

The atveryend package

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Abstract

This \LaTeX package provides two hooks for `\end{document}` that are executed after the hook of `\AtEndDocument`. `\AfterLastShipout` can be used for code that is to be executed right after the last `\clearpage` before the `.aux` file is closed. `\AtVeryEndDocument` is used for code after closing and final reading of the `.aux` file.

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1 Documentation

There are packages (e.g. `hyperref` [4], `lastpage` [6]) that want to call code after the typesetting is done, for example to remember the last page number. `LATEX` provides the hook `\AtEndDocument` (clsguide [1]). There are packages that use this hook to do their job for typesetting pages (e.g. `endfloat` emits the floats here [2]). Also a user might provide additional code in `\AtEndDocument`. Therefore packages have to call `\clearpage` in `\AtEndDocument` to get after the last shipout page. But this is not too reliable, because the right timing is important between packages that want or have to do things before the last page is output and packages that only work properly if they can reach the point after the last shipout.

Therefore the task of this package is to provide additional hooks for `\end{document}`. All hooks are called after the hook of `\AtEndDocument`.

`\BeforeClearDocument {<code>}`

The code is called before the final `\clearpage` in `\enddocument`. However it is unknown, whether the last page is already shipped out or if this will be triggered by the final `\clearpage`.

`\AfterLastShipout {<code>}`

The code is called after the final `\clearpage` of `\enddocument` before the main `.aux` file is closed. This is the right place to remember the last page in the `.aux` file, for instance.

`\AtVeryEndDocument {<code>}`

The code is called after the `.aux` file is closed and read in again. It is the place for final checks, rerun hints, final messages.

1.1 Related work

Package `scrfile`: Markus Kohm has written package `scrfile` (part of KOMA-Script [5]) that provides hooks `\BeforeClosingMainAux` and `\AfterReadingMainAux`. They have the same function as the hooks of this package. In fact this package uses them, if they are available.

Class `revtex4-1`: This class calls `\clear@document` in `\enddocument` that wraps the final call of `\clearpage`. Thus it can be used as hook to call stuff after that `\clearpage`. This is also done by this package.

Package `etoolbox`: It provides `\AfterEndDocument`, a hook right before `\deadcycles` or `\@@end` [3].

This package tries to combine as many approaches as possible:

- It looks for a known `\enddocument` and redefines it.
- Hooks that are provided by others are used (package `scrfile` or class `revtex4-1`).
- It redefines `\@checkend` and `\@dofilelist` to insert the hooks similar to `packagescrfile`.
- The hook execution is wrapped in a macro that is redefined by its first call to prevent calling the hook more than once.

2 Implementation

```

1 (*package)
2 \begingroup
3   \catcode123 1 % {
4   \catcode125 2 % }
5   \def\x{\endgroup
6     \expandafter\edef\csname AtVeryEnd@AtEnd\endcsname{%
7       \catcode35 \the\catcode35\relax
8       \catcode64 \the\catcode64\relax
9       \catcode123 \the\catcode123\relax
10      \catcode125 \the\catcode125\relax
11    }%
12  }%
13 \x
14 \catcode35 6 % #
15 \catcode64 11 % @
16 \catcode123 1 % {
17 \catcode125 2 % }
18 \def\TMP@EnsureCode#1#2{%
19   \edef\AtVeryEnd@AtEnd{%
20     \AtVeryEnd@AtEnd
21     \catcode#1 \the\catcode#1\relax
22   }%
23   \catcode#1 #2\relax
24 }
25 \TMP@EnsureCode{9}{10}% (tab)
26 \TMP@EnsureCode{39}{12}% '
27 \TMP@EnsureCode{40}{12}% (
28 \TMP@EnsureCode{41}{12}% )
29 \TMP@EnsureCode{42}{12}% *
30 \TMP@EnsureCode{45}{12}% -
31 \TMP@EnsureCode{46}{12}% .
32 \TMP@EnsureCode{47}{12}% /
33 \TMP@EnsureCode{61}{12}% =
34 \TMP@EnsureCode{62}{12}% >
35 \TMP@EnsureCode{96}{12}% `
36 \g@addto@macro{\AtVeryEnd@AtEnd}{\endinput}%

Package identification.
37 \NeedsTeXFormat{LaTeX2e}
38 \ProvidesPackage{atveryend}%
39 [2010/03/24 v1.5 Hooks at very end of document (H0)]

```

2.1 Hooks

`ryEnd@BeforeClearDocumentHook`

```
40 \let\AtVeryEnd@BeforeClearDocumentHook\@empty
```

`tVeryEnd@AfterLastShipoutHook`

```
41 \let\AtVeryEnd@AfterLastShipoutHook\@empty
```

VeryEnd@AtVeryEndDocumentHook

```
42 \let\AtVeryEnd@AtVeryEndDocumentHook\@empty
```

\BeforeClearDocument

```
43 \newcommand*{\BeforeClearDocument}{%
44   \g@addto@macro\AtVeryEnd@BeforeClearDocumentHook
45 }
```

\AfterLastShipout

```
46 \newcommand*{\AfterLastShipout}{%
47   \g@addto@macro\AtVeryEnd@AfterLastShipoutHook
48 }
```

\AtVeryEndDocument

```
49 \newcommand*{\AtVeryEndDocument}{%
50   \g@addto@macro\AtVeryEnd@AtVeryEndDocumentHook
51 }
```

\Call@BeforeClearDocument

```
52 \newcommand*{\Call@BeforeClearDocument}{%
53   \let\BeforeClearDocument\@firstofone
54   \ifx\AtVeryEnd@BeforeClearDocumentHook\@empty
55     \PackageInfo{atveryend}{Empty hook 'BeforeClearDocument'}%
56   \else
57     \PackageInfo{atveryend}{Executing hook 'BeforeClearDocument'}%
58     \AtVeryEnd@BeforeClearDocumentHook
59   \fi
60   \global\let\AtVeryEnd@BeforeClearDocumentHook\@undefined
61   \global\let\Call@BeforeClearDocument\relax
62 }
```

\Call@AfterLastShipout

```
63 \newcommand*{\Call@AfterLastShipout}{%
64   \let\AfterLastShipout\@firstofone
65   \ifx\AtVeryEnd@AfterLastShipoutHook\@empty
66     \PackageInfo{atveryend}{Empty hook 'AfterLastShipout'}%
67   \else
68     \PackageInfo{atveryend}{Executing hook 'AfterLastShipout'}%
69     \AtVeryEnd@AfterLastShipoutHook
70   \fi
71   \global\let\AtVeryEnd@AfterLastShipoutHook\@undefined
72   \global\let\Call@AfterLastShipout\relax
73 }
```

\Call@AtVeryEndDocument

```
74 \newcommand*{\Call@AtVeryEndDocument}{%
75   \let\AtVeryEndDocument\@firstofone
76   \ifx\AtVeryEnd@AtVeryEndDocumentHook\@empty
77     \PackageInfo{atveryend}{Empty hook 'AtVeryEndDocument'}%
78   \else
79     \PackageInfo{atveryend}{Executing hook 'AtVeryEndDocument'}%
80     \AtVeryEnd@AtVeryEndDocumentHook
81   \fi
82   \global\let\AtVeryEnd@AtVeryEndDocumentHook\@undefined
83   \global\let\Call@AtVeryEndDocument\relax
84 }
```

2.2 Redefining \enddocument

This approach looks for known versions of `\enddocument` and redefines it. Class `seminar` and package `slidesec` are not checked, because there would be too much combinations to check.

2.2.1 L^AT_EX kernel

\AtVeryEnd@test@standard

```

85 \def\AtVeryEnd@test@standard{%
86   \let\AtEndDocument\@firstofone
87   \@enddocumenthook
88   \@checkend{document}%
89   \clearpage
90   \begingroup
91     \if@filesw
92       \immediate\closeout\@mainaux
93       \let\@setckpt\@gobbletwo
94       \let\@newl@bel\@testdef
95       \@tempswafalse
96       \makeatletter
97       \input\jobname.aux %
98     \fi
99     \@dofilelist
100    \ifdim \font@submax >\fontsubfuzz\relax
101      \@font@warning{Size substitutions with differences\MessageBreak
102        up to \font@submax\space have occurred.\@gobbletwo}%
103    \fi
104    \@defaultsubs
105    \@refundefined
106    \if@filesw
107      \ifx \@multiplelabels \relax
108        \if@tempswa
109          \@latex@warning@no@line{Label(s) may have changed. %
110            Rerun to get cross-references right}%
111        \fi
112      \else
113        \@multiplelabels
114      \fi
115    \fi
116  \endgroup
117  \deadcycles\z@
118  \@@end
119 }
```

tVeryEnd@enddocument@standard

```

120 \def\AtVeryEnd@enddocument@standard{%
121   \let\AtEndDocument\@firstofone
122   \@enddocumenthook
123   \@checkend{document}%
124   \Call@BeforeClearDocument
125   \clearpage
126   \Call@AfterLastShipout
127   \begingroup
128     \if@filesw
129       \immediate\closeout\@mainaux
130       \let\@setckpt\@gobbletwo
131       \let\@newl@bel\@testdef
132       \@tempswafalse
133       \makeatletter
134       \input\jobname.aux %
135     \fi
136     \Call@AtVeryEndDocument
137     \@dofilelist
138     \ifdim \font@submax >\fontsubfuzz\relax
139       \@font@warning{Size substitutions with differences\MessageBreak
140         up to \font@submax\space have occurred.\@gobbletwo}%
141     \fi

```

```

142 \@defaultsubs
143 \@refundefined
144 \if@filesw
145 \ifx \@multiplelabels \relax
146 \if@tempwa
147 \latex@warning@no@line{Label(s) may have changed. %
148 Rerun to get cross-references right}%
149 \fi
150 \else
151 \@multiplelabels
152 \fi
153 \fi
154 \endgroup
155 \deadcycles\z@
156 \@@end
157 }

```

2.2.2 Package `booklet`, file `2up.tex`

`\AtVeryEnd@test@booklet`

```

158 \expandafter\def\expandafter\AtVeryEnd@test@booklet\expandafter{%
159 \expandafter\twoupclearpage
160 \AtVeryEnd@test@standard
161 }

```

`\AtVeryEnd@enddocument@booklet`

```

162 \expandafter\def\expandafter\AtVeryEnd@enddocument@booklet\expandafter{%
163 \expandafter\twoclearpage
164 \AtVeryEnd@enddocument@standard
165 }

```

2.2.3 Class `dinbrief`

`\AtVeryEnd@test@dinbrief`

```

166 \def\AtVeryEnd@test@dinbrief{%
167 \@checkend{document} %
168 \newpage
169 \begingroup
170 \if@filesw
171 \ifnum\c@labelgen>0 %
172 \immediate\closeout\@mainlbl
173 \makeatletter
174 \input \jobname@lbl\relax
175 \clearpage
176 \fi
177 \immediate\closeout\@mainaux
178 \fi
179 \endgroup
180 \deadcycles\z@
181 \@@end
182 }

```

`\AtVeryEnd@enddocument@dinbrief`

```

183 \def\AtVeryEnd@enddocument@dinbrief{%
184 \@checkend{document}%
185 \Call@BeforeClearDocument
186 \newpage
187 \Call@AfterLastShipout
188 \begingroup
189 \if@filesw
190 \ifnum\c@labelgen>\z@

```

```

191         \immediate\closeout\@mainlbl
192         \makeatletter
193         \input \jobname@lbl\relax
194         \clearpage
195         \fi
196         \immediate\closeout\@mainaux
197         \fi
198         \Call@AtVeryEndDocument
199     \endgroup
200     \deadcycles\z@
201     \@@end
202 }

```

2.2.4 Class combine

\AtVeryEnd@test@combine

```

203 \def\AtVeryEnd@test@combine{%
204     \@enddocumenthook
205     \@checkend{document}%
206     \clearpage
207     \begingroup
208         \if@filesw
209             \immediate\closeout\@mainaux
210             \immediate\closeout\@partaux
211             \let\@setckpt\@gobbletwo
212             \let\@newl@bel\@testdef
213             \@tempswafalse
214             \makeatletter \input\c@lmainauxfile %% change here
215             \fi
216             \c@lenddoca %% a replacement
217             \@refundefined
218         \endgroup
219         \deadcycles\z@
220         \@@end
221 }

```

AtVeryEnd@enddocument@combine

```

222 \def\AtVeryEnd@enddocument@combine{%
223     \@enddocumenthook
224     \@checkend{document}%
225     \Call@BeforeClearDocument
226     \clearpage
227     \Call@AfterLastShipout
228     \begingroup
229         \if@filesw
230             \immediate\closeout\@mainaux
231             \immediate\closeout\@partaux
232             \let\@setckpt\@gobbletwo
233             \let\@newl@bel\@testdef
234             \@tempswafalse
235             \makeatletter \input\c@lmainauxfile %% change here
236             \fi
237             \Call@AtVeryEndDocument
238             \c@lenddoca %% a replacement
239             \@refundefined
240         \endgroup
241         \deadcycles\z@
242         \@@end
243 }

```

2.2.5 Class jpsj2

\AtVeryEnd@test@jpsj

```
244 \def\AtVeryEnd@test@jpsj{%
245   \if@lastpagebalancing
246     \global\let\@outputdblcol=\balancing@outputdblcol
247   \fi
248   \@checkend{document}%
249   \clearpage
250   \begingroup
251     \if@filesw
252       \immediate\closeout\@mainaux
253       \def\global\@namedef##1##2{%
254         \def\newlabel{\@testdef r}%
255         \def\bibcite{\@testdef b}%
256         \@tempswafalse
257         \makeatletter
258         \input \jobname.aux %
259         \if@tempswa
260           \@warning{%
261             Label(s) may have changed. %
262             Rerun to get cross-references right%
263           }%
264         \fi
265       \fi
266     \endgroup
267     \deadcycles\z@
268     \@@end
269 }
```

\AtVeryEnd@enddocument@jpsj

```
270 \def\AtVeryEnd@enddocument@jpsj{%
271   \if@lastpagebalancing
272     \global\let\@outputdblcol=\balancing@outputdblcol
273   \fi
274   \@checkend{document}%
275   \Call@BeforeClearDocument
276   \clearpage
277   \Call@AfterLastShipout
278   \begingroup
279     \if@filesw
280       \immediate\closeout\@mainaux
281       \def\global\@namedef##1##2{%
282         \def\newlabel{\@testdef r}%
283         \def\bibcite{\@testdef b}%
284         \@tempswafalse
285         \makeatletter
286         \input \jobname.aux %
287         \if@tempswa
288           \@warning{%
289             Label(s) may have changed. %
290             Rerun to get cross-references right%
291           }%
292         \fi
293       \fi
294     \Call@AtVeryEndDocument
295   \endgroup
296   \deadcycles\z@
297   \@@end
298 }
```


2.2.6 Testing and redefining

\AtVeryEnd@Test

```
299 \def\AtVeryEnd@Test#1#2{%
300   \expandafter\ifx\csname AtVeryEnd@test@#2\endcsname#1%
301     \expandafter\let\expandafter#1%
302     \csname AtVeryEnd@enddocument@#2\endcsname
303   \begingroup
304     \let\on@line\@empty
305     \PackageInfo{atveryend}{%
306       \string#1 detected (#2)%
307     }%
308   \endgroup
309   \expandafter\AtVeryEnd@SkipToNil
310 \fi
311 }
```

\AtVeryEnd@SkipToNil

```
312 \def\AtVeryEnd@SkipToNil#1\@nil{}
```

\AtVeryEnd@RedefEndDocument

```
313 \def\AtVeryEnd@RedefEndDocument#1{%
314   \ifx#1\@undefined
315   \else
316     \AtVeryEnd@Test#1{standard}%
317     \AtVeryEnd@Test#1{booklet}%
318     \AtVeryEnd@Test#1{dinbrief}%
319     \AtVeryEnd@Test#1{combine}%
320     \AtVeryEnd@Test#1{jpsj}%
321     \AtVeryEnd@SkipToNil
322   \@nil
323 \fi
324 }

325 \AtVeryEnd@RedefEndDocument\enddocument
326 \AtVeryEnd@RedefEndDocument\AP@enddocument % afterpage.sty
327 \AtVeryEnd@RedefEndDocument\hyper@back@cite@enddocument % htx-bc.sty
328 \AtVeryEnd@RedefEndDocument\hyper@enddocument % hyper.sty
329 \AtVeryEnd@RedefEndDocument\hyper@fn@enddocument % hyper.sty
330 \AtVeryEnd@RedefEndDocument\cweb@save@enddocument % cweb.cls
331 \AtVeryEnd@RedefEndDocument\prev@enddocument % flushend.sty
332 \AtVeryEnd@RedefEndDocument\endorigdocument % gaceta.cls
333 \AtVeryEnd@RedefEndDocument\keependdoc % aguplus.sty
334 \AtVeryEnd@RedefEndDocument\EMenddocument % t-angles.sty
335 \AtVeryEnd@RedefEndDocument\docmute@enddocument % docmute.sty
336 \AtVeryEnd@RedefEndDocument\@enddocument % alateX.sty
337 \AtVeryEnd@RedefEndDocument\enddocumentasusual % frenchle.sty
338 \AtVeryEnd@RedefEndDocument\old@enddocument % uwthesis.cls
```

2.3 Using hooks of other packages

2.3.1 Package scrfile

```
339 \AtBeginDocument{%
340   \@ifpackageloaded{scrfile}{%
341     \@ifundefined{BeforeClosingMainAux}{}{%
342       \BeforeClosingMainAux{\Call@AfterLastShipout}%
343     }%
344     \@ifundefined{AfterReadingMainAux}{}{%
345       \AfterReadingMainAux{\Call@AtVeryEndDocument}%
346     }%
347   }{}%
```

2.3.2 Package etoolbox

```
348 \ifpackageloaded{etoolbox}{%
349   \@ifundefined{AfterEndDocument}{}{%
350     \AfterEndDocument{\Call@AtVeryEndDocument}%
351   }%
352 }
```

2.4 Hack into \enddocument

```
353 \def\AtVeryEnd@document{document}%
354 \def\AtVeryEnd@RedefCheckEnd{%
355   \expandafter\def\expandafter\@checkend
356   \expandafter##\expandafter1\expandafter{%
357     \@checkend{##1}%
358     \def\AtVeryEnd@temp{##1}%
359     \ifx\AtVeryEnd@temp\AtVeryEnd@document
360       \let\AtVeryEnd@OrgClearpage\clearpage
361       \def\clearpage{%
362         \let\clearpage\AtVeryEnd@OrgClearpage
363         \Call@BeforeClearDocument
364         \clearpage
365         \Call@AfterLastShipout
366       }%
367     \fi
368   }%
369   \aftergroup\AtVeryEnd@RedefCheckEnd
370 }%
371 \AtEndDocument{%
372   \AtVeryEnd@RedefCheckEnd
373 }%
374 }

375 \AtEndDocument{%
376   \@ifundefined{@dofilelist}{}%
377   \gdef@dofilelist{\Call@AtVeryEndDocument}%
378 }{%
379   \begingroup
380     \toks@\expandafter{\@dofilelist}%
381     \xdef@dofilelist{%
382       \noexpand\Call@AtVeryEndDocument
383       \the\toks@
384     }%
385   \endgroup
386 }%
387 }
```

2.5 Class letter

The class letter and some similar classes insert material (`\@startlabels`) at the end of the document. However, this method violates a precondition of this package that the `\clearpage` in `\enddocument` is the final call with no material at later times. Therefore we move the label making from the `.aux` file to `\AtEndDocument`.

```
388 \def\AtVeryEnd@temp{%
389   \AtBeginDocument{%
390     \let\@startlabels\startlabels
391     \let\@mlabel\mlabel
392     \if@filesw
393       \immediate\write\@mainaux{\string\@startlabels}%
394     \fi
395   }%
396   \AtEndDocument{%
397     \if@filesw
398       \immediate\write\@mainaux{\string\clearpage}%
399     \fi

```

```

400 }%
401 }
402 \ifx\makelabels\AtVeryEnd@temp
403 \else
404 \expandafter\AtVeryEnd@AtEnd
405 \fi
406 \let\AtVeryEnd@PatchLetter=N%
407 \begingroup\expandafter\expandafter\expandafter\endgroup
408 \expandafter\ifx\csname endletter\endcsname\relax
409 \else
410 \long\def\AtVeryEnd@TestEndLetter#1\@auxout#2#3\AtVeryEnd@Nil{%
411 \def\AtVeryEnd@temp{#2}%
412 \ifx\AtVeryEnd@temp\@empty
413 \else
414 \@onelevel@sanitize\AtVeryEnd@temp
415 \edef\AtVeryEnd@StringMlabel{%
416 \string\string
417 \string\@mlabel
418 \expandafter\@gobble\string\{%
419 }%
420 \def\AtVeryEnd@CatchFirst##1##2##3##4##5##6##7##8{%
421 ##1##2##3##4##5##6##7##8\AtVeryEnd@CatchSecond
422 }%
423 \def\AtVeryEnd@CatchSecond##1##2##3##4##5##6##7##8##9\@nil{%
424 ##1##2##3##4##5##6##7##8%
425 }%
426 \edef\AtVeryEnd@temp{%
427 \expandafter\AtVeryEnd@CatchFirst\AtVeryEnd@temp
428 {}{}{}{}{}{}{}{}%
429 {}{}{}{}{}{}{}{}%
430 \@nil
431 }%
432 \ifx\AtVeryEnd@temp\AtVeryEnd@StringMlabel
433 \expandafter\def\expandafter\endletter\expandafter{%
434 \endletter
435 \begingroup
436 \let\=\relax
437 \let\protect\@unexpandable@protect
438 \let\@mlabel=\relax
439 \edef\x{\endgroup
440 \noexpand\AtEndDocument{%
441 \@gobble#2%
442 }%
443 }%
444 \x
445 }%
446 \let\AtVeryEnd@PatchLetter=Y%
447 \fi
448 \fi
449 }%
450 \expandafter\AtVeryEnd@TestEndLetter\endletter
451 \@auxout{}\AtVeryEnd@Nil
452 \fi
453 \ifx\AtVeryEnd@PatchLetter Y%
454 \begingroup
455 \let\on@line\@empty
456 \PackageInfo{atveryend}{%
457 \@backslashchar makelabels detected. %
458 Moving labels\MessageBreak
459 from '.aux' file to \@backslashchar AtEndDocument%
460 }%
461 \endgroup

```

```

462 \def\makelabels{%
463   \AtBeginDocument{%
464     \let\@startlabels\startlabels
465     \let\@mlabel\mlabel
466   }%
467 }%
468 \AtEndDocument{%
469   \ifundefined{@startlabels}{%
470     {%
471       \clearpage
472       \@startlabels
473     }%
474   }%
475 \AfterLastShipout{%
476   \let\@startlabels\relax
477   \let\@mlabel\@gobbletwo
478 }%
479 \else
480 \PackageWarningNoLine{atveryend}{%
481   \@backslashchar makelabels detected, but labels cannot\MessageBreak
482   be moved to \@backslashchar AtEndDocument, because\MessageBreak
483   \@backslashchar endletter is not in expected form%
484 }%
485 \fi
486 \AtVeryEnd@AtEnd
487 \endpackage

```

3 Test

3.1 Catcode checks for loading

```

488 \test1
489 \catcode'\{=1 %
490 \catcode'\}=2 %
491 \catcode'\#=6 %
492 \catcode'\@=11 %
493 \expandafter\ifx\csname count\endcsname\relax
494 \countdef\count@=255 %
495 \fi
496 \expandafter\ifx\csname @gobble\endcsname\relax
497 \long\def\@gobble#1{%
498 \fi
499 \expandafter\ifx\csname @firstofone\endcsname\relax
500 \long\def\@firstofone#1{#1}%
501 \fi
502 \expandafter\ifx\csname loop\endcsname\relax
503 \expandafter\@firstofone
504 \else
505 \expandafter\@gobble
506 \fi
507 {%
508 \def\loop#1\repeat{%
509 \def\body{#1}%
510 \iterate
511 }%
512 \def\iterate{%
513 \body
514 \let\next\iterate
515 \else
516 \let\next\relax
517 \fi

```

```

518     \next
519 }%
520 \let\repeat=\fi
521 }%
522 \def\RestoreCatcodes{}
523 \count@=0 %
524 \loop
525   \edef\RestoreCatcodes{%
526     \RestoreCatcodes
527     \catcode\the\count@=\the\catcode\count@\relax
528   }%
529 \ifnum\count@<255 %
530   \advance\count@ 1 %
531 \repeat
532
533 \def\RangeCatcodeInvalid#1#2{%
534   \count@=#1\relax
535   \loop
536     \catcode\count@=15 %
537   \ifnum\count@<#2\relax
538     \advance\count@ 1 %
539   \repeat
540 }
541 \expandafter\ifx\csname LoadCommand\endcsname\relax
542   \def\LoadCommand{\input atveryend.sty\relax}%
543 \fi
544 \def\Test{%
545   \RangeCatcodeInvalid{0}{47}%
546   \RangeCatcodeInvalid{58}{64}%
547   \RangeCatcodeInvalid{91}{96}%
548   \RangeCatcodeInvalid{123}{255}%
549   \catcode'\@=12 %
550   \catcode'\=0 %
551   \catcode'\{=1 %
552   \catcode'\}=2 %
553   \catcode'\#=6 %
554   \catcode'\[=12 %
555   \catcode'\]=12 %
556   \catcode'\%=14 %
557   \catcode'\ =10 %
558   \catcode13=5 %
559   \LoadCommand
560   \RestoreCatcodes
561 }
562 \Test
563 \csname @@end\endcsname
564 \end
565 </test1>

```

4 Installation

4.1 Download

Package. This package is available on CTAN¹:

[CTAN:macros/latex/contrib/oberdiek/atveryend.dtx](http://ctan.org/ctan/macros/latex/contrib/oberdiek/atveryend.dtx) The source file.

[CTAN:macros/latex/contrib/oberdiek/atveryend.pdf](http://ctan.org/ctan/macros/latex/contrib/oberdiek/atveryend.pdf) Documentation.

¹[ftp://ftp.ctan.org/tex-archive/](http://ftp.ctan.org/tex-archive/)

Bundle. All the packages of the bundle ‘oberdiek’ are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

[CTAN:install/macros/latex/contrib/oberdiek.tds.zip](#)

TDS refers to the standard “A Directory Structure for T_EX Files” ([CTAN:tds/tds.pdf](#)). Directories with `texmf` in their name are usually organized this way.

4.2 Bundle installation

Unpacking. Unpack the `oberdiek.tds.zip` in the TDS tree (also known as `texmf` tree) of your choice. Example (linux):

```
unzip oberdiek.tds.zip -d ~/texmf
```

Script installation. Check the directory `TDS:scripts/oberdiek/` for scripts that need further installation steps. Package `attachfile2` comes with the Perl script `pdfatfi.pl` that should be installed in such a way that it can be called as `pdfatfi`. Example (linux):

```
chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/
```

4.3 Package installation

Unpacking. The `.dtx` file is a self-extracting `docstrip` archive. The files are extracted by running the `.dtx` through plain T_EX:

```
tex atveryend.dtx
```

TDS. Now the different files must be moved into the different directories in your installation TDS tree (also known as `texmf` tree):

<code>atveryend.sty</code>	→ <code>tex/latex/oberdiek/atveryend.sty</code>
<code>atveryend.pdf</code>	→ <code>doc/latex/oberdiek/atveryend.pdf</code>
<code>test/atveryend-test1.tex</code>	→ <code>doc/latex/oberdiek/test/atveryend-test1.tex</code>
<code>atveryend.dtx</code>	→ <code>source/latex/oberdiek/atveryend.dtx</code>

If you have a `docstrip.cfg` that configures and enables `docstrip`’s TDS installing feature, then some files can already be in the right place, see the documentation of `docstrip`.

4.4 Refresh file name databases

If your T_EX distribution (teT_EX, miK_T_EX, ...) relies on file name databases, you must refresh these. For example, teT_EX users run `texhash` or `mktextlsr`.

4.5 Some details for the interested

Attached source. The PDF documentation on CTAN also includes the `.dtx` source file. It can be extracted by AcrobatReader 6 or higher. Another option is `pdftk`, e.g. unpack the file into the current directory:

```
pdftk atveryend.pdf unpack_files output .
```

Unpacking with L^AT_EX. The .dtx chooses its action depending on the format:

plain T_EX: Run docstrip and extract the files.

L^AT_EX: Generate the documentation.

If you insist on using L^AT_EX for docstrip (really, docstrip does not need L^AT_EX), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{atveryend.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation. You can use both the .dtx or the .drv to generate the documentation. The process can be configured by the configuration file ltxdoc.cfg. For instance, put this line into this file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdfL^AT_EX:

```
pdflatex atveryend.dtx
makeindex -s gind.ist atveryend.idx
pdflatex atveryend.dtx
makeindex -s gind.ist atveryend.idx
pdflatex atveryend.dtx
```

5 Acknowledgement

Arthur Ogawa: He proposed the new API with \AfterLastShipout and gave me much feedback, comprehensive class/package lists, many suggestions and comments.

6 References

- [1] The L^AT_EX3 Project: *L^AT_EX2_ε for class and package writers* 2006/02/15; [CTAN:macros/latex/doc/clsguide.pdf](#).
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- [4] Sebastian Rahtz, Heiko Oberdiek: *The hyperref package*; 2009/12/05 v6.79l; [CTAN:macros/latex/contrib/hyperref/](#).
- [5] Markus Kohm: *KOMA-Script*; 2009/07/24 v3.04a; <http://www.komascript.de/>.
- [6] Jeff Goldberg: *The lastpage package*; 1994/07/20 v0.1b; [CTAN:macros/latex/contrib/lastpage/lastpage.pdf](#).
- [7] APS, AIP, Arthur Orgawa; ReVTeX 4.1; 2009/10/13 v4.1; <http://authors.aps.org/revtex4/>.

7 History

[2009/12/06 v1.0]

- The first version.

[2009/12/07 v1.1]

- Bug fixes.

[2009/12/09 v1.2]

- Additional support of classes and packages.

[2009/12/11 v1.3]

- Patch for letter like classes that puts label into the ‘.aux’ file.
- Hook `\BeforeClearDocument` added (request from Arthur Ogawa).
- Patch of `\clear@document` removed (Arthur Ogawa).
- A nested `\AtBeginDocument` removed.

[2010/01/25 v1.4]

- Moved from TDS:*/generic/* to TDS:*/latex/.

[2010/03/24 v1.5]

- `\Call@BeforeClearDocument` fixed (Ahmed Musa).

8 Index

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