

# 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 T<sub>E</sub>X Live packages (all packages named `texlive-something`). Further information, especially for *developers*, can be found in the Debian T<sub>E</sub>X Policy draft in `/usr/share/doc/tex-common/`. Information for people upgrading from teT<sub>E</sub>X 2.0.2 in sarge is in the `NEWS.Debian` file.

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# Chapter 1

## Overview of the packages

The Debian T<sub>E</sub>X Live packages are comprised of (currently) 80 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 L<sup>A</sup>T<sub>E</sub>X input files, and will be sufficient for some simple documents

**texlive-latex-recommended** a recommended set of L<sup>A</sup>T<sub>E</sub>X 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** 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.



## Chapter 2

# 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  $\text{\LaTeX}$  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 ( $\text{\TeX}$  add-on packages)

***TEXMFDIST*** Default location: `/usr/share/texmf-texlive`

Contains system-wide, `dpkg`-managed input files (basic  $\text{\TeX}$  packages)

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

## 2.2 General hints

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

TeX Live 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-texlive`) 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



T<sub>E</sub>X formats), `updmap.cfg` (font configuration) and `language.dat` (hyphenation patterns for many formats) are handled through a Debian-specific mechanism that allows the basic T<sub>E</sub>X 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. 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 ukrainian language, the right pattern file depends on the output encoding (see `/usr/share/texmf-texlive/tex/generic/ukrhyph/ukrhyph.tex`); you can also choose different rule sets in the file.

## 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 T<sub>E</sub>X Live, possibly from you, and from other T<sub>E</sub>X-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 T<sub>E</sub>X binaries are built to look for `texmf.cnf` (the master config file for T<sub>E</sub>X 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 `40macros.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 `teTeX` 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 next 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 preceding 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 `l0local.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 A special case in `update-fmtutil`: Formats which are based on other formats

The JadeTeX and xmlTeX formats are built on top of L<sup>A</sup>T<sub>E</sub>X and therefore require special treatment. This is done automatically for the Debian packages for these formats. However, local administrators who similarly base their custom formats on L<sup>A</sup>T<sub>E</sub>X (or any other format) might need to take special care, in particular when dist-upgrading.

JadeTeX is based on L<sup>A</sup>T<sub>E</sub>X such that during format generation, the L<sup>A</sup>T<sub>E</sub>X format dump is preloaded with this line in `fmtutil.cnf`:

```
jadetex etex language.dat &latex jadetex.ini
```

This is problematic if the package which provides L<sup>A</sup>T<sub>E</sub>X (currently `texlive-latex-base`) is upgraded at the same time as the package which provides the executables (currently `texlive-base-bin`). In this `dpkg` run, `texlive-base-bin` will be configured while `texlive-latex-base` is unpacked but unconfigured and might have a `10texlive-latex-base.cnf.dpkg-new` file in `/etc/texmf/fmt.d`. `texlive-base-bin` will call `update-fmtutil` just before it executes `fmtutil --all`, and because of the `dpkg-new` file information for L<sup>A</sup>T<sub>E</sub>X will not be included. If JadeTeX would still be included, its format generation would consequently fail.

`update-fmtutil` knows about this problem and will ignore JadeTeX and xmlTeX if L<sup>A</sup>T<sub>E</sub>X is not available. It does not know which other (locally defined) formats are also based on L<sup>A</sup>T<sub>E</sub>X, though. To prevent failures (and actually a possible fork bomb, see Debian Bug #427562), local administrators should manually disable such formats before upgrading T<sub>E</sub>X Live packages.

### 2.4.4 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 `TEXMFCONFIG/web2c` 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—T<sub>E</sub>X reading and merging all `texmf.cnf` files—the *first* found occurrence of one of the files `updmap.cfg`, `language.dat`, `fmtutil.cnf` is used. Thus, when called by a user, the other configuration update programs also work with files in `TEXMFCONFIG/updmap.d`, `TEXMFCONFIG/fmt.d` or `TEXMFCONFIG/language.d`, where

<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.

*TEXMFCONFIG* is usually *HOME/.texmf-config*. 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 *TEXMFVAR*, 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*.

## 2.5 Font caching

A  $\text{\TeX}$  system needs to generate new font data (pixel data, metric, sources) on the fly. These files can be saved into the  $\text{\TeX}$  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 *VARTEX-FONTS*, */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 preferably 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 site-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 specify 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 another alternative is to bind-mount */var/cache/fonts* from a separate partition, so that users are not able to fill up the */var* partition with font data.

## Chapter 3

# 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).

### 3.2 Note on dvipdfm

The Debian  $\text{\TeX}$  Live packages currently do not evaluate the settings of `/etc/papersize`, please set the paper geometry explicitly in the (La) $\text{\TeX}$  source, e.g. using the packages `geometry` or `hyperref`.

### 3.3 “ $\text{\TeX}$ capacity exceeded” and similar errors

In most cases, this error is the symptom of a syntax error in the document— $\text{\TeX}$  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  $\text{\TeX}$ 's registers leads to that error, or to a similar error message. The package documentation, the Google archive, or  $\text{\TeX}$ -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 5)).



## Chapter 4

# How to install additional or updated (La)T<sub>E</sub>X packages or fonts

If you want to install additional (La)T<sub>E</sub>X stuff, you have to:

- 1 install it at a place where T<sub>E</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 L<sup>A</sup>T<sub>E</sub>X packages, create the directory `tex/latex/package_name` within that tree (or use `tex/latex/misc`) and put the files there; the documentation should be put into `doc/latex/package_name`. 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 `TEXMFLOCAL/fonts/afm/supplier/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-texlive` and `/usr/share/texmf-texlive`; they follow the same layout, called the TeX Directory Structure (which is documented at <http://www.tug.org/tds/>).

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 `teTeX 3` and current `TeX Live` (as opposed to `teTeX 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

```
texdoc TETEXDOC
```



- 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 *TEXMFCONFIG* 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 `00updmap.cfg` in *TEXMFCONFIG/updmap.d/*.

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.

## Chapter 5

# 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 T<sub>E</sub>X 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 T<sub>E</sub>X-related environment variable?
- Try again. This might work in some cases.
- 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`.

- The Debian maintainers will not include anything in the T<sub>E</sub>X Live packages that is not already in T<sub>E</sub>X Live upstream.