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Three types of booth visitors

1. Does not know T_EX
2. Has used T_EX some years or decades ago to typeset a larger document and is astonished that it still exists – and wants to know what is new
This talk is for you
3. Currently typesets a larger document with T_EX and needs help

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Where we have been

- 1978 T_EX78
- 1982 T_EX82
- 1982 METAFONT
- 1986 Computers & Typesetting (T_EXbook etc.)
- 1986 L^AT_EX
- 1990 T_EX90
- 1994 METAPOST
- 1994 L^AT_EX 2_ε
- 1994–2006 t_eT_EX
- 1996 T_EXlive
- 1996 ConT_EXt
- 1997 pdfT_EX
- 2004 X₃T_EX
- 2007 LuaT_EX
- 2007 ConT_EXt MKIV

Problems we are working on: Fonts

T_EX does not handle fonts itself but reads only metric information (tfm files) and leaves the usage of font files to the output drivers. Originally these worked only with METAFONT fonts but nearly nobody outside of the T_EX world created them.

The rest of the world instead developed PostScript (1984), TrueType (1991) and lately OpenType (1996). These fonts can be used with troubles (by experts) with T_EX and pdfT_EX, but then the special features of OpenType are ignored.

Today we have X_YT_EX and LuaT_EX which make the usage of OpenType fonts very simple.

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TeX as designed by Knuth writes a device independent output format (DVI). Today the standard is PDF (1993). For that we made output drivers and finally pdfTeX (1997), which can write PDF directly.

pdfT_FX is now the default engine of the T_FX world.

X_YT_EX and LuaT_EX can also write PDF.

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X₃T_FX and LuaT_FX can also write PDF.

The problem now is tagged PDF – that works with Lua \TeX and Con \TeX t since 2010, but not yet with \LaTeX .

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- ▶ $\text{\LaTeX} 2_{\epsilon}$: Planned as an intermediate version (ϵ) between $\text{\LaTeX} 2.09$ and $\text{\LaTeX} 3$; very stable since 1994
- ▶ KOMA script: An alternative to the standard classes adapted to the typographical conventions of Europe which offers many extensions
- ▶ hyperref: Adds support for hyperlinks, forms and other capabilities of PDF (e. g. metadata)
- ▶ $\text{\LaTeX} 3$: Develops slowly but now offers a good foundation for developers of classes and packages which is used by many new packages (e. g. for \XeLaTeX and \LuaLaTeX)

- ▶ `fontspec`: Font handling
- ▶ `polyglossia`: Multilingual documents; an alternative to `babel`; currently works only with $\text{Xe}\text{L}\text{A}\text{T}\text{E}\text{X}$
- ▶ `luatextra`: Loads all packages needed for $\text{Lua}\text{L}\text{A}\text{T}\text{E}\text{X}$

ConT_EXt is an alternative to L^AT_EX that now (with version Mk IV) makes extensive use of LuaT_EX and PDF to offer features that are hard or impossible with L^AT_EX, e. g.:

- ▶ Multicolumn typesetting
- ▶ Integrated use of METAPOST (also possible with LuaL^AT_EX)
- ▶ Handling of XML
- ▶ Support of layers
- ▶ Typesetting on a grid
- ▶ Creation of tagged PDF, XML, ePUB

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- ▶ Inclusion of images: pdfTeX, XeTeX and LuaTeX can handle JPEG, PNG and PDF when creating PDF; pdfTeX and LuaTeX can also handle JBIG2. EPS must be converted which is now done automatically
- ▶ METAPOST: An extension of METAFONT which can create PostScript and SVG. It can be used for diagrams and is integrated into LuaTeX
- ▶ PGF/TikZ: A macro package for LaTeX and ConTeXt for creating very nice diagrams very easily
- ▶ PSTricks: A macro package for LaTeX which uses PostScript for the creation of diagrams and graphics
- ▶ Asymptote: Creates vector graphics like METAPOST, but the programming is more like C++

Bibliographies

One of the strengths of L^AT_EX is the handling of bibliographies with BibT_EX

- ▶ BibT_EX: Can only handle 7 Bit and is difficult to program
- ▶ BibT_EX8: Can only handle 8 Bit and is difficult to program
- ▶ Biber: A replacement of BibT_EX used by BibL^AT_EX; XML support is planned. The style files are programmed in T_EX
- ▶ BibL^AT_EX is the future (for L^AT_EX)

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Good scientific books have indexes, so their creation also had to be automated

- ▶ MakeIndex: The standard solution since 1986; handles only 7 bit
- ▶ Xindy: Handles any language and unicode, sorting can be adapted, can handle arbitrary “page numbers” (e. g. “Genesis 1:31”), the markup can be configured
- ▶ Every generated index can be manipulated as needed by external programs

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It is not enough to have programs that can handle OpenType fonts, we also need good free OpenType fonts:

- ▶ Latin Modern: An extended and improved version of Computer Modern, which supports all “roman” languages
- ▶ T_EX Gyre: Extended and improved versions of the GhostScript PostScript default fonts
- ▶ Many polish fonts (Antykwa Toruńska, Kurier and Iwona, Cyklop)

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T_EX of course needs math fonts and for decades has been the reference implementation for math typesetting, so math fonts (very few) were designed for T_EX. With the advent of OpenType Microsoft designed OpenType math and created a math font (Cambria Math) for use with Office. Work is ongoing and mostly finished to extend the T_EX engines (X_YT_EX and LuaT_EX) to handle OpenType math and to create free OpenType math fonts:

- ▶ Latin Modern and T_EX Gyre: Work is ongoing on OpenType math
- ▶ Asana math: Free math font designed to complement Palatino. Beta.
- ▶ STIX/XITS: Free math fonts designed to complement Times. STIX is designed to handle *all* mathematical symbols included in Unicode; XITS is the OpenType version.

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Books

There are a lot of books on L^AT_EX and new ones are still published, but some deserve special attention

L^AT_EX Companion The L^AT_EX3 projects sole income is from the sale of the L^AT_EX Companion, the follow-up to the L^AT_EX manual by Leslie Lamport

DANTE books Since there were some books on L^AT_EX missing and publishers are not always interested (the german translation of Lamport's book is unavailable for some years) DANTE (the german T_EX user group) has published some books on its own (e. g. on KOMA script and PSTricks)

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The community

The T_EX community is quite active:

User groups There are a number of national (and one international: TUG) user groups, of which DANTE (for german speakers) is the largest with more then 2000 members

Own conferences DANTE organises two conferences every year and there are conferences by other user groups (of these the polish one is highly recommended), one european and one on ConT_EXt

Conferences by others For some years we also participate in conferences by others (e. g. the Linuxtag, FrOSCon, or OpenRheinRuhr) with booths and presentations

Funding The developement of T_EX et. al. is not funded by companies but mainly by the user groups (from their membership fees and contributions)



- ▶ `tex.stackexchange.com` aka TeX.SX
- ▶ Public online since November 2010
- ▶ Currently more than 10 000 registered users, ca. 19 000 questions and more than 28 000 answers
- ▶ Unique in features and interface
- ▶ Has become the first stop for online TeX support
- ▶ The complete content is released under the cc-wiki license, regular database dumps are freely available for download on `clearbits.net`
- ▶ More infos

Summary

Although T_EX is now nearly 34 years old, it is still actively developed. The main topics are Unicode input and the use of OpenType fonts. The programs developed today are X_YT_EX and LuaT_EX; both can and *should* be used (but one needs an up to date installation of T_EX)

L^AT_EX is still the standard and is being adapted to the new programs; ConT_EXt is a very interesting “newcomer” which develops very fast

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