

CANANOLAB 1.5.2

Installation Guide



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Introduction to caNanoLab

Welcome to the cancer Nanotechnology Laboratory (caNanoLab) 1.5.2 Installation Guide. caNanoLab is a data sharing portal designed to facilitate information sharing in the biomedical nanotechnology research community to expedite and validate the use of nanotechnology in biomedicine. caNanoLab allows researchers to share information on nanomaterials including the composition of the nanomaterial, the functions (e.g. therapeutic, targeting, diagnostic imaging) of the particle, the characterizations of the nanomaterial from physico-chemical (e.g. size, molecular weight, surface) and in vitro (e.g. cytotoxicity, blood contact) assays, and the protocols of these characterization.

As of release 1.1, the caNanoLab domain model has been caGrid enabled. In other words, a caNanoLab grid data service can be deployed and registered with caGrid production index server, allowing sharing of public nanomaterial information across the caGrid. In release 1.5, the caNanoLab grid service has been updated to use caGrid 1.3. For more information, see <https://cabig.nci.nih.gov/workspaces/Architecture/caGrid>.

Targeted Developer

The caNanoLab application development is best suited for an experienced Java developer who has some familiarity with the following J2EE and related technologies:



Important Background Knowledge

- **Unix/Linux environment, Windows XP environment or Mac OS environment (Configuring environment variables; Installing Ant, JDK, Apache Tomcat and JBoss servers)**
 - **Ant build scripts**
 - **J2EE web application development using the Struts framework, Servlet/JSP's, JavaScript**
 - **J2EE middle-ware technologies such as n-tier service-oriented architecture and software design patterns**
 - **Hibernate Java persistence framework**
 - **caGrid 1.3 infrastructure (for understanding how a caNanoLab grid data service functions)**
-

General System Requirements

The following open source technologies power a caNanoLab web application:

Open Source Technologies

- Java Software Development Kit (JDK) version 5.0
http://java.sun.com/javase/downloads/index_jdk5.jsp
- JBoss version 4.0.5 <http://labs.jboss.com/jbossas/downloads>
- Jakarta Ant version 1.7 <http://archive.apache.org/dist/ant/binaries/>
- MySQL version 5.1.x <http://dev.mysql.com/downloads/mysql/5.1.html>

The caNanoLab web application has been tested within NCICBIIT against JBoss servers (version 4.0.5) hosted on Windows XP and RedHat Linux systems, and against MySQL 5.1.48 databases hosted on RedHat Linux systems and MySQL 5.1.51 on Windows XP systems. Prior to release 1.2.1, the caNanoLab web application had been tested against Oracle 9i databases hosted on Sun Solaris systems, and Oracle 10g XE database hosted on Windows XP.

Download each of the tools listed in the bulleted list above and follow the installation instructions provided with each respective product for your environment. Assistance from a MySQL database administrator is expected to properly configure the MySQL database. For MySQL database configuration and maintenance, it is also helpful to download the MySQL workbench (suite of GUI tools) at <http://dev.mysql.com/downloads/gui-tools/5.2.html>.

Grid Service

Setting up a caNanoLab grid service is optional. It is recommended that you install the grid service only after you successfully install the web application and become familiar with submitting and searching data through the web application.

Grid Service Downloads

In release 1.5.2, there are no separate technology downloads required for installing the caNanoLab grid service, and most can be obtained automatically during building of the grid service through Ant.

Obtaining the caNanoLab Source**Source Code**

The caNanoLab source codes and build scripts for caNanoLab web application, grid service and database are distributed as a zip file named `caNanoLab_1.5.2.zip` from the NCICBIIT GForge site at http://gforge.nci.nih.gov/frs/?group_id=69 under release 1.5.2.

Ant Build Properties

Assumptions and Requirements	The caNanoLab source distribution <code>caNanoLab_1.5.2.zip</code> has been downloaded from the NCICBIIT GForge site. Ant has been installed. In caNanoLab release 1.5.2, the Ant build script automatically installs the web application, the database and the grid service.
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Setting Properties

Follow these steps to set the build and deploy properties required for building and deploying the caNanoLab system.

Step	Action
1	<p>Extract the <code>caNanoLab_1.5.2.zip</code> to a location on your local system, for example, <code>C:\caNanoLab_1.5.2</code>. This location is referred as <code><CANANOLAB_SOURCE></code> throughout the document. Verify that the following five folders exist in the directory <code><CANANOLAB_SOURCE></code>:</p> <pre> build cananolab-db cananolab-grid cananolab-webapp common </pre>
2	<p>Edit the Ant properties file <code>deploy.properties</code> at <code><CANANOLAB_SOURCE>/build</code> by specifying values for the following properties:</p> <ol style="list-style-type: none"> 1) <code>file.repository.dir</code>: a directory on the system that hosts the JBoss application server for storing uploaded files, for example, <code>C:/caNanoLab/fileupload</code> Note: This directory should be writable by the user that starts the JBoss server, and this directory should be created prior to starting the application. Either double back slashes <code>\\</code> or a single forward slash <code>/</code> should be used as the file separator if working on Windows platform. 2) <code>admin.email</code>: the email address that receives requests for new user accounts, for example, NCICBIIT application support email for the NCICBIIT installation 3) <code>application.base.path.linux</code>: a directory on the Linux system that stores the downloaded external software, such as the Globus WS Core binary files, for example, <code>/home/canolab/apps</code> Note: This property is currently optional for building the web application and the database, and is only required for building the grid service on a Linux

Step	Action
	<p>system.</p> <p>4) <code>application.base.path.windows</code>: a directory on the Windows system that stores the downloaded external software, such as the Globus WS Core binary files, for example, <code>C:/apps</code></p> <p>Note: This property is currently optional for building the web application and the database, and is only required for building the grid service on a Windows system.</p> <p>5) <code>database.server</code>: the name of the server hosting the database, for example, <code>localhost</code></p> <p>6) <code>database.port</code>: the database port number, for example, <code>3306</code></p> <p>7) <code>database.user</code>: the database user name used in the caNanoLab application, for example, <code>cananolab_app</code></p> <p>8) <code>database.password</code>: the password for the database user specified above, for example, <code>go!234</code></p> <p>9) <code>database.system.user</code>: the system database user name that has privileges to create a database, create tables, grant user accesses to a database, for example, <code>root</code></p> <p>10) <code>database.system.password</code>: the password for the system database user specified above, for example, <code>root</code></p> <p>Note: The following properties 11) through 26) are only required if you setting up a grid service. These properties contain metadata about the grid service that are required for the grid index server to visually map the location of a grid service in the caGrid portal, and are useful during grid service auto-discovery. If you are not setting up a caNanoLab grid service, you may leave these properties blank.</p> <p>11) <code>grid.indexserver</code>: the grid index server from which the caNanoLab grid data services can be automatically discovered, for example, <code>http://cagrid-index.nci.nih.gov:8080/wsrf/services/DefaultIndexService</code>, NCICBIIT's production caGrid index server</p> <p>12) <code>grid.service.hostname</code>: virtual host name for the JBoss server hosting the grid service, for example, <code>cananolab.nci.gov</code></p> <p>13) <code>grid.service.port</code>: port number configured for the JBoss server hosting the caNanoLab grid service, for example, <code>80</code></p> <p>14) <code>grid.service.protocol</code>: protocol configured for the JBoss server hosting the caNanoLab grid service, for example, <code>http</code></p> <p>15) <code>application.owner</code>: owner of the caNanoLab grid service, for example, <code>NCICBIIT</code></p> <p>16) <code>country</code>: the country in which the caNanoLab grid service is running, for example, <code>US</code>.</p> <p>17) <code>city</code>: the city at which the caNanoLab grid service is running, for example, <code>Rockville</code>.</p> <p>18) <code>zipcode</code>: the zip code at which the caNanoLab grid service is running, for</p>

Step	Action
	<p>example, 20852.</p> <p>19) <code>state</code>: the state at which the caNanoLab grid service is running, for example, MD.</p> <p>20) <code>street1</code>: the first part of the street at which the caNanoLab grid service is running, for example, 2115 East Jefferson Street.</p> <p>21) <code>street2</code>: the second part of the street at which the caNanoLab grid service is running.</p> <p>22) <code>affiliation</code>: the affiliation of the person who is responsible for maintaining the caNanoLab grid service, for example, NCICBIIT.</p> <p>23) <code>email</code>: the email of the person who is responsible for maintaining the caNanoLab grid service, for example, NCICBIIT@pop.nih.gov</p> <p>24) <code>phone</code>: the phone number of the person who is responsible for maintaining the caNanoLab grid service.</p> <p>25) <code>first.name</code>: the first name of the person who is responsible for maintaining the caNanoLab grid service.</p> <p>26) <code>last.name</code>: the last name of the person who is responsible for maintaining the caNanoLab grid service.</p> <p>27) <code>ldap.authentication.enabled</code>: a Boolean flag for whether or not using LDAP for user authentication in caNanoLab, for example, <code>true</code></p> <p>Note: Please note that default value is <code>true</code>. If you are not using LDAP for user authentication, please set this value to <code>false</code> and leave properties 27) through 32) blank.</p> <p>28) <code>ldap.host.url</code>: the URL of the LDAP server used for user authentication</p> <p>29) <code>ldap.searchable.base</code>: the location in the directory from which the LDAP search begins</p> <p>30) <code>ldap.userId.label</code>: the uid label for LDAP, for example, <code>cn</code></p> <p>31) <code>superadmin.login.name</code>: the LDAP login name for the user account who is the super admin of the UPT tool. See page 13 for details on setting up UPT</p> <p>32) <code>superadmin.first.name</code>: the LDAP first name for the user account who is the super admin of the UPT tool</p> <p>33) <code>superadmin.last.name</code>: the LDAP last name for the user account who is the super admin of the UPT tool</p>

Database Technology

Assumptions and Requirements The Ant build properties have been set as described on pages 3 through 5. A MySQL database has been set up on a system (local or remote) with a system (or root) account. The system account should match properties 9) and properties 10) in the step 2 of the previous section.

For a Previous Installation If you have installed caNanoLab prior to release 1.5.2 against an MySQL database, or release 1.2 or release 1.1.1 or release 1.1 against an Oracle database, and have associated production data in these schemas and you would like to continue to use the same data for caNanoLab release 1.5.2 in MySQL, review the following database initialization steps, then go directly to *Data Migration* on page 7.

If you have a previously installed caNanoLab application running on a JBoss server, stop the server before running the database scripts.

For a New Installation If you are installing the caNanoLab application for the first time or want to install a new schema for release 1.5.2, follow the steps below to set up the required MySQL schema objects and the seed data for release 1.5.2.

Initializing the MySQL Database

Follow these steps to initialize your MySQL database system:

Step	Action
1	<p>Execute the Ant build script <code>build.xml</code> located at <code><CANANOLAB_SOURCE>/build</code> with the target <code>install:new:cananolab-db</code>.</p> <p><i>Example:</i> Issue the following commands to execute the Ant script:</p> <pre>C:\>cd C:\caNanoLab_1.5.2 C:\caNanoLab_1.5.2>ant install:new:cananolab-db</pre> <p>Successful execution of the Ant script creates the database schema and seed data required the caNanoLab 1.5.2 release.</p>
2	<p>If you are NOT using LDAP for user authentication, you can skip this step. If you are using LDAP for authentication, execute the Ant build script <code>build.xml</code> located at <code><CANANOLAB_SOURCE>/build</code> with the target <code>update:cananolab-db:ldap:upt:superadmin</code></p> <p><i>Example:</i> Issue the following commands to execute the Ant script:</p> <pre>C:\>cd C:\caNanoLab_1.5.1 C:\caNanoLab_1.5>ant update:cananolab-db:ldap:upt:superadmin</pre>

	Successful execution of the Ant script updates the default UPT super admin with the user name entered in the build properties file on page 5.
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Verification

Once the MySQL database has been created, either through new setup or through data migration (described in the next section), verify that the following numbers of database objects are created:

Tables 72

Example: Issue the following query at the MySQL prompt, logging in as `root`:

```
mysql> select count(*) from information_schema.tables where
table_schema='canano' and table_type='BASE TABLE';
```

Data Migration

NOTE:



If you are installing caNanoLab 1.5.2 for the first time or installing a new caNanoLab release 1.5.2 schema, you can skip this section.

This installation guide only discusses the steps for migrating from release 1.5.1 in MySQL to release 1.5.2 in MySQL. If you have previously installed caNanoLab in MySQL prior to release 1.5.1, you'd have to migrate to release 1.5.1 first, one release at a time. Please see the install instructions for each release at http://gforge.nci.nih.gov/frs/?group_id=69 for details.

Follow these steps to complete the required data migration from release 1.5.1 in MySQL to release 1.5.2 in MySQL:

Step	Action
1	<p>Execute the Ant build script <code>build.xml</code> located at <code><CANANOLAB_SOURCE>/build</code> with the target <code>update:cananolab-db</code>.</p> <p><i>Example:</i> Issue the following commands to execute the Ant script:</p> <pre>C:\>cd C:\caNanoLab_1.5.2 C:\caNanoLab_1.5.2>ant update:cananolab-db</pre> <p>Successful execution of the Ant script updates the database schema and seed data required the caNanoLab 1.5.2 release.</p>

Step	Action
2	<p>If you are NOT using LDAP for user authentication, you can skip this step. If you are using LDAP for authentication, execute the Ant build script <code>build.xml</code> located at <code><CANANOLAB_SOURCE>/build</code> with the target <code>update:cananolab-db:ldap:upt:superadmin</code></p> <p><i>Example:</i> Issue the following commands to execute the Ant script:</p> <pre>C:\>cd C:\caNanoLab_1.5.1 C:\caNanoLab_1.5>ant update:cananolab-db:ldap:upt:superadmin</pre> <p>Successful execution of the Ant script updates the default UPT super admin with the user name entered in the build properties file on page 5.</p>
3	<p>If you are NOT using LDAP for user authentication, you can skip this step. If you are using LDAP for authentication, and you already have user accounts in the system and you have data created by these users whose login names are not their LDAP login IDs, you'd need to do the following data update:</p> <ol style="list-style-type: none"> 1) Update the <code>login_name</code> column of the <code>csn_user</code> table with the LDAP login name for each user in the table: <p><i>Example:</i> Issue the following query at the MySQL prompt for each user, logging in as <code>root</code>:</p> <pre>mysql> update csn_user set login_name='@ldap_login@' where login_name='@old_login@';</pre> <p>Where the token <code>@ldap_login@</code> should be replaced by the real LDAP login name that corresponds to the old login name. The token <code>@old_login@</code> should be replaced by the old login name.</p> 2) Update the <code>created_by</code> column of tables containing the column with the LDAP login name: <p><i>Example:</i> Issue the following query at the MySQL prompt for each table containing the <code>created_by</code> column, logging in as <code>root</code>:</p> <pre>mysql> update sample set created_by='@ldap_login@' where created_by = '@old_login@';</pre> <p>Where the token <code>@ldap_login@</code> should be replaced by the real LDAP login name that corresponds to the old login name. The token <code>@old_login@</code> should be replaced by the old login name.</p> <p>Note: if the <code>created_by</code> field contains the word "COPY" in it, update it with have a prefix <code>"@LDAP_login@"</code>, where the token <code>@ldap_login@</code> should be replaced by the real LDAP login name that corresponds to the old login name who created the data. If you don't know the original login who created the data, use the LDAP login of a curator. If you need assistance on completing the data updates for this step, please contact the caNanoLab technical tea</p>

After data migration, refer to the Verification section to verify that the migration has been successful.

caNanoLab Web Application

Assumptions and Requirements

Ant has been installed. Ant build properties have been set up, as described on pages 3 through 5. The database has been installed and verified, as described on pages 6 through 8. The JBoss application server has been installed on a system (local or remote) and can be started at a designated port. JBoss install directory is referred as `<JBOSS_HOME>` in the document. The JBoss application server host URL is referred as `<APP_SERVER_URL>`, for example, `cananolab-dev.nci.nih.gov:19080`.

It is assumed that the default configuration is used for deploying caNanoLab web archive files. For example, in JBoss 4.0.5, the default configuration is located at the directory `<JBOSS_HOME>/server/default`. The caNanoLab web archive file shall be deployed at the directory `<JBOSS_HOME>server/default/deploy`.

It is possible to configure Apache server to interface with the JBoss server and set up a virtual host for the caNanoLab application, if you need assistance, please contact NCICBIIT Application Support (info provided at the end).

Installation and Deployment

Follow these steps to install and deploy caNanoLab:

Step	Action
1	<p>Set up an environment variable <code>JBOSS_HOME</code> to point to the JBoss installation directory.</p> <p>Note: Either double back slashes <code>\\</code> or a single forward slash <code>/</code> should be used as the file separator if working on Windows platform, for example, <code>JBOSS_HOME=C:/jboss-4.0.5.GA</code> (<code>C:\jboss-4.0.5.GA</code> would fail).</p>
2	<p>Execute the Ant build script <code>build.xml</code> located at <code><CANANOLAB_SOURCE>/build</code> with the target <code>deploy:cananolab-webpp</code>.</p> <p><i>Example:</i> Issue the following commands to execute the Ant script:</p> <pre>C:\>cd C:\caNanoLab_1.5.2 C:\caNanoLab_1.5>ant deploy:cananolab-webapp</pre> <p>Successful execution of the Ant script generates the following artifacts that include two deployable web archive war files, configuration files and libraries for running the web application in the JBoss environment, and also places these artifacts in the appropriate directories under <code><JBOSS_HOME></code>:</p>

Step	Action
	<pre> <CANANOLAB_SOURCE>/target/dist/exploADED/cananolab- webapp/caNanoLab.war <CANANOLAB_SOURCE>/target/dist/exploADED/common/upt.wa r <CANANOLAB_SOURCE>/target/dist/exploADED/common/login- config.xml <CANANOLAB_SOURCE>/target/dist/exploADED/common/mysql- ds.xml <CANANOLAB_SOURCE>/target/dist/exploADED/common/mysql- connector-java-5.0.7-bin.jar </pre>
3	<p>When deploying both the caNanoLab application and the caNanoLab grid service (see page 15) to the same JBoss server, we recommend increasing the JBoss JVM heap size to 1G bytes and permanent generation (permgen) memory space to 512M bytes by updating the file <JBoss_HOME>/bin/run.conf with the following JAVA_OPTS:</p> <pre> JAVA_OPTS="-Xms512m -Xmx1024m -XX:PermSize=256m - XX:MaxPermSize=512m -Dsun.rmi.dgc.client.gcInterval=3600000 - Dsun.rmi.dgc.server.gcInterval=3600000" </pre> <p>This configuration file is read when JBoss server starts.</p>
4	<p>When deploying the caNanolab application and the grid service in a production environment, we also recommend updating the default logging behavior of the JBoss server by turning off the unnecessary loggings thus reducing file system requirements for server log files.</p> <p>Please locate the file <JBoss_HOME>/server/default/conf/log4j.xml and add to the beginning of the section Limit categories the following text:</p> <pre> <!-- ===== --> <!-- Limit categories --> <!-- ===== --> <!-- edited for caNanoLab --> <category name="org.hibernate"> <priority value="WARN"/> </category> <category name="org.springframework"> <priority value="WARN"/> </category> <category name="org.globus"> <priority value="WARN"/> </category> <category name="gov.nih.nci"> <priority value="ERROR"/> </category> </pre>


Step	Action
	<pre> <category name="org.displaytag"> <priority value="ERROR"/> </category> <category name="org.directwebremoting"> <priority value="ERROR"/> </category> <category name="net.sf.ehcache"> <priority value="INFO"/> </category> <category name="com.mchange.v2"> <priority value="INFO"/> </category> <category name="org.jboss"> <priority value="INFO"/> </category> <category name="CSM"> <priority value="ERROR"/> </category> <category name="Authorization"> <priority value="ERROR"/> </category> <!--end of edit for caNanoLab --> </pre>

Verification


Once the deployment artifacts have been deployed and the JBoss application server is correctly configured, you can now start the JBoss application server, which in turn starts the caNanoLab application.

Open the URL http://<APP_SERVER_URL>/caNanoLab/ (for example, <http://cananolab-dev.nci.nih.gov:19080/caNanoLab>). You should see a Welcome/Login page.

User Provisioning Tool (UPT)

 <p>Creating User Accounts</p>	<p>Before a user can log in to the caNanoLab application to submit and search data, you must first create his/her user account through the UPT web interface. The caNanoLab application makes use of the NCICBIIT's User Provisioning Tool (UPT), a separate web application, for user account management. The concepts of users, groups, roles, protection groups are defined according the CSM/UPT principles. See the CSM documentation at http://gforge.nci.nih.gov/frs/?group_id=12 for details on these concepts and the use of the UPT tool.</p>
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In release 1.5.2, as a part of the database seed data, two default user groups have been created: `Public` and `Curator`. The group `Public` has been assigned role `R` (read-only) public protocols, samples and publications. The group `Curator` has been assigned role `CURD` (create, update, read and delete) to all protocols, samples and publications in the system. When a user first logs into caNanoLab, he/she will be automatically added to the `Public` group so he/she can see all public data. The user would need to be added to the `Curator` group in the UPT tool in order to have Curator access.


<p>NOTE:</p> 	<p>In release 1.5.2, a user must be assigned as a caNanoLab administrator to see the <code>ADMINISTRATION</code> menu item in the application to log into the UPT tool or do update site preferences such as site logo. A user must be assigned as a caNanoLab administrator and assigned to the <code>Curator</code> group to be able to execute the transfer ownership function.</p>
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UPT Example The following steps illustrate an example use of the UPT tool to create a new user, to assign the user to be a caNanoLab administrator, and to assign the user to the `Curator` group.

Step	Action
1	<p>Launch the UPT tool at <a href="http://<APP_SERVER_URL>/upt">http://<APP_SERVER_URL>/upt and login as the super admin. If you are NOT using LDAP for user authentication, the default user account/password for super admin is <i>superadmin/superadmin</i>. Use <i>csmupt</i> as the application name when prompted at the UPT log in. If you are using LDAP for user authentication, please use the LDAP login name and password of the user who has been assigned as the super admin as specified in the Ant build properties file on page 5.</p> <p>Note: The user <i>superadmin</i> with initial password <i>superadmin</i> was created as a part of the database setup. Only <i>superadmin</i> can assign users to be caNanoLab administrators.</p>

2	<p>If you are using LDAP for user authentication, you can skip this step. If you are not using LDAP for authentication, you can follow this step to reset the password for superadmin:</p> <p>Select User > Select an Existing User. Click on Search and select superadmin and click on View Details. Update the User Password field and Confirm Password field and click on Update to commit the change.</p>
3	<p>Logged in as the super admin, follow these steps to create a new user and assign it to be a caNanoLab administrator:</p> <p>Select User > Create a New User. Create a new user account named admin with an initial password. Select Application > Select an Existing Application; click Search. Select caNanoLab from the application list. Click View Details, then Associated Admins. Assign this user to be an administrator for the caNanoLab application. Click Update Association to commit the change.</p> <p>Note: if you using LDAP for user authentication, any user login names created in the UPT tool should be a valid LDAP log in name.</p>
4	<p>Log out of the UPT tool and log back in as admin. Use caNanoLab as the application name when prompted at the UPT log in.</p>
5	<p>Select User > Select an Existing User, and click Search. Select admin from the User list. Click View Details, then Associated Groups. Select Curator from the pre-defined group list and assign it to the user. Click Update Associations to commit the change.</p>

Follow similar steps to create other application user accounts as appropriate.

<p>NOTES:</p> 	<p>In release 1.5.2, if you are not using LDAP for user authentication, superadmin or caNanoLab administrators maintains the passwords for user accounts. The UPT tool doesn't allow users to manage their own passwords.</p> <p>Publicly available data can be browsed through Browse caNanoLab links on the home page without logins.</p> <p>At each new data submission, the user who creates the data and the Curator group are automatically assigned role CURD to the newly created data.</p>
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For more information about how to use the UPT tool for managing user accounts, contact NCICBIIT Application Support at NCICBIIT@pop.nci.nih.gov and request that the caNanoLab technical team give you a demonstration of the UPT tool in the context of the caNanoLab application.

caNanoLab Grid Data Service

Assumptions and Requirements

Ant has been installed. Ant build properties have been set up, as described on pages 3 through 5. The database has been installed and verified, as described on pages 6 through 8. The JBoss application server has been installed on a system (local or remote) and can be started at a designated port. If you had started the JBoss server to test the caNanoLab application installation, please shut it down now.

In release 1.5.2, the caNanoLab grid service is configured to be deployed to the Tomcat embedded in the same JBoss server used for deploying the caNanoLab web application. Users are not required to install a separate Tomcat server or to download and install Globus Toolkit.

In order for the grid service to successfully register with the NCICBIIT production index server, the server and the port number hosting the JBoss server must be publicly accessible.

Installation and Deployment

Follow these steps to create and deploy a caNanoLab grid data service:

Step	Action
1	If not done already, set up an environment variable <code>JBOSS_HOME</code> to point to the JBoss server install directory as in step 1 on page 9.
2	<p>Execute the Ant build file <code>build.xml</code> located at <code><CANANOLAB_SOURCE>/build</code> with the target <code>deploy:cananolab-grid</code>. For example,</p> <pre>C:\>cd C:\caNanoLab_1.5.2 C:\caNanoLab_1.5.1>ant deploy:cananolab-grid</pre> <p>Successful execution of the Ant script generates the following artifacts that include a deployable web archive war file and libraries for running the grid service in the JBoss environment, and also places these artifacts in the appropriate directories under <code><JBOSS_HOME></code>:</p> <pre><CANANOLAB_SOURCE>/target/dist/exploated/canolab-grid/wsrf-canano.war <CANANOLAB_SOURCE>/target/dist/exploated/common/cog-jglobus.jar <CANANOLAB_SOURCE>/target/dist/exploated/common/cog-tomcat.jar <CANANOLAB_SOURCE>/target/dist/exploated/common/cryptix32.jar</pre>

Step	Action
	<p><CANANOLAB_SOURCE>/target/dist/exploADED/common/cryptix.jar</p> <p><CANANOLAB_SOURCE>/target/dist/exploADED/common/cryptix-asn1.jar</p> <p><CANANOLAB_SOURCE>/target/dist/exploADED/common/jce-jdk13-125.jar</p> <p><CANANOLAB_SOURCE>/target/dist/exploADED/common/puretls.jar</p> <p><CANANOLAB_SOURCE>/target/dist/exploADED/common/xml-apis.jar</p> <p>Note: If you have never installed the Globus toolkit on your system and have never set up an environment variable called <code>GLOBUS_LOCATION</code>, you don't need to do them in order to install the caNanoLab grid service. The Ant build script will automatically download the toolkit and install it at the directory specified on page 3 in the property <code>application.base.path.linux</code> or <code>application.base.path.windows</code> depending on the platform.</p>
3	If not done already, follow step 3 and 4 on pages 10 and 11 to configure appropriate memory settings and logging settings for the JBoss server.

Verification

Once the grid service war file has been deployed, you can now start the JBoss server, which in turn starts the caNanoLab application and the caNanoLab grid service. To verify the creation of the caNanoLab grid data service, open the URL http://<APP_SERVER_URL>/wsrf-canano/services/cagrid/CaNanoLabService, for example, <http://cananolab-dev.nci.nih.gov:19080/wsrf-canano/services/cagrid/CaNanoLabService>. You should see a page that says:

```
cagrid/CaNanoLabService
Hi there, this is an AXIS service!
```

It takes more than ten minutes for the grid service to successfully register in the index server. Wait some time and go into the caGrid portal at <http://cagrid-portal.nci.nih.gov/web/guest/home>. You should see your grid service showing up on the portal map. This completes the release 1.5.2 installation.

For more information and help on caGrid service configuration and deployment, refer to the caGrid wiki page: <http://www.cagrid.org>. If you need further assistance on setting a caNanoLab grid service, contact NCICBIIT Application Support at NCICBIIT@pop.nci.nih.gov and request that the caNanoLab technical team help you with caNanoLab grid service.

Contacting Application Support

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