14 December 1994

Contents

1 Introduction

Welcome to LaTeX2e, the new standard version of the LaTeX Document Preparation System.

This document describes how to take advantage of the new features of LaTeX, and how to process your old LaTeX documents with LaTeX2e. However, this document is only a brief introduction to the new facilities and is intended for authors who are already familiar with the old version of LaTeX. It is *not* a reference manual for LaTeX2e.

1.1 LaTeX2enThe new LaTeX release

The previous version of LaTeX was known as LaTeX 2.09. Over the years many extensions have been developed for LaTeX. This is, of course, a sure sign of its continuing popularity but it has had one unfortunate result: incompatible LaTeX formats came into use at different sites. This included istandard LaTeX 2.09j, LaTeX built with the *New Font Selection Scheme* (), sliTeX, *AmS*-LaTeX, and so on. Thus, to process documents from various places, a site maintainer was forced to keep multiple versions of the LaTeX program. In addition, when looking at a source file it was not always clear for which format the document was written.

To put an end to this unsatisfactory situation, LaTeX2e has been produced; it brings all such extensions back under a single format and thus prevents the proliferation of mutually incompatible dialects of LaTeX 2.09. With LaTeX2e the inew font selection schemej is standard and, for example, amstex (formerly the *AmS*-LaTeX format) or slides (formerly the sliTeX format) are simply extension packages, all working with the same base format.

The introduction of a new release also made it possible to add a small number of often-requested features and to make the task of writing packages and classes simpler.

1.2 LaTeX3nThe long-term future of LaTeX

LaTeX2e is the consolidation step in a comprehensive reimplementation of the LaTeX system. The next major release of LaTeX will be LaTeX3, which will include a radical overhaul of the document designersj and package writersj interface to LaTeX.

LaTeX3 is a long-term research project but, until it is completed, the project team are committed to the active maintenance of LaTeX2e. Thus the experience gained from the production and maintenance of LaTeX2e will be a major influence on the design of LaTeX3.

If you would like to support the project then you are welcome to send donations to the LaTeX3 Project Fund; this has been set up to help the research team by financing various expenses associated with this voluntary work of maintaining the current LaTeX and developing LaTeX3.

The fund is administered by The TeX Users Group and by various local user groups. Information about making donations and joining these groups is available from:

TeX Users Group
P. O. Box 869, Santa Barbara, CA 93102-0869, USA
Fax: +1 805 963 8358
E-Mail: tug@tug.org

Articles covering aspects of the LaTeX3 project are available by anonymous ftp in the Comprehensive TeX Archive, in the directory: ntex-archive/info/ltx3pubn

The file nltx3pub.bibn in that directory contains an abstract of each of the files.

1.3 Overview

This document contains an overview of the new structure and features of LaTeX. It is *not* a self-contained document, as it contains only the features of LaTeX which have changed since version 2.09. You should read this document in conjunction with an introduction to LaTeX.

Section ? contains an overview of the new structure of LaTeX documents. It describes how classes and packages work and how class and package options can be used. It lists the standard packages and classes which come with LaTeX.

Section ? describes the new commands available to authors in LaTeX2e.

Section ? shows how to process old LaTeX documents with LaTeX2e.

Section ? contains advice on dealing with problems you may encounter in running LaTeX2e. It lists some error messages which are new in LaTeX2e and it describes some of the more common problems and how to cure them, or where to find further information.

1.4 Further information

For a general introduction to LaTeX, including the new features of LaTeX2e, you should read by Leslie Lamport [A\s\do5(L)La94].

A more detailed description of the new features of LaTeX, including an overview of more than 150 packages, is to be found in by Michel Goossens, Frank Mittelbach and Alexander Samarin [A\s\do5(G)MS94].

For more information about the many new LaTeX packages you should read the package documentation, which should be available from the same source as your copy of LaTeX.

There are a number of documentation files which accompany every copy of LaTeX. A copy of LaTeX *News* will come out with each six-monthly release of LaTeX; it will be found in the files nltnews*.texn. The class- and package-writerjs guide describes the new LaTeX features for writers of document classes and packages; it is in nclsguide.texn. The guide describes the LaTeX font selection scheme for class- and package-writers; it is in nfntguide.texn.

We are gradually turning the source code for LaTeX into a LaTeX document . This document includes an index of LaTeX commands and can be typeset from nsource2e.texn.

For more information about TeX and LaTeX, please contact your local TeX Users Group, or the international TeX Users Group, P. O. Box 869, Santa Barbara, CA 93102-0869, USA, Fax: +1 805 963 8358, E-mail: tug@tug.org.

2 Classes and packages

This section describes the new structure of LaTeX documents and the new types of file: *classes* and *packages*.

2.1 What are classes and packages?

The main difference between LaTeX 2.09 and LaTeX2e is in the commands before n

2.2 Class and package options

In LaTeX 2.09, only document styles could have options such as ntwosiden or ndraftn. In LaTeX2e, both classes and packages are allowed to have options. For example, to specify a two-sided article with graphics using the ndvipsn driver, you write:

```
\documentclass[twoside]article
\usepackage[dvips]graphics
```

It is possible for packages to share common options. For example, you could, in addition, load the ncolorn package by specifying:

```
\documentclass[twoside]article
\usepackage[dvips]graphics
\usepackage[dvips]color
```

But because n allows more than one package to be listed, this can be shortened to:

```
\documentclass[twoside]article
\usepackage[dvips]graphics,color
```

In addition, packages will also use each option given to the n command (if they know what to do with it), so you could also write:

```
\documentclass[twoside,dvips]article
\usepackagegraphics,color
```

Class and package options are covered in more detail in and in .

2.3 Standard classes

The following classes are distributed with LaTeX:

article The narticlen class described in .

book The nbookn class described in .

report The nreportn class described in .

letter The nlettern class described in .

slides The nslidesn class described in , formerly SliTeX.

proc A document class for proceedings, based on narticlen. Formerly the nprocn package.

ltxdoc The document class for documenting the LaTeX program, based on narticlen.

ltxguide The document class for and , based on narticlen. The document you are reading now uses the nltxguiden class. The layout for this class is likely to change in future releases of LaTeX.

ltnews The document class for the LaTeX *News* information sheet, based on narticlen. The layout for this class is likely to change in future releases of LaTeX.

2.4 Standard packages

The following packages are distributed with LaTeX:

alltt

[Sorry. Ignored `\beginNEWfeature ... \endNEWfeature`]

doc This is the basic package for typesetting the documentation of LaTeX programs. It is described in ndoc.dtxn and in .

exscale This provides scaled versions of the math extension font. It is described in nexscale.dtxn.

fontenc This is used to specify which font encoding LaTeX should use. It is described in nltoutenc.dtxn.

graphpap

[Sorry. Ignored `\beginNEWfeature ... \endNEWfeature`]

ifthen Provides commands of the form iif?then do? otherwise do?j. It is described in nifthen.dtxn and .

inputenc

[Sorry. Ignored `\beginNEWfeature ... \endNEWfeature`]

latexsym LaTeX2e no longer loads the LaTeX symbol font by default. To access it, you should use the nlatexsymn package. It is described in nlatexsym. dtxn and in ; see also Section ?.

makeidx This provides commands for producing indexes. It is described in and in .

newlfont This is used to emulate the font commands of LaTeX 2.09 with the New Font Selection Scheme. It is described in .

oldlfont This is used to emulate the font commands of LaTeX 2.09. It is described in .

showidx This causes the argument of each n

2.5 Related software

The following software should be available from the same distributor as your copy of LaTeX2e. You should obtain at least the graphics and tools collections in order to have all the files described in . The namstexn package (part of amslatex) and babel are also mentioned in the list of istandard packagesj in section C.5.2 of that book.

amslatex Advanced mathematical typesetting from the American Mathematical Society. This is includes the namstexn package; it provides many commands for typesetting mathematical formulas of higher complexity. It is produced and supported by the American Mathematical Society and it is described in .

babel This package and related files support typesetting in many languages. It is described in .

graphics This includes the ngraphicsn package which provides support for the inclusion and transformation of graphics, including files produced

by other software. Also included, is the ncolorn package which provides support for typesetting in colour. Both these packages are described in .

mfnfss Everything you need (except the fonts themselves) for typesetting with a large range of bit-map (Metafont) fonts.

psnfss Everything you need (except the fonts themselves) for typesetting with a large range of Type 1 (PostScript) fonts.

tools Miscellaneous packages written by the LaTeX3 project team.

These packages come with documentation and each of them is also described in at least one of the books and .

2.5.1 Tools

This collection of packages includes, at least, the following (some files may have slightly different names on certain systems):

array Extended versions of the environments narrayn, ntabularn and ntabular*n, with many extra features.

dcolumn Alignment on idecimal pointsj in tabular entries. Requires the narrayn package.

delarray Adds ilarge delimitersj around arrays. Requires narrayn.

hhline Finer control over horizontal rules in tables. Requires narrayn.

longtable Multi-page tables. (Does not require narrayn, but it uses the extended features if both are loaded.)

tabularx Defines a ntabularxn environment that is similar to ntabular*n but it modifies the column widths, rather than the inter-column space, to achieve the desired table width.

afterpage Place text after the current page.

enumerate Extended version of the nenumeraten environment.

fontsmpl Package and test file for producing ifont samplesj.

ftnright Place all footnotes in the right-hand column in two-column mode.

indentfirst Indent The first paragraph of sections, etc.

layout Show the page layout defined by the current document class.

multicol Typeset text in columns, with the length of the columns ibalancedj.

rawfonts Preload fonts using the old internal font names of LaTeX 2.09. See Section ?.

somedefs Selective handling of package options. (Used by the rawfonts package.)

showkeys Prints the ikeysj used by n, n?, n[\s\do5()] etc.; useful whilst drafting.

theorem Flexible declaration of itheorem-likej environments.

varioref iSmartj handling of page references.

verbatim Flexible extension of the verbatim environment.

xr Cross reference other iexternalj documents.

xspace iSmart spacej command that helps you to avoid the common mistake of missing spaces after command names.

3 Commands

This section describes the new commands available in LaTeX2e. They are covered in more detail in and in .

3.1 Initial commands

Initial commands can appear only before the n line.

[Sorry. Ignored `\begindecl ... \enddecl`]

The nfilecontentsn environment is intended for bundling within a single document file the contents of packages, options, or other files. When the document file is run through LaTeX2e the body of this environment is written verbatim (preceded by a comment line) to a file whose name is given as the environmentjs only argument. However, if that file already exists then nothing happens except for an information message.

Only normal ASCII text characters (i.e. 7-bit visible text) should be included in a nfilecontentsn environment. Anything else, such as tab characters, form-feeds or 8-bit characters, should not be included in a nfilecontentsn environment.

Tabs and form feeds produce a warning, explaining that they are turned into spaces or blank lines, respectively. What happens to 8-bit characters depends on the TeX installation and is in general unpredictable.

The nfilecontentsn environment is used for including LaTeX files. For other plain text files (such as Encapsulated PostScript files), you should use the nfilecontents*n environment which does not add a comment line.

These environments are allowed only before n. This ensures that any packages that have been bundled in the document are present when needed.

3.2 Preamble commands

The changes to the preamble commands are intentionally designed to make LaTeX2e documents look clearly different from old documents. The commands should be used only before n

3.3 Document structure

The nbookn document class introduces new commands to indicate document structure.

[Sorry. Ignored `\begindecl ... \enddecl`]

These commands indicate the beginning of the front matter (title page, table of contents and prefaces), main matter (main text) and back matter (bibliography, indexes and colophon).

3.4 Definitions

In LaTeX, commands can have both mandatory and optional arguments, for example in:

```
\documentclass[11pt]article
```

the n11ptn argument is optional, whereas the narticlen class name is mandatory.

In LaTeX 2.09 users could define commands with arguments, but these had to be mandatory arguments. With LaTeX2e, users can now define commands and environments which also have one optional argument.

[Sorry. Ignored `\begindecl ... \enddecl`]

These commands have a new, second, optional argument; this is used for defining commands which themselves take one optional argument. This new argument is best introduced by means of a simple (and hence not very practical) example:

```
\newcommand\example[2][YYY]Mandatory arg: #2;
Optional arg: #1.
```

This defines nn to be a command with two arguments, referred to as n#1n and n#2n in the argdefinitionnnothing new so far. But by adding a second optional argument to this nthe n[YYY]n) the first argument (n#1n) of the newly defined command nn is made optional with its default value being nYYYn.

Thus the usage of nn is either:

```
\exampleBBB
```

which prints:

Mandatory arg: BBB; Optional arg: YYY.

or:

```
\example[XXX]AAA
```

which prints:

Mandatory arg: AAA; Optional arg: XXX.

The default value of the optional argument is YYY. This value is specified as the default argument of the nhat created nn.

As another more useful example, the definition:

```
\newcommand\seq[2][n]\lbrace #2_0,\ldots,\,#2_#1 \
rbrace
```

means that the input n*a*n produces the formula , whereas the input n[*k*]xn produces the formula .

In summary, the command:

n cmd num default argdefinition

defines cmd to be a command with num arguments, the first of which is optional and has default value default.

Note that there can only be one optional argument but, as before, there can be up to nine arguments in total.

[Sorry. Ignored `\begindecl ... \enddecl`]

LaTEX2e also supports the creation of environments that have one optional argument. Thus the syntax of these two commands has been extended in the same way as that of n

[Sorry. Ignored `\begindecl ... \enddecl`]

This takes the same arguments as n If cmd is already defined then the existing definition is kept; but if it is currently undefined then the effect of ns to define cmd just as if nad been used.

[Sorry. Ignored `\beginNEWfeature ... \endNEWfeature`]

3.5 Boxes

These next three commands for making LR-boxes all existed in LaTEX 2.09. They have been enhanced in two ways.

[Sorry. Ignored `\begindecl ... \enddecl`]

One small but far-reaching change for LaTEX2e is that, within the width argument only, four special lengths can be used. These are all dimensions of the box that would be produced by using simply nnargtext:

- nn its height above the baseline;
- nn its depth below the baseline;
- nn the sum of nn and nn;
- nn its width.

Thus, to put ihelloj in the centre of a box of twice its natural width, you would use:

```
\makebox[2\width]hello
```

Or you could put *f* into a square box, like this: *f*

```
\framebox\makebox[\totalheight]\itshape f\/
```

Note that it is the total width of the framed box, including the frame, which is set to nn.

The other change is a new possibility for pos: nsn has been added to nln and nrn. If pos is nsn then the text is stretched the full length of the box, making use of any irubber lengthsj (including any inter-word spaces) in the boxjs contents. If no such irubber lengthj is present, an iunderfull boxj will probably be produced.

[Sorry. Ignored `\begindecl ... \enddecl`]

As for the box commands above, nn, nn, etc. may be used in the height argument to denote the natural dimensions of the box.

The inner-pos argument is new in LaTEX2e. It is the vertical equivalent to the pos argument for nn, etc, determining the position of text within the box. The inner-pos may be any one of ntn, nbn, ncn, or nsn, denoting top, bottom, centred, or istretchedj alignment respectively. When the inner-pos argument is not specified, LaTEX gives it same value as pos (this could be the latterjs default value).

[Sorry. Ignored `\begindecl ... \enddecl`]

This is an environment which does not directly print anything. Its effect is to save the typeset text in the bin cmd. Thus it is like nn argcmd argtext, except that any white space before or after the contents text is ignored.

This is very useful as it enables both the n `command and the \textttverbatim environment to be used within \mtext.`

```
It also makes it possible to define, for example, a `framed box'
environment.  This is done by first using this environment to save
some text in a bin \mcmd and then calling
```

n.
The following example defines an environment, called nfmpagen, that is a framed version of nminipagen.

```
    \newsavebox\fmbox
    \newenvironmentfmpage[1]
\beginlrbox\fmbox\beginminipage#1
\endminipage\endlrbox\fbox\usebox\fmbox
```

3.6 Measuring things

The first of these next commands was in LaTeX 2.09. The two new commands are the obvious analogues.

[Sorry. Ignored `\begindecl ... \enddecl`]

3.7 Line endings

[Sorry. Ignored `\beginNEWdescription ... \endNEWdescription`]

Also, because it is often necessary to distinguish which type of line is to be ended, we have introduced the following new command; it has the same argument syntax as that of n
n.

[Sorry. Ignored `\begindecl ... \enddecl`]

One example of its use is when the text in the last column of a ntabularn environment is set with n

then nn; can be used to indicate the end of a row of the ntabularn, whilst n

n will indicate the end of a line of text in a paragraph within the column. This command can be used in the narrayn environment as well as ntabularn, and also the extended versions of these environments offered by the array and longtable packages in the tools collection.

3.8 Controlling page breaks

Sometimes it is necessary, for a final version of a document, to ihelpj LaTeX break the pages in the best way. LaTeX 2.09 had a variety of commands for this situation: nn, nn etc. LaTeX2e provides, in addition, commands which can produce longer pages as well as shorter ones.

[Sorry. Ignored `\begindecl ... \enddecl`]

These commands increase the height of a page (from its normal value of nn) by the specified amount size, a rigid length. This change affects *only* the current page. This can be used, for example, to allow an extra line to be fitted onto the page or, with a negative length, to produce a page shorter than normal.
The star form also shrinks any vertical white space on the page as much as possible, so as to fit the maximum amount of text on the page.

3.9 Floats

There is a new command, nn, and a new ifloat specifierj. These will enable people to gain better control of LaTeXjs float placement algorithm.

[Sorry. Ignored `\begindecl ... \enddecl`]

This command stops any further floating environments from being placed on the current page. With an optional argument, which should be either ntn or nbn (not both), this restriction applies only to putting further floats at the top or at the bottom. Any floats which would normally be placed on this page are placed on the next page instead.

[Sorry. Ignored `\begindecl ... \enddecl`]

This can be used, along with at least one of `h`, `t`, `b` and `p`, in the location optional argument of a float.
If a `!` is present then, just for this particular float, whenever it is processed by the float mechanism the following are ignored:

all restrictions on the number of floats which can appear;

all explicit restrictions on the amount of space on a text page which may be occupied by floats or must be occupied by text.

The mechanism will, however, still attempt to ensure that pages are not overfull and that floats of the same type are printed in the correct order.
Note that its presence has no effect on the production of float pages.
A `!` specifier overrides the effect of any nn command for this particular float.

3.10 Font changing: text

LaTeX2e has a very different font selection scheme to LaTeX 2.09. In this section, we give a brief description of the new commands. A more detailed description with examples is given in , and the interface for class- and package-writers is described in .

[Sorry. Ignored `\begindecl ... \enddecl`]

These are font commands whose use is the same as the commands nn, **nn, etc. The difference is that each command changes just one attribute of the font (the attribute changed is part of the name). One result of this is that, for example, n***n produces both a change of series and a change of shape, to give a bold italic font.*

[Sorry. Ignored `\begindecl ... \enddecl`***]***

These are one-argument commands; they take as an argument the text which is to be typeset in the particular font. They also automatically insert italic corrections where appropriate; if you do not like the result, you can add an italic correction with nn or remove it with nn. The nn should always be the first or last thing within the arg***text argument.***

3.11 Font changing: math

Most of the fonts used within math mode do not need to be explicitly invoked; but to use letters from a range of fonts, the following class of commands is provided.

[Sorry. Ignored `\begindecl ... \enddecl`***]***

These are also one-argument commands which take as an argument the letters which are to be typeset in the particular font. The argument is processed in math mode so spaces within it will be ignored. Only letters, digits and accents have their font changed, for example nÂ*1n produces Â*1.

3.12 Ensuring math mode

[Sorry. Ignored `\begindecl ... \enddecl`***]***

In LaTeX ***2.09, if you wanted a command to work both in math mode and in text mode, the suggested method was to define something like:***

```
\newcommand\Gp\mbox$G_p$
```

Unfortunately, the nn stops nn changing size correctly in (for instance) subscripts or a fraction.

In LaTeX2e ***you can define it thus:***

```
\newcommand\Gp\ensuremathG_p
```

Now nn will work correctly in all contexts.

This is because the n| does nothing, producing simply nG\s\do5(p)n, when nn is used within math mode; but it ensures that math mode is entered (and exited) as required when nn is used in text mode.

3.13 Text commands: all encodings

[Sorry. Ignored `\beginNEWdescription ... \endNEWdescription`***]***

[Sorry. Ignored `\begindecl ... \enddecl`***]***

This command gives a iringj accent, for example i°oj can be typed n°on.

[Sorry. Ignored `\begindecl ... \enddecl`***]***

This command produces a German iSSj, that is a capital ißj. This letter can hyphenate differently from iSSj, so is needed for entering all-caps German.

[Sorry. Ignored `\begindecl ... \enddecl`***]***

This command is used to build icircled charactersj such as n©n. For example nan produces a.

[Sorry. Ignored `\begindecl ... \enddecl`***]***

This command is used to separate letters which would normally ligature. For example ifij is produced with nfin. Note that the ifj and iij have not ligatured to produce ifij. This is rarely useful in English (ishelffulj is a rare example of where it might be used) but is used in languages such as German.

[Sorry. Ignored `\begindecl ... \enddecl`***]***

This command produces a ivisible spacej character i_j. This is sometimes used in computer listings, for example itype hello_worldj.

[Sorry. Ignored `\begindecl ... \enddecl`***]***

These commands produce characters which would otherwise be accessed via ligatures:

character	command

ligature		
nnn	*n*	*n—n*
nmn	*m*	*n– n*
n¡ n	*¡*	*n¡n*
n¿ n	*¿*	*n¿n*
nkn	*k*	*n“ n*
nln	*l*	*n” n*
nin	*i*	*n‘ n*
njn	*j*	*n’ n*

The reason for making these characters directly accessible is so that they will work in encodings which do not have these characters.

[Sorry. Ignored `\begindecl ... \enddecl`*]*

These commands allow access to characters which were previously only available in math mode:

math command	character	text command
*n*n*	*	*n• n*
*n*n*	*	*n*n*

3.14 Text commands: the T1 encoding

[Sorry. Ignored `\beginNEWdescription ... \endNEWdescription`*]*

[Sorry. Ignored `\begindecl ... \enddecl`*]*

This command produces an iogonekj accent.

[Sorry. Ignored `\begindecl ... \enddecl`*]*

These commands produce characters iethj, idbarj, iengj, and ithornj.

[Sorry. Ignored `\begindecl ... \enddecl`*]*

*These commands produce various sorts of quotation mark. Rough representations of them are: *a* <a> „ al ‚aj and n"nan"n.*

3.15 Logos

[Sorry. Ignored `\begindecl ... \enddecl`*]*

n
LaTeX*n (producing i*LaTeX*j) is still the imainj logo command, but if you need to refer to the new features, you can write n*LaTeX2e*n (producing i*LaTeX2e*j).*

3.16 Picture commands

[Sorry. Ignored `\begindecl ... \enddecl`*]*

The nn command can be used in npicturen mode to draw a quadratic Bezier curve from position n(<AX>,<AY>)n to n(<CX>,<CY>)n with control point n (<BX>,<BY>)n. The optional argument N gives the number of points on the curve.

For example, the diagram:

is drawn with:

```
\beginpicture(50,50)
\thicklines
\qbezier(0,0)(0,50)(50,50)
\qbezier[20](0,0)(50,0)(50,50)
\thinlines
\put(0,0)\line(1,1)50
\endpicture
```

The nn command is the same, except that the argument N is not optional. It is provided for compatibility with the LaTeX *2.09 nbeziern document style option.*

3.17 Old commands

[Sorry. Ignored `\begindecl ... \enddecl`*]*

The nn command still exists but is no longer being maintained. This is because it only ever worked erratically; it does not guarantee that there will be no page-breaks within its scope; and it can cause footnotes and marginals to be wrongly placed.

We recommend using nn in conjunction with page-break commands such as nn and nn to help control page breaks.

[Sorry. Ignored `\begindecl ... \enddecl`*]*

Since SLiTEX ***no longer exists, the logo is no longer defined in the*** LaTEX ***kernel. A suitable replacement is n***SLiTEX***n. The*** SLiTEX ***logo is defined in*** LaTEX ***2.09 compatibility mode.***

[Sorry. Ignored `\begindecl ... \enddecl`*]*

These symbols are contained in the LaTEX ***symbol font, which was automatically loaded by*** LaTEX ***2.09. However,*** TEX ***has room for only sixteen math font families; thus many users discovered that they ran out. Because of this,*** LaTEX ***does not load the*** LaTEX ***symbol font unless you use the nlatexsymn package.***

These symbols are also made available, using different fonts, by the namsfontsn package, which also defines a large number of other symbols. It is supplied by the American Mathematical Society.

The nlatexsymn package is loaded automatically in LaTEX ***2.09 compatibility mode.***

4 LaTEX 2.09 documents

LaTEX2e can process (almost) any LaTEX 2.09 document, by entering LaTEX *2.09 compatibility mode*. Nothing has changed, you run LaTEX in the same way you always did, and you will get much the same results.

The reason for the ialmostj is that some LaTEX 2.09 packages made use of low-level unsupported features of LaTEX. If you discover such a package, you should find out if it has been updated to work with LaTEX2e. Most packages will still work with LaTEX2enthe easiest way to find out whether a package still works is to try it!

LaTEX 2.09 compatibility mode is a comprehensive emulation of LaTEX 2.09, but at the cost of time. Documents can run up to 50% slower in compatibility mode than they did under LaTEX 2.09. In addition, many of the new features of LaTEX2e are not available in LaTEX 2.09 compatibility mode.

4.1 Font selection problems

When using compatibility mode, it is possible that you will find problems with font-changing commands in some old documents. These problems are of two types:

producing error messages;

not producing the font changes you expected.

In case of error messages it is possible that the document (or an old style file used therein) contains references to old internal commands which are no longer defined, see Section ? for more information if this is the case.

LaTEX 2.09 allowed sites to customize their LaTEX installation, which resulted in documents producing different results on different LaTEX installations. LaTEX2e no longer allows so much customization but, for compatibility with old documents, the local configuration file nlatex209.cfgn is loaded every time LaTEX2e enters LaTEX 2.09 compatibility mode.

For example, if your site was customized to use the New Font Selection Scheme () with the noldlfontn option, then you can make LaTEX2e emulate this by creating a nlatex209.cfgn file containing the commands:

```
\ExecuteOptionsoldlfont\RequirePackageoldlfont
```

Similarly, to emulate with the nnewlfontn option, you can create a nlatex209.cfgn file containing:

```
\ExecuteOptionsnewlfont\RequirePackagenewlfont
```

4.2 Native mode

To run an old document faster, and use the new features of LaTEX2e, you should try using LaTEX2e *native mode*. This is done by replacing the command:

narg class

with:

n optionsargclass

nn

However, some documents which can be processed in LaTEX 2.09 compatibility mode may not work in native mode. Some LaTEX 2.09 packages will only work with LaTEX2e in 2.09 compatibility mode. Some documents will cause errors because of LaTEX2ejs improved error detection abilities.

But most LaTEX 2.09 documents can be processed by LaTEX2ejs native mode with the above change. Again, the easiest way to find out whether your documents can be processed in native mode is to try it!

5 Problems

This section describes some of the things which may go wrong when using LaTEX2e, and what you can do about it.

5.1 New error messages

LaTEX2e has a number of new error messages. Please also note that many error messages now produce further helpful information if you press nhn in response to the error prompt.

[Sorry. Ignored `\begindecl ... \enddecl`]

The named package has been loaded twice with different options. If you enter nhn you will be told what the options were, for example, if your document contained:

```
\usepackage[foo]fred
\usepackage[baz]fred
```

then you will get the error message:

```
Option clash for package fred.
```

and typing nhn at the n?n prompt will give you:

```
   The package fred has already been loaded with options:
[foo]
   There has now been an attempt to load it with options:
[baz]
   Adding the line:
\usepackage[foo,baz]fred
   to your document may fix this.
   Try typing <<return>> to proceed.
```

The cure is, as suggested, to load the package with both sets of options. Note that since LaTEX packages can call other packages, it is possible to get a package option clash without explicitly requesting the same package twice.

[Sorry. Ignored `\begindecl ... \enddecl`]

The command is not provided by default in LaTEX2e. This error is generated by using one of the commands:

```
\mho \Join \Box \Diamond \leadsto
\sqsubset \sqsupset \lhd \unlhd \rhd \unrhd
```

which are now part of the nlatexsymn package. The cure is to add:

```
\usepackagelatexsym
```

in the preamble of your document.

[Sorry. Ignored `\begindecl ... \enddecl`]

The command is a LaTeX2e command but this is a LaTeX 2.09 document. The cure is to replace the command by a LaTeX 2.09 command, or to run document in native mode, as described in Section ?.

[Sorry. Ignored `\begindecl ... \enddecl`]

The command nn was used by the New Font Selection Scheme Release 1 but it has now been replaced by nn, the use of which is described in .
The best cure is to update the package which contained the nn command. Find out if there is a new release of the package, or (if you wrote the package yourself) consult for the new syntax of font commands.
If there is no updated version of the package then you can cure this error by using the nnewlfontn or noldlfontn package, which tells LaTeX which version of nn should be emulated.
You should use noldlfontn if the document selects math fonts with syntax such as this:

n An, etc.

Use nnewlfontn if the documentjs syntax is like this:

n An, etc.

[Sorry. Ignored `\begindecl ... \enddecl`]

```
The n command has been begun but not ended on that line.  This
usually means that you have forgotten to put in the end-character of
the  command.

\begindecl
   Illegal use of |
\enddecl
The |\verb| command has been used inside the argument of another
command
```

This has never been allowed in LaTeXnoften producing incorrect output without any warningnand so LaTeX2e produces an error message.

5.2 Old internal commands

A number of LaTeX 2.09 internal commands have been removed, since their functionality is now provided in a different way. See for more details of the new, supported interface for class and package writers.

[Sorry. Ignored `\begindecl ... \enddecl`]

These commands provided access to the seventy fonts preloaded by LaTeX 2.09. In contrast, LaTeX2e normally preloads at most fourteen fonts, which saves a lot of font memory; but a consequence is that any LaTeX file which used the above commands to directly access fonts will no longer work.
Their use will usually produce an error message such as:

```
! Undefined control sequence.
l.5 \tenrm
```

The cure for this is to update the document to use the new font-changing commands provided by LaTeX2e; these are described in .
If this is not possible then, as a last resort, you can use the nrawfontsn package, which loads the seventy LaTeX 2.09 fonts and provides direct access to them using the old commands. This takes both time and memory. If you do not wish to load all seventy fonts, you can select some of them by using the nonlyn option to nrawfontsn. For example, to load only ntenrmn and ntenbfn you write:

```
\usepackage[only,tenrm,tenbf]rawfonts
```

The nrawfontsn package is distributed as part of the LaTeX tools software, see Section ?.

5.3 Old files

One of the more common mistakes in running LaTeX is to read in old versions of packages instead of the new versions. If you get an incomprehensible error message from a standard package, make sure you are loading the most recent version of the package. You can find out which version of the package has been loaded by looking in the log file for a line like:

```
Package: fred 1994/06/01 v0.01 Fred's package.
```

You can use the release-date options to n and n to make sure that you are getting a suitably recent copy of the document class or package. This is useful when sending a document to another site, which may have out-of-date software.

5.4 Where to go for more help

If you canjt find the answer for your problem here, try looking in or . If you have a problem with installing LaTeX, look in the installation guide files which come with the distribution.
If this doesnjt help, contact your local LaTeX guru or local LaTeX mailing list.
If you think youjve discovered a bug then please report it! First, you should find out if the problem is with a third-party package or class. If the problem is caused by a package or class other than those listed in Section ? then please report the problem to the author of the package or class, not to the LaTeX3 project team.
If the bug really is with core LaTeX then you should create a *short*, *self-contained* document which exhibits the problem. You should run a *recent* (less than a year old) version of LaTeX on the file and then run LaTeX on nlatexbug.texn. This will create an error report which you should send, together with the sample document and log file, to the LaTeX bugs address which can be found in the file nlatexbug.texn or nbugs.txtn.

6 Enjoy!

We certainly hope you will enjoy using the new standard LaTeX but, if this is not possible, we hope that you will enjoy success and fulfillment as a result of the documents which it will help you to create.
If you find that the contribution of LaTeX to your life is such that you would like to support the work of the project team, then please read Section ? and discover practical ways to do this.

References

[] Michel Goossens, Frank Mittelbach and Alexander Samarin. *The* LaTeX *Companion*. Addison-Wesley, Reading, Massachusetts, 1994.

[] Donald E. Knuth. *The* TeX*book*. Addison-Wesley, Reading, Massachusetts, 1986. Revised to cover TeX3, 1991.

[] Leslie Lamport. LaTeX*: A Document Preparation System*. Addison-Wesley, Reading, Massachusetts, second edition, 1994.