

TeX (Live) on Debian

Norbert Preining

Vienna University of Technology

Wiedner Hauptstraße 10

1040 Wien, Austria

preining (at) logic dot at

Abstract

TeX Live is a widely used TeX distribution incorporating most of the free (in the Debian sense) packages from CTAN, and binaries for many different architecture–operating system combinations.

Debian GNU/Linux is a popular operating system distribution based on the Linux kernel, containing only free [4] programs. Like most distributions of the Linux flavor, Debian has a strong package managing facility. Debian Etch was released in April 2007 with teTeX (version 3.0) and TeX Live (version 2005) packages. Future releases of Debian will contain only TeX Live packages due to the end of further development of teTeX.

This article describes the usage of TeX on Debian, from both a system administrator’s and a user’s point of view.

Thanks to Thomas Esser

To begin with, I want to take this opportunity to thank Thomas Esser for his incredible work on all TeX related things. His work has been the foundation of TeX Live and he himself continues to help and develop within the TeX Live distribution.

We all are very grateful to Thomas and wish him all the best with his future plans!

1 Rationale of Debian specific changes

As a big GNU/Linux distribution, Debian obliges package maintainers to prepare their packages in a standard way, requiring that (among other things):

- configuration files must be placed into the `/etc/texmf` hierarchy, and
- changes to configuration files are preserved during upgrade, but also preserved during a remove and reinstallation process.

(See the Debian policy document [5] for more details.) Most of the changes introduced in the Debian packages of TeX Live are due to the above two requirements. Other changes are due to the fact that many things (e.g., fonts, L^AT_EX-packages, programs) are already packaged for Debian and should be reused as far as possible.

The Debian TeX Task Force [3] has prepared a detailed document *Debian TeX policy* [2] and the more user oriented document *TeX on Debian* [1].

Finally, we want to stress that there is a certain overlap of Debian developers and TeX Live upstream maintainers, and the cooperation and bug forwarding/fixing has been mutually helpful.

2 Changing the configuration and 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/`
User-specific configuration files.

TEXMFVAR

Default location: `$HOME/.texmf-var/`
User-specific generated files.

TEXMFHOME

Default location: `$HOME/texmf/`
User-specific static input files, e.g., new L^AT_EX packages.

TEXMFSYSCONFIG

Default location: `/etc/texmf`
System-wide configuration files.

TEXMFSYSVAR

Default location: `/var/lib/texmf/`
System-wide generated files.

TEXMFLOCAL

Default location: `/usr/local/share/texmf/`
System-wide input files.

TEXMFMAIN

Default location: `/usr/share/texmf/`
System-wide, `dpkg`-managed input files (TeX add-on packages).

TEXMFDIST

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

System-wide, `dpkg`-managed input files (basic T_EX packages).

2.2 Configuration files

In the Debian Etch release, some configuration files are *not* shared between t_EX and T_EX Live packages. The latter are in `/etc/texmf/texlive`, while the former are directly under `/etc/texmf`.

In the next release, with T_EX Live 2007 in Debian and t_EX gone, all configuration files will be placed in `/etc/texmf`.

In any case, the `/etc/texmf` tree is by default the `TEXMFSYSCONFIG` tree, so any file placed in the proper location will override the respective file in `TEXMFMAIN`. This allows full control over the installation, but should be used with care only, as upgrades of the T_EX system will *not* attempt to merge changes in the shipped files into the replacement files you might put into `TEXMFSYSCONFIG`.

In addition to these files the packages ship some configuration files in `TEXMFSYSCONFIG`, and changes to these files will be preserved, and at upgrade time the system administrator informed about changes.

We will not list all the configuration files for t_EX, T_EX Live 2005, and T_EX Live 2007, but instead pick the three most common situations occurring at normal usage: adapting the search paths and other `texmf.cnf` settings, upgrade or installation of a macro package (e.g., L^AT_EX style file), and installation and activation of a new font (family). We will only slightly touch the installation of new hyphenation patterns and formats.

3 Changing texmf.cnf

The central configuration file `/etc/texmf/texmf.cnf` is special, as it defines all search paths for (almost) all programs in the T_EX world. All the paths mentioned above are defined in it, but other behaviour (such as various size and security settings) is also controlled via this file.

Since many different packages can contribute to the final `texmf.cnf`, we adopted a method often used in Debian: We install separate parts of the configuration file into a special directory `/etc/texmf/texmf.d` and generate the final file from these snippets. Therefore, if a system administrator wants to change some setting, he should change the respective file in `/etc/texmf/texmf.d` and call `update-texmf`.

Take as an example the setting of `TEXMFHOME`: In `/etc/texmf/texmf.d/05TeXMF.cnf` one can find `TEXMFHOME = $HOME/texmf`. However, in my own institution's installation we had the input files always in `$HOME/texlib`, which I wanted to preserve.

So I change the given line in `/etc/texmf/texmf.d/05TeXMF.cnf` and call (as root) `update-texmf`.

The problem with this approach is that upon upgrade, either I have to reject changes of the file `05TeXMF.cnf`, or I have to change the settings after every change of `05TeXMF.cnf` in the Debian package. Here a bit of KPSE magic helps: As earlier settings in `texmf.cnf` override later ones, I can add a file `03local.cnf` to `/etc/texmf/texmf.d` and put the changed `TEXMFHOME` variable there.

Similar changes can be made for all the other settings in `texmf.cnf`.

If you really must change *as a user* some setting in `texmf.cnf`, you have to create your own `texmf.cnf` and override the `TEXMFCNF` variable.

4 Update/installation of a macro package, style file, etc.

This is a quite common task, as many packages are evolving very fast and sometimes newer versions are necessary. Let us go through the necessary steps for the `natbib` package. This procedure is the same for the T_EX systems on Debian and a 'default' T_EX Live installation.

4.1 Package update — system administrator

First you have to get all the files from your local CTAN node:

```
CTAN:/macros/latex/contrib/natbib
```

and put them into a temporary directory. After this you run L^AT_EX over all the `.ins` files to generate the input files, and over all the `.dtx` files to generate the documentation. You will end up with quite a number of files; put the `.sty` files into `$TEXMFLOCAL/tex/latex/natbib`, `.bst` files into `$TEXMFLOCAL/bibtex/bst/natbib`, and if you wish the various `.dvi` files (and any other documentation files) into `$TEXMFLOCAL/doc/latex/natbib`.

After this, run `mktexlsr` and the next time any user of your system uses `natbib` the updated version will be used.

4.2 Package update — user

If you want to update `natbib` for yourself, and/or you don't have permission to change the `TEXMFLOCAL` directory, just replace it with `TEXMFHOME` and continue as above. As a normal user, calling `mktexlsr` is neither necessary nor desirable.

5 Installation and activation of a font package

Installation and activation of a font package is a bit more involved than just updating/installing a macro

package. We will go through this using the MathTimePro2 font set (available from Personal T_EX, Inc.).

5.1 Font update — system administrator

You should have received a zip file `mtp2fonts.zip`, which you should unzip into a temporary directory. MathTime is already shipped as a TEXMF-tree, so just copy all the files under `texmf` to the same location in `TEXMFLOCAL`, e.g.,

```
cp -ar texmf/* /usr/local/share/texmf
```

If you have some package `foo` that is not shipped as a TEXMF-tree, you have to install all the files you have obtained into the right places in `TEXMFLOCAL`, such as

```
.sty, .tex, .fd into $TEXMFLOCAL/tex/latex/foo
.map into $TEXMFLOCAL/fonts/map/dvips/foo
.tfm into $TEXMFLOCAL/fonts/tfm/comp/foo
.pfb into $TEXMFLOCAL/fonts/type1/comp/foo
.vf into $TEXMFLOCAL/fonts/vf/comp/foo
```

(Of course, some of these files may not be present.) After running `mktexlsr` again these fonts are now available to `tex`, but `dvips`, `pdftex`, `xdvi`, et al., will not yet recognize these fonts and will not display the fonts correctly.

For this you have to activate the respective `map` file which was (hopefully) shipped with the package. In our case there is the file `mtp2.map` which we want to activate by default.

Here the Debian specific parts begin (but see below). The best way to do this is by:

1. adding a file `90local-mtp2.cfg` into the directory `/etc/texmf/updmap.d`,
2. calling (as root) `update-updmap`, which generates the final `updmap.cfg` file from the snippets in `/etc/texmf/updmap.d`, and finally (as usual)
3. call `updmap-sys` to update the various configuration files for `dvips`, `xdvi`, etc.

Alternatively, you could put *all* your local adaptations into a file `90local.cfg`, if you prefer to keep them all together.

The above process describes the (native) Debian way to activate font maps. Due to the widespread recommendations on the web and user groups to activate a map file using a call like

```
updmap-sys --enable Map mtp2.map
```

the version of `updmap(-sys)` in Debian has been adapted to *not* change the file `updmap.cfg` directly, but instead to enable and disable maps in `/etc/texmf/updmap.d/99local.cfg`. After this `update-updmap` is called, and then again `updmap-sys` for final operation.

Thus, changes made by `updmap-sys --enable` are not overwritten by a subsequent `update-updmap`.

Some reasons why Debian introduced the additional program `update-updmap` are:

- it does the job of the T_EX Live installer, which reads the information from the `tpm` files and activates the respective maps;
- several Debian packages can ship fonts and map files (e.g., `lmodern` or `cm-super`), and it must be possible for all of these parts to be activated and deactivated independently;
- the format of `updmap.cfg` cannot carry the necessary information on installation status and local changes (installed, removed, purged).

5.2 Font update — user

If a normal user without administrator rights wants to install and activate a new font set, he first has to install the fonts as described above, but instead of `TEXMFLOCAL`, he puts the files under `TEXMFHOME`.

When `update-updmap` is called by a normal user (`uid ≠ 0`) then it acts a bit differently: It merges all snippets present in `/etc/texmf/updmap.d/` and `~/.texmf-config/updmap.d/`, but if there are snippets with the same name, the one on the user directory shadows the system wide one.

Example Assume that a user has his own Sanskrit fonts, which provide fonts named `skt10`, etc., but the system file `10latex-sanskrit.cfg` already activates `skt.map`, which contains different definitions for these fonts. The following assumes the default for `TEXMFCONFIG`, namely `~/.texmf-config`.

To override the system-wide setting he would create a file with the same name, `10latex-sanskrit.cfg`, in `~/.texmf-config/update.d/` and call (as a user) `update-updmap`.

Thus, the files present on the system are as follows. In `/etc/texmf/updmap.d/`:

- `10texlive-base.cfg`
- `10texlive-latex-base.cfg`
- `10latex-sanskrit.cfg`

and in `~/.texmf-config/updmap.d/`:

- `10latex-sanskrit.cfg`.

With these settings the following files are used for *system-wide* `updmap.cfg` generation:

- `/etc/texmf/updmap.d/10texlive-base.cfg`
- `/etc/texmf/updmap.d/10texlive-latex-base.cfg`
- `/etc/texmf/updmap.d/10latex-sanskrit.cfg`

In contrast, the following files are used for *user-specific* `updmap.cfg` generation (the first two are the same):

- `/etc/texmf/updmap.d/10texlive-base.cfg`
- `/etc/texmf/updmap.d/10texlive-latex-base.cfg`
- `~/.texmf-config/updmap.d/10latex-sanskrit.cfg`

Finally the user must call `update-updmap`. This call will generate his own copy of `updmap.cfg` in `~/.texmf-var/web2c`. After this he can call `updmap` to generate the necessary configuration files for `dvips`, `xdvi`, etc., in `~/.texmf-var`.

Note that changes in `/etc/texmf` are *not* automatically carried over to the user files. So in case something is going wrong the user should again call `update-updmap` and `updmap`.

6 Hyphenation patterns and formats

To install new hyphenation patterns and new formats you can follow the above example concerning fonts, with `update-language` and `update-fmtutil` taking the place of `update-updmap`, the path components `language.d` and `fmt.d` the place of `updmap.d`, and `fmtutil(-sys)` the place of `updmap(-sys)`.

7 Backports for Debian Etch

The Debian T_EX Task Force is also trying to provide backports of all the necessary packages for Debian Etch (stable). Currently we are able to provide binaries for the i386, AMD-64, and PowerPC architectures. All that is necessary is to put the following three lines (sorry for the editorial line breaks necessary here) into the `/etc/apt/sources.list` file:

```
deb http://people.debian.org/ preining/TeX/t12007/
deb http://people.debian.org/ preining/TeX/context/
deb http://people.debian.org/ preining/TeX/lmodern/
```

All packages shipped on these pages are signed with my Debian GPG key available in the Debian keyring or various key servers.

8 Further developments

Things are evolving very fast at the moment. While Debian Etch ships with T_EX Live 2005, the 2007 release of T_EX Live is already present in Debian Sid and testing ('lenny'), bringing X_YT_EX to the Debian world.

At the same time we provide independent packaging of ConT_EXt and LuaT_EX to make Debian the ideal play ground for further developments.

People interested in cooperation are invited to contact our mailing list [3], take a look at the Subversion repository [6] where all the packaging scripts are available, not only for T_EX Live, but also Latin Modern, ConT_EXt, LuaT_EX, cm-super, etc., or contact me directly.

References

- [1] T_EX on Debian. <http://people.debian.org/~preining/TeX/TeX-on-Debian/>.
- [2] Debian T_EX policy. <http://people.debian.org/~frank/Debian-TeX-Policy/>.
- [3] Debian T_EX Task Force mailing list. <http://lists.debian.org/mailman/listinfo/debian-tex-maint>.
- [4] Debian Free Software Guidelines contained in the Debian Social Contract. http://www.debian.org/social_contract.
- [5] Debian Policy. <http://www.debian.org/doc/debian-policy/>.
- [6] Subversion repository of the Debian T_EX Task Force. <http://svn.debian.org/wsvn/debian-tex>.