GREENSTONE INSTALLATION

Several people have experienced difficulties installing Greenstone Digital Library (GSDL) 2.83 on both Windows and Mac operating systems. This document describes to steps necessary to get the software running on these machines. The first section describes basic concepts necessary to understand some of the workarounds on both platforms. The following sections outline steps required on the various platforms. Finally, the last few pages contain just the commands needed to make changes without any of the explanations.

CONCEPTS

OPERATING SYSTEM VERSIONS

Windows, Mac, and Linux all have different versions of their respective operating systems (OS).

The versions of Mac OS discussed here include 10.4.x (Tiger), 10.5.x (Leopard), and 10.6.x (Snow Leopard). These different versions all require some modification to the standard GSDL install.

Windows versions (XP, Vista, 7) may or may not require modification depending on installed software and 32-bit vs. 64-bit status, discussed below.

32-BIT VERSUS 64-BIT

Some, generally newer processors have the capability of manipulating 64 bits of information at one time, while 32-bit processors allow the manipulation of 32 bits of information[1]. This allows for faster processing, but programs must be written to take advantage of this increased capacity. Generally, 64-bit processors can run 32-bit applications or OSes. The reverse is not true, and various compatibility issues can crop up in unexpected places. In addition, a 32-bit operating system (OS) will limit applications to 32-bit even if the OS is installed on a 64-bit processor.

PATH

All computers utilize a system variable `PATH` which defines a list of directories which will be searched for programs. For example, Windows users can enter `notepad` in a run or command prompt, and the OS will automatically locate `C:\Windows\system32\notepad.exe` because `C:\Windows\system32` is in the system's `PATH`. Programs located in directories not listed in the `PATH` must be run with the complete path to the executable.

The current value of the `PATH` variable can be displayed in a command prompt on Windows by entering `echo %PATH%`. On Mac OS, the `PATH` can be displayed in a Terminal window using the

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[1] This is a gross generalization. Wikipedia provides more in-depth information on this topic at both http://en.wikipedia.org/wiki/64-bit and http://en.wikipedia.org/wiki/32-bit. More in-depth and technical information is available in numerous books and websites.

command `echo $PATH`. Refer to your OS documentation for details of accessing the command prompt or terminal program as appropriate.

TEXT EDITING

Configuration files mentioned in this document must be edited with a text editor, not a word processor. On Windows, Notepad is provided as part of the OS installation. Similarly, Mac users have TextEdit, although users must be sure to save the files as text, not rich text or HTML. Details on the operation of these or alternate programs are not given here.

SOFTWARE IN GSDL PACKAGE VERSUS SYSTEM SOFTWARE

Some users may already have some of the software GSDL uses installed on their computers. In some cases, users can choose to use either package with little or no difference in operation. In other cases, the user may find that one or the other does not work for a variety of reasons. The most common applications for local versus GSDL installation are GhostScript and ImageMagick.

WINDOWS OS

In general, 32-bit versions of Windows work without needing to modify anything. Modification is needed to run local versions of software, and is required on a 64-bit version of Windows.

LOCAL SOFTWARE

Two conditions must be met to use a locally installed software package.

1. Appropriate folder in *`<GSDL Install Directory>`*`\bin\windows` must be renamed. For example, if you want to use a local installation of ImageMagick, *`<GSDL Install Directory>`*`\bin\windows\imagemagick\` must be renamed to something else (e.g., *`<GSDL Install Directory>`*`\bin\windows\gsdl-imagemagick\`).
2. The ImageMagick programs must be in a directory listed in the `PATH` statement.

Refer to the Windows Help files for information on making permanent changes to the `PATH` variable. Temporary changes can be made by editing the *`<GSDL Install Directory>`*`\setup.bat` file. The variable `%PATH%` can be used to represent the system's `PATH` (although see below for special notes regarding 64-bit Windows). Create new lines near the top of the `setup.bat` file which read:
```
# Set Path to use system ImageMagick
set PATH=C:\directory\with\ImageMagick;%PATH%
```

Save the file, and restart the GLI.

64-BIT WINDOWS

By default, 32-bit Windows applications installed on a 64-bit Windows OS are stored in `C:\Program Files (x86)\`. Unfortunately, the parentheses characters are special, and cause problems with the scripts used to start the GLI. If a window flashes momentarily when trying to

start the GLI, this is likely the problem. **If the GLI starts without any problems, you do not need to complete this step.**

Modifying the PATH is the only way to get the GLI to start correctly, but users must modify the `<GSDL Install Directory>`\setup.bat file instead of making permanent changes to the OS PATH as many important utilities (e.g., CD/DVD burning software) are often found in the C:\Program Files (x86)\ directory. The steps are outlined below.

1. Determine the current PATH by saving it in a text file.
   a. Open a Command Prompt window.
   b. Execute the command
      `echo %PATH% > path.txt`
2. Edit the file by executing the command
   `notepad path.txt`
3. Remove any entry that includes the C:\Program Files (x86)\ directory. Below, a is the original path, while b is the edited one.
   a. (original) `C:\Windows\system32;C:\Windows;` `C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerSh` `ell\v1.0\;C:\Program Files\Intel\WiFi\bin\;C:\Program` `Files\Common Files\Intel\WirelessCommon\;C:\Program Files` `(x86)\Common Files\Lenovo;C:\Program Files (x86)\Common` `Files\Roxio Shared\10.0\DLLShared\;C:\Program Files` `(x86)\Common Files\Roxio Shared\DLLShared\;C:\Program Files` `(x86)\Lenovo\Access Connections\;C:\Program Files` `(x86)\QuickTime\QTSystem\`
   b. (modified) `C:\Windows\system32;C:\Windows;` `C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerSh` `ell\v1.0\;C:\Program Files\Intel\WiFi\bin\;C:\Program` `Files\Common Files\Intel\WirelessCommon\`
4. Copy the modified entry.
5. Enter a custom PATH in the `<GSDL Install Directory>`\setup.bat file.
   a. Open the file in Notepad.
   b. Create new lines immediately under the line GSDLLANG=en (usually around line 4) which read:
      `# Set path to get rid of trouble entries`
      `set PATH=<paste modified path here>`
   c. Example (no carriage returns - although text will wrap, the line beginning set PATH=... is one line):
      `# Set path to get rid of trouble entries`
      `set PATH=C:\Windows\system32;C:\Windows;`
      `C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerSh`
      `ell\v1.0\;C:\Program Files\Intel\WiFi\bin\;C:\Program`
      `Files\Common Files\Intel\WirelessCommon\`
6. Save the file. The GLI should now run correctly.

MAC OS X

INSTALLATION

Use the binary installation package available from http://www.greenstone.org/. During the process, the installation directory may be changed from the default. Installing into `/Applications/Greenstone/` is recommended. Because of problems associated with the uninstall script, GSDL should be installed into its own directory (e.g., `/Applications/Greenstone/`, **NOT** `/Applications/`).

RUNNING FROM COMMAND LINE

When first installed, GSDL does not include any icons to run the programs - They must be run from the command line. The steps are:

1. Open a Terminal window.
2. Navigate to the application directory chosen during the install process:
   `cd <GSDL Install Directory>`
3. Run the setup script. Note that it requires the dot, space, dot, slash, filename structure:
   `. ./setup.bash`
4. Run the GSDL Server process:
   `./gs2-server.sh`
5. Open a new Terminal window by pressing `<Command>-N`.
6. Navigate to the application directory as in Step 2.
7. Run the `setup.bash` file as in Step 3.
8. Change to the `gli` directory:
   `cd gli`
9. Run the GLI script:
   `./gli.sh`

CREATING SHORTCUTS FOR THE PROGRAMS

Running the programs from the command line is cumbersome. You can create icons to run them by using the Apple Script Editor (AppleScript Editor or Script Editor depending on your OS version).

1. Open the Script Editor.
2. Type the following in the program:
   `do shell script "<GSDL Install Directory>/gs2-server.sh"`
3. Save the file **as an application** with a meaningful name, such as GSDL-Server. Remember where you save it.
4. Change the line above to read:
   `do shell script "<GSDL Install Directory>/gli/gli.sh"`
5. Save the file as an application with a meaningful name, such as GSDL-GLI. Remember where you save it.
6. Quit the Script Editor.

These files can be run from where they were saved, or dragged into the dock.

SERVER INTERFACE

The configuration file in the standard Mac installation denies permission for files to be viewed. The fix is straightforward:

1. Run the GSDL server at least once. The configuration file that needs to be edited is created when the program is run the first time. Close the server.
2. Open the file *<GSDL Install Directory>*/llssite.cfg in a text editor.
3. Change the line
   externalaccess=0
   to
   externalaccess=1
4. Save the file.

A possible **untested** alternative to editing the text file is to start the server, then change the settings using the Settings available under the File menu. Select the Allow external connections option, then restart the server. **If you test this and it works, please inform the instructor so these instructions can be updated.**

32-BIT IMAGEMAGICK

The next issue with Mac concerns the 32-bit vs. 64-bit issues. Intel Macs can have either a 32-bit or 64-bit processor. The processor version can be determined by looking in the "About this Mac" box (in the Apple menu). If it says "Intel Core Solo" or "Intel Core Duo" it is 32-bit. Otherwise, it's 64-bit.[2] The OS version can be found in the same screen.

The version of ImageMagick included in the Greenstone installation is compiled for 64-bit operation. The ImageMagick website only includes binaries for 64-bit. If the Mac in question is running on a 32-bit processor, ImageMagick must be compiled for the specific system. ImageMagick requires a number of other packages to compile to correctly - up to 30 more packages! Instead of trying to manually download and compile each of those packages, users can take advantage of the MacPorts system, which will automatically download, compile, and install requested packages and any dependencies.

Please note that the following steps take a long time, and involve high levels of disk and network activity. Laptops should be plugged in rather than relying on battery power.

1. Install the XCode development environment, either by registering for a developer ID and downloading the package (~900MB) or by installing from the CDs or DVDs that came with your system.
2. Install the MacPorts software by downloading the appropriate installation package from http://www.macports.org/.
3. Open a terminal window, and execute the command:
   sudo port install ImageMagick

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[2] See http://support.apple.com/kb/HT3696 for the word details direct from Apple.

This will download and install numerous packages needed by ImageMagick. It takes a long time, and should not be interrupted. The computer can be used during this process.

4. Once the final package - ImageMagick itself - is downloaded, compiled, and installed, this step is done.

Using this newly downloaded and installed software within Greenstone requires three changes.

1. Rename the *<GSDL Install Directory>*/bin/darwin/imagemagick/ to something else (e.g., *<GSDL Install Directory>*/bin/darwin/gsdl-imagemagick/).
2. Explicitly set the path in the *<GSDL Install Directory>*/setup.bash file to include the ImageMagick binaries. MacPorts installs them in /opt/local/bin which is not in the default system path.
   a. Open the file in a text editor, and add lines at the top which say:
      ```
      # Set path to use local ImageMagick programs
      export PATH=/opt/local/bin:$PATH
      ```
   b. Save the file.
3. The utility used to process Microsoft Word documents requires one of the libraries in the ImageMagick installation. However, there is no easy way to force it to look in the current location, so the easiest solution is to copy the library /opt/local/lib/libpng.3.dylib into the /usr/local/lib/ folder. Open a Terminal window, and enter the following command. You will be required to enter your password to complete the command.
   ```
   a. sudo cp /opt/local/lib/libpng.3.dylib /usr/local/lib/
   ```

ALTERNATE SOLUTIONS FOR WVWARE / LIBPNG.3.DYLIB ISSUE

If you forget the third step above or it is ineffective, Office documents will fail to import, and the error log will include an entry similar to:

```
import.pl> dyld: Library not loaded: /usr/local/lib/libpng.3.dylib
```

Try the solution above. If that does not work, a variety of alternative solutions are presented below. Please note that only one of the solutions is necessary. Try one, then test.

- Download the library from http://www.cs.waikato.ac.nz/~kjdon/greenstone/libpng.3.dylib and save it into the *<GSDL Install Directory>*/bin/darwin/imagemagick/lib/ folder.
- Download the library from http://www.cs.waikato.ac.nz/~kjdon/greenstone/libpng.3.dylib and save it into the folder mentioned in the error message (/usr/local/lib/ in the example above).
- Locate the file on the local hard drive, and copy it to the *<GSDL Install Directory>*/bin/darwin/imagemagick/lib/ folder.
- Locate the file on the local hard drive and make a symbolic link in the *<GSDL Install Directory>*/bin/darwin/imagemagick/lib/ folder.

- Locate the file on the local hard drive and make a symbolic link in the folder mentioned in the error message (`/usr/local/lib/` in the example above).

PERL VERSION (SNOW LEOPARD)

GSDL uses the Perl language to do much of its work. The libraries provided with GSDL require version 5.8 of Perl. Snow Leopard uses version 5.10 by default. As a result, the GLI does not work. This can be fixed by modifying the `setup.bash` script.

1. Determine the version of Perl 5.8 that is installed on your computer.
   a. Using Terminal or Finder, determine the complete name for `/usr/bin/perl5.8.x`. This will likely either by `perl5.8.8` or `perl5.8.9`.
2. Open the `<GSDL Install Directory>`/setup.bash file.
3. Add lines near the top that read as below. Note that 5.8.9 is used as an example, but the number should match the number used in the filename in Step 1a.
   ```
   # Set the correct perl version for GSDL
   export VERSIONER_PERL_VERSION=5.8.9
   ```
4. Save the file. GSDL should work properly now.

WINDOWS CHEAT SHEET

LOCAL SOFTWARE

1. Rename *<GSDL Install Directory>*\bin\windows\imagemagick to something else.
2. Make sure the ImageMagick programs are in the PATH.
    a. If not in the system PATH, then edit the *<GSDL Install Directory>*\setup.bat file. The variable %PATH% can be used to represent the system's PATH (although see below for special notes regarding 64-bit Windows). Create new lines near the top of the setup.bat file which read:
       ```
       # Set Path to use system ImageMagick
       set PATH=C:\directory\with\ImageMagick;%PATH%
       ```

64-BIT WINDOWS

1. Determine the current PATH by saving it in a text file.
    a. Open a Command Prompt window.
    b. Execute the command
       ```
       echo %PATH% > path.txt
       ```
2. Edit the file by executing the command
   ```
   notepad path.txt
   ```
3. Remove any entry that includes the C:\Program Files (x86)\ directory.
4. Copy the modified entry.
5. Enter a custom PATH in the *<GSDL Install Directory>*\setup.bat file.
    a. Open the file in Notepad.
    b. Create new lines immediately under the line GSDLLANG=en (usually around line 4) which read:
       ```
       # Set path to get rid of trouble entries
       set PATH=<paste modified path here>
       ```
    c. **Example only - each computer will be different!** (no carriage returns - although text will wrap, the line beginning set PATH=… is one line):
       ```
       # Set path to get rid of trouble entries
       set PATH=C:\Windows\system32;C:\Windows;
       C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerSh
       ell\v1.0\;C:\Program Files\Intel\WiFi\bin\;C:\Program
       Files\Common Files\Intel\WirelessCommon\
       ```
6. Save the file. The GLI should now run correctly.

MAC CHEAT SHEET

RUNNING FROM THE COMMAND LINE

1. Open a Terminal window.
2. `cd <GSDL Install Directory>`
3. `. ./setup.bash`
4. `./gs2-server.sh`
5. Open a new Terminal window by pressing `<Command>-N`.
6. Navigate to the application directory as in Step 2.
7. Run the `setup.bash` file as in Step 3.
8. `cd gli`
9. `./gli.sh`

CREATING SHORTCUTS (ALL VERSIONS)

1. Open the Script Editor.
2. Type the following in the program:
   `do shell script "<GSDL Install Directory>/gs2-server.sh"`
3. Save the file **as an application** with a meaningful name, such as GSDL-Server. Remember where you save it.
4. Change the line above to read:
   `do shell script "<GSDL Install Directory>/gli/gli.sh"`
5. Save the file as an application with a meaningful name, such as GSDL-GLI. Remember where you save it.
6. Quit the Script Editor.

SERVER INTERFACE (ALL VERSIONS)

1. Run the GSDL server at least once. The configuration file that needs to be edited is created when the program is run the first time. Close the server.
2. Open the file `<GSDL Install Directory>/llssite.cfg` in a text editor.
3. Change the line
   `externalaccess=0`
   to
   `externalaccess=1`
4. Save the file.

IMAGEMAGICK (32-BIT VERSIONS)

1. Install the XCode development environment, either by registering for a developer ID and downloading the package (~900MB) or by installing from the CDs or DVDs that came with your system.
2. Install the MacPorts software by downloading the appropriate installation package from http://www.macports.org/.
3. Open a terminal window, and execute the command:
   `sudo port install ImageMagick`

4. Once the final package - ImageMagick itself - is downloaded, compiled, and installed, this step is done.

Using this newly downloaded and installed software within Greenstone requires two changes.

1. Rename the *<GSDL Install Directory>*/bin/darwin/imagemagick/ to something else (e.g., *<GSDL Install Directory>*/bin/darwin/gsdl-imagemagick/).
2. Explicitly set the path in the *<GSDL Install Directory>*/setup.bash file to include the ImageMagick binaries. MacPorts installs them in /opt/local/bin which is not in the default system path.
   a. Open the file in a text editor, and add lines at the top which say:
      ```
      # Set path to use local ImageMagick programs
      export PATH=/opt/local/bin:$PATH
      ```
   b. Save the file.
3. The utility used to process Microsoft Word documents requires one of the libraries in the ImageMagick installation. However, there is no easy way to force it to look in the current location, so the easiest solution is to copy the library /opt/local/lib/libpng.3.dylib into the /usr/local/lib/ folder. Open a Terminal window, and enter the following command. You will be required to enter your password to complete the command.
   a. ```
      sudo cp /opt/local/lib/libpng.3.dylib /usr/local/lib/
      ```

## PERL VERSION (SNOW LEOPARD)
1. Determine the version of Perl 5.8 that is installed on your computer.
   a. Using Terminal or Finder, determine the complete name for /usr/bin/perl5.8.*x*. This will likely either by perl5.8.8 or perl5.8.9.
2. Open the *<GSDL Install Directory>*/setup.bash file.
3. Add lines near the top that read as below. Note that 5.8.9 is used as an example, but the number should match the number used in the filename in Step 1a.
   ```
   # Set the correct perl version for GSDL
   export VERSIONER_PERL_VERSION=5.8.9
   ```
4. Save the file. GSDL should work properly now.