# Debian-specific information about T<sub>E</sub>X packages

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#### **Abstract**

This document covers Debian-specific information for *users* of the Debian teTEX packages (tetex-bin, tetex-base, tetex-extra, tetex-doc, tetex-doc-nonfree and tetex-src) and Debian TEX Live packages (all packages named texlive-something). Further information, especially for *developers*, can be found in the Debian TEX Policy draft in /usr/share/doc/tex-common/. Information for people upgrading from teTEX 2.0.2 in sarge is in the NEWS.Debian file.

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## Overview of the packages

The Debian teT<sub>E</sub>X packages are comprised of:

tetex-bin provides the binary files

- **tetex-base** provides the most basic T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X input files, and will be sufficient for some simple documents, e.g. to build the documentation of other Debian packages (hopefully)
- **tetex-extra** contains lots of fonts and add-on packages for LaTeX and TeX development. If you want to use LaTeX to write and format your own documents, you will probably need many of these.
- **tetex-doc** the free part (according to the Debian Free Software Guidelines) of the documentation for tetex-bin, tetex-base and tetex-extra. It is not needed to build existing documents, but as an author, you will for sure want to install it.
- **tetex-doc-nonfree** the non-free part (according to the Debian Free Software Guidelines) of the documentation for tetex-bin, tetex-base and tetex-extra
- tetex-src the sources (i.e., .dtx files) of all the TeX/IATeX files in tetex-base and tetex-extra, and of the documentation in tetex-doc. This package will only be needed by (La)TeX developers, or if you want to look up licensing information.

The Debian T<sub>E</sub>X Live packages are comprised of (currently) 76 packages in total. The most important are:

**texlive-base-bin** provides the basic binaries and basic T<sub>E</sub>X input files

- **texlive-latex-base** provides the most basic LAT<sub>E</sub>X input files, and will be sufficient for some simple documents
- **texlive-latex-recommended** a recommended set of LATEX packages which are sufficient for most typesetting purposes if you don't have any special requirements

- **texlive-fonts-recommended** a recommended set of fonts which are sufficient for most typesetting purposes if you don't have any special requirements
- texlive-context the complete ConTEXt environment
- **texlive** a meta-package depending on a decent selection of packages, comprising all of the above
- **texlive-full** a meta-package depending on all packages from the T<sub>E</sub>X Live group and on some other packages to create something similar to a full T<sub>E</sub>X Live installation
- **texlive-doc-\*** packages like texlive-doc-en and texlive-doc-de provide documentation in the respective language
- **texlive-lang-\*** packages like texlive-lang-dutch and texlive-lang-spanish provide language-specific support, like hyphenation patterns

There are many more packages, providing extra functionality and extra fonts. Please see the respective descriptions of these packages.

# Changing your configuration, file placement

#### 2.1 Available TEXMF trees for users and system administrators

The following *TEXMF* trees are available. They are displayed below in the order they are searched, where earlier ones override later ones.

TEXMFCONFIG Default location: \$HOME/.texmf-config/

Contains user-specific configuration

**TEXMFVAR** Default location: \$HOME/.texmf-var/

Contains user-specific generated files

TEXMFHOME Default location: \$HOME/texmf/

Contains user-specific static input files, e.g. new LATEX packages.

TEXMFSYSCONFIG Default location: /etc/texmf

Contains system-wide configuration

TEXMFSYSVAR Default location: /var/lib/texmf/

Contains system-wide generated files

TEXMFLOCAL Default location: /usr/local/share/texmf/

Contains system-wide input files

TEXMFMAIN Default location: /usr/share/texmf/

Contains system-wide, dpkg-managed input files (TEX add-on packages)

TEXMFDIST Default location: /usr/share/texmf-{tetex, texlive}

Contains system-wide, dpkg-managed input files (basic TEX packages)

If you want to add files, you should usually use <code>TEXMFLOCAL</code> or <code>TEXMFHOME</code>, depending on whether you are the system administrator or a user. If needed, a system administrator can add additional trees to the <code>TEXMF</code> variable in <code>/etc/texmf/texmf.d/05TEXMF.cnf</code> (earlier entries take precedence). <code>TEXMFCONFIG</code> and <code>TEXMFVAR</code> are used by the user-specific <code>texconfig</code>, <code>updmap</code>, and <code>fmtutil</code> commands. Note that <code>texconfig</code> creates a copy of configuration files from <code>TEXMFMAIN</code> (or <code>/etc/texmf</code>) at the time it is first invoked, and does not track later system-wide changes, and it does not know about <code>update-\*</code> programs (see below 'The files <code>texmf.cnf</code>, <code>fmtutil.cnf</code>, <code>updmap.cfg</code> and <code>language.dat</code>' on the facing page

#### 2.2 General hints

#### 2.2.1 System-wide versus user-specific configuration

TEX Live as well as, since version 3.0, teTEX, supports a complete user-specific configuration setup in the user's home directory. System administrators must use the commands texconfig-sys, fmtutil-sys and updmap-sys which act on the system-wide configuration files. Users can invoke their user counterparts texconfig, fmtutil and updmap. This will put copies of the system-wide configuration files into the user's TEXMFCONFIG directory (by default, \$HOME/.texmf-config), modify them and generate according formats, if applicable.

There is no such mechanism for texmf.cnf. For a way to customize texmf.cnf as a user, see 'Per user configuration changes' on page 7.

#### 2.2.2 Configuration file placement

On a TEX system, in principle every TEX input file can be used to *change the behavior of the system* and hence could be treated as a configuration file. To avoid an inflation of configuration files, those that are used to control the typeset output - the appearance of documents - are not installed as configuration files. It makes more sense to keep changed versions in the current directory for a certain project, or in *TEXMFHOME* or *TEXMFCONFIG* of a particular user. However, local admins can take any file they want from the *TEXMFDIST* (/usr/share/texmf-tetex) or *TEXMFMAIN* (/usr/share/texmf) trees and put changed copies into the respective directories below /etc/texmf (*TEXMFSYSCONFIG* which sorts before all other trees).

Since the package management system does not know whether a file is treated as a configuration file on a specific system, it is up to the site admin or local user to check whether one of their changed files has changed in *TEXMFMAIN* or *TEXMFDIST*.

#### 2.2.3 What is configured where?

The central system-wide configuration files texmf.cnf (which controls the basic operation and file search paths for the included programs), fmtutil.cnf (which specifies the available TEX formats), updmap.cfg (font configuration) and language.dat (hyphenation patterns for many formats) are handled through a Debian-specific mechanism that allows the basic TEX packages, add-on packages and local administrators to combine their changes (see 'The files texmf.cnf, fmtutil.cnf, updmap.cfg and language.dat' on this page below).

For some configuration changes, there is a program called texconfig-dialog (or simply texconfig for a commandline frontend); alternatively, you can of course make the necessary changes in configuration files by hand.

#### 2.3 Hyphenation

Hyphenation should pretty much work out of the box. In teTeX, there have been some changes in the past—see NEWS.Debian and changelog.Debian—but currently (nearly) all available patterns are enabled. If you want to use a reduced set of hyphenation patterns (which might gain you a trifle more speed), you can exclude them from the format file by changing the file specified in the third column of fmtutil.cnf—usually language.dat—and rebuild the formats with fmtutil or fmtutil-sys. Please note that in Debian, language.dat is a generated file (see 'The files texmf.cnf, fmtutil.cnf, updmap.cfg and language.dat' on the current page).

For users of the norwegian language and teTEX, there are several alternatives. For norwegian, there are different sets of patterns, and upstream chose nohyphb.tex. Details can be found in /usr/share/texmf/doc/generic/nohyph/README.nohyph—you can choose another one by editing language.dat or rather /etc/texmf/language.d/01tetex.cnf.

For users of the ukranian language (with teTEX and TEX live), the right pattern file depends on the output encoding (see /usr/share/texmf-{tetex,texlive}/tex/generic /ukrhyph/ukrhyph.tex); you can also choose different rule sets in the file.

There are currently no free hyphenation patterns for british english. Before enabling british/UKenglish, you need to get the non-free ukhyphen.tex - otherwise the format generation will fail. Don't forget to complain to the UK TUG about how annoying this is...

# 2.4 The files texmf.cnf, fmtutil.cnf, updmap.cfg and language.dat

In the following we describe ways to configure these files for the *system administrator*, i.e. one that has write access to the /etc/texmf hierarchy. In 'Per user configuration changes' on page 7 we describe a per-user configuration.

The files texmf.cnf, fmtutil.cnf, updmap.cfg and language.dat contain configuration options from teTeX and/or TeX Live, possibly from you, and from other TeX-related packages. They are generated by scripts and should not—in fact, except texmf.cnf may not—be edited directly. Rather, you should work with the source files in the respective directories below /etc/texmf/.

In order to make updates smooth, you should *avoid editing* system-wide files as far as possible, and instead *add new files* to change settings. For texmf.cnf snippets, this is particularly easy, since earlier entries override any later entries. Only for removing settings from fmtutil.cnf, updmap.cfg or language.dat is it necessary to edit existing files.

#### 2.4.1 texmf.cnf and update-texmf

The TeX binaries are built to look for texmf.cnf (the master config file for TeX and Meta-Font) in /usr/share/texmf/web2c/texmf.cnf (or \$HOME/.texmf-config/web2c/texmf.cnf if it exists). The system-wide file is a symbolic link to /etc/texmf/texmf.cnf. The Debian packaging includes a mechanism for constructing texmf.cnf from a collection of files under /etc/texmf/texmf.d/. To customize texmf.cnf while retaining the Debian-supplied configuration, create an appropriate file (or files) in /etc/texmf/texmf.d/, or change existing files, and then run update-texmf. This will generate the desired texmf.cnf for you.

You should not edit this file directly! While changes made by the local administrator will not be overwritten, they will cause you trouble once a package is updated and brings in a configuration change. You will be shown the differences between the edited and the newly generated file. We will try to merge our and your changes, but that might not always work, and you will probably have to edit again.

Therefore, if you want a smooth upgrade, please edit the files in /etc/texmf/texmf.d, or create an additional one, and invoke update-texmf. This will write your changes into /etc/texmf/texmf.cnf.

You should name your customization file something like 40 macros.cnf; the leading numerals will decide the order in which configuration fragments will be assembled by update-texmf, so it might be important to place your customizations in an appropriate place in the sequence — earlier definitions take precedence over later ones. In previous versions the extension .cnf was not necessary, and all files in the directory were used. If you had  $\text{teT}_EX$  installed in woody, you might still have private files which need the extension to be added.

# 2.4.2 fmtutil.cnf and update-fmtutil, updmap.cfg and update-updmap, language.dat and update-language

These files are also generated files, just as it has been explained above for texmf.cnf. The difference to texmf.cnf is that the system-wide files will be put into /var/lib/texmf/web2c, and any change made in these files will be unconditionally overwritten by update-fmtutil, update-language and update-updmap, respectively. Only the files in /etc/texmf

/updmap.d/, /etc/texmf/fmt.d/ and /etc/texmf/language.d/ will be treated as configuration files. Furthermore, the files fmtutil.cnf, updmap.cfg and language.dat are used on a first-found-first-used basis, if there are more than one in the search path, whereas if there are several texmf.cnf files in the search path, their settings are combined as described in 'Per user configuration changes' on the current page.

Just as for texmf.cnf, the right way to change settings is to edit or add files in /etc/texmf /updmap.d/, /etc/texmf/fmt.d/ or /etc/texmf/language.d/. The details have been described above (see 'texmf.cnf and update-texmf' on the facing page). Note, however, that the extension for updmap.cfg snippets in /etc/texmf/updmap.d/ is .cfg, not .cnf.

updmap-sys (8) provides options for enabling or disabling font map files. When enabling a new map file that is not mentioned, updmap-sys will first create or edit 10local.cfg in the /etc/texmf/updmap.d directory and then call update-updmap. Note that updmap-sys's --edit and --syncwithtrees options cannot be used on a Debian system.

#### 2.4.3 Per user configuration changes

update-texmf is only available for root; if a user wants to maintain their own texmf.cnf, they can put it into <code>TEXMFCONFIG/web2c</code> and must manually edit it. However, in order for it to be found, they need to set an environment variable <sup>1</sup>:

```
export TEXMFCNF=$HOME/.texmf-config/web2c:
```

The final colon includes the system wide default. Since all texmf.cnf files are read, with earlier definitions taking precedence over later ones, it is best to keep only a minimal set of definitions in the user-specific file.

In contrast to the above—TEX reading and merging all texmf.cnf files—the *first* found occurrence of one of the files updmap.cfg, language.dat, fmtutil.cnf are used. Thus, when called by a user, the other configuration update programs also work with files in <code>TEXMFCONFIG/updmap.d</code>, <code>TEXMFCONFIG/fmt.d</code> or <code>TEXMFCONFIG/language.d</code>, where <code>TEXMFCONFIG</code> is usually <code>HOME/.texmf-config</code>. They combine files in these directories with the files in the system-wide directories—naturally the user-specific ones take precedence if the names are equal (see 'User-specific installation' on page 13) —and drop the respective generated file into the user's <code>TEXMFVAR</code>, effectively overriding the system-wide config files. Note that changes to existing configuration file snippets made by package updates will not be propagated to the user's files.

updmap(1) provides the same options for enabling and disabling map files as updmap-sys(8), see above. 10local.cfg is created or edited in TEXMFCONFIG/updmap.d.

<sup>&</sup>lt;sup>1</sup>The reason for this is that the search path for texmf.cnf, which is the file that defines all search paths for later use, naturally cannot be specified in the file, but is fixed at compile time.

#### 2.5 Font caching

A TEX system needs to generate new font data (pixel data, metric, sources) on the fly. These files can be saved into the TEX font cache and later be reused. By default, a separate font cache is created for each user in their own TEXMFVAR directory (\$HOME/.texmf-var/). If this directory is not writable, e.g. during automated package building, a directory called VARTEXFONTS, /tmp/texfonts/, is used instead, but this directory is cleaned up regularly.

On multi-user machines, it might be advisable that the local administrator enables a site-wide font cache and sets VARTEXFONTS to a persistent directory, e.g. /var/cache/fonts. The variable is set in /etc/texmf/texmf.d/05TEXMF.cnf and can either be changed there or preferrably overwritten in a file that sorts before 05TEXMF.cnf, e.g. /etc/texmf/texmf.d/04VARTEXFONTS.cnf. Do not forget to run update-texmf after making the change. To enable a side-wide font caching the admin should edit /etc/texmf/web2c/mktex.cnf and use 'varfonts' instead of 'texmfvar' in MT\_FEATURES. Care should be taken to specifiy appropriate permissions for the directory containing the font cache. Either the local admin should create all available font data and not allow write access, or else write access should be limited to trusted users. Yet an other alternative is to bindmount /var/cache/fonts from a separate partition, so that users are not able to fill up the /var partition with font data.

# Usage hints, Debian-specific adaptations

#### 3.1 Note on dvips

Per default, dvips is in secure mode and won't execute shell commands in \special commands, like backticks in \DeclareGraphicsRule, etc. To enable this, change z1 to z0 in /etc/texmf/dvips/config.ps (second entry) (for teTeX) and in /etc/texmf/texlive /dvips/config.ps (for TeX Live).

#### 3.2 Note on dvipdfm

In Debian teTEX packages, dvipdfm uses the settings in /etc/papersize to determine the default papersize. This only takes effect if the paper geometry is not set explicitly in the (La)TEX source, e.g. using the packages geometry or hyperref.

The Debian TEX Live packages currently do not evaluate the settings of /etc/papersize, please set the paper geometry explicitly in the (La)TEX source, e.g. using the packages geometry or hyperref.

### 3.3 "TEX capacity exceeded" and similar errors

In most cases, this error is the symptom of a syntax error in the document—TEX is getting into an infinite loop, and after some time all its internal registers have been used. Sometimes, however, a large document that loads a package that uses a lot of TEX's registers leads to that error, or to a similar error message. The package documentation, the Google archive, or TEX-related mailing-lists or newsgroups will be helpful to find out which parameter needs to be changed in /etc/texmf/texmf.cnf (or rather in /etc/texmf/texmf.d/95NonPath.cnf, (see 'texmf.cnf and update-texmf' on page 6)).

# How to install additional or updated (La)TEX packages or fonts

If you want to install additional (La)TEX stuff, you have to:

- 1 install it at a place where T<sub>F</sub>X can find it;
- 2 register it properly.

This can generally be done site-wide (by an administrator who has write access to at least /usr/local/share/texmf and /etc/texmf), or on a per-user basis. This can be done by any user on the system, without requiring write access to system directories. Some people might also find it more convenient in case they share their home directory between a couple of machines, even if they do have administrator rights.

In the following, we first explain the principles by describing a site-wide setup; then we explain the details for user-specific setup.

#### 4.1 (La)T<sub>E</sub>X input files

This is usually quite easy. Put the files in an appropriate directory below *TEXMFLOCAL*, which is the directory tree rooted at /usr/local/share/texmf.

For LATEX packages, create the directory tex/latex/packagename within that tree (or use tex/latex/misc) and put the files there; the documentation should be put into doc/latex/packagename. If the package comes as a pair of .dtx and .ins files, you need to run latex over the .ins file in order to produce the package files, and over the .dtx file to produce the documentation. After that, the .dtx and .ins files are no longer needed. Please refer to the README file of the package if there is one.

After that, registering is easy: just run the command mktexlsr (also called texhash). This will regenerate the ls-R file for all TEXMF trees you have write access to.

#### 4.2 Complex installations

With some packages, e.g. when they contain fonts, the procedure is more complicated. Please follow the instructions given in the package. The Debian-specific part comes in when the configuration files texmf.cnf, fmtutil.cnf, updmap.cfg, or language.dat need to be changed. See the description above ('The files texmf.cnf, fmtutil.cnf, updmap.cfg and language.dat' on page 5), the manual pages for update-updmap, update-texmf, update-fmtutil, update-language and 'Font installation' on this page.

#### 4.3 Font installation

If you wish to install a font package in a system-wide manner, please follow the instructions in this section. If you are preparing a Debian package containing fonts, you should refer to the Debian TeX policy instead, which is shipped in the tex-common package.

Generally, you should first have a look at the installation instructions that come with the font package, in case there is something specific to that package with respect to installation. But you should make sure that you install most files in a subdirectory of *TEXMFLOCAL* (see 'Available *TEXMF* trees for users and system administrators' on page 3). This is because we are describing here a system-wide installation that is not done by Debian packages.

For instance, AFM files should be stored into <code>TEXMFLOCAL/fonts/afm/supplier</code> /typeface/ where supplier identifies the supplier of the fonts (for instance, adobe, urw or public) and typeface refers to the name of the font family (e.g., marvosym or lm). If in doubt, you should have a look at the system trees managed by Debian packages, /usr/share/texmf,/usr/share/texmf-tetex and /usr/share/texmf-texlive; they follow the same layout, called the <code>TeX</code> Directory Structure (which is documented at <a href="http://www.tug.org/tds/">http://www.tug.org/tds/</a>).

In order for the various TEX-related programs to be able to use a font, you need to somehow register its map files (simply copying the files to TEXMFLOCAL is not enough). You can do this with the following steps, performed as root, where *foo* stands for the name of the font package you are installing:

1 Make sure you have stored all the relevant files shipped in the package (.afm, .tfm, .pfb, .pfa, .mf, .fd, .enc, .map, .sty are all relevant in this context) in the appropriate subdirectories of TEXMFLOCAL, as explained above.

Note: in teT<sub>E</sub>X 3 and current T<sub>E</sub>X Live (as opposed to teT<sub>E</sub>X 2):

- .map files should go to TEXMFLOCAL/fonts/map/syntax/foo/
- .enc files should go to TEXMFLOCAL/fonts/enc/syntax/foo/

where *syntax* indicates the syntax followed by the files (it is often dvips). Please refer to the teTEX Manual for details. You can read this manual with the command

2 Create a configuration file /etc/texmf/updmap.d/10local-foo.cfg (the extension .cfg is important! You can also use one 10local.cfg for all your locally installed fonts). The file should list the map files you stored in step 1 under TEXMFLOCAL, with one line per file, as in:

```
# This is a comment line
Map foo.map
Map other-map-file-from-package-foo.map
```

If a font is available both as bitmap and outline, you should use MixedMap instead of Map. Please refer to the manual pages for update-updmap and updmap-sys for details.

You can also use updmap-sys --enable Map foo.map; this will create the 10local.cfg file for you.

3 Run the program update-updmap. This will generate an appropriate updmap.cfg file under /var/lib/texmf/web2c/ (not /etc/texmf/!), containing the Map and/or MixedMap lines taken from 10local-foo.cfg.

Note: modifying updmap.cfg directly is not supported in Debian, because Debian font packages need to update it when they are installed or removed. This is why updmap.cfg is not stored under /etc and why you have to use update-updmap whenever you want to modify it.

- 4 Run the program mktexlsr (or texhash, which is the same). This will record all the newly created files in ls-R files (these are used by TEX-related programs as indices to find the files they need when operating).
- 5 Run the program updmap-sys. This will use your updated updmap.cfg to generate files that are needed by dvips, pdflatex, dvipdfm, etc., such as psfonts.map and pdftex.map.

At this point, the font package should be properly installed for all users on the system.

#### 4.4 User-specific installation

Instead of a system-wide installation, one can also install input files and fonts in the private *TEXMFHOME*, which is set to \$HOME/texmf by default. For fonts, compared to the system-wide installation explained above, the following changes have to be made:

- In step 1, copy all relevant files to the appropriate subdirectories in *TEXMFHOME*.
- The configuration file created in step 2 should be placed in *TEXMFCONFIG* (\$HOME /.texmf-config by default). An appropriate place would be *TEXMFCONFIG* /updmap.d/. Note that most likely you will have to create this directory first.

As for the site-wide installation, you can also use updmap --enable Map foo.map.

• After updating the ls-R files with mktexlsr or texhash (step 4), one has to generate the map files in step 5. This is done by running the program updmap instead of updmap-sys. The generated files are created in directories below *TEXMFVAR*.

Note that update-updmap merges the configuration files in \$HOME/.texmf-config/web2c/updmap.d and in /etc/texmf/updmap.d. Therefore, all system-wide installed fonts are accessible without duplicating their configuration files. Merging the configuration files is done on the basis of file names: If a file exists in both directories, the version in TEXM-FCONFIG takes precedence. Thus, you can also use this mechanism to change settings compared to the site-wide configuration, e.g. by keeping a changed copy of <code>OOupdmap.cfg</code> in <code>TEXMFCONFIG/updmap.d/</code>.

Keep in mind that you still have to call update-updmap whenever the system-wide installation changes. If you keep a changed copy of a file from the site-wide directories, you need to manually merge any changes to this file, if desired.

## Problems, bug reports

If the installation failed, please check the following points:

- Is there enough room on your hard disk?
- Is there any privately-compiled TEX system besides the Debian packages?
- Does the command:

```
kpsewhich --format=cnf texmf
return /usr/share/texmf/web2c/texmf.cnf?
```

- Is texmf.cnf modified a lot? Please check /etc/texmf/texmf.d/.
- Did you set any TEX-related environment variable?
- Try again. This might work in some cases.
- For amstex, metapost, eurosym, texdoctk, txfonts, pxfonts, etc., you need tetex-extra at present. (pdftex/pdflatex should work basically only with tetex-base now.)
- Is your language.dat correct?

#### How to report a bug:

- Please calm down anyway. ;)
- Please check the Debian Bug Tracking System first.
- Please read carefully the error messages, if any. It will help both you and us.
- Please use reportbug and include all information it gathers
- Please attach a simple and short sample file which causes the problem you want to report.
- Be prepared that we will have to ask more questions: You should have time to exchange a couple of e-mails with us
- It will be helpful to show us the output of the command:

```
ls /etc/texmf/texmf.d/*
```

• If you see something like:

```
Unpacking replacement tetex-base ...

dpkg: error processing /var/cache/../tetex-base_*_all.deb (--unpack): t
then the problem should be of package foo, not of tetex-base.
```

• Note that teTeX is not further developed upstream, and new features will only be integrated in TeX Live. The Debian maintainers will not include anything in the TeX Live packages that is not already in TeX Live upstream.