An overview of T_EX, its children and their friends ...

Arno Trautmann arno.trautmann@gmx.de

Link for the impatient.

In the world of T_EX, there are many developments and ambiguous names. This paper tries to give an overview of the development of T_EX and related programs. Contributions are welcome!¹

1. Introduction

The base frame and main idea of this document was taken from the article *A brief history* of *T*_EX, *volume II* by Arthur Reutenauer in the proceedings of EuroBachoT_EX2007 and his talk there (see references on page 25). Additional information is taken from original documentations and some review articles. For old, historic information, the historic archive maintained by Ulrik Vieth and hosted on ftp.tug.org (see refs) was very useful, especially in the reconstruction of LAT_EX versions. Many thanks for that great archive!

All information is up to the date of this generated pdf and up to the information I found. Everything here is without guarantee – this is just to get an overview. Consult the references for further (and/or correct) information!

In the tree views, every node has a tooltip that shows up when you hover the mouse over it. For the case that your pdf viewer does not support this, there is a list of all the descriptions on page 18.

I tried to make the graphs more readable by using colors. All decisions reflect my personal opinion, not that of the community, of the authors or someone else.

normal That is, not very important in my opinion, no huge user group, but still maybe important for special needs. Was used by a major community at least some time back, but is not of great impact nowadays.

important

Engines or formats that had or have a great impact on (everyday) typesetting for a large community.

¹The current source code of this document is available at http://github.com/alt/tex-overview. Please feel free to patch there or mail me any suggestions and comments. I'll be happy to extend and correct this document!

experimental Developments that might still be under construction or were never used by a large community. Nevertheless, these might be very important to the development of other engines or for use of special typesetting.

package

EXAMPLE X-packages or single TEX-files (useable as packages or modules) that seemed worth mentioning. There won't be many of this; most very important packages won't be mentioned.

distribution Software bundles that bring T_EX and friends to the normal user.

program Programs that are not directly connected to T_EX (but interesting in the context of using T_EX) or are separate helper programs.

font A font technologie. Neither a program nor libraries that provide access to fonts nor the actual files, but rather the abstract definition or specification.

Some graphs are quite complex, which is the reason why there are two versions of them: A short one mentioning only the most important things and a full version with everything I could find.

In most cases I did not mention the authors of the programs/packages. This is not to diminish their effort but only for brevity (long names make things harder to read). I did not write any of the below-mentioned programs or packages. The authors are given in the documents linked in the references.

2. How to contribute

I hope one day this document would become the standard reference for questions like "What program do I need for ...?", "What's the difference between ...T_EX and ...T_EX?", "Why is it called ...?" etc.

To get to this point, I need some help of people having read more documentation or even developed some of the programs mentioned here themselves. Special help is needed for:

- font technologies
- METAFONT and succesors
- BibT_EX and successors/alternatives

It is up to you to contribute texts, references, links, descriptions, hints etc. I'll be happy about anything I can add here. Also, if you have suggestions about the layout, let me know.

3. Problems with pdf viewers

As this document makes heavy use of pdf-features, some pdf viewers are not able to show everything correct and as intended. My experiences with viewers are as follows:

evince Shows the document correct and complete. Tested using Linux.

- Acrobat Reader will show all the information but might hide some text of very long tooltips (at least that's the case on my machine). Also, it draws annoying green boxes around the tooltips which do not belong there.
- **TeXworks** The built-in pdf viewer of the TeXworks editor does not break lines of tooltips, therefore long annotations are not shown completely.

okular also does not break the lines.

xpdf shows only very short tooltips. Most of the information is not visible in the graphs.

gv shows no tooltips, but the annoying green boxes. (Linux)

About this document

This document is typeset in the TeX Gyre Pagella font using the lual $\Delta T_E X 2_{\varepsilon}/3$ format with luaTeX 0.63.0.

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Part I.

Tree Views

4. T_EX – the program short view



4. T_EX – the program



iT_EX

5. LAT_EX – Lamport's T_EX format short view



5. IAT_EX – Lamport's T_EX format



6. ConT_EXt: con tex t – text with tex short view



6. ConT_EXt: con tex t – text with tex



7. Other Formats

7.1. YT_EX

YTEX

7.2. StarT_EX – Starter's T_EX

StarT_EX

7.3. JadeT_EX

JadeT_EX

8. Pandora's Box

The following pages will be a hodge-podge of many things that are related to T_EX and used in the process of generating documents in different file formats, i. e. conversion tools, bibliography tools etc. Feel free to contribute, I'll choose case-by-case if I'll add something or won't include it. Text editors or viewers will *not* be included!

8.1. Distributions

This section will feature the main distributions of T_EX and related programs. Of course, not every Linux Distribution's T_EX package can be listed here, but only official upstream distributions.

8.1.1. T_EXlive



8.1.2. MikT_EX



8.2. META*



8.3. $BibT_EX$



8.4. (x)dvipdf(m)(x)



8.5. Font Techonolgies

This section tries to cover the development of font technologies – the most important thing for a typesetting system is it's font mechanism ...



Part II.

Text Views

9. T_EX – the program

T_EX

Born in 1978 by Donald Erwin Knuth.

ANT

Ant is Not TeX. A typesetting system inspired by TeX. Only *inspired*, so it has nothing to do with TeX in terms of common code.

TEX-XET

The first extension to TeX, 1987. It was able to typeset in two directions, but only with a mark in the dvi to change the direction.

Nihongo T_EX

A true multibyte extension of TeX. Could handle all Japanese characters in one font.

JT_EX

An extension of TeX for typesetting Japanese. (1987, Yasuki Saito)

pT_EX

Extension of Nihongo TeX to enable vertical typesetting. ("p" for "publishing") Distributed as WEB change files.

TEX--XET

TeX--XeT was able to really put the glyphs on the right place in the dvi.

T_EX3

Ability to handle 8-bit input. 1989. TeX development was frozen in 1991 and only bugfixes were made. Now in version 3.1415926, it gets closer to pi with every bugfix. Don Knuth wishes the version number to be pi when he dies.

encT_EX

A small extension to TeX, started 1997. Adds 10 new primitives relating input re-encoding

MLTEX

Extension to TeX (started 1990) that allows hyphenation of words with accented letters. (Therefore the name: MultiLingual TeX.) Distributed as a change file to the original WEB sources of TeX.

upT_EX

Unicode-aware version of pTeX. ("unicodepublishing"-TeX) Also modernized from TeX3.

T_EX2PDF

Early name for pdfTeX. Don't confuse with converters like dvi2pdf.

Ω

Support for 16bit-unicode-input. Still constrained on the output encoding. Started 1994.

ε**-Τ_ΕΧ**

An extension to TeX, provided by the NTS team as an intermediate project until NTS would be ready. eTex is a full TeX and backward compatible. The number of TeX's registers is increased and various new primitives useful to programmers are added.

pdfT_EX

A new engine to directly produce pdf-files from TeX, without the need of dvi-ps-pdf. This allows to use microtypographic extensions and many other features of the pdf format like page transitions etc.

T_EXgX

GX stands for Graphic eXtension, a font technology available only on Mac OS. TeXGX was able to handle these fonts.

\mathcal{NTS}

A project to completely reimplement TeX in Java. Now NTS is officially declared dead.

Ω_2

A short-time try to pick up the development of Omega again in 2006. Seemed more like a good plan and is now regarded as obsolete. LuaTeX is kind of a successor.

VT_EX

VTeX (VisualTeX) can produce pdf, html, svg, dvi or ps output directly from input. In contrast to pdfTeX, it includes a full PostScript interpreter, thus capable to include EPS figures, PStricks etc. First official version I found: February 15, 1999: VTeX 6.3; last official version seems to be from Oct 1, 2005: VTeX 8.61. Commercial product.

ℵ (Aleph)

Originally named epsilon-Omega, an attempt to stabilize Omega while merging epsilon extensions. Authors: John Plaice and Yannis Haralambous, now maintained for severe bugfixes by Taco Hoekwater.

X_IT_EX

This extension enables full multilingual support for left-to-right typesetting, right-to-left and almost any other possible direction. Unicode encoding is fully supported (utf8 as native encoding). XeTeX also features support for OpenType and AAT-fonts (via the operation system). In newest versions, character protrusion is possible.

$\epsilon \chi T_{\rm E} X$

Planned implementation of a high-quality typesetting system, written in Java. Based on experiences in NTS, eTeX, pdfTeX and Omega. Started in 2003, current version in repository is 0.0. (i. e. not very far ...)

$pdf(\epsilon)-T_EX$

Merging the pdfTeX engine with the eTeXextensions. This engine can produce dvi (with or without the eTeX-extensions) as well as pdf (again, with or without extensions).

eeT_EX

Experimental extension to pdfeTeX by Taco Hoekwater, created 2000. Distributed as change file. Now dead due to his development of lua-TeX.

Lua

A script language; has nothing to do with TeX.

luaT_EX

LuaTeX supports utf8, OpenType and many more things. TeXlive 2010 ships version 0.60.2. luaTeX features an embedded scripting language, lua, making it easy to extend, so most of the programming can be done in lua instead of TeX-hackery.

iT_EX

iTeX is the official successor of TeX3, announced by Don Knuth at the TUG conference 2010.

10. LATEX – Lamport's TEX format

₽T_EX 0.90

First version still on web (historic archive, see refs) is 0.90, for use with TeX 0.95. No installation help found. Apparently one needs the files lplain.tex and latex.tex to create the format.

₽T_EX 0.91

Version 0.91 for use with TeX 0.97 (C) 1983 by Leslie Lamport. Most changes to previous version are in the file lplain.tex.

₽T_EX 0.92

First version with the @ as letter for internal names. Seeminlgy first version with a manual. For use with TeX Version 0.9999999. (no joke, that's the version number given in the latex.tex file!) (C) 1983 by Leslie Lamport, conversion to 0.92 from 0.91 by Arthur Keller.

⊮T_EX 0.92 - 1.0

Adaption of 0.92 for TeX version 1.0. (C) 1983 by Leslie Lamport, conversion to 0.92 from 0.91 by Arthur Keller.

₽T_EX 2.0 - 1.0

Seemingly heavy changes compared to 0.92. Version for TeX 1.0. Release of 11 Dec 1983. There were never public versiaons 1.x

₽T_EX 2.05

No sure information found so far.

₽T_EX 2.06a

Release of version 2.06a of the LaTeX macros. September 1984.

LATEX 2.09

The first official version by Leslie Lamport, 1985.

SLIT_EX

A variation of LaTeX2.09 to provide an easy way for producing presentations. In LaTeX2e absorbed as a documentclass (slides).

A port of Spivak's AMS-TeX to LaTeX 2.09, released 1990

$F_{E} X 2_{\varepsilon}$

June 1994: New release of LaTeX to avoid incompatible dialects of LaTeX 2.09. Introduced by the LaTeX3-Team.

Λ

A LaTeX based format for the omega engine.

Lamed

A LaTeX based format for the aleph engine.

$\mathcal{A}_{\mathcal{M}}\mathcal{S} \blacksquare T_E X 1.2$

A port of version 1.1 to LaTeX 2e by Downes and Jones.

ALATEX

A slightly changed LaTeX format by Matt Swift to offer modularity at format level. Acts as normal LaTeX if not explicitly told to do different. "A" for "alternate", "abstract" or the indefinite article.

Version 2.1 of amsLaTeX.

pdf₽T_EX

The "standard LaTeX". If anyone talks about "LaTeX" it is nearly shure to be this package. pdfLaTeX2e produces pdf or dvi output.

X_HET_EX

Using the XeTeX engine. There are some special packages that provide easy access to the modern features of XeTeX.

pIATEX

A LaTeX based format for the pTeX engine.

Lua PT_EX

LaTeX based on LuaTeX with pdf (standard) or dvi (dviLuaLaTeX) output. LaTeX support for luaTeX is under heavy development to make this machine usable with the format. Work in progress, but already well useable! (This document is processed with luaLaTeX2e.)

₽**T**EX2.5

Will Robertson suggested in an interview (see refs) an interim unstable version on the way to LaTeX3 with version number 2.5 that should bring package authors towards using LaTeX3 syntax. This version should be backwards incompatible to LaTeX2e. (This version does not exist in any official plannings, but I liked the idea, so it is mentioned here ;))

₽T_EX3

The long-time successor of LaTeX2e. It is planned to implement a very elaborate low-level programming language. (Almost done by now.) The expl3-package provides an implemantation that can be used on top of LaTeX2e. Several LaTeX packages already make heavy use of expl3. (As does this document.) LaTeX3 makes use of eTeX primitives and therefore needs this engine or successors. Special adaptions of luaTeX features are starting to evolve.

11. ConT_EXt: con tex t – text with tex

pragmatex

Former name of ConTeXt.

ConT_EXtMkI

Original ConTeXt with Dutch low level interface.

ConT_EXtMkII

ConTeXt with English low level interface. Works with any TeX-engine, as LaTeX does: TeX, e-TeX, pdfTeX, Aleph, XeTeX, ...

ConT_EXt MkIII

Reserved for future use for files supporting Xe-TeX. Was "skipped" for "practical reasons" (Hans Hagen)

ConT_EXtMkIV

Specially designed for LuaTeX.

12. Other Formats

12.1. YT_EX

YT_EX

A macro package developed at MIT. Pronounced "why-TeX", "upsilon-TeX" or "oops-TeX". Tries to offer an easy structure for novices as well as a powerfull macro libraries for experienced users.

12.2. StarT_EX – Starter's T_EX

StarT_EX

A format designed to help students with short documents. Using html-like notation: <command> instead of command

12.3. JadeT_EX

JadeT_EX

A macro package for processing Jade/OpenJade output.

13. Pandora's Box

13.1. Distributions

13.1.1. T_EXlive

Web2c

An Implementation and Distribution of TeX which translates the original WEB sources to a C code.

emT_EX

Eberhard Mattes' TeX Distribution for MS-DOS and OS2.

teT_EX

Maintained by Thomas Esser (hence the te in teTeX) from 1994 to May 2006.

4AllT_EXCD

The (vague) past ... (?)

fpT_EX

A free TeX distribution for Win32 based on teTeX, by Fabrice Popineau. Still active, provides up-to-date binaries for Windows. Special support for Japanese Typesetting.

XEmT_EX

A TeX distribution for Windows, based on fpTeX with XEmacs, AucTeX as IDE for (La)TeX. Xem-TeX was sponsored by the French government.

T_EXlive 1996 – 2007

First version 1996 (UNIX only, later also Windows binaries), and then a long story of ongoing work -- see the detailed documentation for a detailed history.

T_EXlive2008

A new package manager and network installer are available. So installation via the net is possible as well as package updates. Missing packages are not installed on-the-fly. The last of the modern machines is added: luaTeX

gwT_EX

A (re)distribution for Mac OS based on TeXlive by Gerben Wierda. Provides TeX-related packages for the i-Installer. Unsupported from 2007 on.

T_EXlive2009

Dropped Omega and Lambda. Aleph and Lamed are kept.

T_EXlive2010

Up to now, latest release of TeXlive.

TLContrib

An extension of TeXlive that contains packages that TeXlive cannot hold because: not free, binary update, not on CTAN or intermediate release. Useable via the TeXlive manager.

MacT_EX

Easy-to-install distribution based on TeXlive. For Mac OS only, it provides a native installer, the TeXShop editor and Mac-specific tools.

13.1.2. MikT_EX

MikT_EX

MikTeX is a TeX distribution originally for Windows only. Copyright by Christian Schenk goes back to 2001

MikT_EX 2.6

Windows only. featuring pdftex 1.40.4, mpost 1.000

MikT_EX 2.7

Windows only. featuring xetex 0.999.6, pdftex 1.40.9, mpost 1.005

MikT_EX 2.8

Windows only. featuring xetex 0.9995.1, pdftex 1.40.10, mpost 1.005

MikT_EX 2.9

Windows only (stable version). Beta version for GNU/Linux available. featuring xetex 0.9997.4, pdftex 1.40.11, LuaTeX 0.60.2, mpost 1.211. Offers both LaTeX and ConTeXt (Mk IV) formats.

ProTeXt

A distribution based on MikTeX with a comfortable install procedure, Editor etc. Provides an easy installation for a full (La)TeX environment.

13.1.3. T_EX collection

T_EX Collection

A meta-distribution. Provided on DVD by the TUG, this distribution ships with TeXlive, MacTeX and ProTeX as well as with a full CTAN snapshot.

13.1.4. W32T_EX

W32T_EX

A distributon to provide binaries for windows, with special support for Japanese. First version (up to the changelog): 2009/08/02. Still highly up-to-date.

13.1.5. OzTeX

OzT_EX

A commercial distribution for Mac OS. No longer supported.

13.1.6. for Amiga

Amiga-TeX

By Thomas Rockicki and Radical Eye Software. Commercial distribution for Amiga.

pasTeX

A free distribution for Amiga. Distributed as 5 floppy disks (TeX) plus 2 floppy disks (Meta-font). Available from the Aminet.

13.2. META*

METAFONT

The program for creating the fonts originally used by TeX.

Metafog

A program to convert metafont shapes to Type1 contours. Uses mathematically correct transformations instead of autotracing.

MetaType1

A program to produce Type1 fonts from metafont source code.

MetaPost

A graphic generating program inspired by METAFONT. MetaPost can produce PostScript graphics as well as SVG.

MetaFun

"MetaFun is Hans Hagen's extension to (or module for) the MetaPost language."

13.3. BibT_EX

BIBT_EX

A helper program to generate a bibliography list.

NbibTeX

"NbibTeX helps authors take better advantage of BibTeX data" says the homepage.

ВІВ**Т**ЕХ8

The documentation says: "An 8-bit Implementation of BibTeX 0.99 with a Very Large Capacity"

BIBT_EXu

A unicode-aware version of BibTeX

Pybtex

A python implementation of BibTeX.

biber

A cooler version of unicode-aware BibTeX, designed for (?) use with BibLaTeX

Bib⊮T_EX

A LaTeX package as frontend for biber.

Librarian

A TeX file (useable with all formats) that typesets BibTeX-style bibliographies without the need of BibTeX. Therefore, it provides a formatindependent typesetting of bibliographies.

13.4. (x)dvipdf(m)(x)

dvipdf

Converts dvi files to pdf files.

dvipdfm

Converts dvi files to pdf files. Does not build on dvipdf, but is an independent implementation.

dvipdfmx

Extended version of dvipdfm. Support for multi-byte encodings and more pdfTeX features. Still active. Combined work of dvipdfm-jpn and dvipdfm-kor.

xdvipdfmx

Converts xdvi files produced by XeTeX to pdf files. Normally always executed after a XeTeX run, so the user won't notice that an xdvi document was created in between.

13.5. Font Techonolgies

Bitmap fonts

Bitmap fonts contain the shape of the letters as a number of dots. If you zoom in, a bitmap letter will show pixels. Hence one needs a special version for every resolution.

PostScript Type 1

Outline font. The shape of a letter is described as mathematical curves so the letter can be made arbitrarely large without getting pixeled.

TrueType

Available on Windows and Mac OS. Outline font technology with quadratic B splines.

FreeType

TrueType implementation for Unix.

TrueType GX

"Graphis eXtension". A font format only available for Mac OS.

OpenType

Extension of the TrueType font format, adding support for PostScript font data. Developed by Microsoft and Adobe.

AAT

"Apple Advanced Typographie" fonts are succesors of the GX fonts. Only available for Mac OS, too.

Part III.

Appendix

A. References

The references are in order of occurance in the above document. i. e. if you want information about LuaT_EX, it will be below e. g. ϵ T_EX. Everything that is not listet as "book" is freely available on the internet.

Books

D.E. Knuth, D. Bibby, and I. Makai. *The T_EXbook* Addison-Wesley Reading, MA, 1986.

F. Mittelbach, M. Goossens, J. Braams, D. Carlisle, C. Rowley, C. Detig, and J. Schrod. *The LTEX companion*. Addison-Wesley, 2004.

Overview Articles

- Arthur Reutenauer. A Brief History of T_EX. Talk at EuroBachoT_EX 2007. http://www.gust.org.pl/bachotex/EuroBachoTeX2007/presentations/bhot. pdf/view
- A Brief History of LATEX http://www.xent.com/FoRK-archive/feb98/0307.html
- Short Article About Omega And Aleph
 http://www.tex.ac.uk/cgi-bin/texfaq2html?label=omegaleph
- Interviews with Will Robertson, Hans Hagen et.al. http://www.tug.org/interviews

Archives

CTAN – Comprehensive TeX Archive Network: http://www.ctan.org

Historic Archive of TeX Distributions: ftp://ftp.tug.org/historic

Engines

ANT project page http://ant.berlios.de Yasuki S AITO. Report on JTEX: A Japanese TEX. TUGboat 8 (1987), no. 2, 103-116. http://www.tug.org/TUGboat/Articles/tb08-2/tb18saito.pdf pT_FX sources and documentation http://dante.ctan.org/tex-archive/help/Catalogue/entries/ptex.html encT_FX page http://www.olsak.net/enctex.html MLT_EX source (CH file) http://www.tex.ac.uk/tex-archive/systems/generic/mltex/mltex.ch pdfT_EX project page http://tug.org/applications/pdftex/ $\mathcal{N}_{\mathcal{T}}\mathcal{S}$ project page http://nts.tug.org VT_EX – official homepage of micropress-inc http://www.micropress-inc.com/ X_HT_EX project page http://tug.org/xetex/ $\epsilon \chi T_{\rm E} X$ project page http://www.extex.org

eeTEX project page
 http://tex.aanhet.net/eetex

LuaTEX project page
http://www.luatex.org

iTEX announcement by Don Knuth at the TUG 2010 http://river-valley.tv/tug-2010/an-earthshaking-announcement

Formats

ConTEXt wiki http://wiki.contextgarden.net

LATEX project page http://www.latex-project.org

IATEX3 project
http://www.latex-project.org/latex3.html

ALATEX: Discussion in TUGboat Vol. 16 (1995), No. 3, p. 269ff. http://www.tug.org/TUGboat/Articles/tb16-3/tb48swif.pdf

YTEX on CTAN http://tug.ctan.org/tex-archive/macros/ytex/

JadeTEX project page
 http://jadetex.sourceforge.net/

StarTEX on CTAN
 http://www.ctan.org/tex-archive/macros/startex/

Distributions

fpTEX: Announcment at TUG 1999
 http://www.tug.org/tug99/program/node39.html

TEXlive development history http://tug.org/texlive/doc/texlive-en/texlive-en.html

gwTEX project page
http://ii2.sourceforge.net/tex-index.html

Brief History of gwTeX
 http://www.tug.org/twg/mactex/award/2007/gerben/aboutgwtex.html

TLContrib project page
 http://tlcontrib.metatex.org/

MacTEX project page
 http://www.tug.org/mactex

MikTeX project page http://miktex.org/

ProTEXt project page
 http://www.tug.org/protext/

TEXCollection page http://www.tug.org/texcollection/

Win32 project page http://w32tex.org/

OzT_EX project page http://www.trevorrow.com/oztex/

TEX on Amiga http://serpens.de/~zza/amigafaq/AmigaFAQg_49.html

Fonts

Type1 Fonts specifications
http://partners.adobe.com/public/developer/en/font/T1_SPEC.PDF

The FreeType project
 http://freetype.org/index2.html

OpenType specifications
 http://www.microsoft.com/typography/otspec/default.htm

Everything Else

dvipdfmx project page
 http://project.ktug.or.kr/dvipdfmx/

B. List of Contributors

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- Paul Isambert, for usefull discussions and testing
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