

Distributing T_EX and friends

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Overview

- ▶ introduction to T_EX Live
- ▶ important configuration files
- ▶ infrastructure and package hierarchy
- ▶ packaging paradigm
- ▶ distribution breakdown
- ▶ possible problems and warnings
- ▶ recommendations

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What is T_EX

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What is T_EX

```
\long\def\@xargdef#1[#2][#3]#4{%  
  \@ifdefinable#1{%  
    \expandafter\def\expandafter#1\expandafter{%  
      \expandafter  
      \@protected@testopt  
      \expandafter  
      #1%  
      \csname\string#1\endcsname  
      {#3}}%  
  }%  
}
```

....

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  }%  
}
```

....

But this is not what I am talking about today

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History

- ▶ late 1993 Dutch T_EX Users Group, 4AllT_EX CD, TDS working group
- ▶ 1995 Unix-based TDS CD based on teT_EX
- ▶ 1996 first edition, Sebastian Rahtz



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- ▶ 1996 first edition, Sebastian Rahtz
- ▶ 2000 5th edition, non-free software removed
- ▶ 2002 7th edition: Mac OS X support
- ▶ 2005 addition of the -sys scripts

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- ▶ 2002 7th edition: Mac OS X support
- ▶ 2005 addition of the -sys scripts
- ▶ 2006-09 XeT_EX addition, end of teT_EX development, T_EXworks addition, t_lmgr introduction, Karl Berry
- ▶ 2009-12 Japanese T_EX support (pT_EX, upT_EX)
- ▶ 2012 updmap goes multi-input file



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Features

- ▶ ‘complete’ - all the free stuff from CTAN (currently 2474 packages)
- ▶ multi-platform (10 archs, 8 os, 18 combinations)
- ▶ uniform across platforms (Windows is the hard part)
- ▶ own package manager `tlmgr` (responsible for update, backups, configuration, ...)
- ▶ practically daily updates
- ▶ DFSG free with a few exceptions

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Distributon methods

DVD

one a year around June/July, available permanently on CTAN

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`tlnet` distribution

daily updates of parts, no version names in the files nor directories, `tlmgr` is managing updates (and much more)

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stacked versus non-stacked files

non-stacked

more prominent (higher up in the hierarchy of various trees)
located files override less prominent ones (same name)



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located files override less prominent ones (same name)

stacked

all files of the same name that are found are evaluated

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Configuration files for (any) T_EX system stacked

`texmf.cnf` configuration of search paths

`updmap.cfg` meta-listing of available fonts

non-stacked

`fmtutil.cnf` definition of formats (memory dumps)

`language.dat/def/def.lua` specification of available
hyphenations

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texmf.cnf – available trees (increasing order)

- TEXMFDIST shareable components, biggest part (R/texmf-dist)
- TEXMFLOCAL system wide additions (R/./texmf-local)
- TEXMFMAIN non-shareable components (R/texmf)
- TEXMFSYSVAR generated data (R/texmf-var)
- TEXMFSYSCONFIG system wide configuration (R/texmf-config)
- TEXMFHOME user tree (~/.texmf)
- TEXMFVAR user generated data (~/.texlive2012/texmf-var)
- TEXMFCONFIG user configuration (~/.texlive2012/texmf-config)
- VARTEXFONTS location of generated fonts (TEXMFVAR/fonts)

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Possible adaptations of `texmf.cnf`

- ▶ adjustment of tree locations
e.g., `TEXMFSYSCONFIG = /etc/texmf`
- ▶ addition of trees
- ▶ anything else should not be necessary

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How to

Since *all* `texmf.cnf` files are read and evaluated, please only set the necessary changes in

`TEXMFSYSCONFIG/web2c/texmf.cnf`

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Configuration of fonts `updmap.cfg`

- ▶ input file for `updmap(-sys)` which generating font configuration files for `dvipdfm(x)`, `pdftex`, `dvips`
- ▶ lists configuration options (e.g., selection of font embedding) and font map definition files
- ▶ every change of availability of fonts (installation/removal) needs adaption of this file and re-run of `updmap-sys`
- ▶ since it is stacked, local system adaptations (adaptions by the admin) can easily be managed by adding one more config file in `TEXMFLOCAL`

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New operation mode

all updmap.cfg files are read in a stacked mode, below list in decreasing priority order.

System mode

TEXMFSYSCONFIG	\$TEXLIVE/YYYY/texmf-config/web2c/updmap.cfg
TEXMFSYSVAR	\$TEXLIVE/YYYY/texmf-var/web2c/updmap.cfg
TEXMFLOCAL	\$TEXLIVE/texmf-local/web2c/updmap.cfg
TEXMFMAIN	\$TEXLIVE/YYYY/texmf/web2c/updmap.cfg
TEXMFDIST	\$TEXLIVE/YYYY/texmf-dist/web2c/updmap.cfg

User mode

TEXMFCONFIG	\$HOME/.texliveYYYY/texmf-config/web2c/updmap.cfg
TEXMFVAR	\$HOME/.texliveYYYY/texmf-var/web2c/updmap.cfg
TEXMFHOME	\$HOME/texmf/web2c/updmap.cfg
TEXMFSYSCONFIG	\$TEXLIVE/YYYY/texmf-config/web2c/updmap.cfg
TEXMFSYSVAR	\$TEXLIVE/YYYY/texmf-var/web2c/updmap.cfg
TEXMFLOCAL	\$TEXLIVE/texmf-local/web2c/updmap.cfg
TEXMFMAIN	\$TEXLIVE/YYYY/texmf/web2c/updmap.cfg
TEXMFDIST	\$TEXLIVE/YYYY/texmf-dist/web2c/updmap.cfg

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format definitions `fmtutil.cnf`

- ▶ T_EX traditionally reads in a precompiled memory dump for faster execution (back in the 80ies...)
- ▶ input file for `fmtutil(-sys)` which generates these memory dumps
- ▶ *not-stacked!*
- ▶ every change of availability of formats should trigger an adaption of this file, plus a re-run of `fmtutil-sys`

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hyphenation patterns language.dat/.def/.dat.lua

- ▶ these files are read *during* memory dump generation by `fmtutil`, and include hyphenation patterns in the dump.
- ▶ every change of availability of hyphenation patterns should trigger an adaption of these files, plus a re-run of `fmtutil-sys`
- ▶ (exception: `language.dat.lua` is run-time file, no action but updating the file itself necessary)

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Structure of T_EX Live

Hierarchy of packages

Scheme (currently 9) top most level, overlapping contents, examples: `scheme-small`, `scheme-context`, `scheme-normal`

Collection (currently 84) non-overlapping, i.e., partition of the contents, examples: `collection-latex`, `collection-formatsextra`, `collection-langarab`

Package (currently ~2500) smallest unit, relates to one item on CTAN, examples: `beamer`, `koma-script`, `pgf`

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T_EX Live Database `texlive.tlpdb`

One installation or media is now completely described by one file, the T_EX Live Database:

- ▶ simple text file - easily parseable
- ▶ revision number for the single packages
- ▶ generated from static content (the `tlpsrc` files)
- ▶ enriched with information from the T_EX Catalogue
- ▶ format documented in detail (POD documentation in the respective perl module)
- ▶ perl modules for the whole db, for each package, lots of scripts using it to take examples



How does `texlive.tlpdb` look like

`texlive.tlpdb`

`name_␣abbr`

...

`name_␣memoir`

...

- ▶ sequence of key value pairs
- ▶ separated by an empty line (or more)
- ▶ one group per package
- ▶ some 'meta'-packages for configuration options

The single package: tlpobj by example I

droid.tlpobj

```
name_droid
category_Package
revision_23912
shortdesc_LaTeX_support_for_the_Droid_font_families.
longdesc_The_Droid_typeface_family_was_designed_in_the_fall_of_2006_by
longdesc_...
execute_addMap_droid.map
containersize_1658644
containermd5_5d587b24501fd55e66f1d40df121fd91
doccontainersize_541008
doccontainermd5_44fc301be6b6dc0c7c640f4970c41b2f
docfiles_size=205
_texmf-dist/doc/fonts/droid/CHANGES
_...
srccontainersize_8776
srccontainermd5_f867eb9536942a16117678fec7cee69b
srcfiles_size=37
_texmf-dist/source/fonts/droid/Makefile
_...
runfiles_size=2093
_texmf-dist/fonts/afm/public/droid/DroidSans-Bold.afm
_...
catalogue-ctan_/fonts/droid
catalogue-date_2011-09-12_10:00:04_+0200
catalogue-license_lpl1.3
catalogue-version_2.1
```

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The execute statements

`addMap`, `addMixedMap`, `addKanjiMap` lists entries that have to be added to the `updmap.cfg`

```
execute addMap grotesqvn.map
```

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```

`AddFormat` specifies one entry for `fmtutil.cnf`

```
execute AddFormat name=pdflatex engine=pdftex  
patterns=language.dat options="-translate-file=cp227.tcx  
*pdflatex.ini"
```



The execute statements

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patterns=language.dat options="-translate-file=cp227.tcx
*pdflatex.ini"
```

`AddHyphen` specifies one entry for the files `language.*`

```
execute AddHyphen name=basque lefthyphenmin=2
righthyphenmin=2 file=loadhyph-eu.tex
file_patterns=hyph-eu.pat.txt file_exceptions=
```

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Packaging paradigm

How to package 3.6Gb of data?

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Packaging paradigm

How to package 3.6Gb of data?

all-or-nothing one dist-package which contains everything

collection-splitting one dist-package per collections

singe-package one dist-package per tl-package

mixed-mode some intermediate mode

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All-or-nothing packaging

Advantages

easy, no need for special dealing with config files, just use what we ship

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big ... be warned – there will be *many* complaints

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big ... be warned – there will be *many* complaints

I don't know of any distribution using this approach



coleccion-splitting

Advantages

package manager friendly since the collections are disjoint,
conceptually close tl-packages are in the same dist-package,
not too many individual packages



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Debian/Ubuntu uses this approach

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package-splitting

Advantages

straight forward, fine-grained installation possible

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huge number of packages, no way to treat manually, missing dependencies

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Fedora, SuSE are using this approach

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mixed-mode

Advantages

???

Disadvantages

???

some BSD variants use this

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Distribution breakdown - overview

Debian/Ubuntu since etch, collection-splitting

Fedora since FC6, package-splitting

SuSE since SLE 11, package-splitting

FreeBSD since TL2009, package-splitting

OpenBSD since TL2007, mixed-splitting very simple

NetBSD work in progress

MacOS gwT_EX since 2007, MacT_EX (based on T_EX Live)

Windows proT_EXt, upstream, MikT_EX(independent)

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Debian/Ubuntu

- ▶ woody: teT_EX 1; sarge: teT_EX 2; etch: teT_EX 3, TL2005; lenny: TL2007; squeeze: TL2009; wheezy: TL2012
- ▶ hardy: TL2007; lucid, natty, oneiric, precise: TL2009, quantal: TL2012
- ▶ one package per one collection
- ▶ arch-dependent build from separate sources (texlive-binaries)
- ▶ `TEXLIVEROOT = /usr/share/texlive`
- ▶ additional tree `TEXMFDEBIAN = /usr/share/texmf`
- ▶ persistency of admin changes to `format/hyphen` configuration in `/etc/texmf`

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Fedora

- ▶ Fedora till 5 and RHEL 5: teT_EX; TL2007 since FC6; TL2010 for F13, F14; TL2011 for F13-F17; TL2012 for F16-
- ▶ single-package splitting
- ▶ very detailed license check (thanks!)
- ▶ `TEXLIVEROOT = /usr/share/texlive`
- ▶ no persistency of admin adaptations, `postinst` changes config files below `TEXLIVEROOT`

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SuSE

- ▶ SLE 11: TL2010; openSuSE 11.4: TL2010 and TL2011; 12.1: TL2011; 12.2: TL2011 and TL2012; dev: TL2012
- ▶ single-package splitting
- ▶ merge of `texmf-dist` and `texmf` into `/usr/share/texmf`
- ▶ config files are kept in `/etc/texmf`, but no persistency

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Other OS

- ▶ FreeBSD since TL2009, currently TL2012, one-package splitting, hard to see how formats etc are handled
- ▶ OpenBSD since TL2007, mixed splitting into four: base, minimal, full, docs; currently TL2012
- ▶ NetBSD: work in progress
- ▶ MacOS: very nice wrap up of T_EX Live into a package with a bit of front end and configuration: MacT_EX
- ▶ Windows: T_EX Live upstream, repackaged installation: proT_EXt, independent MikT_EX

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Warnings and common pitfalls

- ▶ I never used T_EX Live and I don't know what T_EX does, but I package it! - please no!

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Warnings and common pitfalls

- ▶ I never used T_EX Live and I don't know what T_EX does, but I package it! – please no!
- ▶ **improper configuration file handling** by far the biggest problem (shipping parts of T_EX Live with the full `updmap.cfg` does *not* work

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Warnings and common pitfalls

- ▶ I never used T_EX Live and I don't know what T_EX does, but I package it! – please no!
- ▶ **improper configuration file handling** by far the biggest problem (shipping parts of T_EX Live with the full `updmap.cfg` does *not* work)
- ▶ **what is 'upstream'** only one fixed release, other than that daily updates with no way to fetch the packages of a specific day (especially the BSD ports have problems with that)

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Warnings and common pitfalls II

- ▶ **binaries and source** T_EX Live does *not* update binaries over the year, but the sources changes in svn, source building is complex, loads of scripts that are partially linked

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Warnings and common pitfalls II

- ▶ **binaries and source** T_EX Live does *not* update binaries over the year, but the sources changes in svn, source building is complex, loads of scripts that are partially linked
- ▶ **shipping the `tlmgr`** don't do it. One cannot mix package managers, even if users cry for it, you will not want to have another program changing the files under the nose of the main distribution package manager

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Recommendations

- ▶ Get to know the system - use the normal installer and learn what is going on in T_EX Live
- ▶ learn Perl - there are many perl modules to make programming easier, parsing of executes, generation of proper configuration files, etc., all done already
- ▶ look around - T_EX Live has now been packaged several times, starting with Debian in 2005
- ▶ select a paradigm that fits your need, and your distribution requirements
- ▶ contact us - we have our own mailing list for distributors

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Contact

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Thanks for the attention