Adding-Fonts-and-Restricted-Shell-Escape

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Introduction

There are a couple of changes in TeX Live 2012+ (installed by MacTeX-2012+)—the + indicates 2012 and later—that may require modifications in the way you do things.

Shell-Escape vs Restricted-Shell-Escape

When TeX is called using the --shell-escape flag, it is given permission to call any external program during typesetting. This can be a security risk; for instance TeX could call the rm program and erase the contents of your home directory.

In 2010 TeX Live introduced a --restricted-shell-escape flag which only allows TeX to call a list of carefully monitored programs during typesetting. This flag is automatically activated by TeX Live 2012+. Moreover, in the 2012+ version there is a straightforward way to add programs to this restricted list.

For these reasons, the use of --shell-escape is now strongly discouraged. You should check your GUI editor and turn off the flag if it is currently set. New versions of TeXShop do not set the flag. In addition, old time users of the latexmk engines should either remove the ~/Library/ TeXShop/bin/latexmkrcedit file (it will get recreated the next time one of those engines is used) or edit the file and change the line

```
$TSUserCompileOptions = '--shell-escape';
```

to

```
$TSUserCompileOptions = '';
```

Unfortunately, not having --shell-escape means that a few packages that require external processing won't, in general, work any more; e.g., converting tiff to png for graphic inclusion or using the tikz-fct package fail because the former is usually set to use Apple's sips program to convert tiff to png while the tikz-fct package runs gnuplot to create the required graphs.

Before TeX Live 2012 the only reasonable way to enable those conversions, etc., to run was to activate --shell-escape.

However, in TeX Live 2012+ there is now a way to easily extend this list (actually you override the default list so you must include the original approved programs). While this does open the system up for misuse it certainly is safer than the wide-open window supported by --shell-escape. For details you can download Eps-Tiff-Conversion2024.pdf.zip from my download site, <https://herbs.github.io>.

Font Installation with TeX Live 2012+

In TeX Live there are two places to install fonts; the system-wide tree at /usr/local/texlive/texmf-local/ ... or the personal tree at ~/Library/texmf/....

Note: from 2017 on the you must use updmap-user to load map files stored in your personal tree. Previous to that you used the updmap command. I will use the notation needed for 2017+ in the rest of this document.

Most font collections installed into the TeX distribution are supplied with a file, called a map file, with information about when to use each individual font in the collection. For the TeX distribution to actually use this information the files for all the fonts are collected into a global map file used by the system. This is done using the updmap-sys program for system-wide fonts and updmap-user to *also* include fonts installed in your personal tree. Note: the personal map file also contains all the information about the system fonts since the system-wide map file will not be read if you also have a personal map file. I will call the active map file the global map file.

The updmap-user program writes its global map file in a directory in your home directory, so it does not need special permission to run. But the the updmap-sys program writes its global map file to a location owned by root, and thus must be run under sudo.

The 'sudo' command in OS X and several other operating systems allows you to 'act' like the root (i.e., super-user) but it *doesn't* change the $HOME variable to the root's HOME directory. Previously updmap-sys would therefore still "see" your personal texmf tree (at ~/Library/texmf when using a MacTeX installed TeX Live) and include fonts located there in the system-wide map file. Unfortunately this also opens up a possible security bug. Starting with TeX Live 2012 updmap-sys now will always use root's $HOME variable when run under 'sudo' so map files for fonts in your personal tree will no longer be found.

So, why not just use 'updmap-user' rather than 'updmap-sys'? The problem is that when you update your TeX distribution using TeX Live Utility (or tlmgr directly) 'updmap-sys' is run so the personal version of the system map file will not be updated. You need to run 'updmap-user' every time an update uses 'updmap-sys.' Note: TeX Live Utility 1.30 and later has a preference setting(Automatically enable fonts in my home directory) that will run the equivalent of updmap-user after an update has been installed; that automates the update of the personal map file to include any changes to the system's fonts.

The following sub-sections have information on setting up your system so that fonts can be easily updated.

Creating an **updmap.cfg** file

For either font installation you should create a special updmap.cfg file that tells 'updmap-sys/updmap-user' to include your individual map files. The updmap.cfg file basically contains lines that are similar to those you might use when running updmap-sys/updmap-user manually. See Figure 1 on page 3 for a sample of possible updmap.cfg file contents. Note: to disable a map put a #! with a space before the Map font.map; the line

```
#! Map belleek.map
```

will disable the belleek.map. **Note: make sure to end the file with at least one blank line**. The updmap.cfg file is put in /usr/local/texlive/texmf-local/web2c if you install fonts in /usr/local/ texlive/texmf-local/..., and then read by updmap-sys when needed. The updmap.cfg file should be put in ~/Library/texmf/web2c if you install fonts in ~/Library/texmf/... and then be read by

```
Map lucida.map
Map iffonts.map
#! Map belleek.map
Map mtpro2.map
```

Figure 1: Sample contents for an updmap.cfg file. Here the belleek.map file is deleted while other map files are added. **Note: make sure to end the file with at least one blank line**.

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updmap-user. If you already have an updmap.cfg file in its proper location you need only append any additional individual map files to install to that file.

Installing fonts System-Wide

To me the simplest solution is to install fonts in the texmf-local tree rather than your personal tree. Then make sure you run

```
sudo -H mktexlsr
```

in Terminal.

For font installation in the texmf-local tree you should place the updmap.cfg file created above into /usr/local/texlive/texmf-local/web2c.

The first time you set all this up, right after installing a new version of TeX Live via the MacTeX installer or after adding new fonts to your system, you need to run the commands

```
sudo -H mktexlsr
sudo -H updmap-sys
```

(and give your admin password) so that the TeX distribution rebuilds the system wide map file. I know I'd never remember this so I simply have a three line shell script that I make executable and place in /usr/local/texlive/texmf-local/scripts. The simple contents of my script are shown in Figure 2 on page 4.

Installing fonts in the Personal Tree

To automate the creation of a global map file that includes fonts in your personal tree (~/Library/texmf) you should create an updmap.cfg file as described in the sub-section above. An example file is shown in Figure 1 on page 3.

For font installation in your personal tree you should place the updmap.cfg file in ~/Library/texmf/web2c (creating that folder if needed).

You must then run the

```
updmap-user
```

command in Terminal. **Note: unlike the system-wide install, you should *not* use sudo with this command.** You should also run that command if you ever add fonts to your personal tree.

Unlike a system-wide install, you must manually update your map file using the

```
updmap-user
```

```
#!/bin/bash
sudo -H mktexlsr
sudo -H updmap-sys
```

Figure 2: Example of shell script to force rebuild of the system wide map file. Typically used once, after installing a new version of TeX Live or after installing additional fonts.

command, after each update made using TeX Live Utility or directly using tlmgr. Note: TeX Live Utility 1.30 and later has a preference setting (Automatically enable fonts in my home directory) that will run the equivalent of updmap-user after an update has been installed; that automates the update of the personal map file to include any changes to the system's fonts.

Appendix A — A Sample Font Installation

The Lucida Bright fonts, available through the TeX Users Group, form a very complete set of fonts that are easy to read and are distributed in a way that is relatively easy to install.

These may be installed in either the system-wide tree that has its root at /usr/local/texlive/texmf-local or your personal tree with its root at ~/Library/texmf; I will refer to either choice as ROOT — so ROOT/fonts/map would be /usr/local/texlive/texmf-local/fonts/map for a system-wide installation or ~/Library/texmf/fonts/map for a personal installation.

The lucida-complete folder that contains the fonts is divided into several folders which have sub-folders, etc., eventually coming to a set of files. You need only re-create the folder structure in your chosen ROOT folder; some of these folders may already exist and others you may have to create. E.g., the lucida.map file found in fonts/map/dvips folder in the lucida-complete folder is simply moved into ROOT/fonts/map/dvips. Continue until all the files are moved into place.

Then create an updmap.cfg file that contains the line

```
Map lucida.map
```

(with at least one blank line afterward) and place it into ROOT/web2c. Note: If you already have an updmap.cfg file you should append the line to that file. You must then run the commands given in the appropriate section above.

Note: installing some fonts may be a more intricate task.