

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

Arno Trautmann
arno.trautmann@gmx.de

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 very welcome!¹

[Link for the impatient.](#)

Introduction

This document is for people that have stumbled upon different software names including something related to T_EX and are confused by the many different terms – at least I was, so maybe others are, too ...

The base frame and main idea for this overview was taken from the article *A brief history of T_EX, volume II* by Arthur Reutenauer in the proceedings of EuroBachOT_EX 2007 and his talk there (see references on page 38). Additional information is taken from original documentation of the software and some review articles. For information of very old stuff, the historic archive maintained by Ulrik Vieth and hosted on <ftp.tug.org> (see refs) was very useful, especially in the reconstruction of L^AT_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 24.

¹The latest 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!

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1. The Difference Between Editor, Engine, Format, and Distribution

There are four kinds of terms that are often confused especially by new users. This will try to explain them very shortly:

editor Typically, a user interfaces with any \TeX via an editor as a front end. Although they might look fancy with a lot of graphical interfaces, an editor is just a program that allows the user to create and change a text file. This can be done with any program, but specialized editors offer additional features. It is important to keep in mind that an editor alone can *not* convert a `.tex` file into a pdf or any other output format, but always needs the programs as discussed below, most notably an engine that does all the work. This might often be hidden from the user's direct view by buttons which offer convenient ways to execute everything that is necessary.

engine This is the program that does all the actual work. The original program is \TeX , the most famous derivative is pdf \TeX , while Lua \TeX is the latest successor. Normally, a user does not interface directly with the program, but uses an editor to parse a text file to it.

format A format is a (large) collection of abbreviations (macros) that make the life easy when working with \TeX . The most commonly used formats are L \TeX , Con \TeX t and plain \TeX . The latter one is a minimal set of macros provided by Don Knuth. Formats can be combined with different engines, exploiting the special abilities of these engines. A format is in the beginning a collection of text files, but can be compiled into a binary format that can be read much faster by the engine.

distribution In addition to formats, a large set of supplementary files can be used to work with \TeX , called *packages* for L \TeX , *modules* for Con \TeX t, and many external programs have proven useful for the work with \TeX . Distributions such as \TeX Live and MiK \TeX strive to provide a full set of such programs and macros by using a package manager to take care of package dependencies and updating. Many Linux distributions, as well as cygwin for Windows, repackage a \TeX distribution (mostly \TeX Live) using the Linux distribution's package system.

2. How to read this document

This document consists of several graphs showing the development of software more or less directly related to T_EX. The graphs try to show the time development (downwards), as well as dependencies, changes, etc.

I tried to make the graphs more readable by using colors for different categories. The decisions about what is important and what is “normal” reflect my personal opinion only.

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.

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.

planned

Things that are planned to raise one day and are in the phase of preparation, i. e. there may be some code but not in the final form yet.

package

L^AT_EX-packages or single T_EX-files (useable as packages or modules) that seemed worth mentioning. There won't be many of this; just some that might otherwise be confused for something else.

distribution

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

hist. dist.

Historical distributions that have no use today but were important for bringing T_EX to older computer systems.

program

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

font

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

Some of the graphs have quite many entries, which is the reason why there are two versions of them: A short one listing 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.

3. How to contribute

I hope one day this document would become the standard reference for questions like “Which 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 who know more about the T_EX world than I do. 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 or corrections to the content, let me know.

4. Problems with PDF viewers

This document shows additional information via tooltips. At least that's what it should do. Unfortunately, there is no unique way to get hover-over tooltips to work in all PDF viewers, but each of them has its own way to present the information. For now, the information are provided as a hyperlink which points nowhere meaningful. But most viewers can show this information in a way the user can understand.

The following list summarizes my experience with different PDF viewers, all but the Adobe Reader XI tested on an Arch Linux. Your experience might differ; if you have any annotations to this list, I'll happily add them – especially if the document breaks anything completely.

evince 3.20.0 Shows the document correctly and completely.

Adobe Reader 9 Shows the document correctly and completely, surprisingly.

Adobe Reader XI Shows the document correctly and completely, surprisingly. (Tested on Windows 7)

T_EXworks 0.6.1 r3614278 Shows the document completely, but the tooltips show some characters at the beginning. Ignore those and it's fine.

okular 0.25.0 As T_EXworks, but does not break the tooltips, therefore information is lost.

xpdf 3.04 Shows the tooltips only in the status bar, thus hiding most of the information in the graphs.

About this document

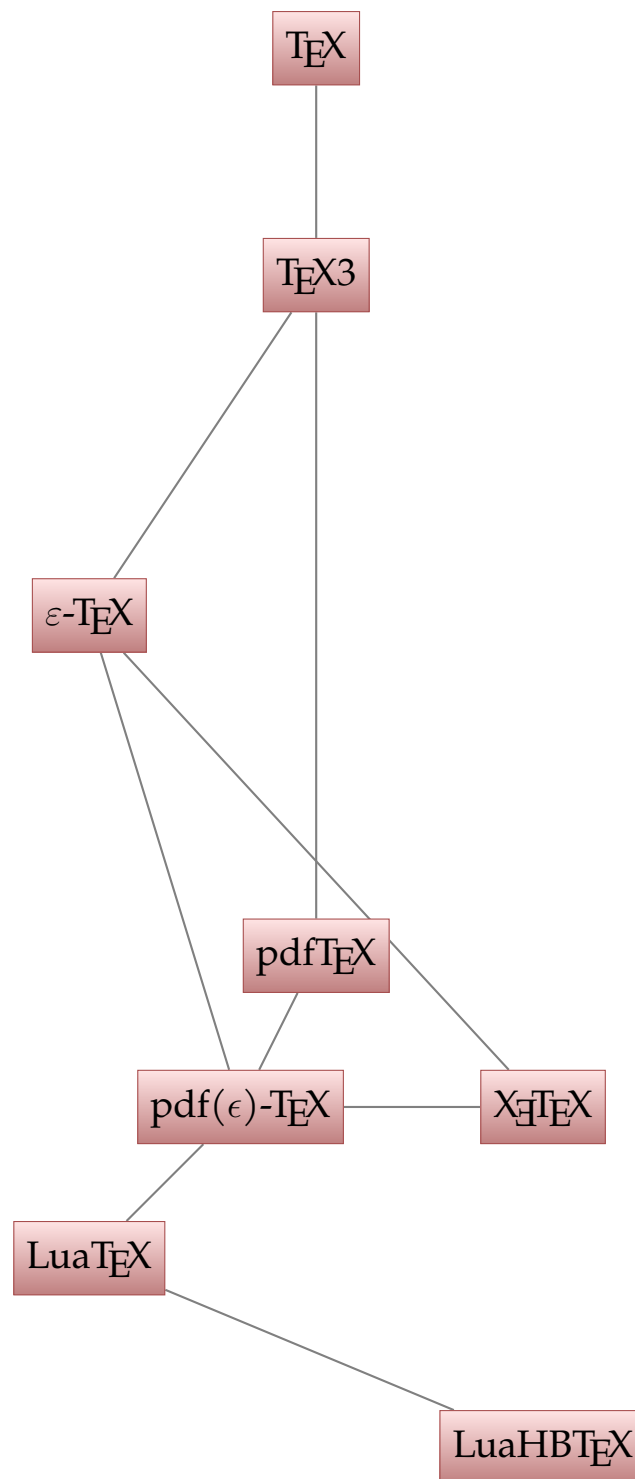
This document is typeset in the T_EX Gyre Pagella font using the LuaL^AT_EX 2_ε format with `expl3` and `xpackages` based on LuaT_EX 0.113.2.

In case you wonder why the typesetting is so ugly, especially the margins: Those are chosen to be small so that much text fits on one page which in this case increases the overview. I do not expect anybody to ever print this document, therefore I ignore the need of margins. In the tooltips, you will not see any colons even if they would make sense – this is because a colon leads to an error and the tooltip will not be displayed.

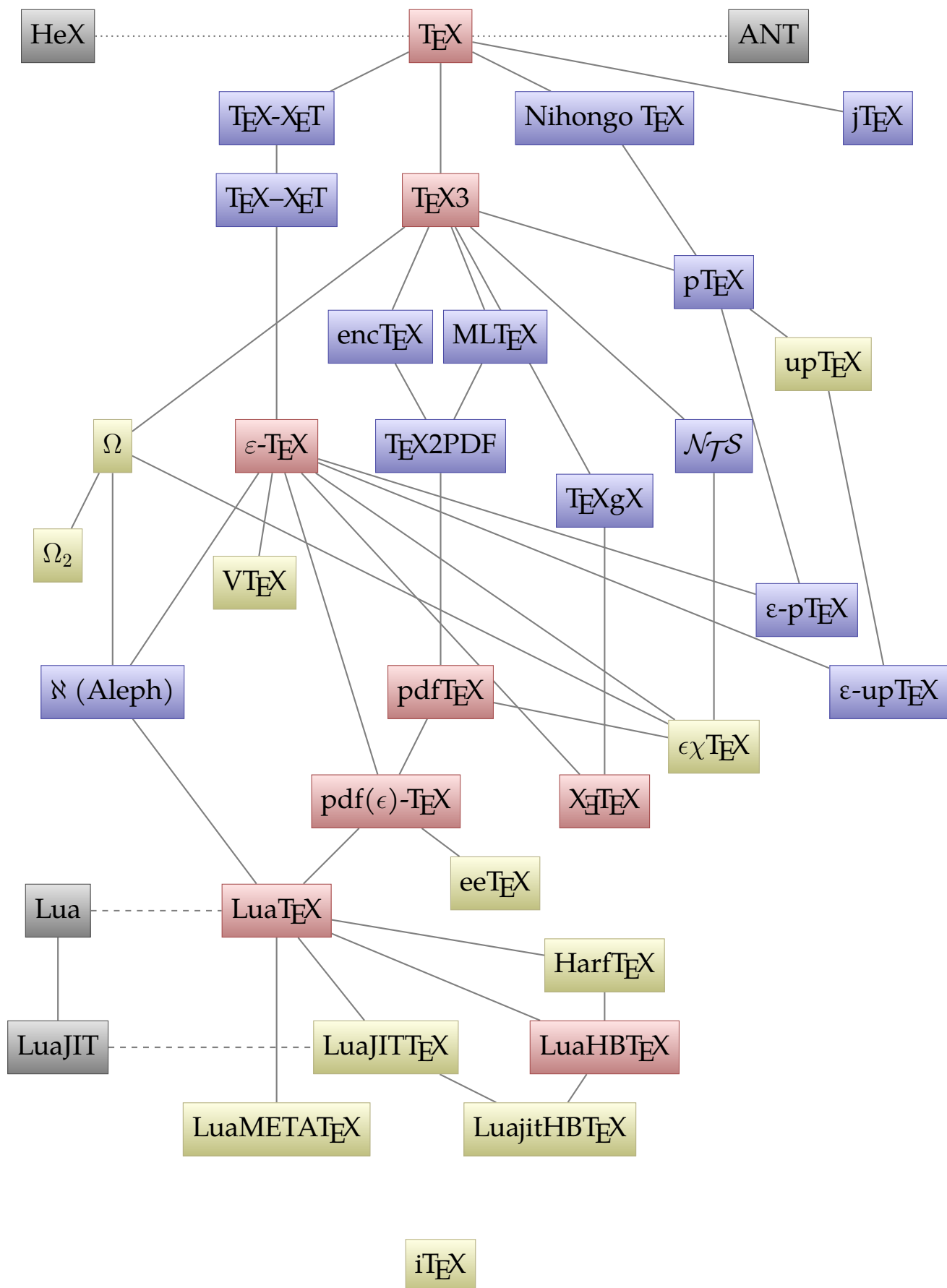
Part I.

Tree Views

5. T_EX – the program short view



5. T_EX – the program



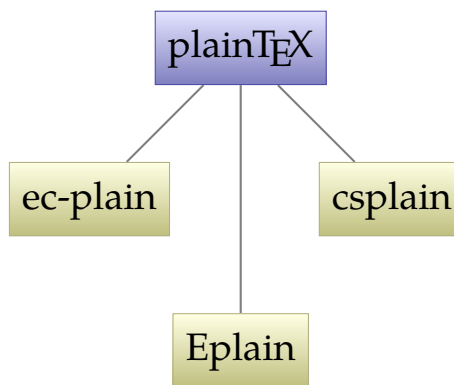
The chronological order may not be exact in this graph. I had to work hard on the arrangement to show both chronological order and code dependence, and for now only the code dependence is (hopefully) correct.

6. iniT_EX, VirT_EX, et al.

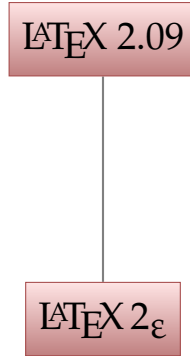


All other engines have the same functionality, but no special names given: `|luatex -ini|` is the INITEX version of LuaT_EX etc.

7. plainT_EX – the first format



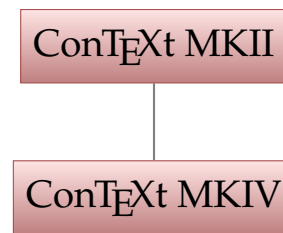
8. \LaTeX – Lamport's \TeX format short view



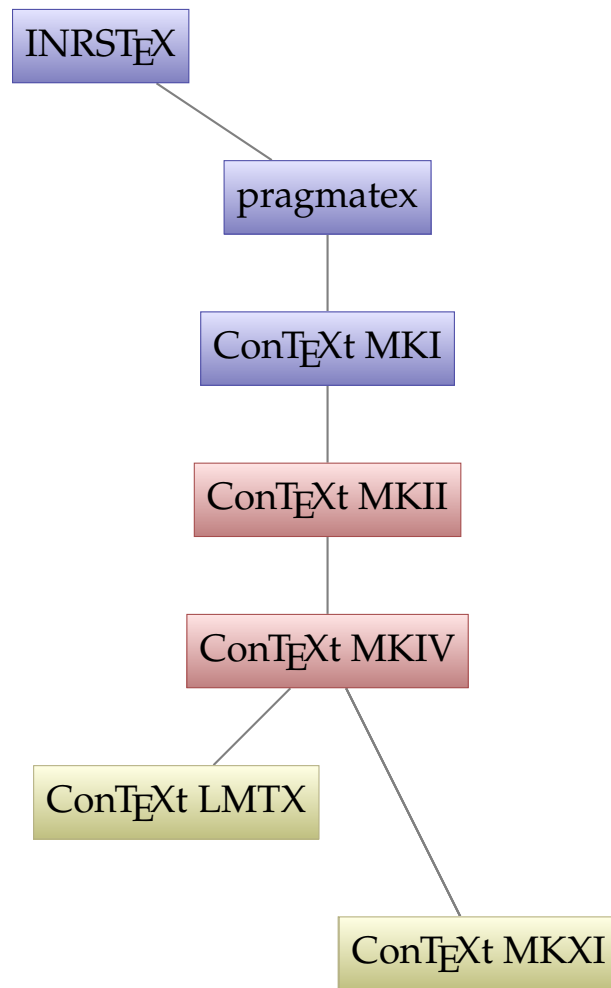
8. L^AT_EX – Lamport's T_EX format



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

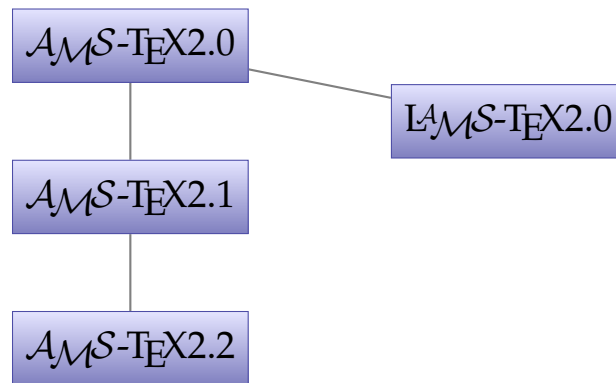


9. ConT_EXt: con tex t – text with tex



10. Other Formats

10.1. AMS- $\text{T}_\text{E}\text{X}$



10.2. BLUe

BLUe

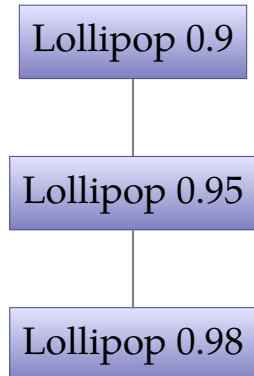
10.3. HP $\text{T}_\text{E}\text{X}$

HP $\text{T}_\text{E}\text{X}$

10.4. Jade $\text{T}_\text{E}\text{X}$

Jade $\text{T}_\text{E}\text{X}$

10.5. Lollipop



10.6. Macro $\text{T}_\text{E}\text{X}$

Macro $\text{T}_\text{E}\text{X}$

10.7. MeX

MeX

10.8. OpTeX

OpTeX

10.9. PHYS(E)

PHYS(E)

10.10. PHYZZX

PHYZZX

10.11. StarT_EX – Starter's T_EX

StarT_EX

10.12. Texinfo

Texinfo

10.13. T_EXsis

T_EXsis

10.14. XMLT_EX

XMLT_EX

10.15. YT_EX

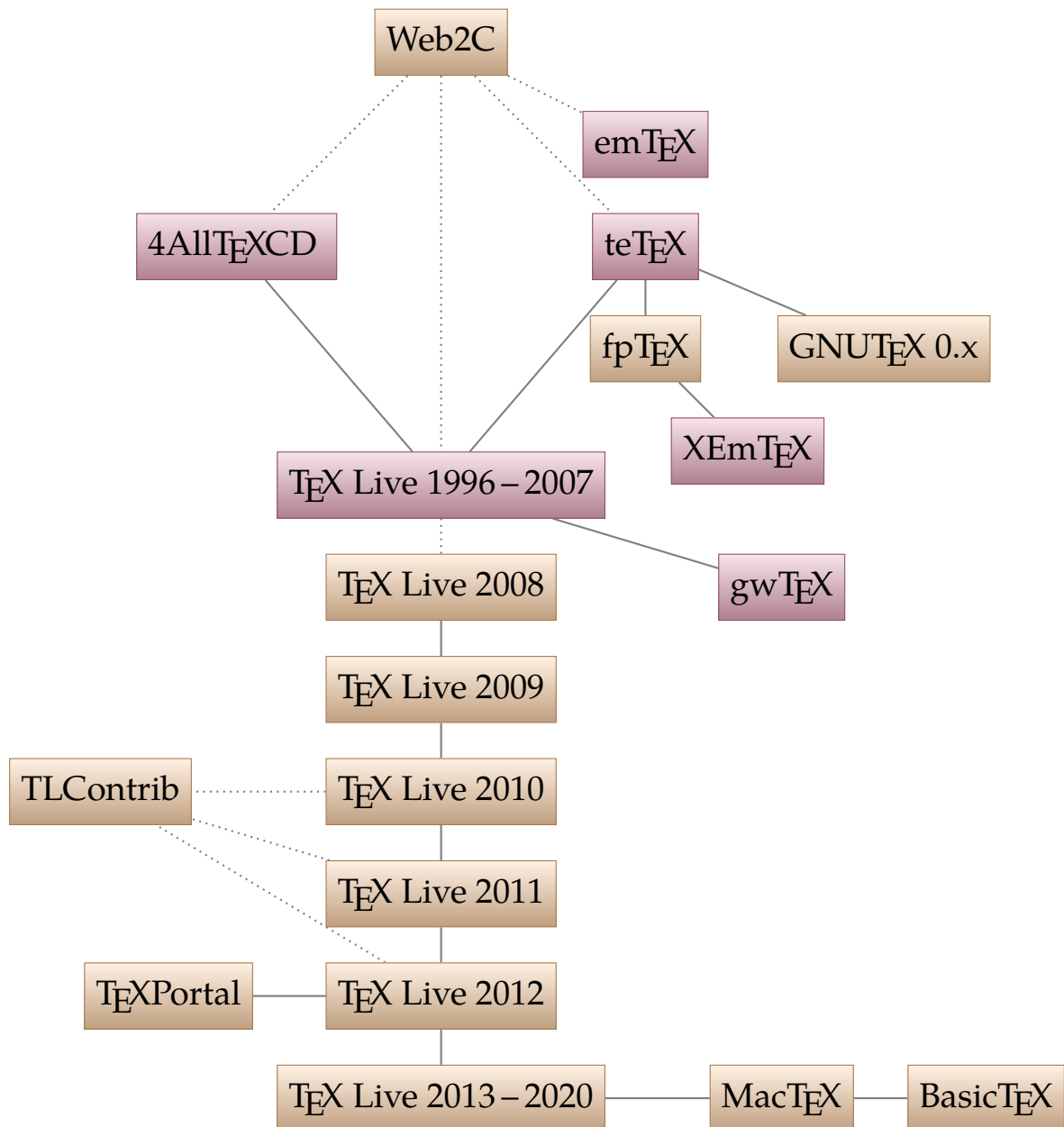
YT_EX



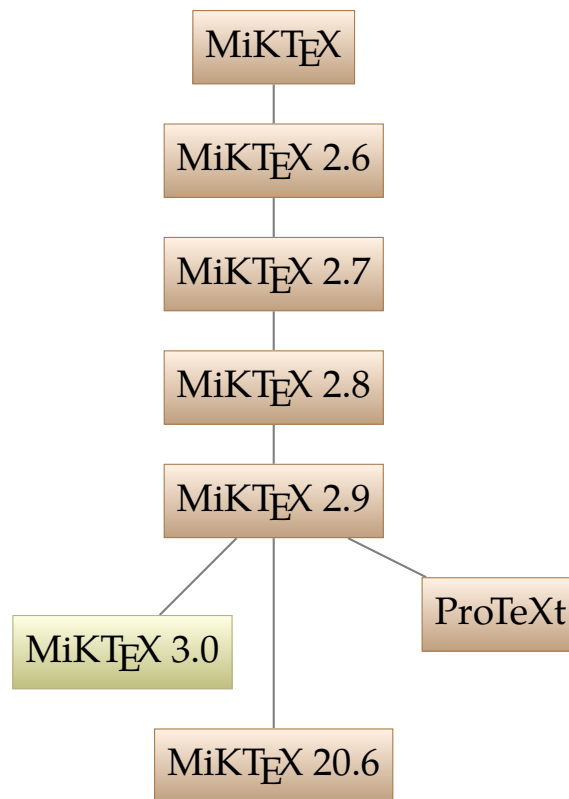
11. Distributions

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.

11.1. T_EX Live



11.2. MiKTeX



11.3. T_EX collection

T_EX Collection

11.4. standalone ConT_EXt

Standalone

11.5. Decus T_EX

Decus T_EX

11.6. KerT_EX

KerT_EX

11.7. W32T_EX

W32T_EX

11.8. OzTeX

OzTeX

11.9. For Amiga

Amiga-TeX

pasTeX

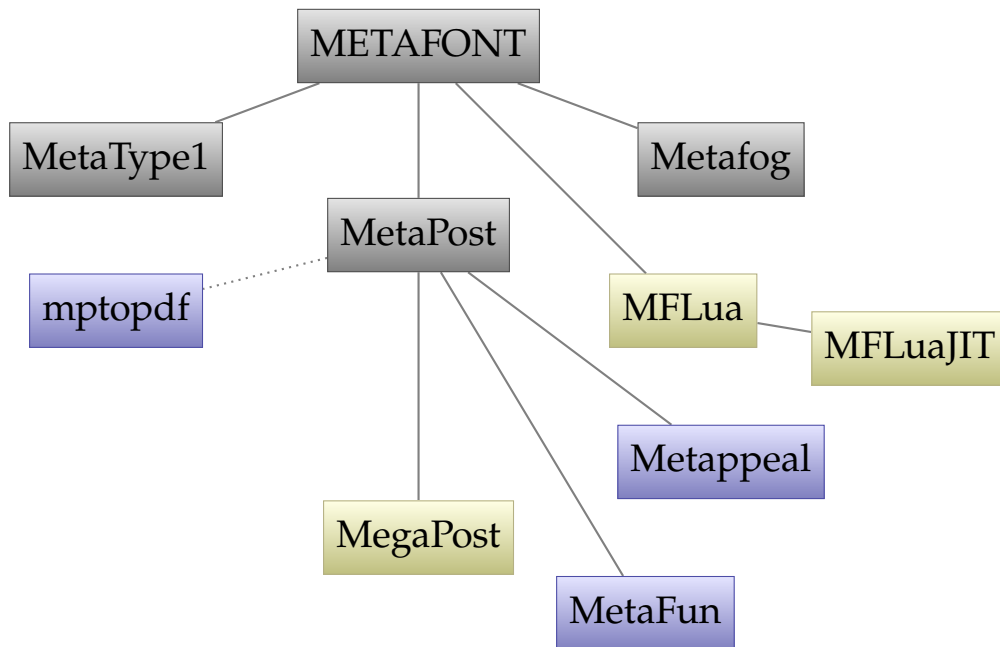
11.10. NTeX

NTeX

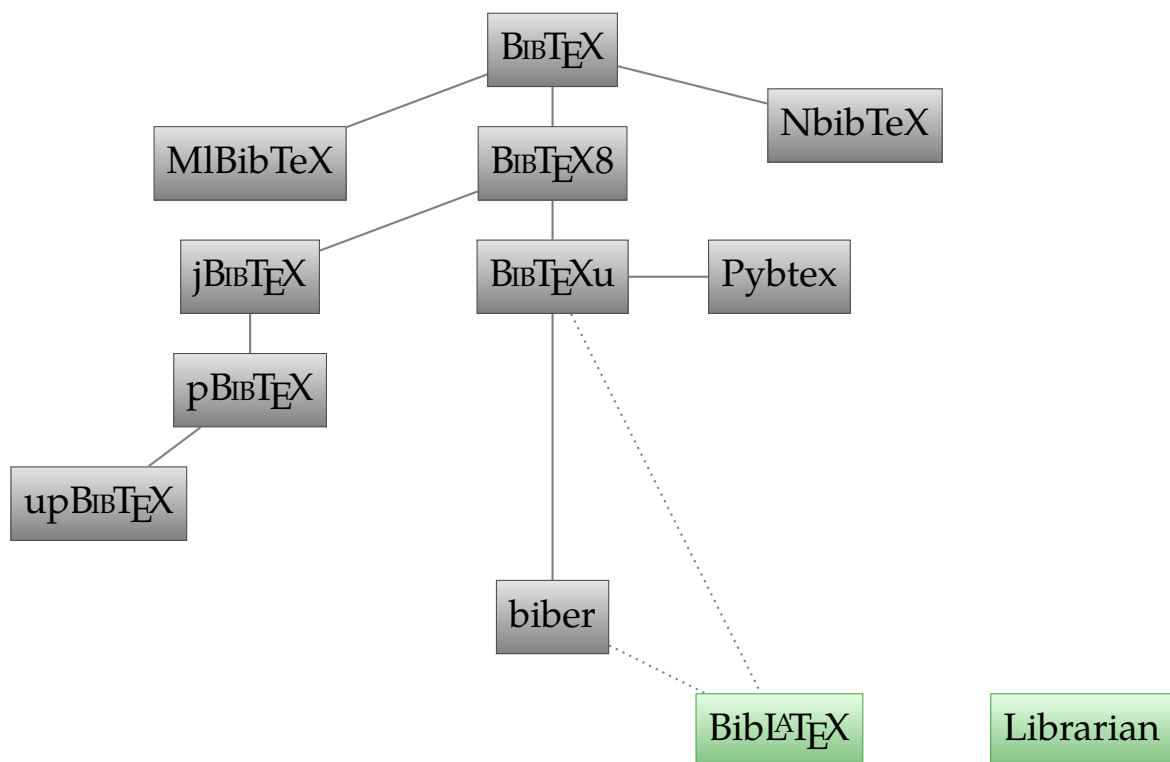
12. Pandora's Box

The following pages will be a hodge-podge of many things that are related to $\text{T}_{\text{E}}\text{X}$ 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!

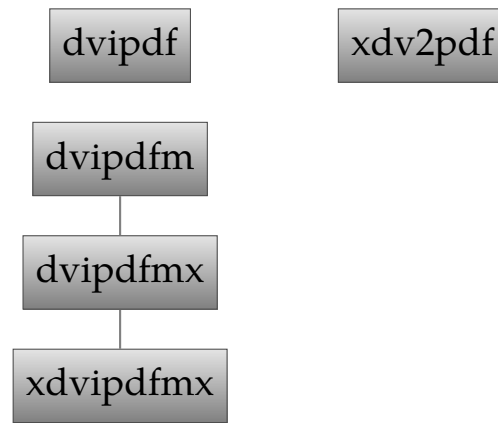
12.1. META*



12.2. Bib $\text{T}_{\text{E}}\text{X}$

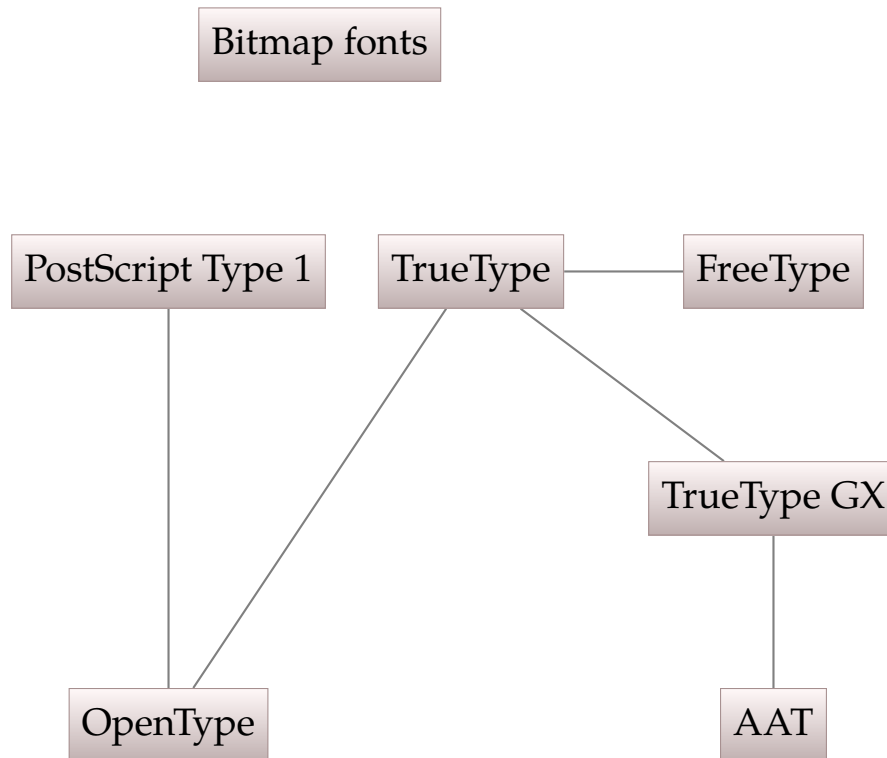


12.3. (x)dvipdf(m)(x)



12.4. Fonts

This section tries to cover the development of fonts – the most important thing for a typesetting system are font mechanisms, after all ...



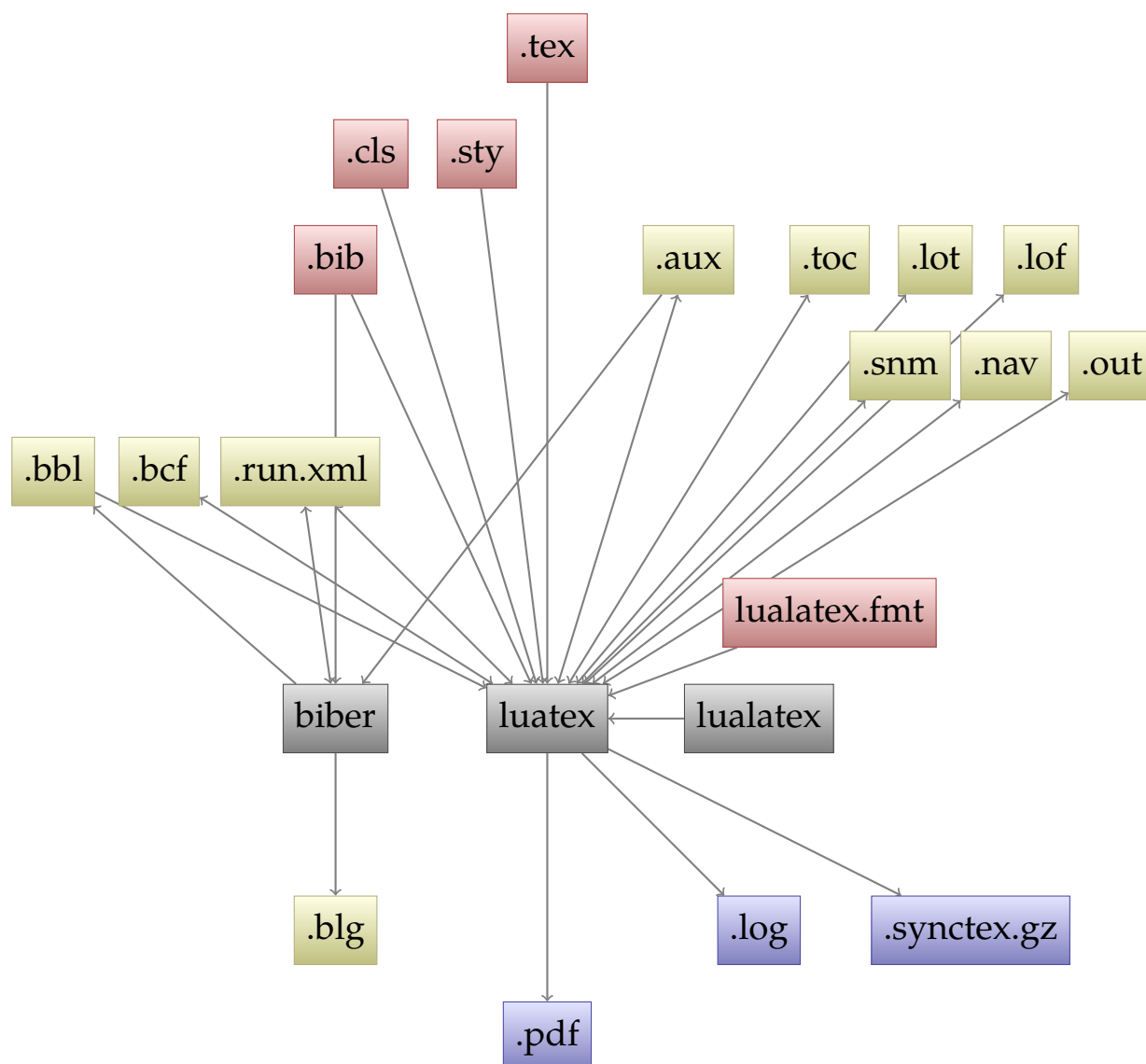
12.5. Work Flow – Under Construction!

This section tries to give a rough overview over the connection of different file types and how they are used by the different programs. We concentrate on the “modern” version of the programs, i. e. LuaTeX, biber etc. The graph so far shows:

- basic files used/produced in every LuaTeXrun,
- files used for complex documents with TOC, LOT and LOF,
- files and programs associated with bibliographies,
- files produced by the beamer class

A next version might show the files produced using TikZ and externalizing etc.
The preliminary nomenclature is:

necessary	necessary input files
temporary	temporary storage files: written in one run, read in the next one
additional	additional input files
automatic	automatically produced files
program	program that is used – editor, processing tool, viewer, ...



Part II.

Text Views

5. \TeX – the program

\TeX

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.

HeX

An experimental reimplementation of TeX in Haskell.

\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 \TeX

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

j \TeX

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

\TeX - \XeT

TeX–XeT was able to really put the glyphs on the right place in the DVI.

\TeX 3

Ability to handle 8-bit input. 1989. TeX development was frozen in 1991 and only bugfixes were made. Now in version 3.14159265 (published 01-2014), it gets closer to pi with every bugfix. Don Knuth wishes the version number to be pi when he dies.

p \TeX

Extension of Nihongo TeX to enable vertical typesetting. (“p” for “publishing”) Distributed as WEB change files. Primary author is D. E. Knuth, latest version (TeX Live 2020) is pTeX 3.14159265-p3.8.3.

enc \TeX

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

ML \TeX

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.

up \TeX

Unicode-aware version of pTeX – “Unicode-publishing”-TeX. Current version in TeX Live 2020 is 3.14159265-p3.8.3-u1.26.

Ω

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

ϵ - \TeX

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.

\TeX 2PDF

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

\mathcal{N}_{TS}

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

\TeX gX

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

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.

V_TE_X

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 is from February 15, 1999; VTeX 6.3; last official version seems to be from Oct 1, 2005; VTeX 8.61. Commercial product.

ε-p_TE_X

A merge of e-TeX with pTeX written by Hironori Kitagawa. Additional support for 256 math fonts, and some pdfTeX functionality. Latest Version (TeX Live 2020) is 3.14159265-p3.83-160201-2.6.

ε-up_TE_X

Merger of e-TeX and upTeX features. Current Version (TeX Live 2020) 3.14159265-p3.8.3-u1.26-191112-2.6.

ℵ (Aleph)

Originally named epsilon-Omega, an attempt to stabilize Omega while merging epsilon extensions. Authors are John Plaice and Yannis Haralambous, now maintained for severe bugfixes by Taco Hoekwater. Latest version number is 3.14159265-1.15-2.1-0.1.

pdf_TE_X

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.

εχ_TE_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(ε)-_TE_X

Merging the pdfTeX engine with the eTeX-extensions. This engine can produce DVI (with or without the eTeX-extensions) as well as PDF (again, with or without extensions). Current Version number 3.14159265-2.6-1.40.21.

X_TE_X

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, AAT, TrueType and Graphite-fonts (via the operation system), using Harfbuzz. In contrary to pdfTeX or LuaTeX, no external configuration file is needed to use fonts. Since version 3.1415926-2.2-0.9997.4, code from pdf(e)TeX for margin kerning has been added. Latest version number is 3.14159265-2.6-0.999992. XeTeX version numbers will converge to 1.

ee_TE_X

Experimental extension to pdfTeX by Taco Hoekwater, created 2000. Distributed as change file. Now dead due to his development of LuaTeX.

Lua

A script language; has nothing to do with TeX.

Lua_TE_X

LuaTeX supports utf8, OpenType and many more things. TeX Live 2020 ships version 1.20. LuaTeX features an embedded scripting language, Lua, making it easy to extend and to change the TeX interna, so most of the programming can be done in Lua instead of TeX-hackery.

Harf_TE_X

“HarfTeX is a TeX engine based on LuaTeX, extending it with HarfBuzz, ICU and possibly other libraries for Unicode text layout and modern fonts support.” according to TUG Development Fund Grant 32. Superseded by LuaHBTeX)

LuaJIT

A just-in-time compiler for Lua.

LuaJIT_TE_X

LuaJITTeX is a LuaTeX based on LuaJIT.

LuaHB_TE_X

LuahbTeX is a LuaTeX including harfbuzz for glyph shaping.)

Lua^jitH^BT_EX

Combines both LuaTeX variants.)

LuaMETAT_EX

LuaMETAT_EX is a “minimalistic” LuaTeX; identifying itself as LuaTeX 2.0 according to Hans Hagen’s article in TugBoat 40.1)

i_ET_EX

iTeX is the official successor of TeX3, announced by Don Knuth at the TUG conference 2010. (It was a joke, ok.) Not to be confused with William Cheswick’s application for the iPad.

6. ini_ET_EX, Vir_ET_EX, et al.

ini_ET_EX

The program TeX without preloaded format (“initial TeX”), intended for format creation. (Format dump possible.)

Vir_ET_EX

The program TeX without preloaded format (“virgin TeX”), intended for production use. (Format dump not possible.) No longer part of TeX Live.

T_EX

In this special context, TeX means the program with the plain format preloaded. (Format dump not possible.)

iniMETA^FONT

The program metafont without preloaded format (“initial metafont”), intended for format creation. (Format dump possible.)

VirMETA^FONT

The program metafont without preloaded format (“virgin metafont”), intended for production use. (Format dump not possible.) No (longer?) part of TeX Live.

META^FONT

In this special context, mf means the program with the plain format preloaded. (Format dump not possible.)

7. plain_ET_EX – the first format

plain_ET_EX

The basic format offered by Don Knuth to provide a minimal set of macros to work with.

ec-plain

A plainTeX using EC fonts. Latest changes in May 2002 for pdfTeX.

csplain

A plainTeX using cs-fonts.

Eplain

Extensions of plainTeX to provide often-used utilities. Not thought for document preparation as LaTeX is; you can use it as a standalone format or as extension to a given format. First version that is still available is 2.1 from 1992. Latest version 3.5 is from 2013-02-13.

8. L^AT_EX – Lamport’s T_EX format

L^AT_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.

L^AT_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.

L^AT_EX 0.92

First version with the @ as letter for internal names. Seemingly first version with a manual. For use with TeX Version 0.999999. (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.

L^AT_EX 0.92 - 1.0

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

L^AT_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 versions 1.x

L^AT_EX 2.05

No sure information found so far.

L^AT_EX 2.06a

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

L^AT_EX 2.09

The first official version by Leslie Lamport, 1985.

SL_AT_EX

A variation of LaTeX 2.09 to provide an easy way for producing presentations. In LaTeX 2e absorbed as a documentclass (slides).

A_MS_LA_TE_X 1.1

A port of Spivak's AMS-TeX to LaTeX 2.09 by Frank Mittelbach and Rainer Schöpf, released 1990.

L^AT_EX 2_ε

June 1994, New release of LaTeX to avoid incompatible dialects of LaTeX 2.09. Introduced by the LaTeX3-Team. This is the latest stable version of LaTeX at the moment. Support for pdfTeX, XeTeX and LuaTeX is given, where small changes allow for the special abilities of the engines. Most adaptation to the engines is done on package level (fonts, encodings etc.) or with additional files during format creation.

Λ

A LaTeX based format for the omega engine.

Lamed

A LaTeX based format for the aleph engine.

A_MS_LA_TE_X 1.2

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

A_LL_AT_EX

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.

A_MS_LA_TE_X 2.2

Latest AMSLaTeX version is 2.2 from 2001. Intermediate versions are not shown.

p_LA_TE_X

A LaTeX based format for the pTeX engine.

expl3

The expl3 bundle is the ground stock of LaTeX3. It is a bundle of packages that can be used with LaTeX2e, but are planned to become the kernel of LaTeX3. They provide the low-level structures, programming structures and everything needed for package authors.

xpackages

The xpackages are a bundle of packages intended to become the ground stock of packages for the high-level and user-level interface in LaTeX3. Based on expl3, they can be used with LaTeX2e already.

L^AT_EX 2_x

A (somewhat) planned experimental step towards LaTeX3. LaTeX2x is a normal LaTeX2e, but with expl3 and xpackages compiled in the format. It is **not** intended for everyday use but only for experimenting with LaTeX3. Might be concentrated on LuaTeX, but XeTeX and pdfTeX variants will be available.

L^AT_EX2.2

Inofficial suggestion by Philipp Stephani on the LuaLaTeX list. LaTeX2.2 should still be a full LaTeX2e, but with the expl3 bundle in the format. In fact, this is what LaTeX2x is planned to be.

L^AT_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 ;))

L^AT_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 implementation 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 adaptations of LuaTeX features are starting to evolve.

timesL^AT_EX

Some LaTeX 2.09 derivate, need more information.

9. ConT_EXt: con tex t – text with tex

INRST_EX

“Extended Plain TeX for use with MLTeX.”

pragmatex

Former name of ConT_EXt. Based, besides others, on INRST_EX.

ConT_EXt MKI

Original ConT_EXt with Dutch low level interface. “MK” stands for “Mark”, meaning “version”.

ConT_EXt MKII

ConT_EXt with English low level interface. Works with any TeX-engine, as LaTeX does; TeX, e-TeX, pdfTeX, Aleph, XeTeX, ... For the end user, no difference to MKI.

ConT_EXt MKIV

Specially designed for LuaTeX. MKIII was “skipped” for “practical reasons”, as Hans Hagens says, and “MKii, MKvi, MKvi all have 4 chars (which is why I skipped the v, but who knows if MKv will show up some day”)

ConT_EXt LMTX

Based on LuaMetaTeX.

ConT_EXt MKVI

Latest experimental version of ConT_EXt.

ConT_EXt MKIX

Special variant of MkIV.

ConT_EXt MKXI

Special variant of MkIV.

10. Other Formats

10.1. AMS-T_EX

A_MS-T_EX2.0

A macro package provided by the American Mathematical Society. Version 2.0 from 1990. No information found for versions pre-2.0.

L_AM_S-T_EX2.0

“LamSTeX is an extension of AmSTeX, and thus almost completely compatible with plain TeX”, as the documentation says. See references for details.

A_MS-T_EX2.1

Version 2.1 released 1991.

$\mathcal{A}_M\mathcal{S}\text{-T}_E\text{X}2.2$

Latest version is 2.2 from 2001.

10.2. BLUe

BLUe

A macro package based on plainTeX. Shareware, last version on CTAN from June 1996.

10.3. HPT E_X

HP T_EX

A format specially written for HP hardware, written 1984.

10.4. Jade T_EX

Jade T_EX

A macro package for processing Jade/OpenJade output, based on LaTeX.

10.5. Lollipop

Lollipop 0.9

First release, October 1992.

Lollipop 0.95

Latest, unofficial, release, January 1993.

Lollipop 0.98

Resurrection of this old format, now by Victor Eijkhout and Vafa Khalighi. Put to CTAN on 04.09.2014.

10.6. Macro T_EX

Macro T_EX

Information needed.

10.7. MeX

MeX

Polish-based format based on PlainTeX. Different versions exist called mex, pdfmex, htmex and utf8mex. All are based on pdfTeX. Contained in TeX Live.

10.8. OpTeX

OpTeX

OpTeX: the LuaTeX format based on Plain TeX and OPmac. On CTAN and contained in TeX Live.

10.9. PHYS(E)

PHYS(E)

Documentation says “The TeX formats PHYSE and PHYS are extensions of the PLAIN format and should simplify the writing of physics papers.” Latest version I found is from 1986. PHYS is for german, PHYSE for english usage.

10.10. PHYZZX

PHYZZX

Documentation says “PHYZZX is a macropackage which is designed to make typing papers destined for Physical Review or Nuclear Physics as simple as possible.” Created 1984, latest version I found is from 1988.

10.11. Star T_EX – Starter’s T_EX

Star T_EX

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

10.12. Texinfo

Texinfo

The official documentation format of the GNU project. Uses TeX to provide documentations.

10.13. T_EX sis

T_EX sis

A plainTeX-based format for physicists. Latest version is 2.18 from 21 April 2001.

10.14. XML_{TeX}

XML_{TeX}

A format (based on machines like pdf_{TeX}, Xe_{TeX} and maybe Lua_{TeX}) that converts XML input to DVI or PDF output. Can also be based on other formats when parsed at format-building time.

10.15. Y_{TeX}

Y_{TeX}

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.

10.16. Zz_{TeX}

Zz_{TeX}

“a macro package for producing books, journals, and technical documentation”, named “after a rock group from Texas.” The author Paul C. Anagnostopoulos found LaTeX too unflexible. Appeared around 1992.

11. Distributions

11.1. T_{EX} Live

Web2C

An Implementation and Distribution of T_{EX} which translates the original WEB sources to a C code.

em_{TeX}

Eberhard Mattes’ T_{EX} Distribution for MS-DOS and OS2.

te_{TeX}

Maintained by Thomas Esser (hence the te in te_{TeX}) from 1994 to May 2006.

4All_{TeX}CD

The (vague) past ... (?)

fp_{TeX}

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

GNUT_{EX} 0.x

A temporary attempt to distribute T_{EX} and related programs according to the GPL. Not a change of te_{TeX}, but a new approach inspired by te_{TeX}. As most (La)_{TeX} packages are not GPL compatible, it was quite “crippled” and never made it into the real world.

XEm_{TeX}

A T_{EX} distribution for Windows, based on fp_{TeX} with XEmacs/Auc_{TeX} as IDE for (La)_{TeX}. XEm-_{TeX} was sponsored by the French government.

T_{EX} Live 1996 – 2007

First version 1996 (UNIX only, later also Windows binaries), and then a long story of ongoing work – see the documentation for a detailed history. Some of the binaries (still) identify themselves as *_{TeX}k. The “k” stands for “Karl” meaning that they were compiled with kpathsea.

T_{EX} Live 2008

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 one of the modern machines is added, Lua_{TeX}

gw_{TeX}

A (re)distribution for Mac OS based on T_{EX} Live (earlier on te_{TeX}) by Gerben Wierda. Provides T_{EX}-related packages for the i-Installer. Unsupported from 2007 on.

T_{EX} Live 2009

Dropped Omega and Lambda. Aleph and Lamed are kept.

T_{EX} Live 2010

Release of 2010.

TLContrib

An extension to TeX Live that contains packages that TeX Live cannot hold due to not-free license, binary update, not on CTAN, or intermediate release. Useable via the TeX Live manager. Latest version can handle several TL sources.

TeX Live 2011

2011 release of TeX Live.

TeX Live 2012

Release of TeX Live for 2012.

TeXPortal

A TeX Live port for Android OS. Based on binaries from the TeXAndroid project; not all binaries are available at the moment.

TeX Live 2013 – 2020

Ongoing yearly releases for 2013 to 2020, without dramatic changes.

MacTeX

Once based on teTeX, MacTeX is now TeX Live-based. For Mac OS X only, it provides a native installer, the TeXShop editor and Mac-specific tools.

BasicTeX

“BasicTeX is a subset of TeX Live of size 100 megabytes instead of 2 gigabytes.”

11.2. MiKTeX

MiKTeX

MiKTeX is a TeX distribution originally for Windows only. Copyright by Christian Schenk goes back to 2001. Regarding the name, the author stated “mik used to be my login name. It is an acronym for Micro-kid. Hence the capital K in MiKTeX.”

MiKTeX 2.6

Windows only. featuring pdftex 1.40.4, mpost 1.000

MiKTeX 2.7

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

MiKTeX 2.8

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

MiKTeX 2.9

Now available for Windows, Linux, Mac, and Docker. Featuring pdftex 1.40.21, LuaTeX 1.12.0. Offers both LaTeX and ConTeXt (MK IV) formats.

ProTeXt

A distribution based on MiKTeX (since 2004) with a comfortable install procedure, Editor etc. Provides an easy installation for a full (La)TeX environment.

MiKTeX 3.0

Planned version, no fixed release date yet.

MiKTeX 20.6

Naming scheme was changed in July 2020 to follow a “YY.M[.D]” scheme.

11.3. TeX collection

TeX Collection

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

11.4. standalone ConTeXt

Standalone

standalone ConTeXt provides a distribution of latest (beta and stable) ConTeXt versions with binaries and formats. Efficient upgrading is possible as well as parallel use with another TeX distribution. Was renamed from “minimals” into standalone in 2011.

11.5. Decus T_EX

Decus T_EX

A TeX/LaTeX distribution for VMS. Started at least in 1988.

11.6. KerT_EX

KerT_EX

A lightweight TeX distribution including all of Don Knuth's programs and fonts, dvips, MetaPost, bibtex and more. It is pure C89 and under a BSD like license. Latest version 0.9999.8.2.

11.7. W32T_EX

W32T_EX

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

11.8. OzT_EX

OzT_EX

A commercial distribution for Mac OS. No longer supported.

11.9. 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 (Metafont). Available from the Aminet.

11.10. NT_EX

NT_EX

A distribution for Linux and other Unix systems. Latest version is 2.3.2, released at 23-Aug-1998. No longer developed.

12. Pandora's Box

12.1. 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 written by John Hobby, inspired by METAFONT. MetaPost can produce PostScript graphics as well as SVG. Latest (experimental) version is 1.750 as of spring 2011.

mptopdf

Actually a pdfTeX-generated format, this program can be used to compile MetaPost source code directly into PDF output. Metafun is supported, too.

MFLua

A (so far) experimental implementation of METAFONT with Lua embedded for better extraction of information from METAFONT. TeX Live 2016 ships version 2.7182818-0.5.

MFLuaJIT

As MFLua, but based on LuaJIT.

Metappeal

"Metappeal is an extension to Plain MetaPost, providing a lightweight framework for consistent development in MetaPost."

MegaPost

A planned extension of MetaPost "that will extend the range and precision of the internal data types."

MetaFun

“MetaFun is Hans Hagen’s extension to (or module for) the MetaPost language.” A format for MetaPost that is useable with ConTeXt.

12.2. BibTeX

BibTeX

A helper program to sort a bibliography list.

NbibTeX

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

BibTeX8

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

MLBibTeX

Mentioned in the kpathsea-manual. No idea what it is. BibTeX for MLTeX?

BibTeXu

A Unicode-aware version of BibTeX

jBibTeX

jBibTeX was developed by Shoichi Matsui around 1988. It is included in the pTeX distribution since 1995.

Pybtex

A python implementation of BibTeX.

pBibTeX

Kind of a successor of jBibTeX, pBibTeX is a Japanese-aware version of BibTeX supporting Japanese bibliography lists. Special support for Japanese (input/output) encodings and punctuation.

upBibTeX

Can be found in the development repositories, but no documentation found.

biber

A perl implementation of a BibTeX-like program, designed as backend for BibLaTeX. “biber” is an animal handling bibliographies. (german for “beaver”, hence the beaver in the biber logo) TeX Live 2016 ships version 2.5.

BibLaTeX

A LaTeX package as frontend for biber (can also be used with BibTeXu/8).

Librarian

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

12.3. (x)dvipdf(m)(x)

dvipdf

A shellscript from Ghostscript that uses dvips and gs for conversion.

xdv2pdf

No idea so far what this is, but it is mentioned in the fontspec manual as possible driver for XeTeX.

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.

12.4. Fonts

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 arbitrarily large without getting pixelated.

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 Typography” fonts are successors of the GX fonts. Only available for Mac OS, too.

12.5. Work Flow – Under Construction!

.tex

The .tex file. A plain text file that typically contains all of the document information.

.sty

Style files contain additional code with arbitrary functionality. There are at least zillions of .sty files.

.cls

Every LaTeX document has to load one class file, containing the basic layout.

.bib

The .bib file contains information about the bibliography.

.aux

Every LaTeX run will produce an aux file that stores information for the next run.

.toc

If a table of contents is used, the necessary information are stored here.

.lot

If a list of figures is used, the necessary information are stored here.

.lof

If a list of tables is used, the necessary information are stored here.

.snm

Help file used by beamer.

.nav

Help file used by beamer.

.out

Help file used by beamer.

.run.xml

Temp file produced by the biblatex package to store information for bibliography settings.

.bcf

Temp file produced by the biblatex package to store information for bibliography settings.

.bbl

File with the formatted and sorted bib entries.

lualatex.fmt

Pre-compiled format file (containing the code that makes LaTeX LaTeX and adaptations to LuaTeX) that is loaded in each run.

lualatex

Call on the script/binary lualatex starts LuaTeX.

luatex

The actual binary, using the format file.

biber

Processes the information in the .bib file according to settings in the .tex file that has been stored in the .aux file.

.log

Log file with information about the recent tex run.

.synctex.gz

SyncTeX file to synchronize between input file and pdf. Used by graphical editors to help navigation.

.blg

Log file produced by the biber run.

.pdf

The resulting, ready-compiled document is most often a PDF document. Production of DVI documents is also mostly possible, but seldom used.

13. Program Names

The following list tries to explain what happens if a program is called by a given name. E. g. calling the command `latex` on the command line will start the PDF ϵ -T \TeX engine² in DVI mode with the format $\text{\LaTeX}2_{\epsilon}$. This will list the names used in the *official* (upstream) T \TeX Live 2016 distribution, which should mostly (but not necessarily all) be the same in MiK \TeX .

²Actually it's only called PDFT \TeX now, but it is always the version that includes ϵ -T \TeX extensions. Here, always the full name is used for clearness.

Part III.

Appendix

A. References

The references are in order of occurrence in the above document. i. e. if you want information about Lua \TeX , it will be below e. g. $\epsilon\TeX$. Everything that is not listed as "book" is freely available on the internet. (TUGboat articles will become freely accessible about one year after publication.)

Books

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

Overview Articles / Pages

Arthur Reutenauer. *A Brief History of \TeX* . Talk at EuroBach \TeX 2007.

<http://www.gust.org.pl/bachotex/EuroBachTeX2007/presentations/bhot.pdf/view>

A Brief History of \LaTeX

<http://www.xent.com/FoRK-archive/feb98/0307.html>

Hans Hagen: *16 years of Con \TeX t*. Article in TUGboat Vol. 32, Number 1, 2011.

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>

The levels of \TeX – explains shortly the differences between engines, distributions, front ends etc.

<http://tug.org/levels.html>

Things with " \TeX " in the name – a page with a similar aim as this document, and many interesting links

<http://www.tex.ac.uk/cgi-bin/texfaq2html?label=textthings>

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>

HeX project page

<http://luispedro.org/software/hex>

Yasuki S AITO. Report on J \TeX : A Japanese \TeX . TUGboat 8 (1987), no. 2, 103–116.

<http://www.tug.org/TUGboat/Articles/tb08-2/tb18saito.pdf>

p \TeX page

<http://ascii.asciimw.jp/pb/ptex/>

pTeX sources and documentation

<http://www.ctan.org/pkg/ptex>

encTeX page

<http://www.olsak.net/encTex.html>

MLTeX on CTAN

<http://www.ctan.org/pkg/mltex>

pdfTeX project page

<http://tug.org/applications/pdftex/>

$\mathcal{N}\mathcal{T}\mathcal{S}$ project page

<http://nts.tug.org>

VTeX – official homepage of micropress-inc

<http://www.micropress-inc.com/>

X_YTeX project page

<http://tug.org/XeTeX/>

εXTeX project page

<http://www.extex.org>

eeTeX project page

<http://tex.aanhet.net/eetex>

LuaTeX project page

<http://www.luatex.org>

LuaJITTeX project page

<http://foundry.supelec.fr/gf/project/luajittex/>

iTeX—*Document formatting in an ereader world*. TUGboat 32 (2011), no. 2, 158–163.

iTeX announcement by Don Knuth at the TUG 2010

<http://river-valley.tv/tug-2010/an-earthshaking-announcement>

Formats

Eplain homepage

<http://www.tug.org/eplain/>

EC plain on CTAN

<http://www.ctan.org/pkg/ec-plain>

ℒTeX project page

<http://www.latex-project.org>

$\mathcal{A}\mathcal{M}\mathcal{S}\mathcal{L}\mathcal{T}\mathcal{E}\mathcal{X}$ on CTAN

<http://www.ctan.org/pkg/amslatex>

ℒTeX2.2 – mail from Philipp Stephani on LuaLaTeX-dev list (last paragraph)

<http://tug.org/pipermail/lualatex-dev/2011-January/001033.html>

ℒTeX3 project

<http://www.latex-project.org/latex3.html>

ConTeXt wiki

<http://wiki.contextgarden.net>

ConTeXt LMTX description

TUGboat, Volume40(2019), No. 1

ℒ^ATeX: Discussion in TUGboat Vol. 16 (1995), No. 3, p. 269ff.

<http://www.tug.org/TUGboat/Articles/tb16-3/tb48swif.pdf>

BLUe on CTAN

<http://www.ctan.org/pkg/blue>

$\mathcal{A}\mathcal{M}\mathcal{S}\mathcal{T}\mathcal{E}\mathcal{X}$ on CTAN

<http://www.ctan.org/pkg/amstex>

INRST $\mathcal{E}\mathcal{X}$ on CTAN

<http://www.ctan.org/pkg/inrstex>

L $\mathcal{A}\mathcal{M}\mathcal{S}\mathcal{T}\mathcal{E}\mathcal{X}$: Announcement of publication in $\mathcal{T}\mathcal{E}\mathcal{X}$ line13, ISSN 0961-3978

<https://www.ctan.org/tex-archive/info/digests/texline/no13>

HP $\mathcal{T}\mathcal{E}\mathcal{X}$ on CTAN

<http://www.ctan.org/tex-archive/macros/hptex>

Jade $\mathcal{T}\mathcal{E}\mathcal{X}$ project page

<http://jadetex.sourceforge.net>

PHYSE and PHYS on CTAN

<http://www.ctan.org/pkg/physe>

PHYZZX on CTAN

<http://www.ctan.org/pkg/phyzzx>

Star $\mathcal{T}\mathcal{E}\mathcal{X}$ on CTAN

<http://www.ctan.org/pkg/startex>

Texinfo project page

<http://www.gnu.org/software/texinfo>

$\mathcal{T}\mathcal{E}\mathcal{X}$ sis project page

<http://www.texsis.org>

XML $\mathcal{T}\mathcal{E}\mathcal{X}$ manual

<http://www.dcarlisle.demon.co.uk/xmltex/manual.html>

Y $\mathcal{T}\mathcal{E}\mathcal{X}$ on CTAN

<http://www.ctan.org/pkg/ytex>

Zz $\mathcal{T}\mathcal{E}\mathcal{X}$: Article in TUGboat 13 (1992), No. 4

<http://www.tug.org/TUGboat/tb13-4/tb37anag.pdf>

Distributions

fp $\mathcal{T}\mathcal{E}\mathcal{X}$: Announcement at TUG 1999

<http://www.tug.org/tug99/program/node39.html>

$\mathcal{T}\mathcal{E}\mathcal{X}$ Live development history

<http://tug.org/texlive/doc/texlive-en/texlive-en.html>

gw $\mathcal{T}\mathcal{E}\mathcal{X}$ project page

<http://ii2.sourceforge.net/tex-index.html>

Brief History of gw $\mathcal{T}\mathcal{E}\mathcal{X}$

<http://www.tug.org/twg/mactex/award/2007/gerben/aboutgwtex.html>

Frank Mittelbach: *Reflections on the history of the $\mathcal{L}\mathcal{T}\mathcal{E}\mathcal{X}$ Project Public License (LPPL)—A software license for $\mathcal{L}\mathcal{T}\mathcal{E}\mathcal{X}$ and more.* In: TUGboat Vol. 32 (2011) No. 1, p. 83 ff.

<http://www.tug.org/TUGboat/Contents/contents32-1.html>

TLContrib project page

<http://tlcontrib.metatex.org/>

Mac $\mathcal{T}\mathcal{E}\mathcal{X}$ project page

<http://www.tug.org/mactex>

$\mathcal{T}\mathcal{E}\mathcal{X}$ Portal project page

<https://github.com/anhoavu/TeXPortal>

$\mathcal{T}\mathcal{E}\mathcal{X}$ Android project page

<https://github.com/anhoavu/TeXAndroid>

MiK $\mathcal{T}\mathcal{E}\mathcal{X}$ project page

<http://miktex.org/>

Christian Schenk about the name of MiKTeX (mailing list archive)

http://sourceforge.net/mailarchive/message.php?msg_id=26826076

Christian Schenk about changing the MiKTeX release versioning (github issue)

<https://github.com/MiKTeX/miktex/issues/554>

ProT_EXt project page

<http://www.tug.org/protext>

T_EXCollection page

<http://www.tug.org/texcollection>

ConT_EXt minimalists on ConT_EXt garden wiki

http://wiki.contextgarden.net/ConTeXt_Minimalists

KerT_EX project page

<http://www.kergis.com/en/kertex.html>

Win32 project page

<http://w32tex.org/>

OzT_EX project page

<http://www.trevorrow.com/oztex>

T_EX on Amiga

http://serpens.de/~zza/amigafaq/AmigaFAQg_49.html

NT_EX project page

<http://www.langbein.org/software/ntex>

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

MetaPost developments in TUGboat Vol. 29 (2008), No. 3, p. 380ff.

<http://www.tug.org/TUGboat/Contents/contents29-3.html>

dvipdfmx project page

<http://project.ktug.or.kr/dvipdfmx/>

B. List of Contributors

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C. To do list

- (maybe) Add copyright and licence mark to each software.