About \textsc{upLaTeX} 2ε

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\texttt{upLaTeX} is a Unicode version of Japanese \texttt{pLaTeX} 2ε. This version is based on ‘\texttt{pLaTeX} 2ε Community Edition.’

\texttt{pLaTeX} is the most popular \TeX{} engine in Japan and is widely used for a high-quality typesetting, even for commercial printing. However, \texttt{pLaTeX} 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 \texttt{pLaTeX}, \texttt{upLaTeX}, has been developed.\footnote{http://www.t-lab.opal.ne.jp/tex/uptex.html} The Unicode \texttt{pLaTeX} format run on \texttt{upLaTeX} is called \texttt{upLaTeX}. Current \texttt{upLaTeX} is maintained by Japanese \TeX{} Development Community,\footnote{https://texjp.org} in sync with \texttt{pLaTeX} community edition.\footnote{https://github.com/texjporg/platex} It runs on ε-\texttt{upLaTeX}, an engine with both \texttt{upLaTeX} and ε-\texttt{pLaTeX} features.

The development version is available from GitHub repository\footnote{https://github.com/texjporg/uplatex}. Any bug reports and requests should be sent to Japanese \TeX{} Development Community, using GitHub Issue system.

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

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

For upTeX, 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 upLaTeX 2ε. Also describes the standard classes and packages.

Section 3 The compatibility note for users of the old version of upLaTeX 2ε or those of the original pLaTeX 2ε/LATEX 2ε.

Appendix A Describes DOCSTRIPT Options for this document.

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

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

2 About Functions of pLaTeX 2ε

The structure of upLaTeX 2ε is similar to that of pLaTeX 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 upLaTeX, process “uplatex.ltx” with INI mode of ε-upTeX. A handy command ‘fmtutil-sys’ (or ‘fmtutil’) for this purpose is available in TeX Live. The following command generates uplatex.fmt.

```
fmtutil-sys --byfmt uplatex
```

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

1 (+pcore)

\footnote{Formerly both upTeX and ε-upTeX can make the format file for upLaTeX, however, it’s not true anymore because LATEX requires ε-TeX since 2017.}
Temporarily disable `\dump` at the end of `latex.ltx`.

2 `\let\orgdump\dump`
3 `\let\dump\relax`

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

4 `\input latex.ltx`

Load `plcore.ltx` and `uplcore.ltx`.

5 `\typeout{**************************************************\%`
6 `*\%`
7 `* making upLaTeX format\%`
8 `*\%`
9 `**************************************************\%`

10 `\makeatletter`
11 `\input plcore.ltx`
12 `\input uplcore.ltx`

Load font-related default settings, `upldefs.ltx`. If a file `upldefs.cfg` is found, then that file will be used instead.

13 `\InputIfFileExists{upldefs.cfg}`
14 `{` `\typeout{***************\%`
15 `* Local config file upldefs.cfg used\%`
16 `***************\%}`
17 `{` `\input{upldefs.ltx}}`%

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

18 `%\the\everyjob`

Load `uplatex.cfg` if it exists at runtime of upLaTeX 2ε. (Counterpart of `platex.cfg` in pLaTeX 2ε.)

19 `\everyjob\expandafter{`
20 `\the\everyjob`
21 `\IfFileExists{uplatex.cfg}{%
22 `\typeout{***************\%`
23 `* Loading uplatex.cfg.\%`
24 `***************\%}}%
25 `\input{uplatex.cfg}}{%
26 `}%`

Dump to the format file.

27 `\let\dump\orgdump`
28 `\let\orgdump@undefined`
29 `\makeatother`
30 `\dump`
31 `%\endinput`
The file `uplcore.ltx`, which provides modifications/extensions to make upL\textTeX\ 2ε, is a concatenation of stripped files below using DOGSTRIP program.

- `uplvers.dtx` defines the format version of upL\textTeX\ 2ε.
- `uplfonts.dtx` extends NFSS2 for Japanese font selection.
- `plcore.dtx` (the same content as pL\textTeX\ 2ε); defines other modifications to L\textTeX\ 2ε.

Moreover, default settings of pre-loaded fonts and typesetting parameters are done by loading `upldefs.ltx` inside `uplatex.ltx`.\footnote{Older upL\textTeX loaded `upldefs.ltx` inside `uplcore.ltx`; however, upL\textTeX community edition newer than 2018 loads `upldefs.ltx` inside `uplatex.ltx.`} This file `upldefs.ltx` is also stripped from `uplfonts.dtx`.

Attention:
You can customize upL\textTeX\ 2ε 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 upL\textTeX is named after pL\textTeX ones, prefixed with “u.”

### 2.1.1 Version

The version (like “2019-10-01u02”) and the format name (“pLaTeX2ε”) of upL\textTeX\ 2ε are defined in `uplvers.dtx`. This is similar to pL\textTeX\ 2ε, which defines those in `plvers.dtx`.

### 2.1.2 NFSS2 Commands

upL\textTeX\ 2ε shares `plcore.dtx` with pL\textTeX\ 2ε, so the extensions of NFSS2 for selecting Japanese fonts are available.

### 2.1.3 Output Routine and Floats

upL\textTeX\ 2ε shares `plcore.dtx` with pL\textTeX\ 2ε, so the output routine and footnote macros will behave similar to pL\textTeX\ 2ε.
2.2 Classes and Packages

Classes and packages bundled with \texttt{upl\TeX} $2\varepsilon$ are based on those in original \texttt{pl\TeX} $2\varepsilon$, and modified some parameters.

\texttt{upl\TeX} $2\varepsilon$ classes:

\begin{itemize}
\item \texttt{ujarticle.cls}, \texttt{ujbook.cls}, \texttt{ujreport.cls}
    
    Standard \textit{yoko-kumi} (horizontal writing) classes; stripped from \texttt{ujclasses.dtx}.
    \texttt{upl\TeX} edition of \texttt{jarticle.cls}, \texttt{jbook.cls} and \texttt{jreport.cls}.
\item \texttt{utarticle.cls}, \texttt{utbook.cls}, \texttt{utreport.cls}
    
    Standard \textit{tate-kumi} (vertical writing) classes; stripped from \texttt{ujclasses.dtx}.
    \texttt{upl\TeX} edition of \texttt{tarticle.cls}, \texttt{tbook.cls} and \texttt{treport.cls}.
\end{itemize}

We don’t provide \texttt{upl\TeX} edition of \texttt{jltxdoc.cls}, but the one from \texttt{pl\TeX} can be used also on \texttt{upl\TeX} without problem.

\texttt{upl\TeX} $2\varepsilon$ packages:

\begin{itemize}
\item \texttt{uptrace.sty}
    
    \texttt{upl\TeX} $2\varepsilon$ version of \texttt{tracefnt.sty}; the package \texttt{tracefnt.sty} overwrites \texttt{upl\TeX} $2\varepsilon$-style NFSS2 commands, so \texttt{uptrace.sty} provides redefinitions to recover \texttt{upl\TeX} $2\varepsilon$ extensions. Stripped from \texttt{uplfonts.dtx}.
\end{itemize}

Other \texttt{pl\TeX} packages work also on \texttt{upl\TeX}.

3 Compatibility with Other Formats and Older Versions

Here we provide some information about the compatibility between current \texttt{upl\TeX} $2\varepsilon$ and older versions or original \texttt{pl\TeX} $2\varepsilon/\mu\TeX$ $2\varepsilon$.

3.1 Compatibility with \texttt{pl\TeX} $2\varepsilon/\mu\TeX$ $2\varepsilon$

\texttt{upl\TeX} $2\varepsilon$ is in most part upper compatible with \texttt{pl\TeX} $2\varepsilon$, so you can move from \texttt{pl\TeX} $2\varepsilon$ to \texttt{upl\TeX} $2\varepsilon$ by simply replacing the document class and some macros. However, the default Japanese font metrics in \texttt{upl\TeX} $2\varepsilon$ is different from those in \texttt{pl\TeX} $2\varepsilon$; therefore, you should not expect identical output from both \texttt{pl\TeX} $2\varepsilon$ and \texttt{upl\TeX} $2\varepsilon$. 

5
Note that up\LaTeX{} is a new format, so we do \textit{not} provide support for 2.09 compatibility mode. Follow the standard \LaTeX{}\,2\varepsilon{} convention!

We hope that most classes and packages meant for \LaTeX{}\,2\varepsilon{}/\pLaTeX{}\,2\varepsilon{} works also for up\LaTeX{}\,2\varepsilon{} without any modification. However for example, if a class or a package uses Kanji encoding ‘JY1’ or ‘JT1’ (default on \pLaTeX{}\,2\varepsilon{}), an error complaining the mismatch of Kanji encoding might happen on up\LaTeX{}, in which the default is ‘JY2’ and ‘JT2.’ In this case, we have to say that the class or package does not support up\LaTeX{}\,2\varepsilon{}; you should use \pLaTeX{}, or report to the author of the package or class.

\section*{3.2 Support for Package ‘latexrelease’}

\pLaTeX{} 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 up\LaTeX{}, but currently we don’t need it; up\LaTeX{} does not have any recent up\LaTeX{}-specific changes. So, you can safely use ‘platexrelease’ package for emulating the specified format date.

\section*{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 up\LaTeX{},2\varepsilon{} 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>

\section*{B Documentation of up\LaTeX{}\,2\varepsilon{} sources}

The contents of ‘upldoc.tex’ for typesetting up\LaTeX{}\,2\varepsilon{} 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\varepsilon{} sources is written in Japanese. If you need English version, first save

\begin{verbatim}
\newif\ifJAPANESE
\end{verbatim}
as uplatex.cfg, and process upldoc.tex (upL\LaTeX 2\epsilon newer than July 2016 is required).

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

33 (+pldoc)
34 \begin{filecontents}{upldoc.dic}
35 \begin{filecontents}{upldoc.dic}
36 %
37 \end{filecontents}

38 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 upL\LaTeX 2\epsilon files, so no need for it.
39 \documentclass{jltxdoc}
40 %\usepackage{plext} %% comment out for upLaTeX
41 \listfiles
42 \DoNotIndex{\def, \long, \edef, \zdef, \gdef, \let, \global}
43 \DoNotIndex{\if, \ifnum, \ifdim, \ifmmode, \ifvmode, \ifhmode,\iftrue, \ifndef, \ifvoid, \ifeof, \ifcase, \else, \or, \fi}
44 \DoNotIndex{\box, \copy, \setbox, \unvbox, \unhbox, \hbox, \vbox, \vtop, \vcenter}
45 \DoNotIndex{\immediate, \write}
46 \DoNotIndex{\egroup, \bgroup, \expandafter, \begingroup, \endgroup}
47 \DoNotIndex{\divide, \advance, \multiply, \count, \dimen}
48 \DoNotIndex{\relax, \space, \string}
49 \DoNotIndex{\csname, \endcsname, \@spaces, \openin, \openout, \closein, \closeout}
50 \DoNotIndex{\catcode, \endinput}
51 \DoNotIndex{\jobname, \message, \read, \the, \m@ne, \noexpand}
52 \DoNotIndex{\hsize, \vsize, \hskip, \vskip, \kern, \hfil, \hfill, \hss, \vss, \unskip}
53 \DoNotIndex{\hsize, \vsize, \hskip, \vskip, \kern, \hfil, \hfill, \hss, \vss, \unskip}
54 \DoNotIndex{\d@width, \ht, \setlength, \addtolength}
55 \DoNotIndex{\newcommand, \renewcommand}
56 \ifJAPANESE
57 \IndexPrologue{\part*{索 引}％}
58 \markboth{索 引}{索 引}％
59 \addcontentsline{toc}{part}{索 引}％
60 \else
61 \IndexPrologue{\part*{Index}％}
62 \markboth{Index}{Index}％
63 \addcontentsline{toc}{part}{Index}％
64 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.\)
\fi
\%
\ifJAPANESE
\GlossaryPrologue\part*{変更履歴}\%
\markboth{変更履歴}{変更履歴}\%
\addcontentsline{toc}{part}{変更履歴}\}
\else
\GlossaryPrologue\part*{Change History}\%
\markboth{Change History}{Change History}\%
\addcontentsline{toc}{part}{Change History}\}
\fi
\makeatletter
\def\changes@#1#2#3{\let\protect\@unexpandable@protect
\edef\@tempa{\noexpand\glossary{#2\space
\currentfile\space#1\levelchar
\ifsaved@macroname\@empty
\space\actualchar\generalname
\else
\expandafter\@gobble\saved@macroname\actualchar
\string\verb\quotechar*%
\verbatimchar\saved@macroname
\verbatimchar
\fi
:\levelchar #3}}%
\@tempa\endgroup\@esphack}
\renewcommand\MacroFont{\fontencoding\encodingdefault\fontfamily\ttdefault\fontseries\mddefault\fontshape\updefault\footnotesize\hfuzz 6pt\relax}
\renewcommand\l@subsection{\@dottedtocline{2}{1.5em}{2.8em}}
\renewcommand\l@subsubsection{\@dottedtocline{3}{3.8em}{3.4em}}
\makeatother
\RecordChanges
\CodelineIndex
\EnableCrossrefs
\setcounter{IndexColumns}{2}
\settowidth{\MacroIndent}{\ttfamily\scriptsize 000 }{

Set the title, authors and the date for this document.
\title{The \LaTeX\ Sources}
\author{Ken Nakano \& Japanese \TeX \ Development Community \& TTK}
\maketitle
\% Get the (temporary) date and up-patch level from uplvers.dtx
\makeatletter
Here starts the document body:

```
\begin{document}
\pagenumbering{roman}
\maketitle
\renewcommand\maketitle{}
\tableofcontents
\clearpage
\pagenumbering{arabic}
\DocInclude{uplvers} % upLaTeX version
\DocInclude{uplfonts} % NFSS2 commands
\DocInclude{ukinsoku} % kinsoku parameter
\DocInclude{ujclasses} % Standard class
```

9
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 pL\TEX\textsuperscript{2}, so here we describe only the difference.

```bash
rm -f upldoc.toc upldoc.idx upldoc.glo
rm -f upldoc-en.toc upldoc-en.idx upldoc-en.glo
mendex -U -s gind.ist -d upldoc.dic -o upldoc.ind upldoc.idx
```

To make the Change log and Glossary (Change History) for up\LaTeX\textsuperscript{2}, we need to run it in UTF-8 mode. So, option \texttt{-U} is important.\footnote{The command \texttt{uplatex} should be also in UTF-8 mode, but it defaults to UTF-8 mode; therefore, we don’t need to add \texttt{-kanji=utf8} explicitly.}

```bash
uplatex upldoc.tex
uplatex -jobname=upldoc-en upldoc.tex
```
C.2 Perl Script dstcheck.pl
The one from p\LaTeX\ 2\epsilon can be use without any change, so omitted here in up\LaTeX\ 2\epsilon.

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 p\LaTeX\ 2\epsilon.

\begin{verbatim}
\input docstrip
\keepsilent
{\catcode'#=12 \gdef\MetaPrefix{## }}
\declarepreamble\thispre
\endpreamble
\usepreamble\thispre
\declarepostamble\thispost
\endpostamble
\usepostamble\thispost
\generate{
\file{mkpldoc.sh}{\from{uplatex.dtx}{shprog,ja}}
\file{mkpldoc-en.sh}{\from{uplatex.dtx}{shprog,en}}
}
\endbatchfile
\end{verbatim}

\textit{Xins}
References

[1] Takuji Tanaka, UpTEX — Unicode version of \TeX{} with CJK extensions
    TUGboat issue 34:3, 2013.
## Change History

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011/05/07</td>
<td>v1.0c-u00</td>
<td>Created \upl\TeX{} version based on \pL\TeX{} one (based on platex.dtx 1997/01/29 v1.0c)</td>
</tr>
<tr>
<td>2016/05/08</td>
<td>v1.0h-u00</td>
<td>Exclude uplpatch.ltx from the document (based on platex.dtx 2016/05/08 v1.0h)</td>
</tr>
<tr>
<td>2016/06/06</td>
<td>v1.0k-u01</td>
<td>Update documents for \upl\TeX{}.</td>
</tr>
<tr>
<td>2016/06/19</td>
<td>v1.0l-u01</td>
<td>Get the patch level from uplvers.dtx (based on platex.dtx 2016/06/19 v1.0l)</td>
</tr>
<tr>
<td>2016/08/26</td>
<td>v1.0m-u01</td>
<td>Moved loading uplatex.cfg from uplcore.ltx to uplatex.ltx (based on platex.dtx 2016/08/26 v1.0m)</td>
</tr>
<tr>
<td>2017/11/29</td>
<td>v1.0q-u01</td>
<td>New English documentation added (based on platex.dtx 2017/11/29 v1.0q)</td>
</tr>
<tr>
<td>2017/12/05</td>
<td>v1.0s-u01</td>
<td>Moved loading default settings from uplcore.ltx to uplatex.ltx (based on platex.dtx 2017/12/05 v1.0s)</td>
</tr>
<tr>
<td>2017/12/10</td>
<td>v1.0s-u02</td>
<td>Load plcore.ltx before uplcore.ltx (recent version of \pL\TeX{} is assumed)</td>
</tr>
<tr>
<td>2018/04/08</td>
<td>v1.0w-u02</td>
<td>Stop showing banner during format generation for safety (based on platex.dtx 2018/04/08 v1.0w)</td>
</tr>
<tr>
<td>2018/09/03</td>
<td>v1.0x-u02</td>
<td>Update document. (based on platex.dtx 2018/09/03 v1.0x)</td>
</tr>
<tr>
<td>2018/09/22</td>
<td>v1.0y-u02</td>
<td>Show last update info on upldoc.pdf (based on platex.dtx 2018/09/22 v1.0y)</td>
</tr>
<tr>
<td>2019/05/22</td>
<td>v1.0y-u03</td>
<td>Update document.</td>
</tr>
</tbody>
</table>

13