

Compiling with \LaTeX

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Existing compilers

Four main compilers:

- 1 latex,
- 2 pdflatex,
- 3 lualatex,
- 4 xelatex.

A very short history

To understand the reason why several compilers exist and how to choose one, a very short overview of the $\text{T}_{\text{E}}\text{X}/\text{\LaTeX}$ history is presented:

- 1 $\text{T}_{\text{E}}\text{X}$ (Donald Knuth), the original work, generating DVI files;
- 2 \LaTeX (Leslie Lamport), a layer above $\text{T}_{\text{E}}\text{X}$ which facilitates and standardises the use of $\text{T}_{\text{E}}\text{X}$ (packages, classes, and so on), still generating DVI files;
- 3 $\text{PDF}_{\text{T}}\text{E}_{\text{X}}$ and $\text{PDF}_{\text{L}}\text{\LaTeX}$ (Hàn Thế Thành), which generate directly PDF files, allowing to embed several properties such as hyperlinks and metadata;
- 4 $\text{Xe}_{\text{T}}\text{E}_{\text{X}}$ and $\text{Xe}_{\text{L}}\text{\LaTeX}$, which improve/allow font use and characters management, required for other languages than English;
- 5 $\text{Lua}_{\text{T}}\text{E}_{\text{X}}$ and $\text{Lua}_{\text{L}}\text{\LaTeX}$, which are an attempt to extend the existing $\text{T}_{\text{E}}\text{X}$ with the Lua programming language.

T_EX vs L^AT_EX

Pro-T_EX:

- some people really like plain-T_EX,
- from my experience there are no “good/valid” arguments to do so.

Pro-L^AT_EX:

- embed properties in the PDF files, which is important in a more and more digital world;
- the last version of L^AT_EX (i.e., L^AT_EX 2_ε) is very stable and allows the use of classes and packages which are very useful to automate complex writing generation, such as mathematics.

There is a third option which will not be discussed: ConTeXt. The philosophy of ConTeXt is to provide a full-access to typography and document's layout to the user, while L^AT_EX's mindset consists in automating it through internal rules to let the user focus on the writing.

Which compiler to choose

Comparison of the compilers' features

Features	Compilers			
	LaTeX	PDFLaTeX	LuaLaTeX	XeLaTeX
Output	dvi	pdf	pdf	pdf
Embed prop?	no	yes	yes	yes
Fonts	MetaFont	MetaFont	OpenType	OpenType
Images	eps	png/jpg/pdf	png/jpg/pdf	png/jpg/pdf
Compiling	short	short	long	long

Which compiler to choose

Discussion built on my own experience

Every comment here below is my opinion, even though I provide some arguments:

- the LaTeX compiler should not be used as many documents are published in a e-format;
- between PDFLaTeX, XeLaTeX and LuaLaTeX, a discussion is possible because
 - PDFLaTeX is more stable and the compilation is performed faster;
 - XeLaTeX is intended for modern font management;
 - LuaLaTeX is still under development but has been claimed as the successor of PDFLaTeX.

I used to compile with PDFLaTeX. Now, I tend to compile with LuaLaTeX. Whatever your choice is, try to not change it while writing a document because it could affect the packages in use.