***max_allowed_packet=64M*** ***[mysql]*** ***max_allowed_packet=64M*** **Note:** If the file is not present, you will need to create it. To do so, enter the above text in a text editor such as NotePad. b. Save the amended or new `my.ini` file in the <`MySQL installation directory`>. c. Restart the MySQL Windows service for the changes to take effect. To do so, select **Settings > Control Panel**. Select **Administrative Tools > Services.**. Scroll down to MySQL. Right click and select **Restart**.

Downloading and Installing UPT (Optional)

If you do not already have a User Provisioning Tool (UPT) installed, and you wish to manage user accounts for your caArray application, you must install UPT.

Overview of UPT

UPT is used to provision users in the caArray application. Each application installs with its own Common Security Module (CSM) schema that has sample/default users and a role/permissions structure. To add additional users you must provision the caArray application in the UPT. Then you can assign users to caArray. Below is the general flow for UPT as it relates to caArray, but for more complete documentation of UPT see this document: https://gforge.nci.nih.gov/frs/download.php/2634/UPT_User_Guide.pdf.

NOTE 	Verify that default port values defined in `upt-install.properties` files are not in use on your system by running `netstat –a` from the command line. The installers run pre-installation checks and fail the installation if ports the installer must use are in use. If the ports are in use prior to installation, you will need to stop any processes that are running.

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

Step	Action
1	The installation file for UPT 3.2 is over 30MB. From the https://gforge.nci.nih.gov/frs/?group_id=305 directory in GForge, download the `upt_distribution_[version].zip` file. Remember the download location as you will be using this file to run the installation in the steps that follow.
2	From the directory where you downloaded the `upt_distribution_[version].zip` Downloading UPT files file, unzip the files, using one of these two methods: a. Open a command prompt and use it to extract this file to a temporary location. For example, you may enter a command such as `unzip -q upt_distribution_[version].zip`. (You must have a ZIP tool installed.) This location will be referred to as the `<upt_installer_directory>` henceforth. *Example*: C:\UPT_installer. b. Use WinZip or a similar utility to unzip the files.
3	Open the `<upt_installer_directory>/upt/upt-install.properties` file and modify the values for your environment and save the file. At a minimum, you will need to modify the values in the following table:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td></td><td>
<table>
<tr><th>Environment Variable</th><th>Description</th></tr>
<tr><td>upt.home</td><td>The location where you want to install UPT.

Example: In Windows, it could be C:/apps/upt. Linux users can use ${user.home}/apps/upt or any other folder to which you have write permissions.

Important: The upt.home directory must be different than <upt_installer_directory> or the installation will fail.</td></tr>
<tr><td>database.system.user</td><td>This value should correspond to a MySQL username that has full system privileges. You should have recorded this when you installed MySQL.</td></tr>
<tr><td>database.system.password</td><td>This value must correspond to the password for the database.system.user user. You should have recorded this when you installed MySQL. In some cases, this password may be blank.</td></tr>
<tr><td>database.server</td><td>This value must correspond to the domain name of machine that hosts the MySQL server. You may need to consult your system administrator for this information.</td></tr>
<tr><td>database.port</td><td>This value must correspond to the port for the database.server. 3306 is the default port, but check with your database administrator to be certain.</td></tr>
<tr><td>database.name</td><td>Choose a name for the UPT MySQL database.</td></tr>
<tr><td>database.user</td><td>Choose a username to access database.name. This can be any valid name that you choose, but it must be different than database.system.user.</td></tr>
<tr><td>database.password</td><td>Choose a password to access database.name for the username identified in database.user. This must be different from the database.system.password.</td></tr>
</table>
Note: 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 upt-install.properties to verify that the ports in this file are not being used by other applications, otherwise you will experience problems.
</td></tr>
<tr><td>4</td><td>From the command line, navigate to <upt_installer_directory>/upt (Example:cd C:\UPT_installer\upt), and type ant. This runs the installation.</td></tr>
<tr><td>5</td><td>To verify the UPT installation, go to: http://<jboss.server.hostname>.<jboss.server.port>/caarray (example; http://upt.nci.nih.gov/upt/. Refer to the upt-install.properties for the correct values. See note below.)</td></tr>
</table>

Step	Action
6	After successfully installing UPT, make a backup of `<upt_installer_directory>/upt/upt-install.properties` in another directory for future reference.

Installing caArray 2.1.1 Application and Services

To newly install the caArray 2.1.1 application and services, follow the steps in this section:

- Downloading caArray 2.1.1 files from GForge on this page
- Installing a New caArray on page 12
    - GUI Installer Method on page 12
    - Command-Line Method on page 17
- Configuring JBoss on page 28
    - Configuring JBoss Servers and MySQL Server to Run as Services on page 29
- Post-Installation Tasks on page 31
    - Updating Help Desk Contact Information in SQL on page 31
    - Using UPT to Add caArray Users on page 31

BEFORE YOU BEGIN	
	• **Important**: There must already be a pre-existing MySQL DB and connection username/password for caArray to install into; caArray does not create its own DB. • If you have installed a previous version of caArray 2.X, you must follow the upgrade procedures described in Upgrading caArray 2.X to 2.1.1 on page 22 to migrate to caArray 2.1.1.

Downloading caArray 2.1.1 files

To download the caArray 2.1.1 files, follow this step:

Step	Action
1	The installation files for caArray 2.1.1 are each over 300MB. All of the files can be downloaded from the caArray distribution folder here: https://gforge.nci.nih.gov/frs/?group_id=305. • For a new command-line installer, download the caarray_distribution_2_1_1.zip file. • For a command-line upgrade installer download the caarray_upgrade_2_1_1.zip file. • For a GUI installer that you can use to do a fresh caArray 2.1.1 installation, download the caarray_gui_distribution_2_1_1.jar file. Remember the download location, as you will be using this file to run the installation in the steps that follow.

Server Components in caArray 2.1.1

These server components are installed and configured as part of the caArray 2.1.1 installation. You do not need to do anything further to download or install these components.

- JBoss 4.0.4 (hosts the caArray grid service)
- JBoss 4.0.5 (hosts the caArray application)

Installing a New caArray 2.1.1

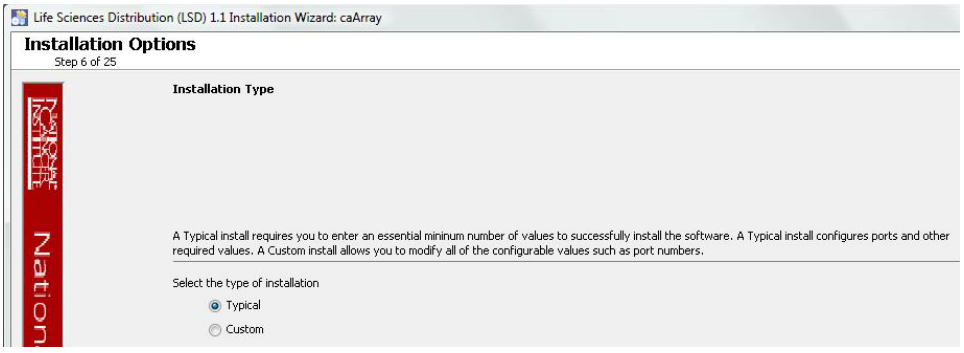
You can perform a new installation of caArray v.2.1.1 using either of these two methods:

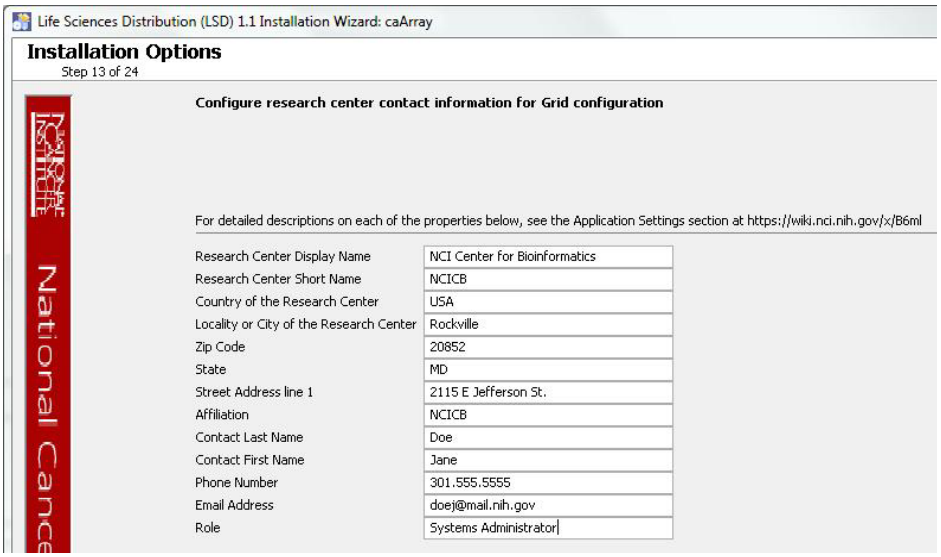
- A GUI Installation wizard. Instructions for this method begin on this page
- A command-line installation. For instructions, see page 17.

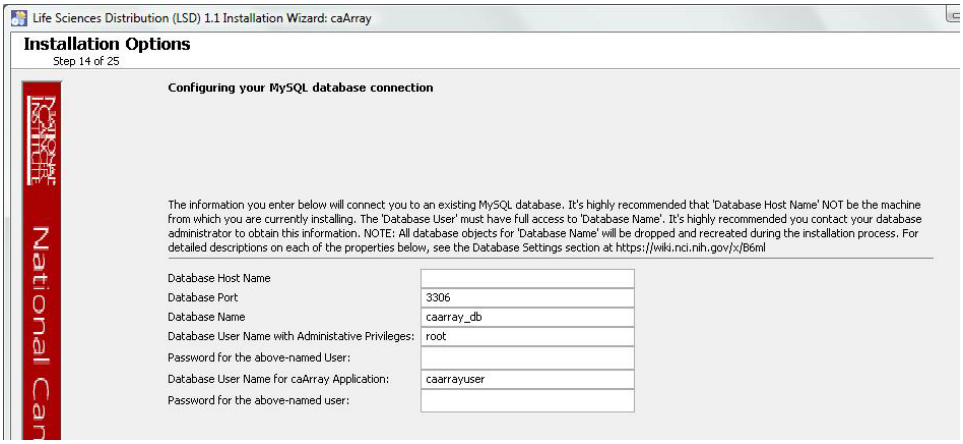
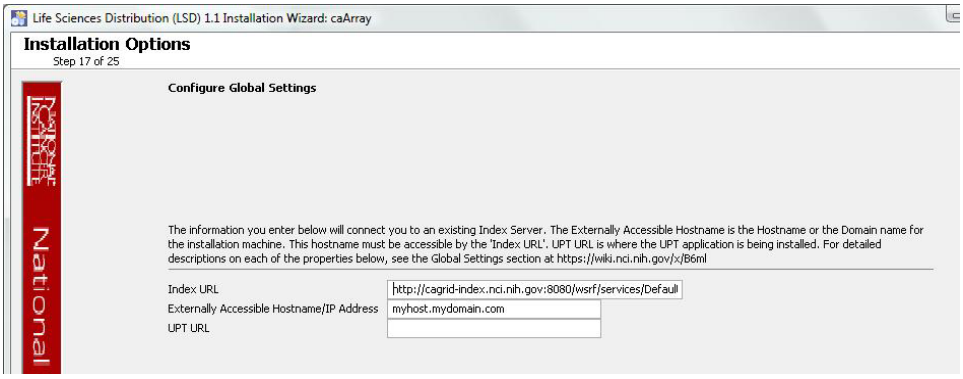
GUI Installer Method of Installation

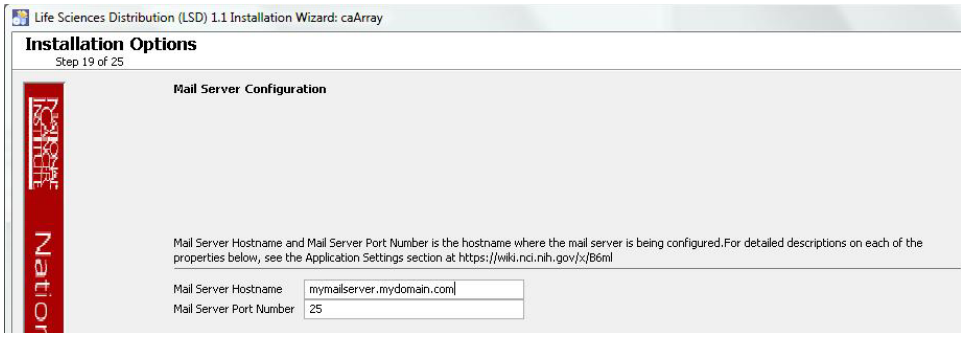
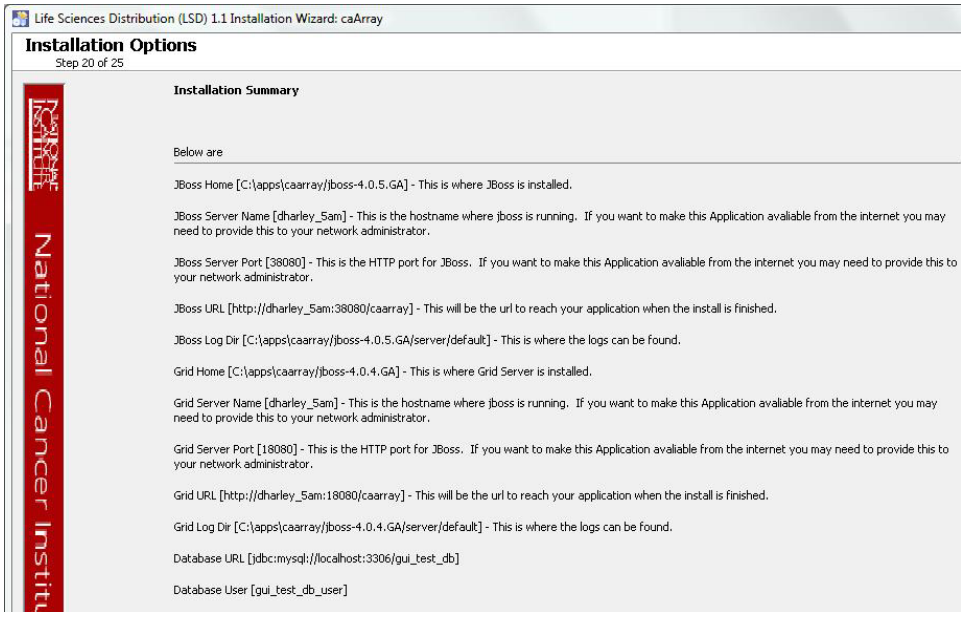
For detailed information on all of the GUI installer fields, refer to the documentation at this location: https://wiki.nci.nih.gov/x/B6ml.

For performing an installation using the GUI Installer, follow these steps:

Step	Action
1	Open a command prompt in the directory where you downloaded the `caarray_gui_distribution_2_1_1.jar`. Enter this command to Invoke the GUI installer : `java -jar caarray_gui_distribution_2_1_1.jar`.
2	The Installation Wizard opens to facilitate the installation process. Click **Next** to proceed through the pages of the wizard, beginning with progressing past the Welcome page.
3	Review the release notes.
4	You must accept the license agreement.
5	Select Install installation type. For a new installation, select **Install**.
6	Navigate to the directory where you would like to install caArray 2.1.1.  If the folder does not yet exist, click **OK** in the dialog box to indicate that you want the folder to be created.
7	Choose the type of installation you prefer **Typical** or **Custom**. **NOTE**  The Custom installation allows more detailed configuration options. If you choose to do a *Custom* installation type, go directly to the walk-through presented in the Appendix: Custom Type GUI Installer Walk-Through on page 33. Do not proceed further with this section which describes the remaining steps for the *Typical* installation type. 

Step	Action
8	Specify the admin account password for the JBoss servers to be installed (caArray and grid service). The username is “admin” and is not currently configurable. The admin account is needed to login to the JBoss JMX console or admin console, or to shutdown a JBoss server from the command line.  If you do not specify passwords, or if one of the passwords does not match its confirmation field, you will see error messages.
9	Specify the research center and technical point-of-contact information needed for grid service registration.  An error message displays if you did not enter all of the required information.

Step	Action
10	Specify the database connection information, including the name of the **pre-existing** database where the caArray schema will be installed, and the **pre-existing** user which will be used by caArray to connect to its database.  Error messages inform you if the following occurs: • If the specified database host cannot be reached, or the field is blank. • If the database admin user's credentials are incorrect. • If the specified database does not already exist, or the caArray DB user's credentials are wrong.
11	Specify the grid service index URL, an externally-visible hostname or IP address which the index service can use to communicate with the grid service, and optionally, the UPT user management URL.  If the index service cannot be reached at the specified URL, an error message displays, informing you to check your firewall or the proxy setting.

Step	Action
12	Specify the SMTP mail server connection information so that caArray can send emails from users with new account requests. 
13	Review the summary of the information you have entered. 
14	On the next two pages, review the selected install type and the installation destination. After you click **Next** from reviewing the installation destination, the installer runs. The installation wizard displays the installation progress and completion.
15	When you are informed that the process is finished, click **Done** on the lower right corner of the wizard to close the installer.
16	To verify caArray installation, open your web browser to http://<jboss.server.hostname>.<jboss.server.port>/caarray (example; https://array.nci.nih.gov/caarray/. Refer to the `<user home>/.installer-csarray/caarray_installer/install.properties` file for the correct values. Enter ***`caarrayadmin`*** as the user and ***`caArray2!`*** as the password.

Step	Action
17	After successfully installing caArray, make a backup of the `<user home>/.installer-csarray/caarray_installer/install.properties` file in a different directory for future reference.

Command-Line Method of Installation

About Properties

An important component of caArray 2.1.1 command-line installation is configuring properties.

Overview of caArray 2.1.1 Command-Line Installer Properties Files

When you do a command-line installation of caArray 2.1.1 for the first time, you will work with the properties file included in the `caarray_distribution_2_1_1.zip`. The file is: `install.properties`.

If you are command-line upgrading from a previous version of caArray 2.X, you will work with the `upgrade.properties` file included in the `caarray_upgrade_2_1_1.zip`. For more information about upgrading caArray, see Upgrade Using Command-Line Installer on page 26.

In several instances in this section, property variables must be modified. Note the following points about changing or entering variables.

Paths in .properties Files

NOTE 	The paths in the `.properties` files should use *forward* slashes. For example, you would use `caarray2.home=C:/apps/caarray-app`, **not** `caarray2.home=C:\apps\caarray-app`. If you use backslashes, you will experience undesirable results.

Spaces in Property Values

NOTE 	You should not put any spaces in the property values of `*.properties` files (e.g. `install.properties`). In Windows, note that the `C:\Documents and Settings\<username>` path contains spaces and the installation will likely fail. If you are using Windows, use a path such as `C:/apps/caarray`.

More About Property Values

NOTES 	• In the `install.properties` and the `upgrade.properties` files, any property value marked with uppercase `REPLACE_*` must be manually updated with the appropriate value. • In each `*.properties file`, any property value marked with lowercase `replace_*` may be optionally updated with the appropriate value. • In many of the steps below, there is reference to a `database.system.user` for your MySQL server. To determine which users are have full privileges to create and manage other databases, type ***`show grants`*** from a MySQL prompt to determine the correct level of privileges.

caArray Port Usage

NOTE 	Verify that default port values defined in `install.properties` files are not in use on your system by running `netstat –a` from the command line. If the ports are in use prior to installation, you will likely experience problems with your installation.

JBoss Errors During Installation

NOTE 	You may receive an error such as Exception in thread "main" `java.lang.NoClassDefFoundError: org/jboss/Shutdown`. 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.

Command-line Installation Steps

To install a new instance of caArray 2.1.1 using the command-line, follow these steps:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>From the directory where you downloaded the <code>caarray_distribution_2_1_1.zip</code> from Downloading caArray 2.1.1 files on page 12, unzip the files, using one of these two methods:
a. Open a command prompt and use it to extract this file to a temporary location. For example, you may enter a command such as <code>unzip -q caarray_distribution_2_1_1.zip</code> (you must have a ZIP tool installed). This location will be referred to as the <code><installer_directory></code> henceforth.
b. Use WinZip or a similar utility to unzip the files to a temporary location. This location will be referred to as the <code><installer_directory></code> henceforth.
Example: <code><installer directory></code> = C:\caarray_211_installer</td></tr>
<tr><td>2</td><td>Note: Setting the property values is an important step in the install process. Before you complete steps 2 & 3, review About Properties on page 17. Follow steps 2 and 3 carefully.
Open the <code><installer_directory>/install.properties</code> file, modify the values for your environment and save the file. At a minimum, you will need to modify the values in the following table:</td></tr>
<tr><td></td><td>
<table>
<tr><th>Environment Variable</th><th>Description</th></tr>
<tr><td><code>${application.base.path}</code></td><td>The location where you are going to install caArray (your <code><application_base_path>)</code>. For example in Windows, the <code><application_base_path></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.</td></tr>
<tr><td>database.type</td><td>This value by default is ‘MYSQL’ and should not be changed.
Note: mysql is the only database supported by caArray 2.X at this time. The use of any other database may cause the application to function improperly.</td></tr>
<tr><td><code>database.system.user</code></td><td>This value should correspond to a MySQL username that has full system privileges. This must correspond to <code>database.system.user</code> defined when MySQL was configured. See the first bullet in More Tips on page 7.</td></tr>
<tr><td><code>database.system.password</code></td><td>This value must correspond to the password for the <code>database.system.user</code> defined when MySQL was configured. See the first bullet in More Tips on page 7.</td></tr>
</table>
</td></tr>
</table>

Step	Action	
	`database.server`	This value must correspond to the domain name of machine that hosts the MySQL server. Talk to your database administrator to learn the server name and port.
	`database.port`	This value must correspond to the port for the `database.server`. 3306 is the default port, but check with your database administrator to be certain.
	`database.name`	Choose a name for the caArray MySQL database. This must be different than the UPT database name (page 10).
	`database.user`	Choose a user name to access `database.name`. This can be any valid name that you choose, but it must be different than `database.system.user`.
	`database.password`	Choose a password to access `database.name` for the username identified in `database.user`. This must be different than the database.system.password.
	`mail.smtp.host`	This value must correspond to an SMTP server available in your network. This will differ in your environment. Consult your email administrator for the SMPT server and port (next value).
	`mail.smtp.port`	This value must correspond to the SMTP server. The default is 25, but this may be different in your environment. Consult your email administrator.
	`grid.index.url`	The default value points to the production grid index server. To change to a different grid index, uncomment the desired one while commenting-out the production value.
	`grid.static.hostname`	This value must contain a publicly accessible address or DNS-resolvable host name so the Grid Index Service (and other clients) can connect to it.
	`grid.web.password`	Set this value to a secure password to be used to secure the grid service JBoss server's administrative functions (e.g, admin console, JMX console, command-line shutdown of JBoss server, etc.).
	`jboss.web.password`	Set to a secure password to be used to secure the caArray JBoss server's administrative functions (e.g, admin console, JMX console, command-line shutdown of JBoss server, etc.)

Step	Action	
	`ldap.authentication.disabled`	This value (true/false) triggers the use of LDAP authentication.
	`research.center.displayName`	Set this value to the full name of the research center which is hosting the caArray installation.
	`research.center.shortName`	Set this value to the short name, or initials, for the research institution which is hosting the caArray installation.
	`research.center.address.country`	Set this value to the name of the country where the research institution which is hosting the caArray installation resides.
	`research.center.address.locality`	Set this value to the name of the locality where the research institution which is hosting the caArray installation resides.
	`research.center.address.postalCode`	Set this value to the postal code where the research institution which is hosting the caArray installation resides.
	`research.center.address.stateProvince`	Set this value to the name of the state or province where the research institution which is hosting the caArray installation resides.
	`research.center.address.street1`	Set this value to the street address of the research institution which is hosting the caArray installation.
	`point.of.contact.affiliation`	Set this value to the name of the institution with which the primary point of contact for the caArray installation is affiliated.
	`point.of.contact.email`	Set this value to the email address of the primary point of contact for the caArray installation.
	`point.of.contact.firstName`	Set this value to the first name of the primary point of contact for the caArray installation.
	`point.of.contact.lastName`	Set this value to the last name of the primary point of contact for the caArray installation.
	`point.of.contact.phoneNumber`	Set this value to the phone number of the primary point of contact for the caArray installation.
	`point.of.contact.role`	Set this value to the role of the primary point of contact for the caArray installation.

Step	Action
3	**Record these property values**. **Note:** You shouldn't need to modify the other default values as we have chosen unique ports to reduce the risk of other applications using the same values. However, be sure to verify that the ports in this file are not being used by other applications.
4	From the command line, navigate to `<installer_directory>/`(*Example*:`cd C:\` caarray_211_installer), and type ***`ant`***. This initiates the installation process. The anticipated duration is anywhere from 1-15 minutes, depending on your system's speed, power and memory. The installer installs the caArray schema in the specified **pre-existing** database on your MySQL server, and installs, configures, and starts two JBoss servers, one for the caArray application, and one for the grid service.
5	To verify caArray installation, open your web browser to http://<jboss.server.hostname>.<jboss.server.port>/caarray (example; https://array.nci.nih.gov/caarray/. Refer to the `<installer_directory>/install.properties` file for the correct values. Enter ***`caarrayadmin`*** as the user and ***`caArray2!`*** as the password.
6	After successfully installing caArray, make a backup of the `<installer_directory>/install.properties file` in a different directory for future reference.

Upgrading caArray 2.X to 2.1.1

This section describes how to upgrade your product from caArray 2.X to caArray 2.1.1. The instructions in this section apply only if you have already installed a caArray version 2.X.

You can perform an upgrade installation of caArray v.2.1.1 using either of these two methods:

- A GUI Installation wizard. Instructions for this method begin on page 23.
- A command-line installation. For instructions, see page 26.

Before You Begin	
	• **Important:** Backup the 2.X database. You need to create a reliable copy of your entire caArray database—the DDL and DML. • **Important:** Backup the `jboss.home` directory. To do this, make a copy of the `caarray2.home` folder along with any artifacts from the initial installation, such as the property files, already mentioned.

If you are performing a new installation, go directly to the installation of version 2.1.1, Installing caArray 2.1.1 Application and Services, on page 11.

 **caArray 2.X Users Upgrading to caArray 2.1.1**	The directions in this section presume that you have a valid and functioning caArray 2.X. That assumes that Java SDK, Apache Ant and MySQL have all been successfully uploaded and installed, as described on pages 3 - 8 in this document.

Overview of Properties Files

When you installed the previous version of caArray 2.X, you configured the `install.properties`. The `caarray_upgrade_2_1_1.zip` that you must download to perform the upgrade to 2.1.1 includes another properties file, `upgrade.properties`. To complete the upgrade to caArray 2.1.1, you must use values in the `install.properties` to configure values in the upgrade installer wizard GUI, or the `upgrade.properties` file if you are doing a command-line method of upgrade.

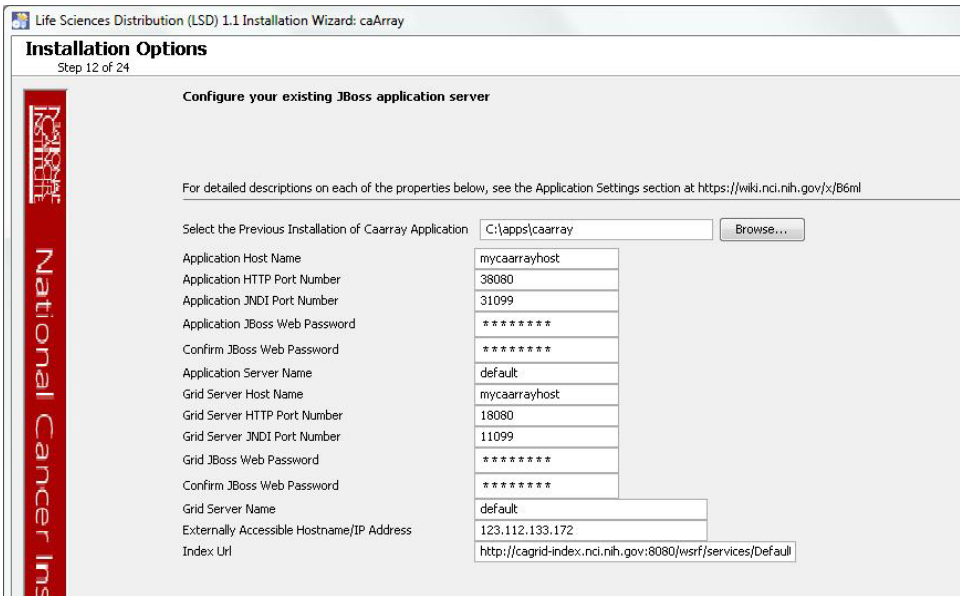
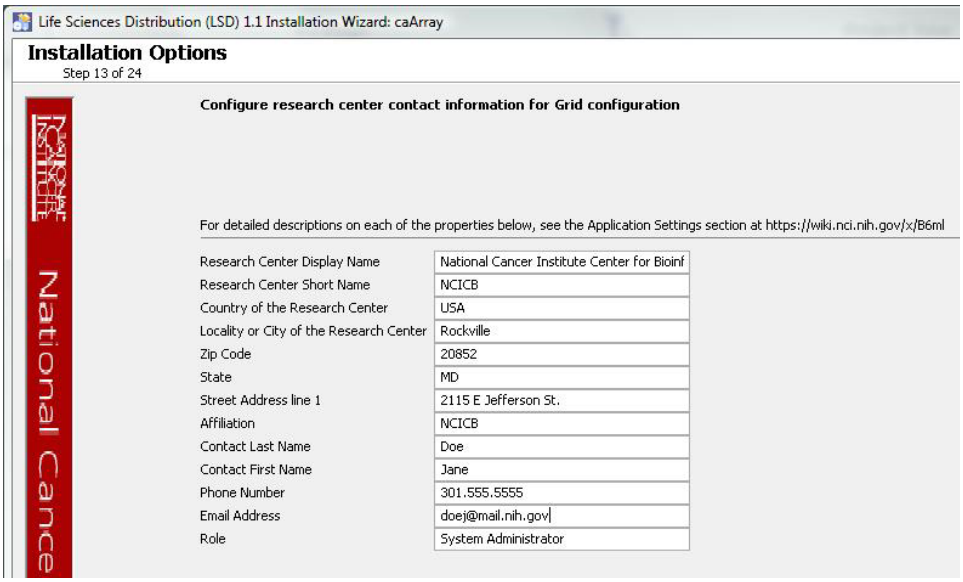
See the steps below for more information.

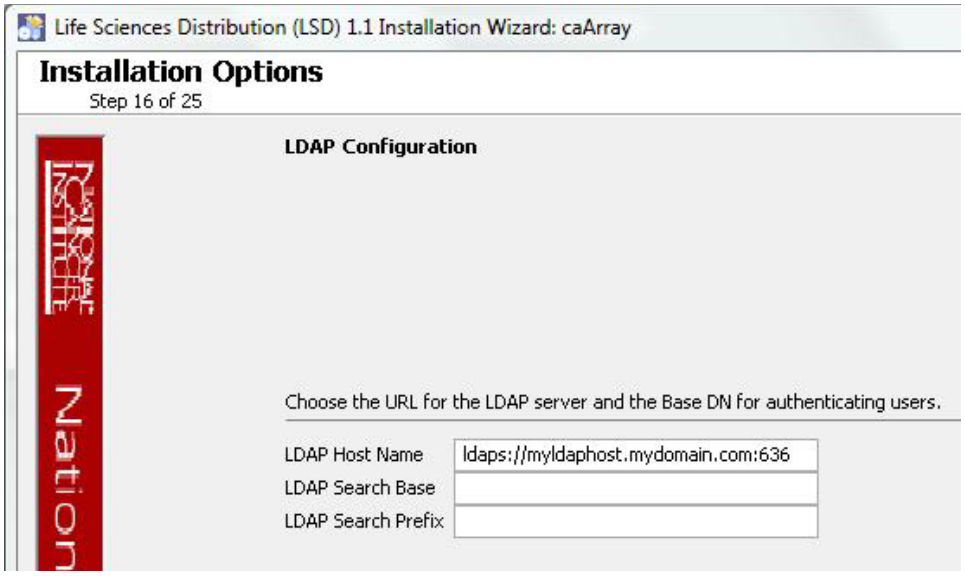
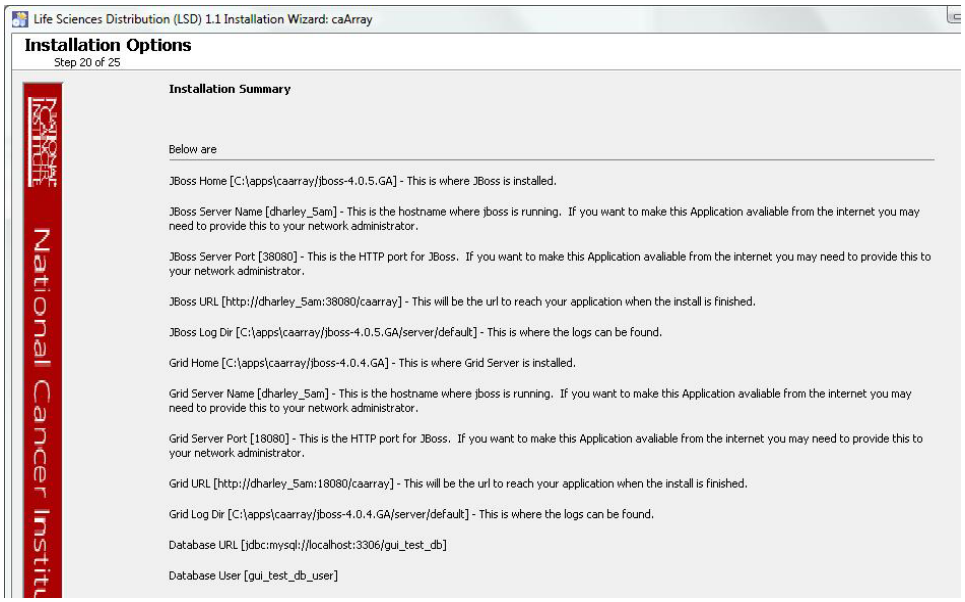
Upgrade Using the GUI Installer

For detailed information on all of the GUI installer fields, refer to the documentation at this location: https://wiki.nci.nih.gov/x/B6ml.

To perform an upgrade to caArray 2.1.1 using the GUI Installation Wizard, follow these steps:

Step	Action
1	Open a command prompt in the directory where you downloaded the `caarray_gui_distribution_2_1_1.jar` and invoke the GUI installer like this: `java –jar caarray_gui_distribution_2_1_1.jar`.
2	The Installation Wizard opens to facilitate the installation process. Click **Next** to proceed through the pages of the wizard, beginning with progressing past the Welcome page.
3	Review the release notes.
4	You must accept the license agreement to continue.

Step	Action
5	Select the **Upgrade** installation type.
6	Configure the JBoss Server-related upgrade settings.  If the path pointing to the caArray installation to be upgraded is incorrect, an error message appears.
7	Specify a research center and technical point-of-contact information needed for grid service registration.  If you do not specify all of the required fields, an error message appears.

Step	Action
8	Specify the authentication type that caArray is using. If you choose LDAP, configure the LDAP information. 
9	Review the summary of gathered information. 
10	Click **Next** to proceed through the next two pages. Review the selected upgrade installation type and the upgrade destination.
11	After you click **Next** from reviewing the installation destination, the installer runs. The installation wizard displays the installation progress and completion. When you are informed that the process is finished, click Done in the lower right corner to close the installation wizard.

Step	Action
12	To verify caArray installation, open your web browser to `http://<jboss.server.hostname>.<jboss.server.port>/caarray` (example: https://array.nci.nih.gov/caarray) and enter ***caarrayadmin*** as the user and ***caArray2!*** as the password. Refer to the original `install.properties` for the correct `jboss.server.hostname` and `jboss.server.port` values.

Upgrade Using Command-Line Installer

To perform an upgrade to caArray 2.1.1 using the command-line, follow these steps.

Step	Action
1	From the directory where you downloaded the upgrade zip file, extract the files, using one of these two methods: a. Open a command prompt and use it to extract this file to a temporary location. For example, you may enter a command such as `unzip -q caarray_upgrade_2_1_1.zip`. (You must have a ZIP tool installed). **Note:** It is recommended that you use a new directory for the unzipped files, rather than the one you used to unzip the installer for the previous version(s) of caArray. This location will be referred to as the `<upgrade_installer_directory>` henceforth. b. Use WinZip or a similar utility to unzip the files to a temporary location. This location will be referred to as the `<upgrade_installer directory>` henceforth Example `<upgrade_installer directory>` = C:\caarray211_upgrade_installer
2	Edit the default properties in the `<upgrade_installer_directory>/upgrade.properties` file. To do so, open both properties files, the one you configured originally when you installed the previous version of caarray_2.X. (`<install properties file>`) and the `<upgrade_installer_directory>/upgrade.properties` file. **Note:** Where there are duplicate attributes, the values must be the same in both files. Copy each entry you modified in the `2.X installation` file and paste it in the corresponding location in the `upgrade.properties` file, replacing the default text, as appropriate.
	Notes regarding property values: `ldap.authentication.disabled` — This is a new property in `upgrade.properties` `grid.web.password` — Set to a secure password to be used to secure the grid service JBoss server's administrative functions (e.g, admin console, JMX console, command-line shutdown of JBoss server, etc.)

Step	Action	
	jboss.web.password	Set to a secure password to be used to secure the caArray JBoss server's administrative functions (e.g, admin console, JMX console, command-line shutdown of JBoss server, etc.)
	`grid.static.hostname`	Set to the same value as the domain.name property from the prior install.properties file. If it was not present, then set this value to a publicly accessible address or DNS-resolvable host name so the Grid Index Service (and other clients) can connect to it.
	`database.type`	This is a new property in `upgrade.properties`. This value by default is 'MYSQL' and should not be changed.
	`grid.index.url`	This is a new property in `upgrade.properties`. The default value points to the training grid server. To advertise your grid service to the production server, you must un-comment the corresponding property for the production grid server and comment out the property for the training grid server.
	`research.center.displayName`	Set this value to the full name of the research center which is hosting the caArray installation.
	`research.center.shortName`	Set this value to the short name, or initials, for the research institution which is hosting the caArray installation.
	`research.center.address.country`	Set this value to the name of the country where the research institution which is hosting the caArray installation resides.
	`research.center.address.locality`	Set this value to the name of the locality where the research institution which is hosting the caArray installation resides.
	`research.center.address.postalCode`	Set this value to the postal code where the research institution which is hosting the caArray installation resides.
	`research.center.address.stateProvince`	Set this value to the name of the state or province where the research institution which is hosting the caArray installation resides.
	`research.center.address.street1`	Set this value to the street address of the research institution which is hosting the caArray installation.
	`point.of.contact.affiliation`	Set this value to the name of the institution with which the primary point of contact for the caArray installation is affiliated.
	`point.of.contact.email`	Set this value to the email address of the primary point of contact for the caArray installation.
	`point.of.contact.firstName`	Set this value to the first name of the primary point of contact for the caArray installation.
	`point.of.contact.lastName`	Set this value to the last name of the primary point of contact for the caArray installation.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td></td><td>
<table>
<tr><td>point.of.contact.phoneNumber</td><td>Set this value to the phone number of the primary point of contact for the caArray installation.</td></tr>
<tr><td>point.of.contact.role</td><td>Set this value to the role of the primary point of contact for the caArray installation.</td></tr>
</table>
Additional Notes:
• mysql is the only database supported by caArray 2.X at this time. The use of any other database may cause the application to function improperly.
• The upgrade.properties file does not have as many attributes, so you may not need to transfer all values you set in the previous installation file.
</td></tr>
<tr><td>3</td><td>Record these property values.

Note: You shouldn't need to modify the other default values as we have chosen unique ports to reduce the risk of other applications using the same values. However, be sure to check the *.properties to verify that the ports in this file are not being used by other applications.</td></tr>
<tr><td>5</td><td>From the command line, navigate to <upgrade_installer_directory>/ (Example:cd C:\caarray211_upgrade_installer), and type ant. This initiates the upgrade process. The anticipated duration is anywhere 1-15 minutes depending on your system's speed, power and memory.

The installer upgrades your existing caArray database on your MySQL server, starts your existing JBoss servers and starts up the grid service for the caArray application.

Notes regarding upgrade:

When the installer detects that a database exists, it warns you to back it up, which you were instructed to do earlier in this process. Press Y to proceed.</td></tr>
<tr><td>6</td><td>To verify caArray installation, open your web browser to http://<jboss.server.hostname>.<jboss.server.port>/caarray (example: https://array.nci.nih.gov/caarray) and enter caarrayadmin as the user and caArray2! as the password. Refer to the original install.properties for the correct jboss.server.hostname and jboss.server.port values.</td></tr>
</table>

Configuring JBoss

NOTE	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.

To configure JBoss in Windows, follow these steps:

Step	Action
1	Add the following entry to the JBoss `run.bat` file which is located will be located at `<application_root_directory>/jboss-4.0.5.GA/bin/run.bat`. Add the text right after the line "`rem Add -server to the JVM options, if supported`". `-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` **Warning**: Be careful when copying and pasting from this document, whether PDF or MS Word. No spaces must come before and after the columns. A safe way to ensure that the text has no unwanted space and unwanted characters is to copy the text into a blank NotePad first. Correct the spacing, then copy and paste back into the `run.bat` file.
2	Restart your JBoss 4.0.5 server for the changes to take effect. The method of doing this may depend on the start/stop/restart scripts you created after the installation. Most commonly, you can execute `shutdown.bat` and then `run.bat` under $JBOSS_HOME/bin. Refer to the publicly available JBoss user's guide at www.jboss.org for more information.

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

Configuring JBoss Servers and MySQL Server to Run as Services

NOTE 	MySQL, and the two JBoss servers that make up caArray, and the JBoss server optionally installed for UPT, must run continually as services. The instructions in this section cover all of these scenarios. For a caArray 2.1.1 deployment, there are at least three servers, and if UPT is installed, four servers: • JBoss 4.0.4 for UPT (optional) • JBoss 4.0.4 (for Grid services) • JBoss 4.0.5 (for caArray application) • MySQL 5.0.27

Running JBoss as a Service

NOTE 	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.

To run JBoss as a service, follow these steps:

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

Running MySQL as a Service

NOTE 	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	**Linux** See http://www.redhat.com/docs/manuals/enterprise/RHEL-AS-2.1-Manual/cluster-manager/s1-service-mysql.html.

Step	Action
2	**Windows** When installing MySQL server on Windows, choose the option to run MySQL as a Windows service.

Post-Installation Tasks

Updating Help Desk Contact Information in SQL

The Help Desk information provided by default in the caArray database must be changed for your environment.

Step	Action
1	Connect to your MySQL server and the caArray database and run the following script (replacing `email_address` with a return email address that is accessible at your location). ***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';***

Using UPT to Add caArray Users

To use the UPT, follow these steps:

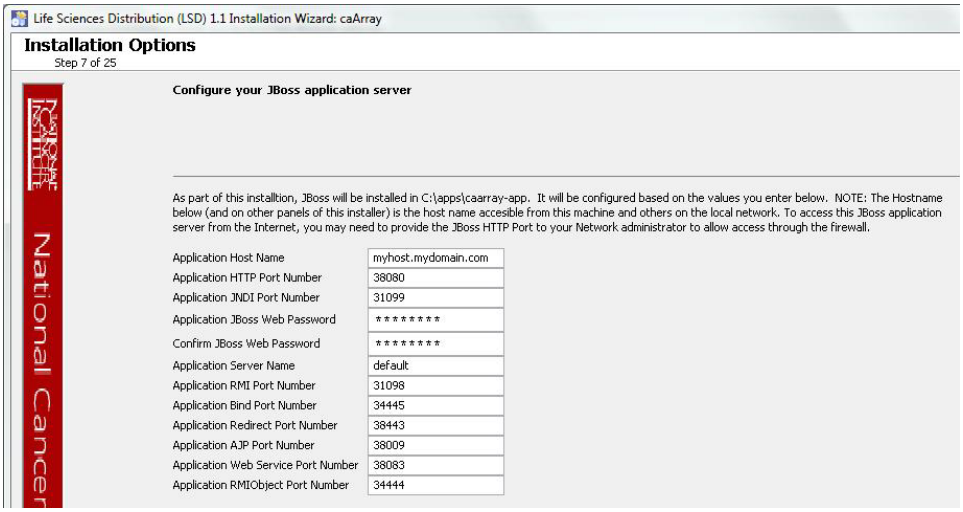
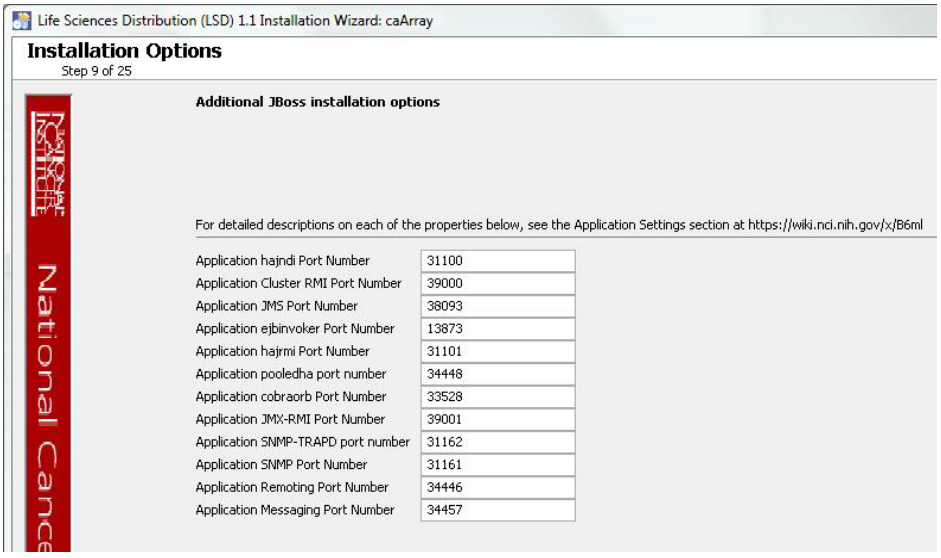
Step	Action
1	Install UPT. For more information, see page 9.
2	Launch a browser and access UPT via **Error! Hyperlink reference not valid.** (from `upt-install.properties`).
3	Login to UPT, using the following profile: • Login ID=***superadmin*** • Password=***changeme*** • Application Name=***csmupt***
4	Select the **User** tab at the top of the page, and click **Create a New User**.

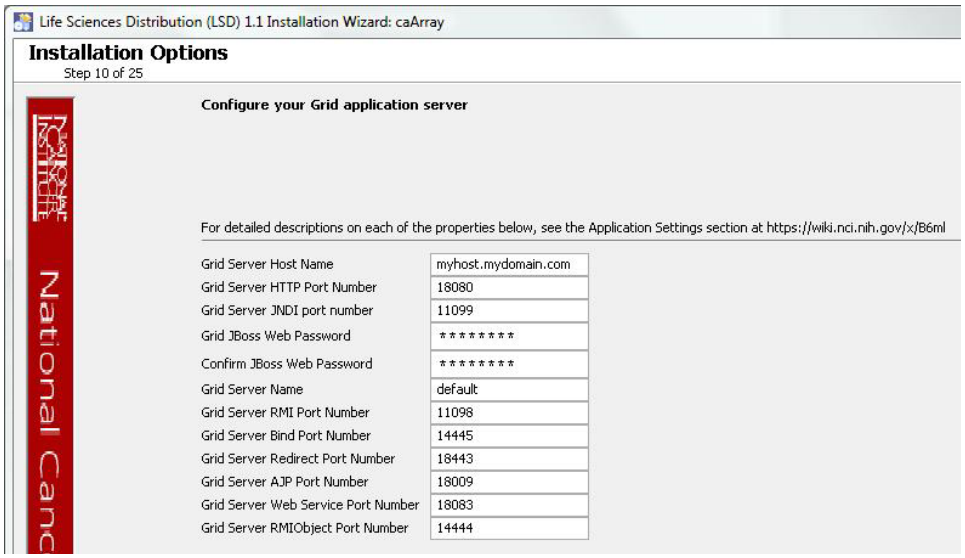
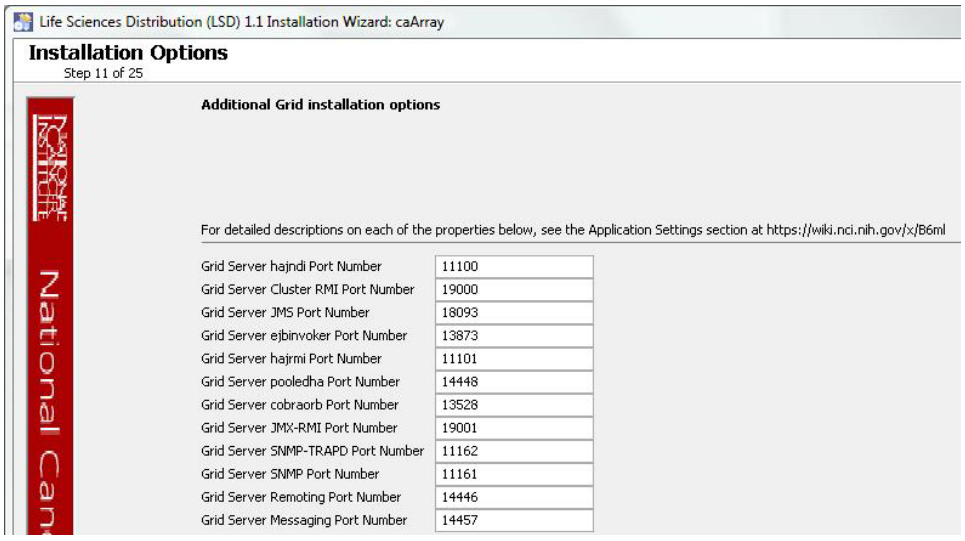
Step	Action
5	Enter **Login Name**, **User First Name**, **User Last Name**, **User Password**, **User Password Confirm**. Click **Add**.
6	On the **Application** tab at the top of the screen, click **Create a New Application**.
7	Enter the following parameters: • Application Name=***caArray*** • Application Description=***<Application Description>*** • Application Declarative Flag=***Yes*** • Application Active Flag=***Yes*** • Application Database URL=`jdbc:mysql://${database.server}:${database.port}/${caarray.database.name}` • Application Database User Name=***${caarray.database.user}*** • Application Database User Password=***${caarray.database.password}*** • Application Database Confirm Password=***${caarray.database.password}*** • Application Database Dialect=***org.hibernate.dialect.MySQLDialect*** • Application Database Driver=***${com.mysql.jdbc.Driver}***
8	Click on **Add > Associated Admins**. then click on **Assign Admin**.
9	Highlight the user you want to be admin of the application, and click **Assign Admin**.
10	Logout of UPT.
11	Login to UPT at **Error! Hyperlink reference not valid.** (from `upt-install.properties`). Use the following login profile: • Login ID=*<User created above>* • Password=*<Password for User created above>* • Application Name=*caArray*
12	Add users to the caArray application like you did above.
13	Click **Logout.**

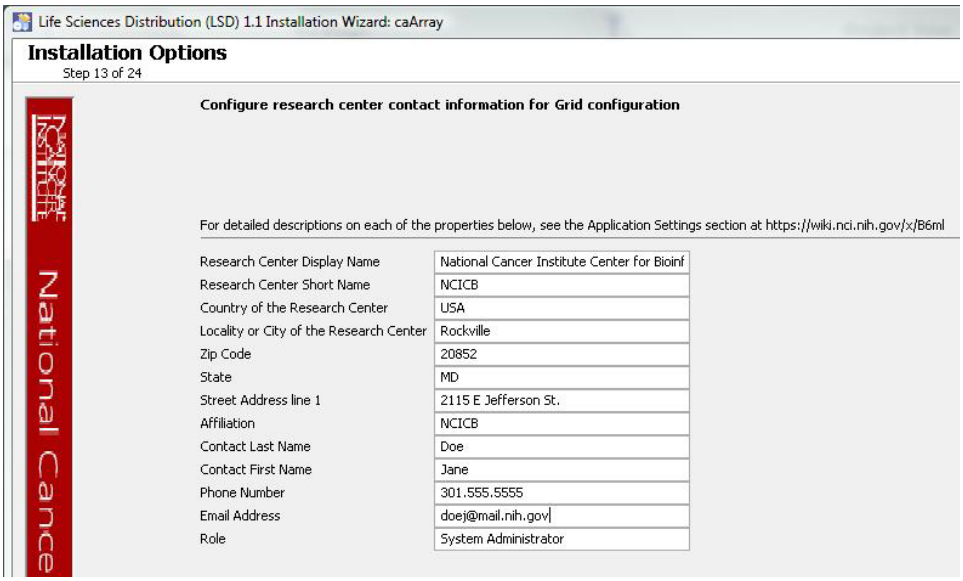
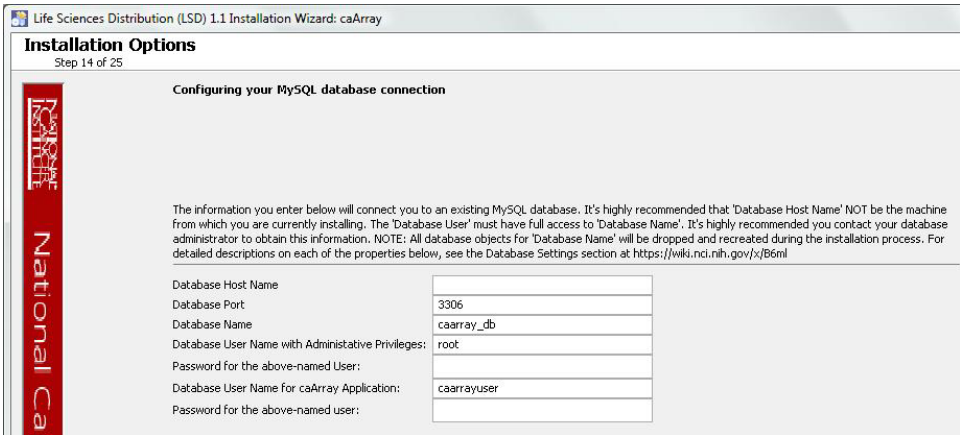
Appendix: Custom Type GUI Installer Walk-Through

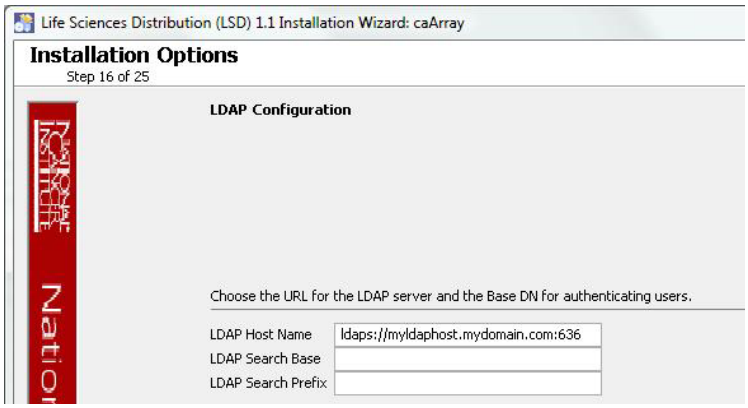
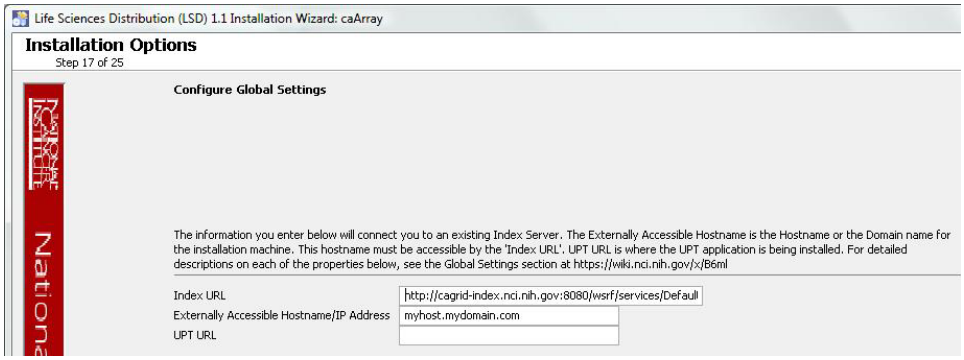
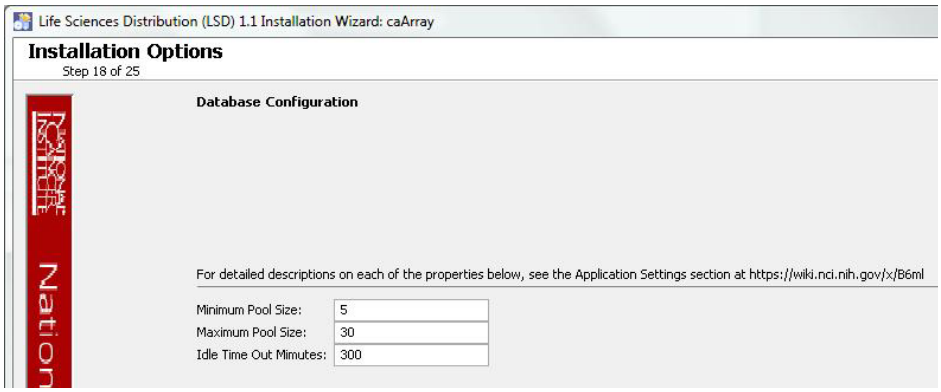
The Custom type GUI installer process walk-through begins on the panel immediately following the panel where you specified the Custom type install (page 13).

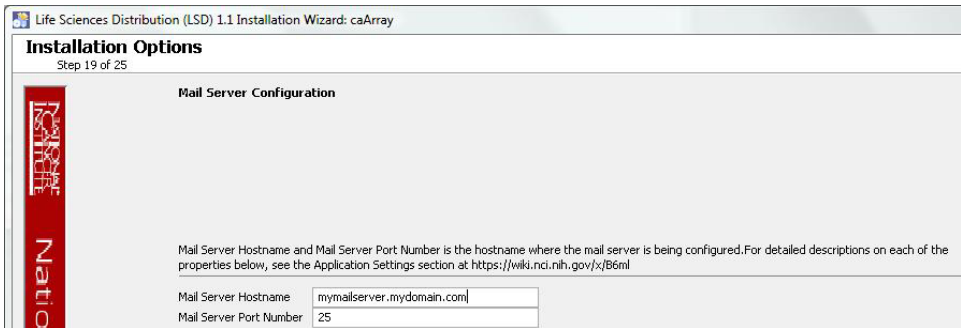
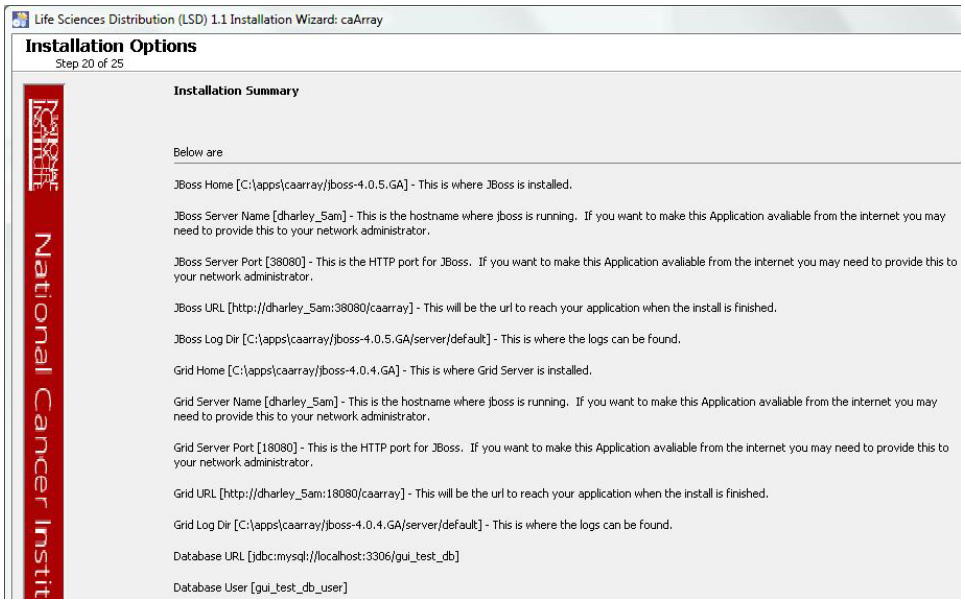
To continue with the Custom installation, follow these steps:

1	Configure caArray JBoss server on the next two pages of the installation wizard. The screen shots show example values. The port values which are specified are the defaults and can be used unless you want to reconfigure the values because of values already in use. 
2	

3	Configure grid service JBoss server on the next two pages of the installation wizard. The screen shots show example values. 
4	

5	Specify the research center and technical point-of-contact info needed for grid service registration.  An error message opens informing you of required fields you may have missed.
6	Specify the database connection information, including the name of the **pre-existing** database where the caArray schema will be installed, and the **pre-existing** user to be used by caArray to connect to its database.  Error messages inform you if the following occurs: • If the specified database host cannot be reached, or the field is blank. • If the database admin user's credentials are incorrect. • If the specified database does not already exist, or the caArray DB user's credentials are wrong.

7	Specify the authentication type that caArray should use. If LDAP is chosen, configure LDAP info. 
8	Specify the grid service index URL, an externally-visible hostname or IP address which the index service can use to communicate with the grid service, and optionally, the UPT user management URL.  If the grid index service cannot be reached at the specified URL, an error message appears.
9	Configure the database connection pool settings. 

10	Specify SMTP mail server connection info so that caArray can send emails from users with new account requests. 
11	Review the summary of the information you entered. 
12	Review the selected install type and the installation destination. After you click **Next** from reviewing the installation destination, the installer runs. The installation wizard displays the installation progress and completion.
13	When you are informed that the process is finished, click **Done** in the lower right corner of the wizard to close the installer.
14	To verify caArray installation, open your web browser to http://<jboss.server.hostname>.<jboss.server.port>/caarray (example; https://array.nci.nih.gov/caarray/. Refer to the `<user home>/.installer-csarray/caarray_installer/install.properties` file for the correct values. Enter ***`caarrayadmin`*** as the user and ***`caArray2!`*** as the password.
15	After successfully installing caArray, make a backup of the `<user home>/.installer-csarray/caarray_installer/install.properties` file in a different directory for future reference.

Contacting Application Support

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