The attachfile package*

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Abstract

This package defines an `\attachfile` command that lets you attach arbitrary files to a PDF document. These files are embedded right in the PDF file, so they get transmitted along with it. The package also gives you control over the corresponding icon's properties and various other associated metadata.

1 Introduction

PDF, Adobe's Portable Document Format, is a common way to distribute documents that look the same on all platforms and output devices. Beginning with PDF version 1.3, PDF supports "file attachment annotations". These are arbitrary auxiliary files that get embedded directly into the PDF document, just like attachments in an e-mail message.

The attachfile package gives pdfLaTeX users the ability to add these attachments to their documents automatically. And because LaTeX is a markup language, not a WYSIWYG tool, the user has precise control over the location of the file attachment icons. If an icon representing an attached spreadsheet file is placed next to a figure, the icon will move along with the figure whenever the document is modified. Furthermore, it is possible to define global properties for all the file attachments in a document. With one command, a user can change the properties of all the icons in the entire document.

Finally, one nifty feature that attachfile supports is the ability to use your own icons, which can be text, graphics, tables, mathematics—you name it! With this feature, a PDF file can, for example, instruct the reader to click on a formula to extract the Mathematica notebook that derived it. Or to click on a graph to extract the Microsoft Excel spreadsheet that contains all the data that was plotted. The possiblities are endless.

Okay, let's get down to business. Here are some sample file attachments so you can see if your PDF viewer is able to handle them:

*This file has version number v1.9, last revised 2016/09/18.

Icon:		(Should resemble this:	)
LaTeX text:	`attachfile.bib`	(Should resemble this:	`attachfile.bib`)

Each of the above points to the BibTeX bibliography (a plain text file) for the document you're reading now. Try extracting the attachment. In Adobe Acrobat, this is achieved by right-clicking on the icon and choosing "Save Embedded File to Disk..." (or in older versions of Adobe Acrobat, "Extract File..."). You can also double-click to open the file immediately. If you're unable to access the attached file, or you observe miscellaneous strange behavior, your PDF viewer might not be cabable of handling file attachments properly. See Section 5 for some PDF viewer problems I encountered while testing attachfile.

2 Usage

Load attachfile by putting a `\usepackage{attachfile}` in your document's preamble. attachfile implicitly loads a variety of other packages. Section 5 presents the complete list.

attachfile v1.9 does not have any of its own package options; any options that get passed to attachfile are forwarded to hyperref. Because hyperref works best when loaded as one of the last packages in the document the same holds true for attachfile.

3 Commands

The following are the commands that attachfile makes available for attaching files, customizing the icon appearance, and changing various file attachment metadata.

`\attachfile [`⟨*options*⟩`] {`⟨*filename*⟩`}`

The `\attachfile` macro has only one required argument: the name of the file to attach. `\attachfile` will insert an icon at the current point in the document to represent the attachment. ⟨*options*⟩ is a list of optional parameters for describing the icon and other assorted metadata. It is described in Section 4.

`\noattachfile [`⟨*options*⟩`]`

When writing instructions, it is sometimes convenient to describe what a file attachment icon looks like without actually attaching a file. That's what `\noattachfile` is for. All it does is insert the image of a file attachment icon into the document. ⟨*options*⟩ is a list of optional parameters for describing the icon and other assorted metadata. It is described in Section 4. In particular, note that if the `print` option is set to `false` then `\noattachfile` will output empty space of the same size as the icon image.

`\textattachfile [⟨options⟩] {⟨filename⟩} {⟨text⟩}`

`\textattachfile` is just like `\attachfile`, except that instead of using one of the predefined PDF icons, it lets you use an arbitrary piece of text to represent the attachment. The ⟨*text*⟩ parameter is not limited to text; it can contain any arbitrary horizontal material. The following are all legal uses of `\textattachfile`:

- `You can \textattachfile{myfile.cc}{extract my source code} if your PDF viewer supports file annotations.`
- `It is intuitively obvious to even the most casual observer that`

```
\textattachfile{derivation.m}{$\displaystyle
  \frac{\partial E_p}{\partial w_{ji}^h} =
    -\sum_k (y_{pk} - o_{pk}) f_k^{o}{}'(\mbox{net}_{pk}^o)
            w_{kj}^o f_j^h{}'(\mbox{net}_{pj}^h) x_{pi}$}
```

- `\textattachfile{earningsdata.csv}{\includegraphics{earnings}}`

`\notextattachfile [⟨options⟩] {⟨text⟩}`

Just as `\noattachfile` is a dummy version of `\attachfile`, so `\notextattachfile` is a dummy version of `\textattachfile`. All `\notextattachfile` does is insert ⟨*text*⟩ into the document according to ⟨*options*⟩ (described in Section 4). In particular, note that if the `print` option is set to `false` then `\notextattachfile` will output empty space of the same size as ⟨*text*⟩.

`\attachfilesetup {⟨options⟩}`

If you find yourself passing the same set of options to multiple `\attachfile` calls in your document, you can use `\attachfilesetup` to specify default option values. `\attachfilesetup`'s ⟨*options*⟩ parameter is the same as that used by `\attachfile` and is described in Section 4. Some noteworthy points are:

1. `\attachfilesetup` can be called as many times as desired. Any options specified replace the previous value of those options. All unspecified options are left alone.
2. Options passed to `\attachfile` take precedence over those specified by `\attachfilesetup`. This lets you define default values for all file attachments and selectively override them on a per-attachment basis.
3. Options set by `\attachfilesetup` are local to the current scope. This lets you assign defaults to a group of file attachments without affecting the global defaults. To define options that apply to the entire document, `\attachfilesetup` should be called at the top-level scope (which includes the document's prologue).

4 Options

attachfile gives the user a great deal of control over the way files are attached to a document. All the commands in Section 3 accept the same set of options, which are entered as comma-separated, ⟨*key*⟩=⟨*value*⟩ pairs. Options can be specified in any order. Case is significant. Only the options you want to change need to be specified; the others will retain their previous value (or the default, if no previous value was specified).

4.1 List of available options

The following are the options attachfile accepts, in alphabetical order.

`appearance=`⟨*boolean*⟩

The attachfile package normally embeds the file attachment's icon explicitly with each file attachment annotation. (In PDF-speak, it includes an appearance dictionary in the FileAttachment object.) The advantages to doing this are to ensure that:

- The file attachment icons look the same in all PDF viewers.
- TEX knows exactly how much space to allocate, instead of just guessing based on the size of the Adobe Acrobat icons.
- Pre-1.3 PDF viewers don't regress to showing an "unknown annotation type" graphic.

However, the problems with embedding the icon graphic are:

- It adds a bit of extra bulk to the PDF file.
- It takes flexibility away from the PDF viewer, which can no longer choose for itself how best to render a file attachment icon.

The `appearance` option gives the author the ability to prevent the icon's appearance from being specified explicitly in the PDF file. By setting `appearance=false`, it will be left up to the PDF viewer to decide how to display the icon.

`author=`⟨*text*⟩

The metadata associated with a file attachment annotation includes the name of the person who attached the file. In Adobe Acrobat, this information is shown when one right-clicks on the file attachment icon and selects *Properties*.... By default, no author is listed but specifying `author=`⟨*name*⟩ sets the author field to ⟨*name*⟩.

`color=`⟨*red*⟩ ⟨*green*⟩ ⟨*blue*⟩

The icons inserted by `\attachfile` and the text inserted by `\textattachfile` can be any color. The `color` option sets this color. Each of ⟨*red*⟩, ⟨*green*⟩, and ⟨*blue*⟩ must be a decimal number between 0 (darkest) and 1 (brightest). The default is `color=1 0.9255 0.7765`, which is a beige.

`created=`⟨*PDF date*⟩

Virtually all filesystems associate a file-creation timestamp with each file. Although TEX provides no portable mechanism for determining the date and time a file was created the `created` option lets you manually specify these parameters for the reader's benefit. See Section 4.2 for more information about attachfile dates.

`date=`⟨*PDF date*⟩

Each annotation in a PDF file can have a timestamp indicating when the annotation was last modified. attachfile automatically adds a timestamp to file attachment annotations. It uses the date and time at which LATEX started processing your job (to minute precision because that's what TEX's `\time` command provides) and includes the timezone, if specified (using the `timezone` option, p. 7). Although it's unlikely you'll need to use it, the `date` option lets you override the annotation's modification date and time with a date and time of your choice. See Section 4.2 for more information about attachfile dates.

`description=`⟨*text*⟩

The metadata associated with a file attachment annotation can include a brief description of the file. In Adobe Acrobat, this information is shown when one right-clicks on the file attachment icon and selects *Properties*.... Also, in later versions of Adobe Acrobat, the description field shows up as a tool tip when the user mouses over the attachment. By default, no description is included, but specifying `description=`⟨*text*⟩ sets the description field to ⟨*text*⟩.

`icon=`⟨*name*⟩

PDF 1.3 defines four icons that can be used for file attachments: Graph, Paperclip, PushPin, and Tag. These are shown in Table 1. If no icon name is specified, PushPin is assumed. While the PDF specifications say that, normally, a PDF viewer chooses how to display each of those, the attachfile package specifies the appearance explicitly. This is what Adobe Acrobat does, presumably because doing so ensures that viewers which don't support file attachment annotations can still display something reasonable. The tradeoff is that it slightly increases the size of the PDF file.

Graph	
Paperclip	
PushPin	
Tag	

Table 1: Valid file attachment icons

`mimetype=`⟨*type*⟩

It is considered good practice to specify the MIME type [2] of each attached file. That way, a PDF viewer can automatically launch an appropriate application to process the file. ⟨*type*⟩ should be the form "⟨*type*⟩/⟨*subtype*⟩". For instance, a plain text file would be specified with "`mimetype=text/plain`". An MPEG movie would be specified with "`mimetype=video/mpeg`". The Internet Assigned Numbers Authority maintains a list of registered media types [3], so look there first to see what type to use for a given file.

`modified=`⟨*PDF date*⟩

Virtually all filesystems associate a last-modification timestamp with each file. Although TEX provides no portable mechanism for determining the date and time a file was last modified the `modified` option lets you manually specify these parameters for the reader's benefit. See Section 4.2 for more information about attachfile dates.

`print=`⟨*boolean*⟩

By default, file annotation icons print along with the rest of the document. By setting `print=false`, the icons will not print. Note that in Adobe Acrobat, annotations will *never* print unless the Annotations box is checked in the Print dialog.

`size=`⟨*integer*⟩

The `size` option tells the PDF viewer that the attached file is ⟨*integer*⟩ bytes long. Adobe Acrobat displays this size under the "Size" column in the Attachments pane but does not otherwise seem to use the ⟨*integer*⟩ value.

`subject=`⟨*text*⟩

The metadata associated with a file attachment annotation can include a brief comment about the subject of the attachment. In Adobe Acrobat, this information is shown when one right-clicks on the file attachment icon and selects *Properties*. By default, no subject is included, but specifying `subject=`⟨*text*⟩ sets the subject field to ⟨*text*⟩.

`timezone=`⟨*offset*⟩

Because TEX doesn't make the current timezone available, `attachfile` is unable to include timezone information when it timestamps a file attachment. The `timezone` option lets you manually specify the timezone. ⟨*offset*⟩ is the offset from Universal Time (a.k.a. GMT) and should be in the format specified in the PDF reference manual [1, §3.8.3, "Dates"], namely:

`+`⟨*HH*⟩`'`⟨*mm*⟩`'`	⟨*HH*⟩ hours, ⟨*mm*⟩ minutes later than Universal Time (i.e., east of Greenwich, England)
`-`⟨*HH*⟩`'`⟨*mm*⟩`'`	⟨*HH*⟩ hours, ⟨*mm*⟩ minutes earlier than Universal Time (i.e., west of Greenwich, England)
`Z`	Universal Time (i.e., at the same longitude as Greenwich, England)

For example, U.S. Central Time would be specified with `timezone=-06'00'`.

`zoom=`⟨*boolean*⟩

Normally, when a reader magnifies or reduces the view of the PDF document, the file annotation icons change size proportionally with the text. By setting `zoom=false`, the icon size does not scale.

The defaults for all of the options described above are summarized in Table 2.

4.2 Date usage

Section 4.1 presents three timestamp-related options: `date`, `created`, and `modified`. The `date` option specifies the annotation date—the date and time the given file was attached to the PDF file—and should usually be left unspecified. (It defaults to the date and time at which LATEX started processing your job.) The annotation date is displayed in Adobe Acrobat by right-clicking on the annotation, choosing *Properties...* from the menu, and clicking on the *General* tab. The `modified` option specifies the file's modification date—the date and time the given file was last modified. Adobe Acrobat displays the modification date under the "Modified" column in the Attachments pane but does not otherwise appear to

Option	Default setting
`appearance`	`true`
`author`	*none*
`color`	`1 0.9255 0.7765`
`created`	*none*
`date`	*automatic*
`description`	*none*
`icon`	`PushPin`
`mimetype`	*none*
`modified`	*none*
`print`	`true`
`size`	*none*
`subject`	*none*
`timezone`	*none*
`zoom`	`true`

Table 2: Default values for all options

use the modification date. Finally, the `created` option specifies the file's creation date—the date and time the given file was first written to disk. As of this writing, Adobe Acrobat does not appear to use or even display the creation date; perhaps future versions or other PDF viewers will.

Dates should be specified in the form "`D:`*YYYYMMDDHHmmSSOHH'mm'*" as described in the PDF reference manual [1, §3.8.3, "Dates"]. Note, however, that although the PDF reference manual clearly states that "viewer applications should be prepared to accept and display a string in any format" [1, Table 8.11, "Entries common to all annotation dictionaries"], Adobe Acrobat will ignore any timestamp that is not in the recommended format and will instead show "00/00/00 00:00:00" for the annotation date or "Unknown" for the modification date.

5 Caveats

Note that there are a few caveats you should be aware of:

1. attachfile requires either pdfLaTeX version 0.14 or later or LuaLaTeX. (Version 0.14 of pdfLaTeX was released circa 1999 so it's unlikely that you're running an older version than that.) While there are many other ways to produce PDF files from LaTeX source, attachfile v1.9 supports only pdfLaTeX and LuaLaTeX.

2. LuaLaTeX 0.85 introduced incompatible changes in the set of PDF primitives supported. Because attachfile does not yet provide explicit support for these new primitives, documents will need to include a `\usepackage{luatex85}` line in the preamble in order to build under LuaLaTeX 0.85+.

3. attachfile will not run unless the following LaTeX packages are installed: calc, keyval, color, hyperref, and ifpdf. (Most TeX distributions include all of these.)

4. File attachments are a PDF 1.3 feature. They will not be visible in PDF viewers that don't support PDF 1.3. (Version 4.0 of Adobe Acrobat is the first version of that program which does.)

5. Even some viewers that purportedly support PDF 1.3 don't support file attachments. As far as I can tell, very old versions of Adobe Acrobat Reader (the free, view-only version of Adobe Acrobat) doesn't seem to support *any* annotations except text annotations.

6. Even some viewers that do support PDF 1.3 and file attachments don't support them under all circumstances. For instance, some Windows versions of Adobe Acrobat, when functioning as a Web-browser plug-in, give an error message[1] when a file attachment icon is activated.

7. Even in circumstances where file attachments are supported, the support may be flawed. For example, some Windows versions of Adobe Acrobat change a custom icon to the default icon when it's selected.

8. While file-attachment icons with custom appearances printed fine in older versions of Adobe Acrobat, Adobe introduced a bug circa Adobe Acrobat 6.0 that prevents attachfile's icons from printing. Unfortunately, because Adobe Acrobat lacks attachfile's ability to create custom appearances for file-attachment icons it's unlikely that this bug will ever get fixed. Nevertheless, please consider sending a bug report to Adobe to let them know that you'd like to be able to print file-attachment icons with custom appearances.

Even given all of those caveats, file attachments can be a useful way to pass additional information along with a PDF file. The attachfile package makes file annotations automatic and easy.

6 Implementation

This section contains the complete source code for attachfile. Most users will not get much out of it, but it should be of use to those who need more precise documentation and those who want to extend the attachfile package.

6.1 Sanity checking

attachfile v1.9 requires either LuaLaTeX or pdfLaTeX (and at least version 0.14 of pdfLaTeX, although attachfile no longer checks for that). (Future versions of attachfile may support dvipdfm, dvips with pdfmarks, VTeX, etc.) Also, pdfLaTeX/LuaLaTeXmust be in PDF-generating mode, not DVI-generating mode. So, to save

[1] "Launching embedded files from within a browser environment is not allowed".

the user some aggravation, we check for the correct backend right up front and give a warning if all is not well. Later, in Section 6.7, we replace all of the core attachfile macros with dummy versions so LaTeX can at least run to completion.

```
\RequirePackage{ifpdf}
\ifpdf
\else
  \PackageWarningNoLine{attachfile}{%
    attachfile works _only_ with pdfLaTeX and LuaLaTeX\MessageBreak
    and _only_ in PDF-generating mode.  For this run,\MessageBreak
    placeholders will be substituted for all\MessageBreak
    attachfile commands%
  }
\fi
```

6.2 Preliminaries

We need to load hyperref to get our hands on that great `\pdfstringdef` macro. For now, we blindly pass all our package options directly to hyperref. In the future, it would be nice to do a `\setkeys{AtFi}` on our options.

```
\RequirePackage{keyval}
\RequirePackage{calc}
\RequirePackage{color}
\RequirePackageWithOptions{hyperref}
```

6.3 Adobe Acrobat icons

The following macros draw a representation of the various icons that Adobe Acrobat[2] inserts to represent what the PDF 1.3 specifications refer to as "Graph," "Paperclip," "PushPin," and "Tag". The `\parbox` dimensions are taken directly from the original graphics' bounding box. However, I just eyeballed the `\raisebox` heights (intended to put shadows below the baseline).

`\atfi@acroGraph@data` Recreate Adobe Acrobat's Graph icon.

```
\newcommand{\atfi@acroGraph@data}{%
  q 0.5 g 1.1133 0 20.7202 18.2754 re f 1 g 0 G 0 i 0.5 w 4 M
  0.25 1.6453 20.145 17.7715 re B 0 g 2.7319 4.1367 3.9571
  13.8867 re f 8.7031 4.1367 3.9571 9.8867 re f 14.7471 4.1367
  3.9571 11.8867 re f \atfi@color@rgb\space rg 1.689 3.0938
  3.9571 13.8867 re f 7.6602 3.0938 3.9571 9.8867 re f 13.7041
  3.0938 3.9571 11.8867 re f Q
}
```

`\atfi@acroGraph` Draw `\atfi@acroGraph@data` in a box of the appropriate size.

```
\DeclareRobustCommand{\atfi@acroGraph}{%
  \raisebox{-1.5bp}{\parbox[b][20bp]{22bp}{%
    \rule{0pt}{0pt}\pdfliteral{\atfi@acroGraph@data}}%
```

[2] I got these graphics specifically from the Windows version of Adobe Acrobat 4.0.

```
  }%
}
```

\atfi@acroPaperclip@data Recreate Adobe Acrobat's Paperclip icon.

```
\newcommand{\atfi@acroPaperclip@data}{%
  q 0.75 G 0 i 2.5 w 1 J 4 M 1.9619 11.7559 m 1.9619 3.3037
  1.9619 2.5059 v 1.9619 1.707 4.0947 1.25 y 7.4141 1.25 l 9.4292
  1.8223 9.4292 3.3066 v 9.4292 4.79 9.4292 16.8945 y 9.7852
  18.1514 8.481 18.1514 v 7.1768 18.1514 5.1616 18.1514 y 3.8574
  17.9209 3.8574 16.8945 v 3.8574 15.8652 3.8574 6.6172 y 4.3325
  5.418 5.1025 5.418 v 5.8726 5.418 6.5845 5.418 y 7.6812 5.6455
  7.6812 6.4736 v 7.6812 7.3027 7.6812 11.5264 y S 0 G 1.2495
  12.4404 m 1.2495 3.9883 1.2495 3.1895 v 1.2495 2.3906 3.3833
  1.9326 y 6.7026 1.9326 l 8.7178 2.5068 8.7178 3.9902 v 8.7178
  5.4736 8.7178 17.5781 y 9.0732 18.834 7.769 18.834 v 6.4653
  18.834 4.4497 18.834 y 3.146 18.6055 3.146 17.5781 v 3.146
  16.5498 3.146 7.3018 y 3.6201 6.1016 4.3911 6.1016 v 5.1611
  6.1016 5.873 6.1016 y 6.9692 6.3301 6.9692 7.1572 v 6.9692
  7.9863 6.9692 12.21 y S \atfi@color@rgb\space RG 1 w
  1.2495 12.4404 m 1.2495 3.9883 1.2495 3.1895 v 1.2495 2.3906
  3.3833 1.9326 y 6.7026 1.9326 l 8.7178 2.5068 8.7178 3.9902 v
  8.7178 5.4736 8.7178 17.5781 y 9.0732 18.834 7.769 18.834 v
  6.4653 18.834 4.4497 18.834 y 3.146 18.6055 3.146 17.5781 v
  3.146 16.5498 3.146 7.3018 y 3.6201 6.1016 4.3911 6.1016 v
  5.1611 6.1016 5.873 6.1016 y 6.9692 6.3301 6.9692 7.1572 v
  6.9692 7.9863 6.9692 12.21 y S Q
}
```

\atfi@acroPaperclip Draw \atfi@acroPaperclip@data in a box of the appropriate size.

```
\DeclareRobustCommand{\atfi@acroPaperclip}{%
  \raisebox{-1.25bp}{\parbox[b][21bp]{12bp}{%
    \rule{0pt}{0pt}\pdfliteral{\atfi@acroPaperclip@data}}%
  }%
}
```

\atfi@acroPushPin@data Recreate Adobe Acrobat's PushPin icon.

```
\newcommand{\atfi@acroPushPin@data}{%
  q \atfi@color@rgb\space rg 0 G 1 w 1 6 m 11 6 l 11 13 l 12
  13 l 14 11 l 21 11 l 22 12 l 23 12 l 23 2 l 22 2 l 21 3 l 14 3
  l 12 1 l 11 1 l 11 6 l B 0.5 G 0 7 m 10 7 l 10 8 l 1 8 l S 1 G
  12 12 m 14 10 l 22 10 l 22 11 l S Q
}
```

\atfi@acroPushPin Draw \atfi@acroPushPin@data in a box of the appropriate size.

```
\DeclareRobustCommand{\atfi@acroPushPin}{%
  \raisebox{-1.25bp}{\parbox[b][14bp]{24bp}{%
    \rule{0pt}{0pt}\pdfliteral{\atfi@acroPushPin@data}}%
  }%
}
```

\atfi@acroTag@data Recreate Adobe Acrobat's Tag icon.

```
\newcommand{\atfi@acroTag@data}{%
  q 0.5 g 10.0542 14.9873 m 24.27 14.9873 l 25.252 14.0059 l
  25.252 1.1455 l 24.1064 0 l 9.9609 0 l 6.0327 6.0088 l 6.0327
  9.002 l 10.0542 14.9873 l 9.3994 9.376 m 8.5215 9.376 7.8096
  8.5596 7.8096 7.5527 c 7.8096 6.5449 8.5215 5.7285 9.3994
  5.7285 c 10.2778 5.7285 10.9897 6.5449 10.9897 7.5527 c 10.9897
  8.5596 10.2778 9.376 9.3994 9.376 c h f
  \atfi@color@rgb\space rg 0 G 0 i 0.5 w 4 M 1 j 8.5107
  16.5313 m 22.7266 16.5313 l 23.7085 15.5488 l 23.7085 2.6895 l
  22.563 1.543 l 8.4175 1.543 l 4.4893 7.5527 l 4.4893 10.5449 l
  8.5107 16.5313 l 7.856 10.9199 m 6.978 10.9199 6.2661 10.1035
  6.2661 9.0957 c 6.2661 8.0879 6.978 7.2715 7.856 7.2715 c
  8.7344 7.2715 9.4463 8.0879 9.4463 9.0957 c 9.4463 10.1035
  8.7344 10.9199 7.856 10.9199 c h B 1 w 12.3291 12.2656 m
  21.1206 12.2656 l S 12.3291 9.1797 m 21.1206 9.1797 l S 12.3291
  6.1875 m 21.1206 6.1875 l S 0 G 0.5 w 0 9.0488 m 6.2661 9.0957
  l S 1.4028 5.2148 m 1.4028 9.6094 l 1.6831 10.6387 2.4316
  10.6387 v 3.6475 10.6387 3.5542 9.0488 y S Q
}
```

\atfi@acroTag Draw \atfi@acroTag@data in a box of the appropriate size.

```
\DeclareRobustCommand{\atfi@acroTag}{%
  \raisebox{-1.6bp}{\parbox[b][17bp]{25bp}{%
    \rule{0pt}{0pt}\pdfliteral{\atfi@acroTag@data}}%
  }%
}
```

6.4 Helper routines

\atfi@temp@string
\atfi@pdfstringdef This is the same as \pdfstringdef, except that it *locally* defines its argument. For those of you who like analogies, \atfi@pdfstringdef is to \def as \pdfstringdef is to \gdef.

```
\def\atfi@temp@string{}
\DeclareRobustCommand{\atfi@pdfstringdef}[2]{%
  \pdfstringdef\atfi@temp@string{#2}%
  \edef#1{\atfi@temp@string}%
}
```

\c@atfi@tmp Because TEX provides only a limited number of counters, we recycle a single counter, atfi@tmp, throughout the entire package whenever the need to perform arithmetic arises.

\theatfi@tmp

```
\newcounter{atfi@tmp}
\renewcommand*{\theatfi@tmp}{\the\value{atfi@tmp}}
```

\atfi@embedfile If the given file has not yet been embedded, embed it as a PDF EmbeddedFile object, and store its object number in \atfi@embedfile@⟨*filename*⟩.

```
\DeclareRobustCommand{\atfi@embedfile}[1]{%
  \expandafter\ifx\csname atfi@embed@file@#1\endcsname\relax
    \immediate\pdfobj stream attr {
      /Type /EmbeddedFile
      \atfi@mimetype\space
      \atfi@dlsize\space
      /Params <<
        \atfi@credate\space
        \atfi@moddate\space
        \atfi@size\space
      >>
    } file {#1}%
    \expandafter\xdef\csname atfi@embed@file@#1\endcsname{\the\pdflastobj}%
  \fi
}
```

`\atfi@appearancewidth` `\atfi@appearanceheight` `\atfi@appearancedepth` `\atfi@appearancebox`

Each PDF annotation can an associated "appearance". In the attachfile package, we store the appearance with the `\atfi@set@appearance` macro (below). As a side effect, `\atfi@set@appearance` stores the dimensions of its argument in `\atfi@appearancewidth`, `\atfi@appearanceheight`, and `\atfi@appearanceddepth` so that, later, we can allocate an appropriate amount of space for the file attachment icon to fit within. `\atfi@appearancebox` is a temporary storage location for the TEX box that will get converted to an XObject.

```
\newlength{\atfi@appearancewidth}
\newlength{\atfi@appearanceheight}
\newlength{\atfi@appearancedepth}
\newsavebox{\atfi@appearancebox}
```

`\atfi@set@appearance` `\atfi@appearance@obj`

`\atfi@set@appearance` stores its argument as a PDF XObject for later referral by the file annotation's appearance dictionary. This serves two purposes:

1. It enables a TEX box with arbitrary contents to serve as the file attachment icon.
2. It enables (generally older) PDF viewers that don't recognize the icon name to still display something meaningful.

```
\DeclareRobustCommand{\atfi@set@appearance}[1]{%
  \savebox{\atfi@appearancebox}{#1}%
  \settowidth{\atfi@appearancewidth}{\usebox{\atfi@appearancebox}}%
  \settoheight{\atfi@appearanceheight}{\usebox{\atfi@appearancebox}}%
  \settodepth{\atfi@appearancedepth}{\usebox{\atfi@appearancebox}}%
  \immediate\pdfxform \atfi@appearancebox
  \edef\atfi@appearanceobj{\the\pdflastxform}%
}
```

`\atfi@flags@to@int` `\atfi@flags`

Convert all our flag options from booleans into a single integer (`\atfi@flags`).

```
\DeclareRobustCommand{\atfi@flags@to@int}{%
  \setcounter{atfi@tmp}{0}%
```

```
  \ifatfi@print
    \addtocounter{atfi@tmp}{4}%
  \fi
  \ifatfi@zoom
  \else
    \addtocounter{atfi@tmp}{8}%
  \fi
  \edef\atfi@flags{\theatfi@tmp}%
}
```

`\atfi@insert@file@annot` `\atfi@file`

Insert a PDF FileAttachment annotation that refers to the object created by `\atfi@embedfile`. TEX doesn't normally "see" a `\pdfannot`, so we have to explicitly allocate space for it. `\atfi@insert@file@annot` takes one argument, the name of the file to attach. This should be the same value that was passed to `\atfi@embedfile`.

```
\DeclareRobustCommand{\atfi@insert@file@annot}[1]{%
  \rule{0pt}{0pt}%
  \bgroup\Hy@unicodefalse
    \atfi@pdfstringdef\atfi@file{#1}%
    \edef\next{\egroup
      \def\noexpand\atfi@file{\atfi@file}%
    }\next
  \filename@parse{\atfi@file}%
  \@ifundefined{filename@ext}{%
    \edef\atfi@file{\filename@base}%
  }{%
    \edef\atfi@file{\filename@base.\filename@ext}%
  }%
  \ifatfi@appearance
```

We currently use the same appearance for Normal, Rollover, and Down, although future versions of attachfile may provide support for different appearances. Although the PDF PDF specification claims that R and D appearances default to the N appearance, experience dictates otherwise. Hence, we explicitly specify all three appearances.

```
    \def\atfi@appearance@dict{%
      /AP <<
        /N \atfi@appearanceobj\space 0 R
        /R \atfi@appearanceobj\space 0 R
        /D \atfi@appearanceobj\space 0 R
      >>%
    }%
  \fi%
  \pdfannot width \atfi@appearancewidth
            height \atfi@appearanceheight
            depth \atfi@appearancedepth {
    /Subtype /FileAttachment
    \atfi@appearance@dict\space
    \atfi@author\space
```

```
    \atfi@color\space
    \atfi@date\space
    \atfi@description\space
    \atfi@icon\space
    \atfi@moddate\space
    \atfi@subject\space
    /F \atfi@flags\space
    /FS <<
      /Type /Filespec
      /F (\atfi@file)
      /EF <<
        /F \csname atfi@embed@file@#1\endcsname\space 0 R
      >>
    >>
  }%
```

Now, so TEX can budget space for the annotation, we insert some zero-width rules into the document.

```
  \rule{0pt}{\atfi@appearanceheight}%
  \rule[-\atfi@appearancedepth]{0pt}{\atfi@appearancedepth}%
  \rule{\atfi@appearancewidth}{0pt}%
}
```

`\atfi@attachfile` This macro does all the work of the `\attachfile` author command. `\attachfile` began a group in which most special characters are set to category code "other". `\atfi@attachfile` reads the filename within this group, embeds the corresponding file into the generated PDF file, and places an icon at the current location. Then, it ends the group, thereby restoring the original category codes.

```
\def\atfi@attachfile#1#2{%
    \setkeys{AtFi}{#1}%
    \atfi@embedfile{#2}%
    \@ifundefined{atfi@acro\atfi@icon@icon}{%
      \PackageError{attachfile}{Icon not found}{%
        attachfile defines only the following icons:\MessageBreak
        Graph, Paperclip, PushPin, Tag
      }%
    }{}%
    \atfi@set@appearance{\csname atfi@acro\atfi@icon@icon\endcsname}%
    \atfi@flags@to@int%
    \atfi@insert@file@annot{#2}%
  \endgroup
}
```

`\atfi@textattachfile` All this macro does is evaluate its second argument (a filename) within the group begun by `\textattachfile` then pass control to `\atfi@textattachfile@i`, which does all the work. `\atfi@textattachfile` is needed to force the filename to be evaluated while special characters are set to use category code "other".

```
\def\atfi@textattachfile#1#2{%
    \endgroup
```

```
    \atfi@textattachfile@i{#1}{#2}%
}
```

\atfi@textattachfile@i
\atfi@textcolor

This macro does all the work of the \textattachfile author command. Given a filename, some arbitrary text, and an optional set of attachment options, embed the corresponding file into the generated PDF file, and use the text as the icon. We recycle the icon color for the text. Note that the \strut is a bug workaround; I don't know whose fault this is, but the bottom point or so of the text seems to get cut off. Weird.

```
\def\atfi@textattachfile@i#1#2#3{%
    \setkeys{AtFi}{#1}%
    \atfi@embedfile{#2}%
    \def\atfi@textcolor(##1 ##2 ##3)##4{%
      \textcolor[rgb]{##1,##2,##3}{##4}}%
    \atfi@set@appearance{%
      \expandafter\atfi@textcolor\expandafter
      (\atfi@color@rgb){#3\strut}}%
    \atfi@flags@to@int
    \atfi@insert@file@annot{#2}%
  \endgroup
}
```

\atfi@pdf@slash

The PDF specification dictates that MIME types be specified not as strings (e.g., "(Hello)") but rather as PDF names (e.g., "/Hello"). The catch is that the forward slash—required in all MIME types—cannot be part of a PDF name. The solution is to replace the MIME "/" with the hexadecimal sequence "#2f". Unfortunately, pdfLaTeX replaces "#" with "##" in a \pdfobj but leaves "\#" as is. The solution is to play some games with TeX to define \atfi@pdf@slash as a "#2f" sequence that can used within \pdfobj.

```
\bgroup
  \lccode`\@=`\#
  \lowercase{\gdef\atfi@pdf@slash{@2f}}
\egroup
```

\atfi@split@mimetype
\atfi@mime@type
\atfi@mime@subtype

Split a MIME type (e.g., "image/jpeg") into a type, \atfi@mime@type (e.g., "image"), and a subtype, \atfi@mime@subtype (e.g., "jpeg").

```
\def\atfi@split@mimetype#1/#2/{%
  \def\atfi@mime@type{#1}%
  \def\atfi@mime@subtype{#2}%
}
```

6.5 Annotation option processing

We start by defining the various options that \attachfile accepts and their default values.

\atfi@mimetype

Declare the MIME type of the attached file. For example, "text/plain" would specify that the attachment is an ordinary text file.

```
\def\atfi@mimetype{}
\define@key{AtFi}{mimetype}{%
  \atfi@pdfstringdef\atfi@mimetype{#1}%
  \atfi@split@mimetype#1/%
  \edef\atfi@mimetype{%
    /Subtype /\atfi@mime@type\atfi@pdf@slash\atfi@mime@subtype
  }%
}
```

`\atfi@icon` `\atfi@icon@icon` Specify an icon to represent the attachment. This should be one of Graph, Paperclip, PushPin (the default), or Tag. `\atfi@icon` is an attribute/value pair that gets inserted directly into the file attachment object. `\atfi@icon@icon` is only the icon name itself and is used to insert a static graphic that represents Adobe Acrobat's rendition of a file attachment icon.

```
\define@key{AtFi}{icon}{%
  \def\atfi@icon{/Name /#1}%
  \def\atfi@icon@icon{#1}%
}
\setkeys{AtFi}{icon=PushPin}
```

`\atfi@color` `\atfi@color@rgb` Specify the color of the attachment icon as an RGB triplet. For example, "`0 0.3 0`" would be a fairly dark green. `\atfi@color` is an attribute/value pair that gets inserted directly into the file attachment object. It defaults to the empty string, which means the PDF viewer gets to choose what color the icon should be. `\atfi@color@rgb` is only the RGB triplet itself and is used to insert a static graphic that represents Adobe Acrobat's rendition of a file attachment icon. It defaults to a beige color.

```
\define@key{AtFi}{color}{%
  \def\atfi@color{/C [#1]}%
  \def\atfi@color@rgb{#1}%
}
\setkeys{AtFi}{color=1 0.9255 0.7765}
```

`\atfi@author` Specify the author of the annotation. Adobe Acrobat shows this when you right-click on the annotation and choose *Properties*.

```
\def\atfi@author{}
\define@key{AtFi}{author}[]{%
  \edef\atfi@author{/T (#1)}%
}
```

`\atfi@pad@ii` Pad a number to exactly two digits. This is used by `\atfi@date` (below).

```
\def\atfi@pad@ii#1{%
  \ifnum#1>9
    #1%
  \else
    0#1%
  \fi
}
```

`\atfi@timezone` Specify the timezone to attach to the file modification date. It would be awfully nice if TEX had some way to produce this automatically. (Does it?)

```
\def\atfi@timezone{}
\define@key{AtFi}{timezone}{\def\atfi@timezone{#1}}
```

`\atfi@time` `\atfi@hours` `\atfi@minutes` `\atfi@date` The date the annotation was last modified. It's unlikely you'd want to specify this explicitly in your LATEX document, but if you want to, you can. Seconds are hardwired to zero, and the time zone must be manually specified. (I don't believe TEX makes either of those available.) Note that `\time` is stored in `\atfi@time` in case the minutes roll over during the time calculations. I was too lazy to do the same for `\day`, `\month`, and `\year`, so don't process your LATEX document at midnight if you want to get a correct datestamp.

```
\edef\atfi@time{\time}
\setcounter{atfi@tmp}{\atfi@time/60}
\edef\atfi@hours{\theatfi@tmp}
\setcounter{atfi@tmp}{\atfi@time-\atfi@hours*60}
\edef\atfi@minutes{\theatfi@tmp}
\def\atfi@date{%
  /M (D:\the\year%
      \expandafter\atfi@pad@ii\the\month
      \expandafter\atfi@pad@ii\the\day
      \atfi@pad@ii\atfi@hours
      \atfi@pad@ii\atfi@minutes
      00%
      \atfi@timezone)%
}
\define@key{AtFi}{date}{%
  \bgroup \Hy@unicodefalse
    \atfi@pdfstringdef\atfi@date{#1}%
    \edef\next{\egroup
      \def\noexpand\atfi@date{/M (\atfi@date)}%
    }\next
}
```

`\atfi@description` Store the annotation's description. Adobe Acrobat shows this when you right-click on the annotation and choose *Properties*. It also shows it in the Annotations tab once you "Rescan Document".

```
\def\atfi@description{}
\define@key{AtFi}{description}{%
  \atfi@pdfstringdef\atfi@description{#1}%
  \edef\atfi@description{/Contents (\atfi@description)}%
}
```

`\atfi@subject` Store the annotation's subject. Adobe Acrobat shows this when you right-click on the annotation and choose *Properties*. It also shows it in the Annotations tab once you "Rescan Document".

```
\def\atfi@subject{}
\define@key{AtFi}{subject}{%
```

```
  \atfi@pdfstringdef\atfi@subject{#1}%
  \edef\atfi@subject{/Subj (\atfi@subject)}%
}
```

`\atfi@credate` Store the annotation's creation date. Adobe Acrobat shows this when you right-click on the annotation and choose *Properties*. It also shows it in the Annotations tab once you "Rescan Document". Note that creation date is a PDF 1.5 feature.

```
\def\atfi@credate{}
\define@key{AtFi}{created}{%
  \bgroup \Hy@unicodefalse
    \atfi@pdfstringdef\atfi@credate{#1}%
    \edef\next{\egroup
      \def\noexpand\atfi@credate{/CreationDate (\atfi@credate)}%
    }\next
}
```

`\atfi@moddate` Store the annotation's modification date. Adobe Acrobat shows this when you right-click on the annotation and choose *Properties*. It also shows it in the Annotations tab once you "Rescan Document". Note that modification date is a PDF 1.5 feature.

```
\def\atfi@moddate{}
\define@key{AtFi}{modified}{%
  \bgroup \Hy@unicodefalse
    \atfi@pdfstringdef\atfi@moddate{#1}%
    \edef\next{\egroup
      \def\noexpand\atfi@moddate{/ModDate (\atfi@moddate)}%
    }\next
}
```

`\atfi@size` `\atfi@dlsize` Store the annotation's file size. Adobe Acrobat shows this when you right-click on the annotation and choose *Properties*. It also shows it in the Annotations tab once you "Rescan Document". Note that file size is a PDF 1.5 feature.

```
\def\atfi@size{}
\def\atfi@dlsize{}
\define@key{AtFi}{size}{%
  \bgroup \Hy@unicodefalse
    \atfi@pdfstringdef\atfi@size{#1}%
    \edef\next{\egroup
      \def\noexpand\atfi@size{/Size \atfi@size}%
      \def\noexpand\atfi@dlsize{/DL \atfi@size}%
    }\next
}
```

`\ifatfi@print` `\atfi@printtrue` `\atfi@printfalse` By default, file annotation icons print along with the rest of the document. (In Adobe Acrobat, that's the case if and only if the Annotations box is checked in the Print dialog.) By setting `print=false`, the icons will not print.

```
\newif\ifatfi@print
\atfi@printtrue
\define@key{AtFi}{print}[true]{\csname atfi@print#1\endcsname}
```

\ifatfi@zoom
\atfi@zoomtrue
\atfi@zoomfalse

By default, file annotation icons zoom along with the rest of the document. By setting `zoom=false`, the icons will remain at a constant size, regardless of magnification.

```
\newif\ifatfi@zoom
\atfi@zoomtrue
\define@key{AtFi}{zoom}[true]{\csname atfi@zoom#1\endcsname}
```

\ifatfi@appearance
\atfi@appearancetrue
\atfi@appearancefalse
\atfi@appearance@dict

The attachfile package normally embeds an icon graphic in each file attachment annotation's appearance dictionary. By setting `appearance=false`, no appearance dictionary will be added to a file attachment annotation; the PDF viewer will need to decide for itself how to display the icon.

```
\newif\ifatfi@appearance
\atfi@appearancetrue
\def\atfi@appearance@dict{}
\define@key{AtFi}{appearance}[true]{\csname atfi@appearance#1\endcsname}
```

6.6 Author commands

The commands described in this section are those available to the user writing a LaTeX document. If the macros seem too simple, it's because all the work is performed by the helper routines in Section 6.4 and the option-processing routines in Section 6.5.

\attachfilesetup

Set default values for all the various annotation options.

```
\DeclareRobustCommand{\attachfilesetup}[1]{\setkeys{AtFi}{#1}}
```

\attachfile

Given a filename and an optional set of attachment options, embed the corresponding file into the generated PDF file, and place an icon at the current location. The real work is performed by `\atfi@attachfile`. `\attachfile` merely sets up the category codes in such a way as to allow filenames to contain special characters such as underscores.

```
\DeclareRobustCommand{\attachfile}[1][]{%
  \begingroup
    \let\do\@makeother
    \dospecials
    \catcode`\\=0\relax
    \catcode`\{=1\relax
    \catcode`\}=2\relax
    \atfi@attachfile{#1}%
}
```

\textattachfile

Given a filename, some arbitrary text, and an optional set of attachment options, embed the corresponding file into the generated PDF file, and use the text as the icon. After setting up the category codes to use for processing the filename, `\textattachfile` passes to control to `\atfi@textattachfile`, which resets the category codes, and then to `\atfi@textattachfile@i`, which does all the work.

We define two groups: one for keeping the attachment options local and one for temporarily altering category codes.

```
\DeclareRobustCommand{\textattachfile}[1][]{%
  \begingroup
    \begingroup
      \let\do\@makeother
      \dospecials
      \catcode`\\=0\relax
      \catcode`\{=1\relax
      \catcode`\}=2\relax
      \atfi@textattachfile{#1}%
}
```

`\noattachfile` Insert the same icon into the document that we would for an `\attachfile` call. This is useful for writing documentation that instructs a user on how to deal with file attachments. `\noattachfile` is fairly simple; is just calls `\setkeys` in order to get the latest values of `\atfi@icon@icon` and `\atfi@color@rgb`, and then it defers to one of `\atfi@acroGraph`, `\atfi@acroPaperclip`, `\atfi@acroPushPin`, or `\atfi@acroTag`, which do the actual rendering work.

```
\DeclareRobustCommand{\noattachfile}[1][]{%
  \begingroup
    \setkeys{AtFi}{#1}%
    \ifatfi@print
      \csname atfi@acro\atfi@icon@icon\endcsname
    \else
      \setbox0=\hbox{\csname atfi@acro\atfi@icon@icon\endcsname}%
      \makebox[\wd0]{}%
    \fi
  \endgroup
}
```

`\notextattachfile` Insert the same text into the document that we would for a `\textattachfile` call. This is useful for writing documentation that instructs a user on how to deal with file attachments.

```
\DeclareRobustCommand{\notextattachfile}[2][]{%
  \begingroup
    \setkeys{AtFi}{#1}%
    \ifatfi@print
      \def\atfi@textcolor(##1 ##2 ##3)##4{%
        \textcolor[rgb]{##1,##2,##3}{##4}}%
      \expandafter\atfi@textcolor\expandafter
        (\atfi@color@rgb){#2\strut}%
    \else
      \setbox0=\hbox{#2\strut}%
      \makebox[\wd0]{}%
    \fi
  \endgroup
}
```

6.7 Dummy commands

If the author is not using pdfLaTeX or LuaLaTeX or not using it in PDF-generating mode, we replace the core attachfile commands with dummy versions so LaTeX can at least run to completion.

```
\ifpdf
\else
```

`\atfi@dummy@pushpin` Define an empty space of approximately the same size as `\atfi@acroPushPin`.

```
  \def\atfi@dummy@pushpin{%
    \raisebox{-1.25bp}{\parbox[b][14bp]{24bp}{}}%
  }
```

`\textattachfile` Define a dummy `\textattachfile` in terms of `\notextattachfile`.

```
  \DeclareRobustCommand{\textattachfile}[3][]{%
    \notextattachfile[#1]{#3}%
  }
```

`\noattachfile` Define a dummy `\noattachfile` in terms of `\notextattachfile`.

```
  \DeclareRobustCommand{\noattachfile}[1][]{%
    \notextattachfile[#1]{\atfi@dummy@pushpin}%
  }
```

`\attachfile` Define a dummy `\attachfile` in terms of the dummy `\noattachfile`.

```
  \DeclareRobustCommand{\attachfile}[2][]{%
    \noattachfile[#1]%
  }

\fi
```

7 Future work

The following are some avenues for future work on attachfile. First, attachfile supports only pdfLaTeX and LuaLaTeX for generating PDF files. It would be nice if it supported all the backends that hyperref supports: dvipdfm, dvips with pdfmarks, VTeX, and so forth. Along those same lines, a "draft" package option would be a welcome addition, for use when PDF is not the final output format.

Second, PDF supports platform-specific file attachments. That is, a file attachment icon can represent a different file when activated on Windows, Unix, or MacOS. It might be nice for attachfile to support that feature.

Finally, I'd like to see attachfile expand sometime to support *all* the various PDF annotations: Sound, Movie, Stamp, Ink, Popup, etc.

Of course, I make no promises that I'll ever do *any* of the above. attachfile was just something I wrote in my spare time, and it's unlikely I'll be able to devote another large block of time to enhance it.

References

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[2] N. Freed and N. Borenstein. Multipurpose Internet Mail Extensions (MIME) part two: Media types. Request for Comments (RFC) 2046, Internet Engineering Task Force (IETF), Network Working Group, November 1996. Available from `http://www.rfc-editor.org/rfc/rfc2046.txt`.

[3] Internet Assigned Numbers Authority. MIME media types. Available from `http://www.iana.org/assignments/media-types/`.

Change History

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Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.