An overview of TEX, its children and their friends …

Arno Trautmann
arno.trautmann@gmx.de

In the world of TEX, there are many developments and ambiguous names. This paper tries to give an overview of the development of TEX 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 icluding something related to TEX and are confused by the many different terms – at least I was, so mabye others are, too …

The base frame and main idea for this overview was taken from the article *A brief history of TEX, volume II* by Arthur Reutenauer in the proceedings of EuroBachoTEX 2007 and his talk there (see references on page 40). 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 LATEX 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 26.

[1] The latest source code of this document is availble 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!

Contents

1. The Difference Between Editor, Engine, Format, and Distribution 3
2. How to read this document 4
3. How to contribute 4
4. Problems with PDF viewers 5

I. Tree Views 6
5. TEX 8
6. iniTEX et al. 9
7. plainTEX 9
8. LATEX 11
9. ConTEXt 13
10. Other Formats 14
- 10.1. AMS-TEX . . . 14
- 10.2. BLUe . . . 14
- 10.3. HPTEX . . . 14
- 10.4. JadeTEX . . . 14
- 10.5. Lollipop . . . 14
- 10.6. MacroTEX . . . 14
- 10.7. MeX . . . 15
- 10.8. PHYS(E) . . . 15
- 10.9. PHYZZX . . . 15
- 10.10. StarTEX . . . 15
- 10.11. Texinfo . . . 15
- 10.12. TeXsis . . . 15
- 10.13. XMLTEX . . . 15
- 10.14. YTEX . . . 15
- 10.15. ZzTEX . . . 15

11. Distributions 16
- 11.1. TEX Live . . . 16
- 11.2. MiKTEX . . . 17
- 11.3. TEX collection . . . 17
- 11.4. standalone ConTEXt . . . 17
- 11.5. Decus TEX . . . 17
- 11.6. KerTEX . . . 17
- 11.7. W32TEX . . . 17
- 11.8. OzTeX . . . 18
- 11.9. For Amiga . . . 18
- 11.10. NTEX . . . 18

12. Pandora's Box 19
- 12.1. META* . . . 20
- 12.2. BibTEX . . . 21
- 12.3. (x)dvipdf(m)(x) . . . 21
- 12.4. Fonts . . . 22
- 12.5. Work Flow . . . 23

13. Program Names

II. Text Views 25
5. TEX 26
6. iniTEX et al. 28
7. plainTEX 28
8. LATEX 28
9. ConTEXt 30
10. Other Formats 30
- 10.1. AMS-TEX . . . 30
- 10.2. BLUe . . . 30
- 10.3. HPTEX . . . 30
- 10.4. JadeTEX . . . 30
- 10.5. Lollipop . . . 30
- 10.6. MacroTEX . . . 31
- 10.7. MeX . . . 31
- 10.8. PHYS(E) . . . 31
- 10.9. PHYZZX . . . 31
- 10.10. StarTEX . . . 31
- 10.11. Texinfo . . . 31
- 10.12. TeXsis . . . 31
- 10.13. XMLTEX . . . 31
- 10.14. YTEX . . . 31
- 10.15. ZzTEX . . . 31

11. Distributions 31
- 11.1. TEX Live . . . 31
- 11.2. MiKTEX . . . 32
- 11.3. TEX collection . . . 33
- 11.4. standalone ConTEXt . . . 33
- 11.5. Decus TEX . . . 33
- 11.6. KerTEX . . . 33
- 11.7. W32TEX . . . 33
- 11.8. OzTeX . . . 33
- 11.9. For Amiga . . . 33
- 11.10. NTEX . . . 33

12. Pandora's Box 33
- 12.1. META* . . . 33
- 12.2. BibTEX . . . 34
- 12.3. (x)dvipdf(m)(x) . . . 35
- 12.4. Fonts . . . 35
- 12.5. Work Flow . . . 35

13. Program Names 37

III. Appendix 39
A. References 40
B. List of Contributors 44
C. To do list 44

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 pdfTEX, while LuaTEX 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 LATEX, ConTEXt and plainTEX. 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 LATEX, *modules* for ConTEXt, and many external programs have proven useful for the work with TEX. Distributions such as TEX Live and MiKTEX 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 TEX. 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 LATEX-packages or single TEX-files (useable as packages or modules) that seemed worth mentioning. There won't be many of this; just some that might elsewise be confused for something else.

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

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

program Programs that are not directly connected to TEX (but interesting in the context of using TEX) 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 …TEX and …TEX?", "Why is it called …?" etc.

To get to this point, I need some help of people who know more about the TEX 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 shows 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 experince 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)

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

okular 0.25.0 As TEXworks, 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.

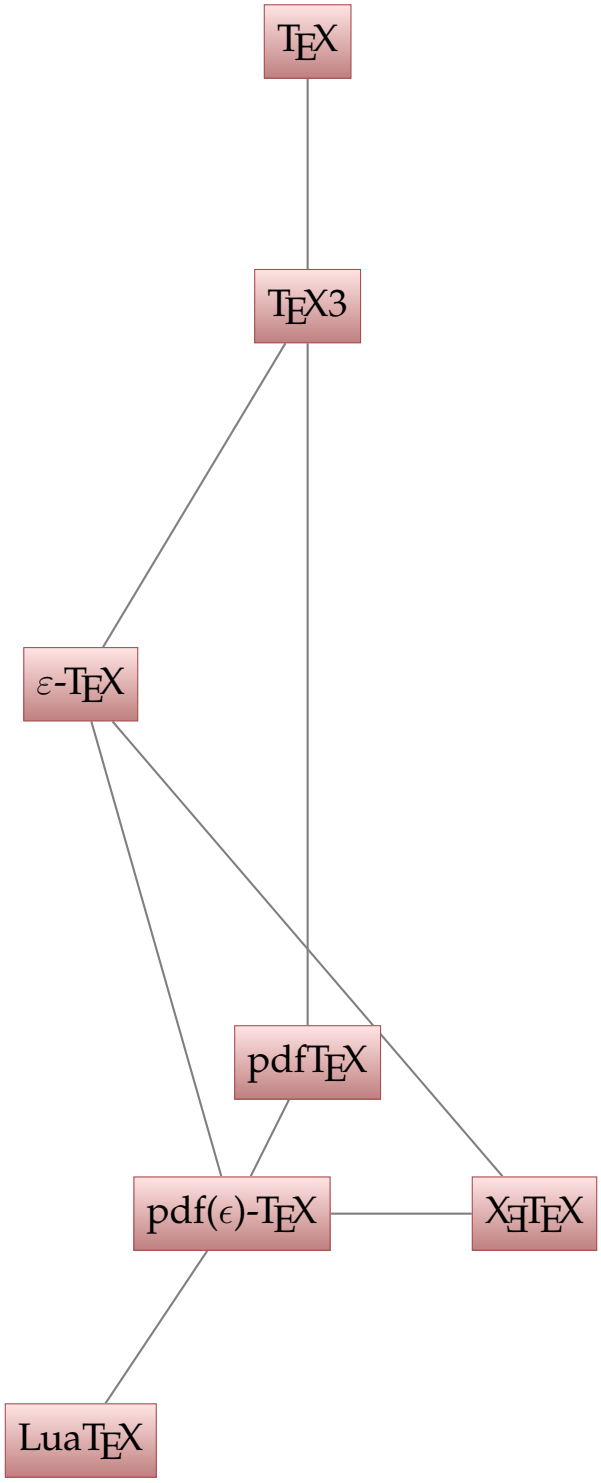
About this document

This document is typeset in the TEX Gyre Pagella font using the LuaLATEX 2_ε format with `expl3` and `xpackages` based on LuaTEX 0.95.0.

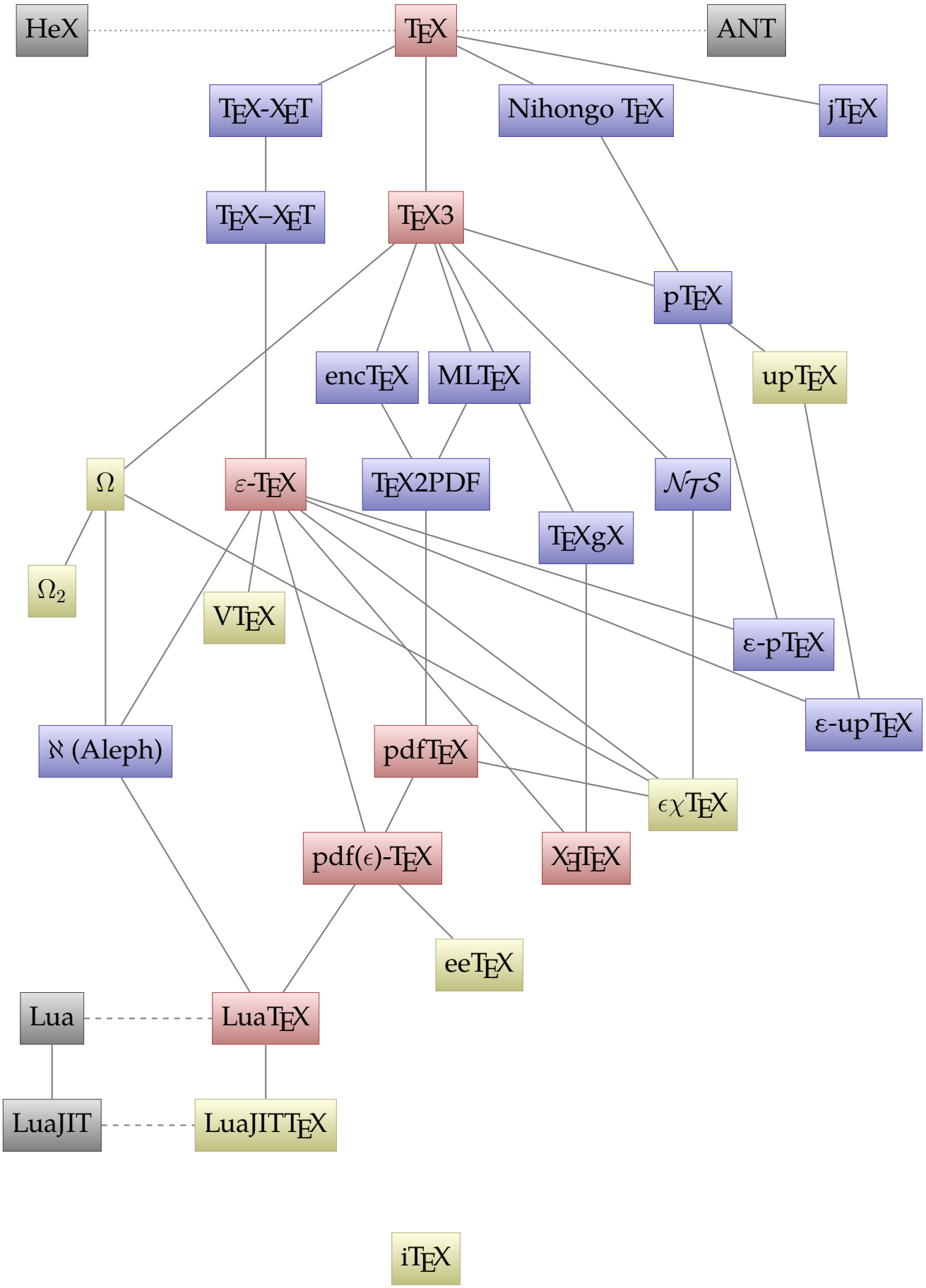
In case you wonder why the typesetting is so ugly, especially the margins: Those are chosen to be small so that much text fits on one page which in this case increases the overview. I do not expect anybody to ever print this document, therefore I ignore the need of margins. In the tooltips, you will 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. TEX – the program short view

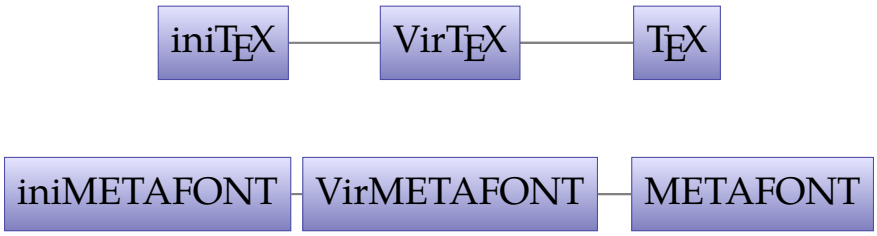


5. TEX – the program



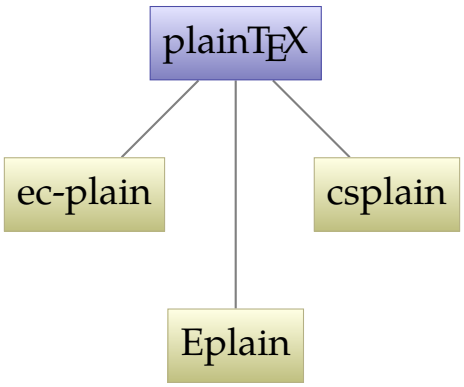
The chronological order may not be exact in this graph. I had to work hard on the arrangement to show both chronological order and code dependence, and for now only the code dependence is (should be) correct.

6. iniTEX, VirTEX, et al.

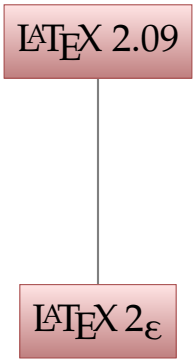


All other engines have the same functionality, but no special names given: |luatex –ini| is the INITEX version of LuaTEX etc.

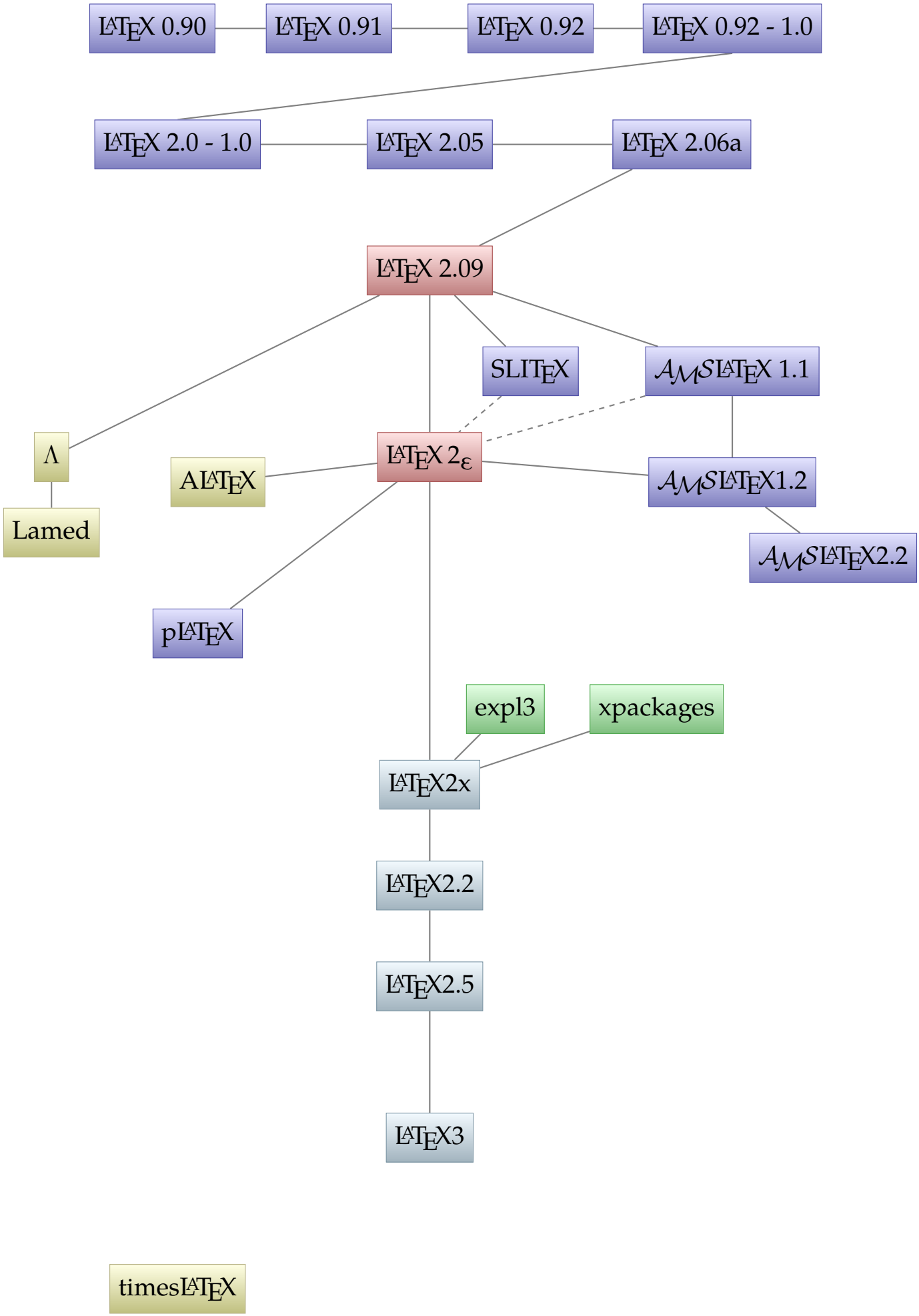
7. plainTEX – the first format



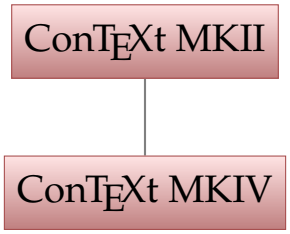
8. LaTeX – Lamport's TeX format short view



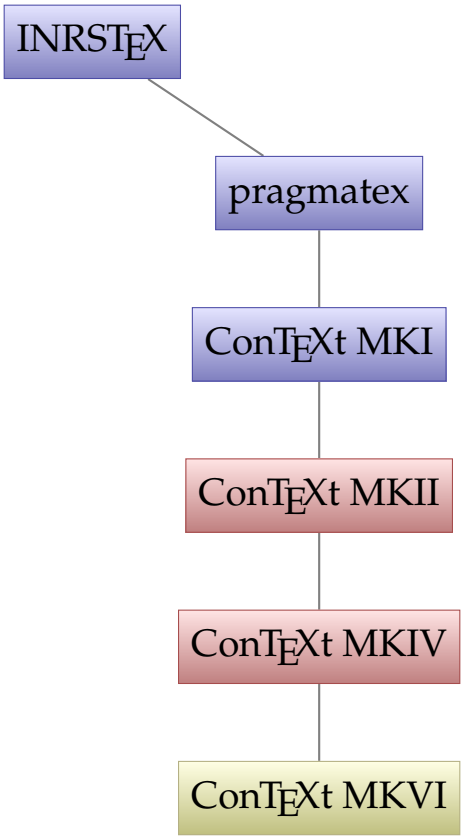
8. LaTeX – Lamport's TeX format



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

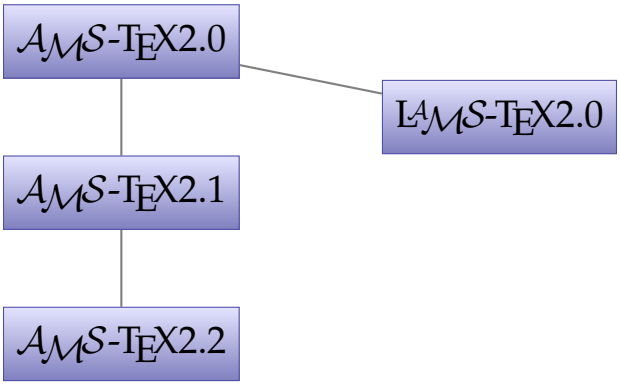


9. ConTEXt: con tex t – text with tex



10. Other Formats

10.1. AMS-TEX

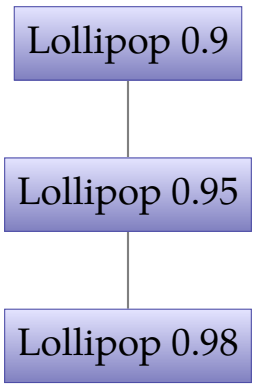


10.2. BLUe

10.3. HPTEX

10.4. JadeTEX

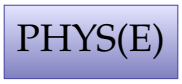
10.5. Lollipop



10.6. MacroTEX

10.7. MeX

10.8. PHYS(E)



10.9. PHYZZX

10.10. StarTEX – Starter's TEX

10.11. Texinfo

10.12. TEXsis

10.13. XMLTEX

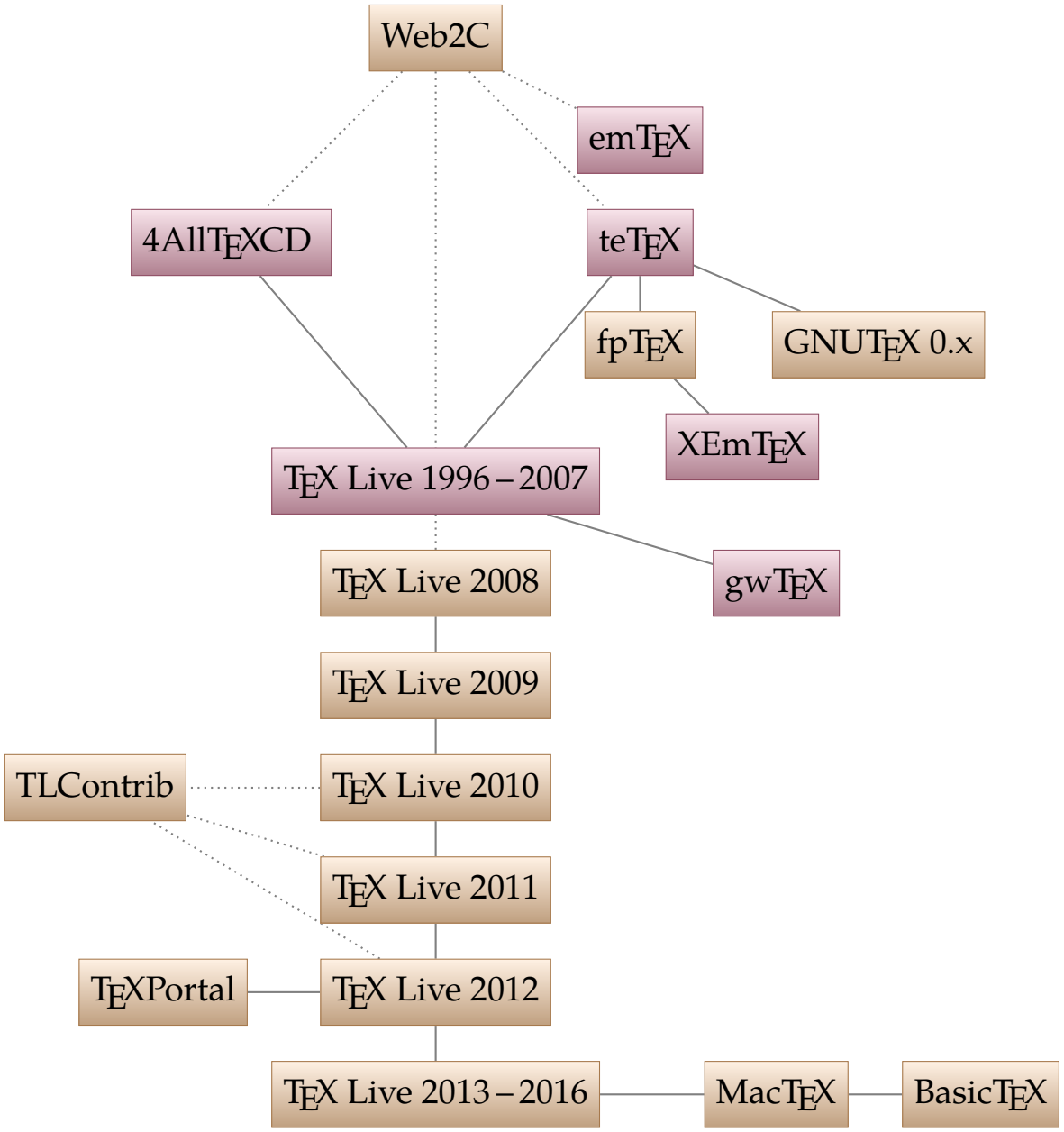
10.14. YTEX

10.15. ZzTEX

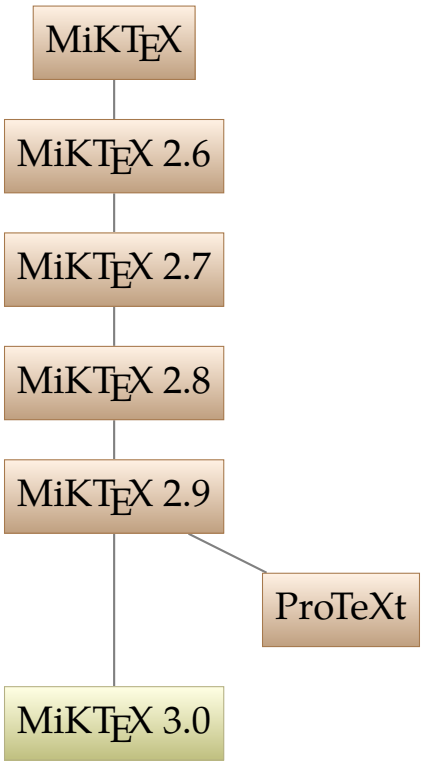
11. Distributions

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

11.1. TEX Live



11.2. MiKTEX



11.3. TEX collection

11.4. standalone ConTEXt

11.5. Decus TEX

11.6. KerTEX

11.7. W32TEX

11.8. OzTeX

OzTeX

11.9. For Amiga

Amiga-TeX pasTeX

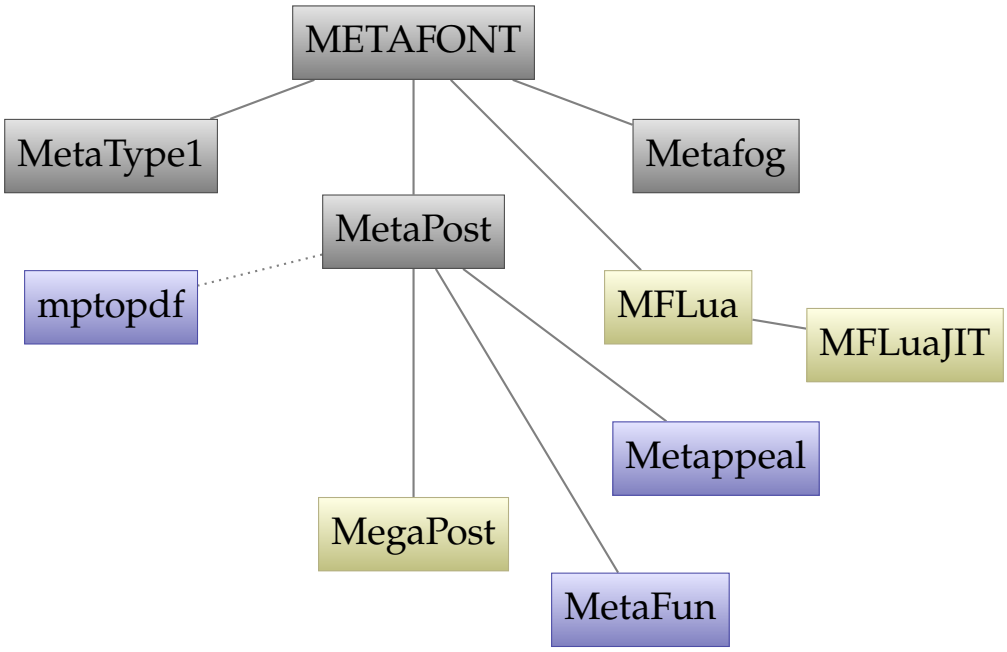
11.10. NTeX

NTeX

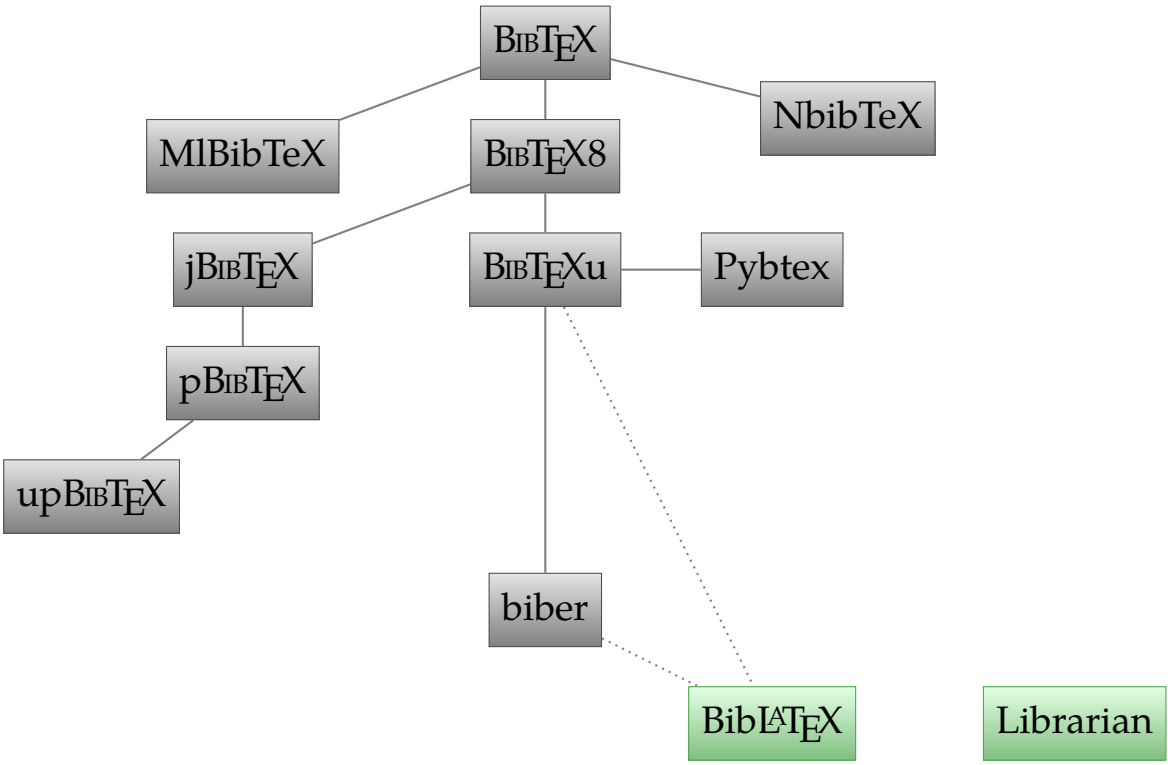
12. Pandora's Box

The following pages will be a hodge-podge of many things that are related to TEX 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!

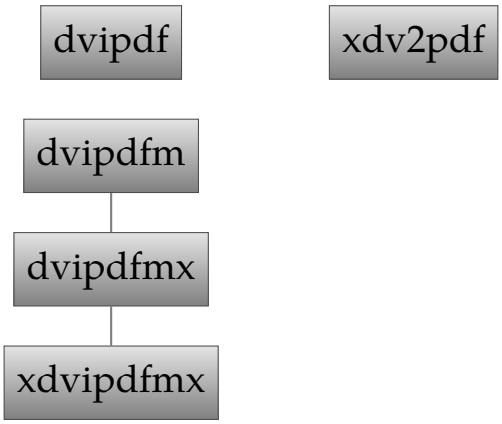
12.1. META*


METAFONT
MetaType1
Metafog
MetaPost
mptopdf
MFLua
MFLuaJIT
Metappeal
MegaPost
MetaFun

12.2. BibTEX

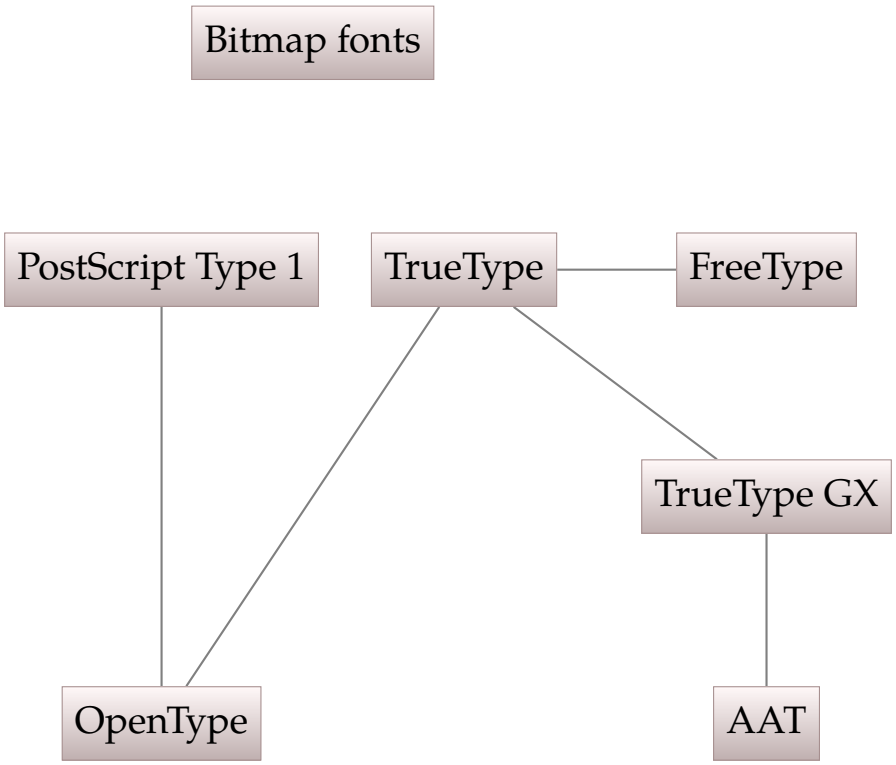


12.3. (x)dvipdf(m)(x)



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 LuaLATEXrun,
- 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 Ti*k*Z and externalizing etc. The preliminary nomenclature is:

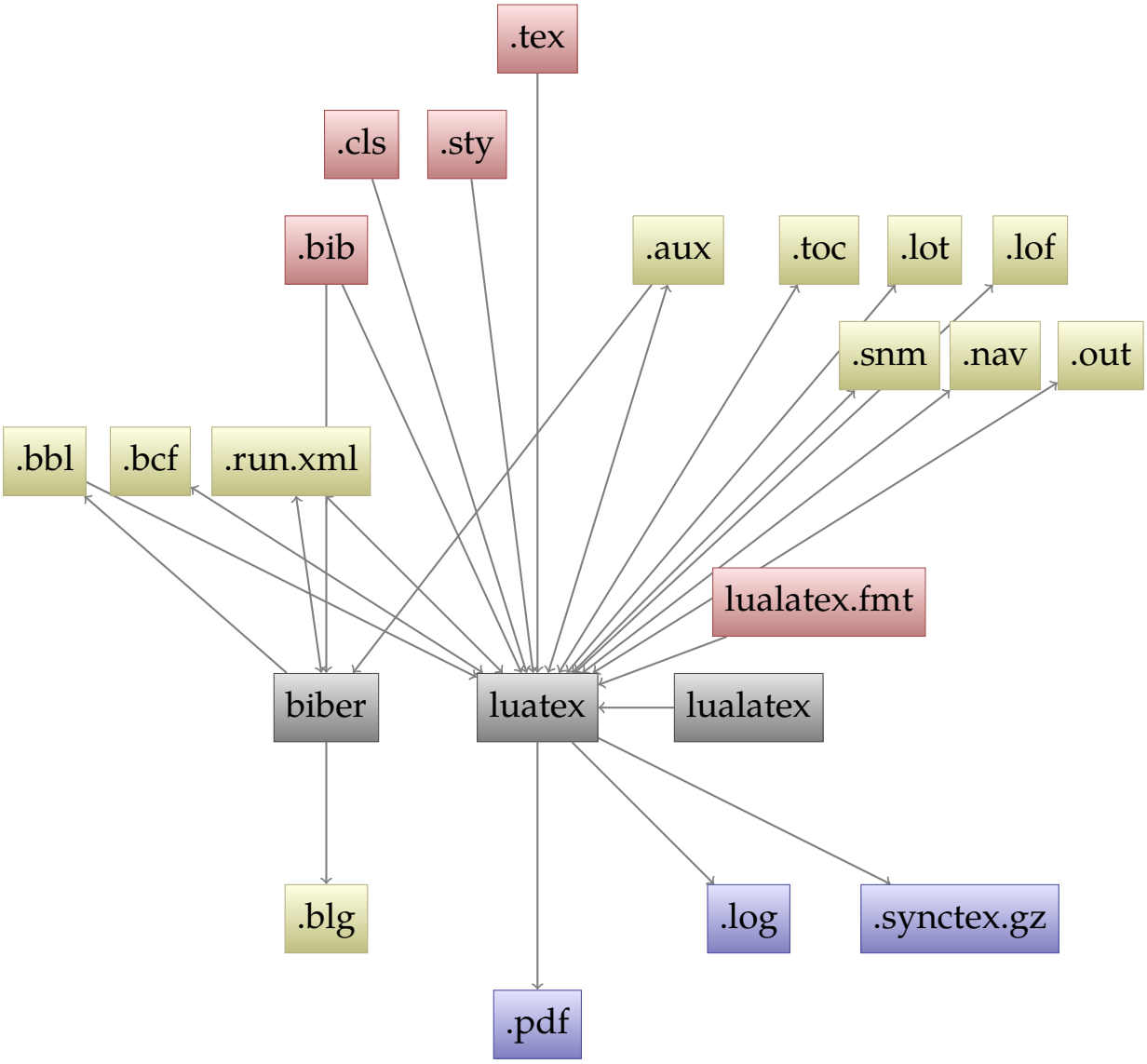
necessary — necessary input files

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, …


.tex
.cls
.sty
.bib
.aux
.toc
.lot
.lof
.snm
.nav
.out
.bbl
.bcf
.run.xml
lualatex.fmt
biber
luatex
lualatex
.blg
.log
.synctex.gz
.pdf

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.

jTEX

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.

TEX3

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.

pTEX

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 2016) is pTeX 3.14159265-p3.7.

encTEX

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.

upTEX

Unicode-aware version of pTeX – "Unicode-publishing"-TeX. Current version in TeX Live 2015 is 3.14159265-p3.7-u1.21.

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.

TEX2PDF

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

$\mathcal{NTS}$

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

TEXgX

"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.

VTEX

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-pTEX

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 2016) is 3.14159265-p3.7-160201-2.6.

ε-upTEX

Merger of e-TeX and upTeX features. Current Version (TeX Live 2016) 3.14159265-p3.7-u1.21-160201-2.6.

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.

pdfTEX

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.

ϵχTEX

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)-TEX

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 3.14159265-2.6-1.40.17.

XƎTEX

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). 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 3.14159265-2.6-0.99996. XeTeX version numbers will converge to 1.

eeTEX

Experimental extension to pdfeTeX 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.

LuaTEX

LuaTeX supports utf8, OpenType and many more things. TeX Live 2016 ships version beta-0.95.0. 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.

LuaJIT

A just-in-time compiler for Lua.

LuaJITTEX

LuaJITTeX is a LuaTeX based on LuaJIT.

iTEX

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. iniTEX, VirTEX, et al.

iniTEX

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

VirTEX

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

TEX

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

iniMETAFONT

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

VirMETAFONT

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

METAFONT

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

7. plainTEX – the first format

plainTEX

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. LATEX – Lamport’s TEX format

LATEX 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.

LATEX 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.

LATEX 0.92

First version with the @ as letter for internal names. Seeminlgy 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.

LATEX 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.

LATEX 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

LATEX 2.05

No sure information found so far.

LATEX 2.06a

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

LaTeX 2.09

The first official version by Leslie Lamport, 1985.

SLiTeX

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

AMS-LaTeX 1.1

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

LaTeX 2ε

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 adaption 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.

AMS-LaTeX1.2

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.

AMS-LaTeX2.2

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

pLaTeX

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-levle 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-levle and user-level interface in LaTeX3. Based on expl3, they can be used with LaTeX2e already.

LaTeX2x

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.

LaTeX2.2

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.

LaTeX2.5

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 ;))

LaTeX3

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 adaptions of LuaTeX features are starting to evolve.

timesLaTeX

Some LaTeX 2.09 derivate, need more information.

9. ConTeXt: con tex t – text with tex

INRSTeX

"Extended Plain TeX for use with MLTeX."

pragmatex

Former name of ConTeXt. Based, besides others, on INRSTeX.

ConTeXt MKI

Original ConTeXt with Dutch low level interface. "MK" stands for "Mark", meaning "version".

ConTeXt MKII

ConTeXt 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.

ConTeXt 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")

ConTeXt MKVI

Latest experimental version of ConTeXt.

10. Other Formats

10.1. AMS-TeX

AMS-TeX2.0

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

LAMS-TeX2.0

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

AMS-TeX2.1

Version 2.1 released 1991.

AMS-TeX2.2

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. HPTeX

HP TeX

A format specially written for HP hardware, written 1984.

10.4. JadeTeX

JadeTeX

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. MacroTEX

MacroTEX

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. 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.

10.9. 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.

10.10. StarTEX – Starter's TEX

StarTEX

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

10.11. Texinfo

Texinfo

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

10.12. TEXsis

TEXsis

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

10.13. XMLTEX

XMLTEX

A format (based on machines like pdfTeX, XeTeX and maybe LuaTeX) that converts XML input to DVI or PDF output. Can also be based on other formats when parsed at format-building time.

10.14. YTEX

YTEX

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.

10.15. ZzTEX

ZzTEX

"a macro package for producing books, jour- nals, 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. TEX Live

Web2C

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

emTEX

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

teTEX

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

4AllTEXCD

The (vague) past ... (?)

fpTEX

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.

GNUTEX 0.x

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

XEmTEX

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

TEX 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 themselfes as *TeXk. The "k" stands for "Karl" meaning that they were compiled with kpathsea.

TEX 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, LuaTeX

gwTEX

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

TEX Live 2009

Dropped Omega and Lambda. Aleph and Lamed are kept.

TEX Live 2010

Release of 2010.

TLContrib

An extension to TeX Live that contains packages that TeX Live cannot hold due to not-free lizence, 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 – 2016

Ongoing yearly releases for 2013, 2014, 2015, 2016, 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

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 (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.

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 TeX

Decus TeX

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

11.6. KerTeX

KerTeX

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. W32TeX

W32TeX

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. OzTeX

OzTeX

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. NTeX

NTeX

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 punctiation.

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 multibyte 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 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 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 biblography.

.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 maken LaTeX LaTeX and adaptions 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 accourding 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 programm is called by a given name. E. g. calling the command `latex` on the command line will start the PDFε-TEX engine[2] in DVI mode with the format LATEX 2ε. This will list the names used in the *official* (upstream) TEX Live 2016 distribution, which should mostly (but not necessarily all) be the same in MiKTEX.

program	meaning
engines / no preloaded format	
`initex`	INITEX (same as `tex --ini`)
`inimf`	INIMF (same as `mf --ini`
`texlua`	LuaTEX in Lua mode
`texluac`	LuaTEX as byte compiler
`texluajit`	LuaJITTEX in Lua mode
`texluac`	LuaJITTEX as byte compiler
plain formats	
`tex`	TEX with the plain format
`aleph`	Aleph with the plain format
`csplain`	PDFε-TEX with the csplain format and DVI output
`dviluatex`	LuaTEX with the plain format and DVI output
`eplain`	PDFε-TEX with the eplain format and DVI output
`eptex`	ε-pTEX with the plain format
`euptex`	ε-upTEX with the plain format
`etex`	PDFε-TEX with the plain format and DVI output
`luatex`	LuaTEX with the plain format and PDF output
`luajittex`	LuaJITTEX with the plain format and PDF output
`mltex`	PDFε-TEX with MLTEX extensions enabled, DVI output
`pdfcsplain`	PDFε-TEX with the csplain format and PDF output
`pdfetex`	PDFε-TEX with the plain format and PDF output
`pdftex`	PDFε-TEX with the plain format and PDF output
`ptex`	pTEX with the plain format
`xetex`	XƎTEX with the plain format
LATEX 2ε	
`latex`	PDFε-TEX with the LATEX 2ε format and DVI output
`dvilualatex`	LuaTEX with the LATEX 2ε format and DVI output
`lamed`	Aleph with the Lamed format
`lualatex`	LuaTEX with the LATEX 2ε format and PDF output
`mllatex`	PDFε-TEX with MLTEX extensions enabled, LATEX 2ε format and DVI output
`pdflatex`	PDFε-TEX with the LATEX 2ε format and PDF output
`platex`	ε-pTEX with the pLATEX format and DVI output
`uplatex`	ε-upTEX with the upLATEX format and DVI output
`xelatex`	XƎTEX with the LATEX 2ε format
ConTEXt	
`texexec`	PDFε-TEX with ConTEXt MKII format and PDF output
`texexec --interface = de`	dito, with german interface (only an example, more languages available)
`texexec --xtx`	XƎTEX with ConTEXt MKII format

[2] Actually it's only called PDFTEX now, but it is always the version that includes ε-TEX extensions. Here, always the full name is used for clearness.

`context`	LuaTEX with ConTEXt MKIV format and PDF output
`context --interface = de`	dito, with german interface (only an example)
`contextjit`	ConTEXt with LuaJITTEX
other formats	
`amstex`	PDFε-TEX with the $\mathcal{AMS}$TEX format and DVI output
`jadetex`	PDFε-TEX with the JadeTEX format and DVI output
`lamed`	Aleph with the Lamed (LATEX 2_ε) format and DVI output
`lollipop`	PDFε-TEX with the LOLLIPOP format and PDF output
`lualollipop`	LuaTEX with the LOLLIPOP format and PDF output (removed in TL2016)
`mex`	PDFε-TEX with the MeX format and DVI output
`pdfjadetex`	PDFε-TEX with the JadeTEX format and PDF output
`pdfmex`	PDFε-TEX with the MeX format and PDF output
`pdfxmltex`	PDFε-TEX with the XMLTEX format
`texsis`	PDFε-TEX with the TEXsis format and DVI output
`utf8mex`	PDFε-TEX with the UTF8MeX format and DVI output
`xelollipop`	XETEX with the LOLLIPOP format and PDF output (removed in TL2016)
`xmltex`	PDFε-TEX with the XMLTEX format
metafont	
`mf`	the METAFONT program
`mflua`	MFLua
`mfluajit`	MFLuaJIT
`mp`	the METAPOST program
`mptopdf`	PDFε-TEX with the mptopdf format and PDF output

Part III.
Appendix

A. References

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

Books

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

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 EuroBachoTEX 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

Hans Hagen: *16 years of ConTEXt*. 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=texthings

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 JTEX: A Japanese TEX. TUGboat 8 (1987), no. 2, 103 – 116.
http://www.tug.org/TUGboat/Articles/tb08-2/tb18saito.pdf

pTEX page
http://ascii.asciimw.jp/pb/ptex/

pTEX sources and documentation
http://dante.ctan.org/tex-archive/help/Catalogue/entries/ptex.html

encTEX page
http://www.olsak.net/enctex.html

MLTEX source (CH file)
http://www.tex.ac.uk/tex-archive/systems/generic/mltex/mltex.ch

pdfTEX project page
http://tug.org/applications/pdftex/

$\mathcal{NTS}$ project page
http://nts.tug.org

VTEX – official homepage of micropress-inc
http://www.micropress-inc.com/

XƎTEX project page
http://tug.org/XeTeX/

$\epsilon\chi$TEX 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/tex-archive/macros/ec-plain

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

$\mathcal{AMS}$LATEX: Documentation on CTAN
http://www.ctan.org/tex-archive/macros/amstex/doc/

LATEX2.2 – mail from Philipp Stephani on LuaLaTeX-dev list (last paragraph)
http://tug.org/pipermail/lualatex-dev/2011-January/001033.html

LATEX3 project
http://www.latex-project.org/latex3.html

ConTEXt wiki
http://wiki.contextgarden.net

ALATEX: 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/tex-archive/macros/blu

$\mathcal{AMS}$-TEX on CTAN
http://www.ctan.org/tex-archive/macros/amstex

INRSTEX on CTAN
http://www.ctan.org/tex-archive/macros/inrstex

LAMS-TEX: Announcement of publication in TEXline13, ISSN 0961-3978
http://www.tex.ac.uk/tex-archive/digests/texline/no13/lamstex

HP TEX on CTAN
http://www.ctan.org/tex-archive/macros/hptex

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

PHYSE and PHYS on CTAN
http://ctan.org/tex-archive/macros/physe

PHYZZX on CTAN
http://ctan.org/tex-archive/macros/phyzzx

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

Texinfo project page
http://www.gnu.org/software/texinfo

TEXsis project page
http://www.texsis.org

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

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

ZzTEX: Article in TUGboat 13 (1992), No. 4
http://www.tug.org/TUGboat/tb13-4/tb37anag.pdf

Distributions

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

TEX Live 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

Frank Mittelbach: *Reflections on the history of the LATEX Project Public License (LPPL)—A software license for LATEX 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/

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

TEXPortal project page
https://github.com/anhoavu/TeXPortal

TEXAndroid project page
https://github.com/anhoavu/TeXAndroid

MiKTeX project page
http://miktex.org/

Christian Schenk about the name of MiKTeX (mailing list archive)
http://sourceforge.net/mailarchive/message.php?msg_id=26826076

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

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

ConTEXt minimals on ConTEXt garden wiki
http://wiki.contextgarden.net/ConTeXt_Minimals

KerTEX project page
http://www.kergis.com/en/kertex.html

Win32 project page
http://w32tex.org/

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

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

NTEX 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

I have to thank some people for helping me to improve this document. Of course I thank all the people provinding the above-mentioned programs and references.

- Paul Isambert, for usefull discussions and testing.
- Heiko Oberdiek, for solving a bug that broke the document with Acrobat Reader.
- Peter Dyballa, for detailed historic information.
- Mojca Miklavec, for many information, especially on ConTEXt-related stuff.
- Hironori Kitagawa, for information about Japanese-specific programs.
- Many people that stumbled upon my questions on different mailinglist, mostly texhax.

C. To do list

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