About up\LaTeX 2ε

Ken Nakano & Japanese \TeX Development Community & TTK

Date: 2021/02/25

up\LaTeX is a Unicode version of Japanese \LaTeX. This version is based on ‘\LaTeX 2ε Community Edition.’

\LaTeX is the most popular \TeX engine in Japan and is widely used for a high-quality typesetting, even for commercial printing. However, \LaTeX has some limitations:

- The character set available is limited to JIS X 0208, namely JIS level-1 and level-2
- Difficulty in handling 8-bit Latin, due to conflict with legacy multibyte Japanese encodings
- Difficulty in typesetting CJK (Chinese, Japanese and Korean) multilingual documents

To overcome these weak points, a Unicode extension of \LaTeX, up\LaTeX, has been developed.\(^1\) The Unicode \LaTeX format run on up\LaTeX is called up\LaTeX. Current up\LaTeX is maintained by Japanese \TeX Development Community,\(^2\) in sync with \LaTeX community edition.\(^3\) It runs on ε-up\LaTeX, an engine with both up\LaTeX and ε-\LaTeX features.

The development version is available from GitHub repository\(^4\). Any bug reports and requests should be sent to Japanese \TeX Development Community, using GitHub Issue system.

\(^1\)http://www.t-lab.opal.ne.jp/tex/uptex.html
\(^2\)https://texjp.org
\(^3\)https://github.com/texjporg/platex
\(^4\)https://github.com/texjporg/uplatex
1 Introduction to this document

This document briefly describes upΛTEX 2ε, but is not a manual of upΛTEX 2ε. The basic functions of upΛTEX 2ε are almost the same with those of pΛTEX 2ε and ΛTEX 2ε, so please refer to the documentation of those formats.

For upΛTEX, please refer to the official website or [1] (in English).

This document consists of following parts:

Section 1 This section describes this document itself.

Section 2 Brief explanation of extensions in upΛTEX 2ε. Also describes the standard classes and packages.

Section 3 The compatibility note for users of the old version of upΛTEX 2ε or those of the original pΛTEX 2ε/ΛTEX 2ε.

Appendix A Describes DOCSTRIP Options for this document.

Appendix B Description of ‘upldoc.tex’ (counterpart for ‘source2e.tex’ in ΛTEX 2ε).

Appendix C Description of a shell script to process ‘upldoc.tex’, etc.

2 About Functions of pΛTEX 2ε

The structure of upΛTEX 2ε is similar to that of pΛTEX 2ε; it consists of 3 types of files: a format (uplatex.ltx), classes and packages.

2.1 About the Format

To make a format for upΛTEX, process “uplatex.ltx” with INI mode of ε-TEX. A handy command ‘fmtutil-sys’ (or ‘fmtutil’) for this purpose is available in ΛTEX Live. The following command generates uplatex.fmt.

fmtutil-sys --byfmt uplatex

The content of uplatex.ltx is shown below. In the current version of upΛTEX, first we simply load latex.ltx and modify/extend some definitions by loading plcore.ltx (available from pΛTEX) and uplcore.ltx.

1 (+plcore)

Footnote:

Formerly both upΛTEX and ε-ΛTEX can make the format file for upΛTEX, however, it’s not true anymore because ΛTEX requires ε-ΛTEX since 2017.
Temporarily disable \texttt{\textbackslash{}dump} at the end of \texttt{latex.ltx}.

\begin{verbatim}
2 \let\orgdump\dump
3 \let\dump\relax

Load \texttt{latex.ltx} here. Within the standard installation of \TeX{} Live, \texttt{hyphen.cfg} provided by “Babel” package will be used.

4 \input latex.ltx

If \texttt{\textbackslash{}typeout} is still undefined, the input of \LaTeX{} kernel should have failed; abort now.

5 \ifx\typeout\undefined
6 \errhelp{Please reinstall LaTeX, or check e-\TeX{} availability.}%
7 \errmessage{Failed to load \textquote{\texttt{latex.ltx}} properly}%
8 \expandafter\end
9 \fi

Load \texttt{plcore.ltx} and \texttt{uplcore.ltx}.

\begin{verbatim}
10 \typeout{**************************^^J%
11 *^^J%
12 * making up\LaTeX{} format^^J%
13 *^^J%
14 **************************}
15 \makeatletter
16 \input plcore.ltx
17 \input uplcore.ltx
\end{verbatim}

Load font-related default settings, \texttt{upldefs.ltx}. If a file \texttt{upldefs.cfg} is found, then that file will be used instead. Some code may be executed after loading.

\begin{verbatim}
18 \InputIfFileExists{upldefs.cfg}
19 {\typeout{*************************************^^J%
20 * Local config file upldefs.cfg used^^J%
21 *************************************}}%
22 {\input{upldefs.ltx}}
23 \ifx\code@after@pldefs\@undefined\else \code@after@pldefs \fi
\end{verbatim}

In the previous version, we displayed up\LaTeX{} version on the terminal, so that it can be easily recognized during format creation; however \texttt{\textbackslash{}everyjob} can contain any code other than showing a banner, so now disabled.

\begin{verbatim}
24 \%\the\everyjob
\end{verbatim}

Load \texttt{uplatex.cfg} if it exists at runtime of up\LaTeX{} 2ε. (Counterpart of \texttt{platex.cfg} in \TeX{} 2ε.)

\begin{verbatim}
25 \everyjob\expandafter{%
26 \the\everyjob
27 \IfFileExists{uplatex.cfg}{{%
28 \typeout{*************************^^J%
29 * Loading uplatex.cfg.^^J%
30 *************************}}%}
\end{verbatim}
The file `uplcore.ltx`, which provides modifications/extensions to make `upl\TeX\ 2\epsilon`, is a concatenation of stripped files below using `docstrip` program.

- `uplvers.dtx` defines the format version of `upl\TeX\ 2\epsilon`.
- `uplfonts.dtx` extends NFSS2 for Japanese font selection.
- `plcore.dtx` (the same content as `p\TeX\ 2\epsilon`); defines other modifications to `\TeX\ 2\epsilon`.

Moreover, default settings of pre-loaded fonts and typesetting parameters are done by loading `upldefs.ltx` inside `uplatex.ltx`.\footnote{Older `upl\TeX\` loaded `upldefs.ltx` inside `upcore.ltx`; however, `upl\TeX\` community edition newer than 2018 loads `upldefs.ltx` inside `uplatex.ltx`.

Attention:

You can customize `upl\TeX\ 2\epsilon` by tuning these settings. If you need to do that, copy/rename it as `upldefs.cfg` and edit it, instead of overwriting `upldefs.ltx` itself. If a file named `upldefs.cfg` is found at a format creation time, it will be read as a substitute of `upldefs.ltx`.

As shown above, the files in `up\TeX\` is named after `p\TeX\` ones, prefixed with "u."

### 2.1.1 Version

The version (like “2020-10-01u04”) and the format name ("pLaTeX2e") of `upl\TeX\ 2\epsilon` are defined in `uplvers.dtx`. This is similar to `p\TeX\ 2\epsilon`, which defines those in `plvers.dtx`. 
2.1.2 NFSS2 Commands

upL\TeX\ L\TEX\ 2\varepsilon shares plcore.dtx with pL\TEX\ 2\varepsilon, so the extensions of NFSS2 for selecting Japanese fonts are available.

2.1.3 Output Routine and Floats

upL\TeX\ L\TEX\ 2\varepsilon shares plcore.dtx with pL\TEX\ 2\varepsilon, so the output routine and footnote macros will behave similar to pL\TEX\ 2\varepsilon.

2.2 Classes and Packages

Classes and packages bundled with upL\TeX\ L\TEX\ 2\varepsilon are based on those in original pL\TEX\ 2\varepsilon, and modified some parameters.

upL\TeX\ 2\varepsilon classes:

- ujarticle.cls, ujbook.cls, ujreport.cls
  Standard yoko-kumi (horizontal writing) classes; stripped from ujclasses.dtx.
  upL\TeX\ edition of jarticle.cls, jbook.cls and jreport.cls.

- utarticle.cls, utbook.cls, utreport.cls
  Standard tate-kumi (vertical writing) classes; stripped from ujclasses.dtx.
  upL\TeX\ edition of tarticle.cls, tbook.cls and treport.cls.

We don’t provide upL\TeX\ edition of jltxdoc.cls, but the one from pL\TEX\ can be used also on upL\TeX\ without problem.

upL\TeX\ 2\varepsilon packages:

- uptrace.sty
  upL\TeX\ 2\varepsilon version of tracefnt.sty; the package tracefnt.sty overwrites upL\TeX\ 2\varepsilon-style NFSS2 commands, so uptrace.sty provides redefinitions to recover upL\TeX\ 2\varepsilon extensions. Stripped from uplfonts.dtx.

Other pL\TEX\ packages work also on upL\TeX\.

3 Compatibility with Other Formats and Older Versions

Here we provide some information about the compatibility between current upL\TeX\ 2\varepsilon and older versions or original pL\TEX\ 2\varepsilon/L\TEX\ 2\varepsilon.
3.1 Compatibility with \LaTeX\ 2ε/\LaTeX\ 2ε

\LTX\ 2ε is in most part upward compatible with \LaTeX\ 2ε, so you can move from \LTX\ 2ε to \LTX\ 2ε by simply replacing the document class and some macros. However, the default Japanese font metrics in \LTX\ 2ε is different from those in \LTX\ 2ε; therefore, you should not expect identical output from both \LTX\ 2ε and \LTX\ 2ε.

Note that \LTX\ is a new format, so we do not provide support for 2.09 compatibility mode. Follow the standard \LaTeX\ 2ε convention!

We hope that most classes and packages meant for \LaTeX\ works also for \LTX\ without any modification. However for example, if a class or a package uses Kanji encoding ‘JY1’ or ‘JT1’ (default on \LTX\), an error complaining the mismatch of Kanji encoding might happen on \LTX, in which the default is ‘JY2’ and ‘JT2.’ In this case, we have to say that the class or package does not support \LTX\; you should use \LTX\, or report to the author of the package or class.

3.2 Support for Package ‘latexrelease’

\LTX provides ‘platexrelease’ package, which is based on ‘latexrelease’ package (introduced in \LaTeX\ <2015/01/01>). It could be better if we also provide a similar package on \LTX, but currently we don’t need it; \LTX\ does not have any recent \LaTeX\-specific changes. So, you can safely use ‘platexrelease’ package for emulating the specified format date.

A DOCSTRIP Options

By processing \texttt{uplatex.dtx} with DOCSTRIP program, different files can be generated. Here are the DOCSTRIP options for this document:

<table>
<thead>
<tr>
<th>Option</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>plcore</td>
<td>Generates a fragment of format sources</td>
</tr>
<tr>
<td>pldoc</td>
<td>Generates ‘upldoc.tex’ for typesetting \LTX\ sources</td>
</tr>
<tr>
<td>shprog</td>
<td>Generates a shell script to process ‘upldoc.tex’</td>
</tr>
<tr>
<td>Xins</td>
<td>Generates a DOCSTRIP batch file ‘Xins.ins’ for generating the above shell/perl scripts</td>
</tr>
</tbody>
</table>
B Documentation of up\LaTeX\ 2\epsilon sources

The contents of ‘upldoc.tex’ for typesetting up\LaTeX\ 2\epsilon sources is described here. Compared to individual processings, batch processing using ‘upldoc.tex’ prints also changes and an index.

By default, the description of up\LaTeX\ 2\epsilon sources is written in Japanese. If you need English version, first save

\newif\ifJAPANESE

as uplatex.cfg, and process upldoc.tex (up\LaTeX\ 2\epsilon newer than July 2016 is required).

Here we explain only difference between pldoc.tex (p\LaTeX\ 2\epsilon) and upldoc.tex (up\LaTeX\ 2\epsilon).

The document of p\LaTeX\ 2\epsilon requires plext package, since plext.dtx contains several examples of partial vertical writing. However, we don’t have such examples in up\LaTeX\ 2\epsilon files, so no need for it.

\documentclass{jltxdoc}
\listfiles
\DoNotIndex{\def,\long,\edef,\xdef,\gdef,\let,\global}
\DoNotIndex{\if,\ifnum,\ifdim,\ifcat,\ifmmode,\ifvmode,\ifhmode,\iftrue,\iffalse,\ifvoid,\ifx,\ifeof,\ifcase,\else,\or,\fi}
\DoNotIndex{\box,\copy,\setbox,\unvbox,\unhbox,\hbox,\vbox,\vtop,\vcenter}
\DoNotIndex{\@empty,\immediate,\write}
\DoNotIndex{\@spaces,\openin,\openout,\closein,\closeout}
\DoNotIndex{\catcode,\endinput}
\DoNotIndex{\jobname,\message,\read,\the,\string,\unskip}
\DoNotIndex{\hsize,\vsize,\hskip,\vskip,\kern,\hfil,\hfill,\hss,\vss,\unskip}
\DoNotIndex{\newcommand,\renewcommand}
\ifJAPANESE
\begin{filecontents}{upldoc.dic}
੢ྐྵ ͍ͤΕ͖
࿨ྐྵ ΘΕ͖
\end{filecontents}

The document of pl\LaTeX\ 2\epsilon requires plext package, since plext.dtx contains several examples of partial vertical writing. However, we don’t have such examples in up\LaTeX\ 2\epsilon files, so no need for it.
The italic numbers denote the pages where the corresponding entry is described, numbers underlined point to the definition, all others indicate the places where it is used.
RecordChanges
CodelineIndex
EnableCrossrefs
\setcounter{IndexColumns}{2}
\settowidth\MacroIndent{\ttfamily\scriptsize 000\ }

Set the title, authors and the date for this document.
\title{The \LaTeXe\ Sources}
\author{Ken Nakano \& Japanese \TeX\ Development Community \& TTK}
\maketitle
% Get the (temporary) date and up-patch level from uplvers.dtx
\makeatletter
\let\patchdate=\@empty
\begingroup
\def\ProvidesFile#1[#2 #3]#4\def\uppatch@level#5{\date{#2}\xdef\patchdate{#5}\endinput}
\input{uplvers.dtx}
\endgroup
% Add the patch version if available.
\def\Xpatch{}
\ifx\patchdate\Xpatch\else
\edef\@date{\@date\space version \patchdate}
\fi
% Obtain the last update info, as upLaTeX does not change format date
% -> if successful, reconstruct the date completely
\def\lastupd@te{0000/00/00}
\begingroup
\def\ProvidesFile#1[#2 #3]#4\def\@tempd@te{#2}\endinput
\@ifl@t@r{\@tempd@te}{\lastupd@te}{\global\let\lastupd@te\@tempd@te}
\endgroup
\let\ProvidesClass\ProvidesFile
\let\ProvidesPackage\ProvidesFile
\input{uplvers.dtx}
\input{uplfonts.dtx}
\input{ukinsoku.dtx}
\input{ujclasses.dtx}
\@ifl@t@r{\lastupd@te}{0000/00/00}{\date{Version \patchdate\break (last updated: \lastupd@te)}}
\makeatother

Here starts the document body.
\begin{document}
\pagenumbering{roman}
\maketitle
C Additional Utility Programs

C.1 Shell Script mkpldoc.sh

A shell script to process ‘pldoc.tex’ and produce a fully indexed source code description. Run sh mkpldoc.sh to use it.

The script is almost identical to that in \texttt{pLaTeX\ 2\varepsilon}, so here we describe only the difference.
To make the Change log and Glossary (Change History) for upLATEX using `mendex`, we need to run it in UTF-8 mode. So, option `-U` is important.\footnote{The command `uplatex` should be also in UTF-8 mode, but it defaults to UTF-8 mode; therefore, we don’t need to add `-kanji=utf8` explicitly.}

```
201 (ja) rm -f upldoc.toc upldoc.idx upldoc.glo
202 (en) rm -f upldoc-en.toc upldoc-en.idx upldoc-en.glo
203 echo "" > ltxdoc.cfg
204 (ja) uplatex upldoc.tex
205 (en) uplatex -jobname=upldoc-en upldoc.tex

to make the Change log and Glossary (Change History) for upLATEX using `mendex`, we need to run it in UTF-8 mode. So, option `-U` is important.\footnote{The command `uplatex` should be also in UTF-8 mode, but it defaults to UTF-8 mode; therefore, we don’t need to add `-kanji=utf8` explicitly.}

206 (ja) mendex -U -s gind.ist -d upldoc.dic -o upldoc.ind upldoc.idx
207 (en) mendex -U -s gind.ist -d upldoc.dic -o upldoc-en.ind upldoc-en.idx
208 (ja) mendex -U -f -s gglo.ist -o upldoc.gls upldoc.glo
209 (en) mendex -U -f -s gglo.ist -o upldoc-en.gls upldoc-en.glo
210 echo "\includeonly{}" > ltxdoc.cfg
211 (ja) uplatex upldoc.tex
212 (en) uplatex -jobname=upldoc-en upldoc.tex
213 echo "" > ltxdoc.cfg
214 (ja) uplatex upldoc.tex
215 (en) uplatex -jobname=upldoc-en upldoc.tex
216 # EOT
217 (/shprog)
```

C.2 Perl Script dstcheck.pl

The one from pLATEX$^2\varepsilon$ can be use without any change, so omitted here in upLATEX$^2\varepsilon$.

C.3 DOCSTRIP Batch file

Here we introduce a DOCSTRIP batch file `Xins.ins,' which generates the script described in Appendix C.1. The code is almost identical to that in pLATEX$^2\varepsilon$.

```
218 \(*Xins*
219 \input docstrip
220 \keepsilent
221 {\catcode'#=12 \gdef\MetaPrefix{## }}
222 \declarepreamble\thispre
223 \endpreamble
224 \usepreamble\thispre
225 \declarepostamble\thispost
226 \endpostamble
227 \usepostamble\thispost
228 \generate{
229 \file{mkpldoc.sh}{\from{uplatex.dtx}{shprog,ja}}
230 \file{mkpldoc-en.sh}{\from{uplatex.dtx}{shprog,en}}
```

```
```
\end{document}
References

[1] Takuji Tanaka, UpTeX — Unicode version of \( \LaTeX \) with CJK extensions.
   TUGboat issue 34:3, 2013.
Change History

2011/05/07 v1.0c-u00
Created upL\TeX\ version based on
\TeX\ one (based on
\TeX\ dtx 1997/01/29 v1.0c) . . . 1

2016/05/08 v1.0h-u00
Exclude uplpatch\.ltx from the
document (based on platex\.dtx
2016/05/08 v1.0h) ............. 9

2016/06/06 v1.0k-u00
Update documents for upL\TeX\ . . 1

2016/06/19 v1.0l-u01
Get the patch level from
uplvers\.dtx (based on
platex\.dtx 2016/06/19 v1.0l) . . 9

2016/08/26 v1.0m-u01
Moved loading uplatex\.cfg from
uplcore\.ltx to uplatex\.ltx
(based on platex\.dtx
2016/08/26 v1.0m) ............. 3

2017/11/29 v1.0n-u01
New English documentation added
(based on platex\.dtx
2017/11/29 v1.0n) ............. 1

2017/12/05 v1.0s-u01
Moved loading default settings

2017/12/10 v1.0s-u02
Load plcore\.ltx before
uplcore\.ltx (recent version of
pl\TeX\ is assumed) ............. 3

2018/04/08 v1.0w-u02
Stop showing banner during
format generation for safety
(based on platex\.dtx
2018/04/08 v1.0w) ............. 3

2018/09/03 v1.0x-u02
Update document. (based on
platex\.dtx 2018/09/03 v1.0x) . . 1

2018/09/22 v1.0y-u02
Show last update info on
upldoc\.pdf (based on
platex\.dtx 2018/09/22 v1.0y) . . 9

2019/05/22 v1.0y-u03
Update document. ............. 1

2020/09/28 v1.1b-u03
Add hook after loading defs . . . 3

2021/02/25 v1.1c-u03
Check for latex\.ltx status . . . 3