

Changes in MacTeX-2020+ (TeX Live 2020+)

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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. NOTE: in 2014+ the convert program from Imagemagik is no longer installed by MacTeX because tex4ht, the only program supplied by TeX Live that used convert, no longer requires that program.

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. If you are a long time user of this program, you should turn it off by upgrading to TeXShop 2.47 or TeXShop 3.11 (or later), opening TeXShop Preferences, selecting the Engine tab, and pushing the two “Default” buttons on the middle left side. In addition, old time users of the latexmk engines should either remove the ~/Library/TeXShop/bin/latexmkrc 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`. There is an “Eps-Tiff-Conversion.pdf” document included with MacTeX-2012+ (see the `/Applications/TeX` folder) that describes how to do this. You may also download that document as `Eps-Tiff-Conversion2020.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 `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
```

```
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.**

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 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 T_EX Live via the MacT_EX 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 T_EX 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
```

```
#!/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 T_EX Live or after installing additional fonts.

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
```

command, after each update made using TeX Live Utility or directly using tlmgr. Note: T_EX 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 T_EX 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.