# Installing GenoCAD

After experimenting with GenoCAD on GenoCAD.org, advanced users will want to install GenoCAD on their own servers. This solution allows organizations to protect their intellectual property by leaving sensitive information behind their firewall. It also makes it possible to customize the GenoCAD database content to the specific needs of an organization instead of relying on generic grammars and parts libraries.

GenoCAD is developed using the PHP Zend framework. This section describes how GenoCAD 1.5.8 may be installed on a local server. To run GenoCAD, we recommend the following configurations:

* OpenSUSE or SLES v.11
* the latest stable version of PHP (at least 5.0 or greater),
* the latest stable release of MySQL (recommended version: 5.1.49-log SUSE MySQL RPM),
* Apache 2.2 (or greater)
* the latest stable release of libsbml (recommend version: 5.0.0),
* CopasiSE (recommended version: 4.7 Build 34),
* NCBI’s BLAST (downloadable from http://blast.ncbi.nlm.nih.gov/Blast.cgi)
* and SWI-Prolog (www.**swi-prolog**.org/).

1. Download the source code. To begin with, the source code should be downloaded from SourceForge. Although the source code is version-controlled using SourceForge’s instance of subversion, it is possible to download the latest stable release as a package by clicking on the Download Now! button provided by SourceForge. If the latest stable release is downloaded as a package, it needs to be unzipped before proceeding to the next step.
2. Copy the genocad directory to the server’s webroot directory. To simplify the coordination of the Zend parts of the application, it is strongly recommended that the GenoCAD instance have its own domain URL, rather than installing it as a subdirectory under another root -- for example, having the index.php file in <https://mygenocadinstance.myinstitution.edu/> is better that having index.php in <https://www.myinstitution.edu/mygenocadinstance>.
3. Edit the php.ini file to set short\_open\_tag to “On”.
4. Create a Virtual Host for Zend. The exact technique may vary depending on the web server being used, but there is a good description of what needs to be done in this Zend article: <http://framework.zend.com/manual/en/learning.quickstart.create-project.html> ; the primary focus of this article is how to create a Zend project, but it includes a section on creating a virtual host. As an example on how to create a virtual host on an Apache server, the relevant portions of the public website’s httpd.conf are displayed below:

<VirtualHost \*:80>

<!--- Clipped out sections of this tag that didn’t need to change --🡪

<Directory "/srv/www/vhosts/www.genocad.org/htdocs/no-ssl/zend/public/">

DirectoryIndex index.php

AllowOverride All

Order allow,deny

Allow from all

</Directory>

</VirtualHost>

Alias /zend/ "/srv/www/vhosts/www.genocad.org/htdocs/no-ssl/zend/public/"

1. Create a lucene directory where the lucene index for the search may be stored. You will need to run a chmod 755 on this directory for the search to work.
2. Create a blast directory where the index for the BLAST search can be stored. You will need to run a chmod 755 on this directory for the BLAST search to work.
3. Create a mysql database instance for the local GenoCAD database.
4. Import genocad.sql to create a seed database. As an example, the command for importing this database would probably be something like this:

mysql -u <username> -p <name of genocad repository created in previous step> < genocad.sql

1. Modify the following files to set database connection settings to point to the database just created:

* scripts/create\_lucene\_index.php (in addition to setting the database variables $server, $username, $password, and $database, you will need to adjust the pathnames in the include commands to make sure they point to the right location, and you will need to set the $indexPath variable to the full path of the Lucene directory created in Step 5.)
* scripts/makeBlastDatabases.php (in addition to setting $server, $username, $password, and $database, it will also be necessary to set the $indexPath to the parent directory, $blastExec to the NCBI makeblastdb executable, and $blastIndex to the index directory created in Step 6.
* zend\application\configs\application.ini (set variables resources.db.params.host, resources.db.params.username, resources.db.params.password, and resources.db.params.dbname). You will also need to set the search.lucene\_index\_path to the full path of the Lucene directory created in Step 5.
* zend/public/mysql\_include.php to set $server, $user, $pwd, $mydb, and $root (which points to the zend public directory).

1. From the command line, run the create\_lucene\_index.php file. From the command prompt, this would look something like this:

**php create\_lucene\_index.php**

To keep the index up-to-date, it is a good idea to make this a cron job that runs daily.

1. From the command line, run the makeBlastDatabases.php script. From the command prompt, this would look something like this:

**php makeBlastDatabases.php**

To keep the index up-to-date, it is a good idea to make this a cronjob that runs daily.

1. In order for the compiler to work properly, you will also need to create a compilers directory under zend\public; the webuser will need permissions to read, write, and execute in this directory.
2. In order for BLAST to work properly, you will also need to create a blastResults directory under zend\public; the webuser will need permissions to read, write, and execute in this directory.
3. Restart the webserver.
4. To delete out-dated files in the compiler directory created above, it is recommended that you add the following line to your crontab: **find /path/to/compiler/directory/compiler -mtime 1 -exec rm -f {} \;** This will remove the files that are older than a day in the compiler directories.

# Upgrading GenoCAD

**Note: Before upgrading GenoCAD, it is STRONGLY recommended that you back up the files and database just in case you need to revert to your previous install.**

1. Download the latest files to a subdirectory by running one of the following commands:

**svn co https://genocad.svn.sourceforge.net/svnroot/genocad/trunk genocad**

for the trunk install, or

**svn co https://genocad.svn.sourceforge.net/svnroot/genocad/tags/{version} genocad**

if you are planning to deploy a specific tagged version.

1. Run the following command to remove the subversion directories:

**find genocad -type d -name '.svn' -exec rm -rf '{}' \;**

1. Run applicable scripts under the database\_scripts directory. If you are upgrading one tag to a nonconsecutive new tag, you may need to run more than one script. \*\*\*\* Need to come up with a standardized way to do this. (mandywil 12/1/11)
2. Update the following configuration files to point to the GenoCAD database:
   * Common.php (set variables "Database”, "Host", "Port", "User", and "Password" under the $CCConnectionSettings array.)
   * common\_genocad.php (set variables $server, $user, $pwd, and $db)
   * create\_lucene\_index.php (in addition to setting the database variables $server, $username, $password, and $database, you will need to adjust the pathnames in the include commands to make sure they point to the right location, and you will need to set the $indexPath variable to the full path of the Lucene directory.)
   * zend\application\configs\application.ini (set variables resources.db.params.host, resources.db.params.username, resources.db.params.password, and resources.db.params.dbname). You will also need to set the search.lucene\_index\_path to the full path of the Lucene directory.
3. Delete all the files from the current genocad webhome directory (to avoid keeping old files that may cause issues).
4. Copy the files below the new genocad directory you just created over to the webhome directory.
5. Restart the webserver.