

The **l3pdfmeta** module

PDF standards

L^AT_EX PDF management testphase bundle

The L^AT_EX Project*

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1 **l3pdfmeta** documentation

This module sets up some tools and commands needed for PDF standards in general. The goal is to collect the requirements and to provide code to check and fulfill them.

1.1 Verifying requirements of PDF standards

Standards like pdf/A set requirements on a PDF: Some things have to be in the PDF, e.g. the catalog has to contain a `/Lang` entry and an `colorprofile` and an `/OutputIntent`, some other things are forbidden or restricted, e.g. the action dictionary of an annotation should not contain Javascript.

The **l3pdfmeta** module collects a number of relevant requirements, tries to enforce the ones which can be enforced and offers some tools for package authors to test if an action is allowed in the standard or not.

This is work in progress and more tests will be added. But it should be noted that it will probably never be possible to prevent all forbidden actions or enforce all required ones or even to simply check all of them. The commands here don't replace a check with an external validator.

Verifying against a PDF-standard involves two different tasks:

- Check if you are allowed to ignore the requirement.
- Decide which action to take if the answer to the first question is NO.

The following conditionals address the first task. Because of the second task a return value **FALSE** means that the standard requires you to do some special action. **TRUE** means that you can ignore this requirement.¹

In most cases it only matters if a requirement is in the standard, for example **Catalog_no_OCProperties** means “don't use `/OCProperties` in the catalog”. For a small number of requirements it is also needed to test a user value against a standard value. For example, **named_actions** restricts the allowed named actions in an annotation

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¹One could also make the logic the other way round—there are arguments for both—but I had to decide.

of subtype `/Named`, in this case it is needed to check not only if the requirement is in the standard but also if the user value is in the allowed list.

```
\pdfmeta_standard_verify_p:n * \pdfmeta_standard_verify:n{<requirement>}
\pdfmeta_standard_verify:nTF *
```

This checks if `<requirement>` is listed in the standard. `FALSE` as result means that the requirement is in the standard and that probably some special action is required—which one depends on the requirement, see the descriptions below. `TRUE` means that the requirement is not there and so no special action is needed. This check can be used for simple requirements where neither a user nor a standard value is of importance.

```
\pdfmeta_standard_verify:nnTF \pdfmeta_standard_verify:nn{<requirement>}{<value>}
```

This checks if `<requirement>` is listed in the standard, if yes it tries to find a predefined test handler for the requirement and passes `<value>` and the value recorded in the standard to it. The handler returns `FALSE` if some special action is needed (e.g. if `<value>` violates the rule) and `TRUE` if no special action is needed. If no handler exists this commands works like `\pdfmeta_standard_verify:n`.

In some cases one needs to query the value in the standard, e.g. to correct a wrong minimal PDF version you need to know which version is required by `min_pdf_version`. For this two commands to access the value are provided:

```
\pdfmeta_standard_item:n * \pdfmeta_standard_item:n{<requirement>}
```

This retrieves the value of `<requirement>` and leaves it in the input. If the requirement isn't in the standard the result is empty, that means that requirements not in the standard and requirement without values can not be distinguished here.

```
\pdfmeta_standard_get:nn \pdfmeta_standard_get:nn{<requirement>} <tl var>
```

This retrieves the value of `<requirement>` and stores it in the `<token list variable>`. If the `<requirement>` is not found the special value `\q_no_value` is used. The `<token list variable>` is assigned locally.

The following describe the requirements which can be currently tested. Requirements with a value should use `\pdfmeta_standard_verify:nn` or `\pdfmeta_standard_verify:nnN` to test a local value against the standard. The rule numbers refer to <https://docs.verapdf.org/validation/pdfa-part1/>

1.1.1 Simple tests without handler

`outputintent_A` requires to embed a color profile and reference it in a `/Outputintent` and that all output intents reference the same colorprofile. The value stores the subtype. *This requirement is detected and fulfilled by `l3pdfmeta` if the provided interface in `\DocumentMetadata` is used, see below.*

`annot_flags` in annotations the Print flag should be true, Hidden, Invisible, NoView should be false. *This requirement is detected and set by `l3pdfmeta` for annotations created with the `l3pdfannot`. A new check is only needed if the flags are changed or if links are created by other means.*

`no_encryption` don't encrypt

`no_external_content` no `/F`, `/FFilter`, or `/FDecodeParms` in stream dictionaries

`no_embed_content` no `/EF` key in filespec, no `/Type/EmbeddedFiles`. *This will be checked in future by `l3pdfmeta` for the files it embeds.* The restriction is set for only PDF/A-1b. PDF/A-2b and PDF/A-3b lifted this restriction: PDF/A-2b allows to embed other PDF documents conforming to either PDF/A-1 or PDF/A-2, and PDF/A-3 allows any embedded files. I don't see a way to test the PDF/A-2b requirement so currently it will simply allow everything. Perhaps a test for at least the PDF-format will be added in future.

`Catalog_no_OCProperties` don't add `/OCProperties` to the catalog *`l3pdfmeta` removes this entry at the end of the document*

`annot_widget_no_AA` (rule 6.6.2-1) no AA dictionary in widget annotation, this will e.g. be checked by the new hyperref driver.

`annot_widget_no_A_AA` (rule 6.9-2) no A and AA dictionary in widget.

`form_no_AA` (6.9-3) no `/AA` dictionary in form field

`unicode` that is set in the U-standards, A-2u and A-3u and means that every text should be in unicode. This is not something that can be enforced or tested from TeX, but in a current LaTeX normally `ToUnicode` are set for all fonts.

`tagged` that is set in A-2a and A-3a and means that the pdf must be tagged. This is currently neither tested not enforced somewhere.

`Trailer_no_Info` The `Info` dictionary has been deprecated since quite some time. Metadata should be set with XMP-data instead. In PDF A-4 now the `Info` dictionary shall not be present in the trailer dictionary at all (unless there exists a `PieceInfo` entry in the Catalog). And if it is present it should only contain the `/ModDate` entry. The engines do not offer currently an option to suppress the dictionary completely, one can only give the entries the value null (it only works for all entries with `lualatex` and `pdflatex`). The next `pdflatex` will offer `\pdfomitinfodict`. Until then `l3pdfmeta` does nothing with this requirement.

1.1.2 Tests with values and special handlers

`min_pdf_version` stores the minimal PDF version needed for a standard. It should be checked against the current PDF version (`\pdf_version:`). A failure means that the version should be changed. Currently there is only one hard requirement which leads to a failure in a validator like `verapdf`: The A-4 standard should use PDF 2.0. As PDF A-1 is based on PDF 1.4 and PDF A-2 and A-3 are based on PDF 1.7 `l3pdfmeta` also sets these versions also as requirements. These requirements are checked by `l3pdfmeta` when the version is set with `\DocumentMetadata` and a warning is issued (but the version is not changed). More checks are only needed if the version is changed later.

`max_pdf_version` stores the maximal PDF version. It should be checked against the current PDF version (`\pdf_version:`). A failure means that the version should be changed. The check is currently relevant only for the A-1 to A-3 standards: PDF 2.0 leads to a failure in a validator like `verapdf` so the maximal version should be PDF 1.7. This requirement is checked by `l3pdfmeta` when the version is set with

`\DocumentMetadata` and a warning is issued (but the version is not changed). More checks are only needed if the version is changed later.

`named_actions` this requirement restricts the list of allowed named actions to `NextPage`, `PrevPage`, `FirstPage`, `LastPage`. The check should supply the named action without slash (e.g. `View` (failure) or `NextPage` (pass)).

`annot_action_A` (rule 6.6.1-1) this requirement restricts the allowed subtypes of the `/A` dictionary of an action. The check should supply the user subtype without slash e.g. as `GoTo` (pass) or `Movie` (failure).

1.2 Colorprofiles and OutputIntent

The pdf/A standards require that a color profile is embedded and referenced in the catalog in the `/OutputIntent` array.

The problem is that the pdf/A standards also require, that if the PDF has more than one entry in the `/OutputIntent` array (which is allowed), their `/DestOutputProfile` should all reference the same color profile².

Enforcing this fully is impossible if entries are added manually by users or packages with `\pdfmanagement_add:nnn {Catalog}{OutputIntents}{<object reference>}` as it is difficult to inspect and remove entries from the `/OutputIntent` array.

So we provide a dedicated interface to avoid the need of manual user settings and allow the code to handle the requirements of the standard. The interface doesn't handle yet all finer points for PDF/X standards, e.g. named profiles, it is meant as a starting point to get at least PDF/A validation here.

The interface looks like this

```
\DocumentMetadata
{
  %other options for example pdfstandard
  colorprofiles=
  {
    A = sRGB.icc, %or a or longer GTS_PDFA1 = sRGB.icc
    X = FOGRA39L_coated.icc, % or x or longer GTS_PDFX
    ISO_PDFE1 = whatever.icc
  }
}
```

`sRGB.icc` and `FOGRA39L_coated.icc` (from the `colorprofiles` package are predefined and will work directly³. `whatever.icc` will need special setup in the document preamble to declare the values for the `OutputIntent` dictionary, but the interface hasn't be added yet. This will be decided later.

If an A-standard is detected or set which requires that all `/DestOutputProfile` reference the same color profile, the setting is changed to the equivalent of

²see rule 6.2.2-2 at <https://docs.verapdf.org/validation/pdfa-part1/>

³The `dvips` route will require that `ps2pdf` is called with `-dNOSAfer`, and that the color profiles are in the current folder as `ps2pdf` doesn't use `kpathsea` to find them.

```

\DocumentMetadata
{
  %other options
  pdfstandard=A-2b,
  colorprofiles=
  {
    A = sRGB.icc, %or longer GTS_PDFA1 = sRGB.icc
    X = sRGB.icc,
    ISO_PDFA1 = sRGB.icc
  }
}

```

The pdf/A standards will use A=sRGB.icc by default, so this doesn't need to be declared explicitly.

1.3 Regression tests

When doing regression tests one has to set various metadata to fix values.

```
\pdfmeta_set_regression_data: \pdfmeta_set_regression_data:
```

This sets various metadata to values needed by the L^AT_EX regression tests. It also sets the seed for random functions.

2 XMP-metadata

XMP-metadata are data in XML format embedded in a stream inside the PDF and referenced from the `/Catalog`. Such a XMP-metadata stream contains various document related data, is required by various PDF standards and can replace or extend the data in the `/Info` dictionary. In PDF 2.0 the `/Info` dictionary is actually deprecated and only XMP-metadata should be used for the metadata of the PDF.

The content of a XMP-metadata stream is not a fix set of data. Typically fields like the title, the author, the language and keywords will be there. But standards like e.g. ZUGferd (a standard for electronic bills) can require to add more fields, and it is also possible to define and add purely local data.

In some workflows (e.g. if dvips + ghostscript is used) a XMP-metadata stream with some standard content is added automatically by the backend, but normally it must be created with code.

For this task the packages `hyperxmp`, `xmpincl` or `pdfx` (which uses `xmpincl`) can be used, but all these packages are not compatible with the `pdfmanagement`⁴. The following code is meant as replacement for these packages.

`hyperxmp` uses `\hypersetup` as user interface to enter the XMP-metadata. This syntax is also supported by the new code⁵, so if `hyperref` has been loaded, e.g. `pdftitle=xxx` can be used to set the title. But XMP-metadata shouldn't require to use `hyperref` and in a future version an interface without `hyperref` will be added.

⁴`hyperxmp` was partly compatible as the `pdfmanagement` contained some patches for it, but these patches have now been removed.

⁵with a number of changes which are discussed in more details below

There is currently no full user interface command to extend the XMP-metadata with for example the code needed for ZUGferd, they will be added in a second step.

2.1 Debug option

The resulting XMP-packet can be written to an external file by activating a debug option

```
\DocumentMetadata{debug={xmp-export}}
%or
\DocumentMetadata{debug={xmp-export=true}}
%or
\DocumentMetadata{debug={xmp-export=filename}}
```

By default the data are written to `\jobname.xmpi`, if a `filename` is given, then `filename.xmpi` is used instead. `xmp-export=false` deactivates the export.

2.2 Encoding and escaping

XMP-metadata are stored as UTF-8 in the PDF. This mean if you open a PDF in an editor a content like “grüße” will be shown probably as “grÃ¼Ãe”. As XMP-metadata are in XML format special chars like `<`, `>`, and `&` and „ must be escaped.

`hyperxmp` hooks into `hyperref` and passes all input through `\pdfstringdef`. This means a word like “hallo” is first converted by `\pdfstringdef` into `\376\377\000h\000a\0001\0001\000o` and then back to UTF-8 by `hyperxmp` and in the course of this action the XML-escapings are applied. `pdfx` uses `\pdfstringdef` together with a special fontencoding (similar to the PU-encoding of `hyperref`) for a similar aim. The code here is based on `\text_purify:n` followed by a few replacements for the escaping.

User data should normally be declared in the preamble (or even in the `\DocumentMetadata` command), and consist of rather simple text; `&` can be entered as `\&` (but directly `&` will normally work too), babel shorthands should not be used. Some datas are interpreted as comma lists, in this cases commas which are part of the text should be protected by braces. In some cases a text in brackets like `[en]` is interpreted as language tag, if they are part of a text they should be protected by braces too. XMP-metadata are stored uncompressed in the PDF so if you are unsure if a value has been passed correctly, open the PDF in an editor, copy the whole block and pass it to a validator, e.g. <https://www.w3.org/RDF/Validator/>.

2.3 User interfaces and differences to `hyperxmp`

2.3.1 PDF standards

The `hyperxmp`/`hyperref` keys `pdfapart`, `pdfaconformance`, `pdfuapart`, `pdfxstandard` and `pdfa` are ignored by this code. Standards must be set with the `pdfstandard` key of `\DocumentMetadata`. This key can be used more than once, e.g. `pdfstandard=A-2b,pdfstandard=X-4,pdfstandard=UA-1`.

Note that using these keys doesn’t mean that the document actually follows the standard. L^AT_EX can neither ensure nor check all requirements of a standard, and not everything it can do theoretically has already been implemented. When setting an A standard, the code will e.g. insert a color profile and warn if the PDF version doesn’t fit, but X and UA currently only adds the relevant declarations to the XMP-metadata. It is up to the author to ensure and validate that the document actually follows the standard.

2.3.2 Dates

- The dates `xmp:CreateDate`, `xmp:ModifyDate`, `xmp:MetadataDate` are normally set automatically to the current date/time when the compilation started. If they should be changed (e.g. for regression tests to produce reproducible documents) they can be set with `\hypersetup` with the keys `pdfcreationdate`, `pdfmoddate` and `pdfmetadate`.

```
\hypersetup{pdfcreationdate=D:20010101205959-00'00'}
```

The format should be a full date/time in PDF format, so one of these (naturally the numbers can change):

```
D:20010101205959-00'00'  
D:20010101205959+00'00'  
D:20010101205959Z
```

- The date `dc:date` is an “author date” and so should normally be set to the same date as given by `\date`. This can be done with the key `pdfdate`⁶. The value should be a date in ISO 8601 format:

```
2022                %year  
2022-09-04          %year-month-day  
2022-09-04T19:20    %year-month-day hour:minutes  
2022-09-04T19:20:30 % year-month-day hour:minutes:second  
2022-09-04T19:20:30.45 % year-month-day hour:minutes:second with fraction  
2022-09-04T19:20+01:00 % with time zone designator  
2022-09-04T19:20-02:00 % time zone designator  
2022-09-04T19:20Z    % time zone designator
```

It is also possible to give the date as a full date in PDF format as described above. If not set the current date/time is used.

2.4 Language

The code assumes that a default language is always declared (as the pdfmanagement gives the `/Lang` entry in the catalog a default value) This language can be changed with the `\DocumentMetadata` key `lang` (preferred) but the `hyperref` key `pdflang` is also honored. Its value should be a simple language tag like `de` or `de-DE`.

The main language is also used in a number of attributes in the XMP data, if wanted a different language can be set here with the `hyperref/hyperxmp` key `pdfmetalang`.

A number of entries can be given a language tag. Such a language is given by using an “optional argument” before the text:

```
\hypersetup{pdftitle={ [en]english, [de]deutsch}}  
\hypersetup{pdfsubtitle={ [en]subtitle in english}}
```

⁶Extracting the value automatically from `\date` is not really possible as authors often put formatting or additional info in this command.

2.5 Rights

The keys `pdfcopyright` and `pdflicenseurl` work similar as in `hyperxmp`. But differently to `hyperxmp` the code doesn't set the `xmpRights:Marked` property, as I have some doubts that one deduce its value simply by checking if the other keys have been used; if needed it should be added manually.

2.6 PDF related data

The PDF producer is for all engines by default built from the engine name and the engine version and doesn't use the banners as with `hyperxmp` and `pdfx`, it can be set manually with the `pdfproducer` key.

The key `pdftrapped` is ignored. `Trapped` is deprecated in PDF 2.0.

2.7 Document data

The authors should be given with the `pdfauthor` key, separated by commas. If an author contains a comma, protect/hide it by a brace.

2.8 User commands

The XMP-meta data are added automatically. This can be suppressed with the `\DocumentMetadata` key `xmp`.

<code>\pdfmeta_xmp_add:n</code>	<code>\pdfmeta_xmp_add:n{<XML>}</code>
---------------------------------	--

With this command additional XML code can be added to the Metadata. The content is added unchanged, and not sanitized.

<code>\pdfmeta_xmp_xmlns_new:nn</code>	<code>\pdfmeta_xmp_xmlns_new:nn{<prefix>}{<uri>}</code>
--	---

With this command a xmlns name space can be added.

3 l3pdfmeta implementation

```

1 <@@=pdfmeta>
2 <*header>
3 \ProvidesExplPackage{l3pdfmeta}{2023-02-07}{0.95u}
4   {PDF-Standards---LaTeX PDF management testphase bundle}
5 </header>

```

Message for unknown standards

```

6 <*package>
7 \msg_new:nnn {pdf }{unknown-standard}{The~standard~'#1'~is~unknown~and~has~been~ignored}

```

Message for not fitting pdf version

```

8 \msg_new:nnn {pdf }{wrong-pdfversion}
9   {PDF~version~#1~is~too~#2~for~standard~'#3'.}

```

```

\l__pdfmeta_tmpa_tl
\l__pdfmeta_tmppb_tl
\l__pdfmeta_tmpa_str
\g__pdfmetatmpa_str
\l__pdfmeta_tmpa_seq
\l__pdfmeta_tmppb_seq
10 \tl_new:N \l__pdfmeta_tmpa_tl
11 \tl_new:N \l__pdfmeta_tmppb_tl
12 \str_new:N \l__pdfmeta_tmpa_str
13 \str_new:N \g__pdfmeta_tmpa_str

```



```

14 \seq_new:N \l__pdfmeta_tmpa_seq
15 \seq_new:N \l__pdfmeta_tmpb_seq

```

(End definition for \l__pdfmeta_tmpa_tl and others.)

3.1 Standards (work in progress)

3.1.1 Tools and tests

This internal property will contain for now the settings for the document.

\g__pdfmeta_standard_prop

```

16 \prop_new:N \g__pdfmeta_standard_prop

```

(End definition for \g__pdfmeta_standard_prop.)

3.1.2 Functions to check a requirement

At first two commands to get the standard value if needed:

\pdfmeta_standard_item:n

```

17 \cs_new:Npn \pdfmeta_standard_item:n #1
18 {
19   \prop_item:Nn \g__pdfmeta_standard_prop {#1}
20 }

```

(End definition for \pdfmeta_standard_item:n. This function is documented on page 2.)

\pdfmeta_standard_get:nN

```

21 \cs_new_protected:Npn \pdfmeta_standard_get:nN #1 #2
22 {
23   \prop_get:NnN \g__pdfmeta_standard_prop {#1} #2
24 }

```

(End definition for \pdfmeta_standard_get:nN. This function is documented on page 2.)

Now two functions to check the requirement. A simple and one value/handler based.

\pdfmeta_standard_verify_p:n
\pdfmeta_standard_verify:nTF

This is a simple test is the requirement is in the prop.

```

25 \prg_new_conditional:Npnn \pdfmeta_standard_verify:n #1 {T,F,TF}
26 {
27   \prop_if_in:NnTF \g__pdfmeta_standard_prop {#1}
28   {
29     \prg_return_false:
30   }
31   {
32     \prg_return_true:
33   }
34 }

```

(End definition for \pdfmeta_standard_verify:nTF. This function is documented on page 2.)

`\pdfmeta_standard_verify:nnTF` This allows to test against a user value. It calls a test handler if this exists and passes the user and the standard value to it. The test handler should return true or false.

```

35 \prg_new_protected_conditional:Npnn \pdfmeta_standard_verify:nn #1 #2 {T,F,TF}
36 {
37   \prop_if_in:NnTF \g__pdfmeta_standard_prop {#1}
38   {
39     \cs_if_exist:CTF {__pdfmeta_standard_verify_handler_#1:nn}
40     {
41       \exp_args:Nnnx
42       \use:c
43       {__pdfmeta_standard_verify_handler_#1:nn}
44       { #2 }
45       { \prop_item:Nn \g__pdfmeta_standard_prop {#1} }
46     }
47     {
48       \prg_return_false:
49     }
50   }
51   {
52     \prg_return_true:
53   }
54 }

```

(End definition for `\pdfmeta_standard_verify:nnTF`. This function is documented on page 2.)

Now we setup a number of handlers.

The first actually ignores the user values and tests against the current pdf version. If this is smaller than the minimum we report a failure. #1 is the user value, #2 the reference value from the standard.

`_standard_verify_handler_min_pdf_version:nn`

```

55 %
56 \cs_new_protected:Npn \__pdfmeta_standard_verify_handler_min_pdf_version:nn #1 #2
57 {
58   \pdf_version_compare:NnTF <
59   { #2 }
60   {\prg_return_false:}
61   {\prg_return_true:}
62 }

```

(End definition for `__pdfmeta_standard_verify_handler_min_pdf_version:nn`.)

The next is the counter part and checks that the version is not too high

`_standard_verify_handler_max_pdf_version:nn`

```

63 %
64 \cs_new_protected:Npn \__pdfmeta_standard_verify_handler_max_pdf_version:nn #1 #2
65 {
66   \pdf_version_compare:NnTF >
67   { #2 }
68   {\prg_return_false:}
69   {\prg_return_true:}
70 }

```

(End definition for `__pdfmeta_standard_verify_handler_max_pdf_version:nn`.)

The next checks if the user value is in the list and returns a failure if not.

ta_standard_verify_handler_named_actions:nn

```
71
72 \cs_new_protected:Npn \__pdfmeta_standard_verify_handler_named_actions:nn #1 #2
73 {
74   \tl_if_in:nnTF { #2 }{ #1 }
75     {\prg_return_true:}
76     {\prg_return_false:}
77 }
```

(End definition for __pdfmeta_standard_verify_handler_named_actions:nn.)

The next checks if the user value is in the list and returns a failure if not.

a_standard_verify_handler_annot_action_A:nn

```
78 \cs_new_protected:Npn \__pdfmeta_standard_verify_handler_annot_action_A:nn #1 #2
79 {
80   \tl_if_in:nnTF { #2 }{ #1 }
81     {\prg_return_true:}
82     {\prg_return_false:}
83 }
```

(End definition for __pdfmeta_standard_verify_handler_annot_action_A:nn.)

This check is probably not needed, but for completeness

dard_verify_handler_outputintent_subtype:nn

```
84 \cs_new_protected:Npn \__pdfmeta_standard_verify_handler_outputintent_subtype:nn #1 #2
85 {
86   \tl_if_eq:nnTF { #2 }{ #1 }
87     {\prg_return_true:}
88     {\prg_return_false:}
89 }
```

(End definition for __pdfmeta_standard_verify_handler_outputintent_subtype:nn.)

3.1.3 Enforcing requirements

A number of requirements can sensibly be enforced by us.

Annot flags pdf/A require a number of settings here, we store them in a command which can be added to the property of the standard:

```
90 \cs_new_protected:Npn \__pdfmeta_verify_pdfa_annot_flags:
91 {
92   \bitset_set_true:Nn \l_pdfannot_F_bitset {Print}
93   \bitset_set_false:Nn \l_pdfannot_F_bitset {Hidden}
94   \bitset_set_false:Nn \l_pdfannot_F_bitset {Invisible}
95   \bitset_set_false:Nn \l_pdfannot_F_bitset {NoView}
96   \pdfannot_dict_put:nnn {link/URI}{F}{ \bitset_to_arabic:N \l_pdfannot_F_bitset }
97   \pdfannot_dict_put:nnn {link/GoTo}{F}{ \bitset_to_arabic:N \l_pdfannot_F_bitset }
98   \pdfannot_dict_put:nnn {link/GoToR}{F}{ \bitset_to_arabic:N \l_pdfannot_F_bitset }
99   \pdfannot_dict_put:nnn {link/Launch}{F}{ \bitset_to_arabic:N \l_pdfannot_F_bitset }
100  \pdfannot_dict_put:nnn {link/Named}{F}{ \bitset_to_arabic:N \l_pdfannot_F_bitset }
101 }
```

At begin document this should be checked:

```

102 \hook_gput_code:nnn {begindocument} {pdf}
103 {
104   \pdfmeta_standard_verify:nF { annot_flags }
105   { \__pdfmeta_verify_pdfa_annot_flags: }
106   \pdfmeta_standard_verify:nnF { min_pdf_version }
107   { \pdf_version: }
108   { \msg_warning:nnxxx {pdf}{wrong-pdfversion}
109     {\pdf_version:}{low}
110     {
111       \pdfmeta_standard_item:n{type}
112       -
113       \pdfmeta_standard_item:n{level}
114     }
115   }
116   \pdfmeta_standard_verify:nnF { max_pdf_version }
117   { \pdf_version: }
118   { \msg_warning:nnxxx {pdf}{wrong-pdfversion}
119     {\pdf_version:}{high}
120     {
121       \pdfmeta_standard_item:n{type}
122       -
123       \pdfmeta_standard_item:n{level}
124     }
125   }
126 }

```

3.1.4 pdf/A

We use global properties so that follow up standards can be copied and then adjusted. Some note about requirements for more standard can be found in info/pdfstandard.tex.

```

\g__pdfmeta_standard_pdf/A-1B_prop
\g__pdfmeta_standard_pdf/A-2A_prop
\g__pdfmeta_standard_pdf/A-2B_prop
\g__pdfmeta_standard_pdf/A-2U_prop
\g__pdfmeta_standard_pdf/A-3A_prop
\g__pdfmeta_standard_pdf/A-3B_prop
\g__pdfmeta_standard_pdf/A-3U_prop
\g__pdfmeta_standard_pdf/A-4_prop
127 \prop_new:c { g__pdfmeta_standard_pdf/A-1B_prop }
128 \prop_gset_from_keyval:cn { g__pdfmeta_standard_pdf/A-1B_prop }
129 {
130   ,name           = pdf/A-1B
131   ,type           = A
132   ,level          = 1
133   ,conformance    = B
134   ,year           = 2005
135   ,min_pdf_version = 1.4           %minimum
136   ,max_pdf_version = 1.4           %minimum
137   ,no_encryption  =
138   ,no_external_content = % no F, FFilter, or FDecodeParms in stream dicts
139   ,no_embed_content = % no EF key in filespec, no /Type/EmbeddedFiles
140   ,max_string_size = 65535
141   ,max_array_size  = 8191
142   ,max_dict_size   = 4095
143   ,max_obj_num     = 8388607
144   ,max_nest_qQ      = 28
145   ,named_actions   = {NextPage, PrevPage, FirstPage, LastPage}
146   ,annot_flags      =
147   %booleans. Only the existence of the key matter.

```

```

148 %If the entry is added it means a requirements is there
149 %(in most cases "don't use ...")
150 %
151 %=====
152 % Rule 6.1.13-1 CosDocument, isOptionalContentPresent == false
153 ,Catalog_no_OCProperties =
154 %=====
155 % Rule 6.6.1-1: PDAAction, S == "GoTo" || S == "GoToR" || S == "Thread"
156 % || S == "URI" || S == "Named" || S == "SubmitForm"
157 % means: no /S/Launch, /S/Sound, /S/Movie, /S/ResetForm, /S/ImportData,
158 % /S/JavaScript, /S/Hide
159 ,annot_action_A = {GoTo,GoToR,Thread,URI,Named,SubmitForm}
160 %=====
161 % Rule 6.6.2-1: PDAnnot, Subtype != "Widget" || AA_size == 0
162 % means: no AA dictionary
163 ,annot_widget_no_AA =
164 %=====
165 % Rule 6.9-2: PDAnnot, Subtype != "Widget" || (A_size == 0 && AA_size == 0)
166 % (looks like a tightening of the previous rule)
167 ,annot_widget_no_A_AA =
168 %=====
169 % Rule 6.9-1 PDAcroForm, NeedAppearances == null || NeedAppearances == false
170 ,form_no_NeedAppearances =
171 %=====
172 %Rule 6.9-3 PDFormField, AA_size == 0
173 ,form_no_AA =
174 %=====
175 % to be continued https://docs.verapdf.org/validation/pdfa-part1/
176 % - Outputintent/colorprofiles requirements
177 % an outputintent should be loaded and is unique.
178 ,outputintent_A = {GTS_PDFA1}
179 % - no Alternates key in image dictionaries
180 % - no OPI, Ref, Subtype2 with PS key in xobjects
181 % - Interpolate = false in images
182 % - no TR, TR2 in ExtGstate
183 }
184
185 %A-2b =====
186 \prop_new:c { g__pdfmeta_standard_pdf/A-2B_prop }
187 \prop_gset_eq:cc
188 { g__pdfmeta_standard_pdf/A-2B_prop }
189 { g__pdfmeta_standard_pdf/A-1B_prop }
190 \prop_gput:cnn
191 { g__pdfmeta_standard_pdf/A-2B_prop }{name}{pdf/A-2B}
192 \prop_gput:cnn
193 { g__pdfmeta_standard_pdf/A-2B_prop }{year}{2011}
194 \prop_gput:cnn
195 { g__pdfmeta_standard_pdf/A-2B_prop }{level}{2}
196 % embedding files is allowed (with restrictions)
197 \prop_gremove:cn
198 { g__pdfmeta_standard_pdf/A-2B_prop }
199 { embed_content}
200 \prop_gput:cnn
201 { g__pdfmeta_standard_pdf/A-2B_prop }{max_pdf_version}{1.7}

```

```

202 %A-2u =====
203 \prop_new:c { g__pdfmeta_standard_pdf/A-2U_prop }
204 \prop_gset_eq:cc
205 { g__pdfmeta_standard_pdf/A-2U_prop }
206 { g__pdfmeta_standard_pdf/A-2B_prop }
207 \prop_gput:cnn
208 { g__pdfmeta_standard_pdf/A-2U_prop }{name}{pdf/A-2U}
209 \prop_gput:cnn
210 { g__pdfmeta_standard_pdf/A-2U_prop }{conformance}{U}
211 \prop_gput:cnn
212 { g__pdfmeta_standard_pdf/A-2U_prop }{unicode}{ }
213
214 %A-2a =====
215 \prop_new:c { g__pdfmeta_standard_pdf/A-2A_prop }
216 \prop_gset_eq:cc
217 { g__pdfmeta_standard_pdf/A-2A_prop }
218 { g__pdfmeta_standard_pdf/A-2B_prop }
219 \prop_gput:cnn
220 { g__pdfmeta_standard_pdf/A-2A_prop }{name}{pdf/A-2A}
221 \prop_gput:cnn
222 { g__pdfmeta_standard_pdf/A-2A_prop }{conformance}{A}
223 \prop_gput:cnn
224 { g__pdfmeta_standard_pdf/A-2A_prop }{tagged}{ }
225
226
227 %A-3b =====
228 \prop_new:c { g__pdfmeta_standard_pdf/A-3B_prop }
229 \prop_gset_eq:cc
230 { g__pdfmeta_standard_pdf/A-3B_prop }
231 { g__pdfmeta_standard_pdf/A-2B_prop }
232 \prop_gput:cnn
233 { g__pdfmeta_standard_pdf/A-3B_prop }{name}{pdf/A-3B}
234 \prop_gput:cnn
235 { g__pdfmeta_standard_pdf/A-3B_prop }{year}{2012}
236 \prop_gput:cnn
237 { g__pdfmeta_standard_pdf/A-3B_prop }{level}{3}
238 % embedding files is allowed (with restrictions)
239 \prop_gremove:cn
240 { g__pdfmeta_standard_pdf/A-3B_prop }
241 { embed_content}
242
243 %A-3u =====
244 \prop_new:c { g__pdfmeta_standard_pdf/A-3U_prop }
245 \prop_gset_eq:cc
246 { g__pdfmeta_standard_pdf/A-3U_prop }
247 { g__pdfmeta_standard_pdf/A-3B_prop }
248 \prop_gput:cnn
249 { g__pdfmeta_standard_pdf/A-3U_prop }{name}{pdf/A-3U}
250 \prop_gput:cnn
251 { g__pdfmeta_standard_pdf/A-3U_prop }{conformance}{U}
252 \prop_gput:cnn
253 { g__pdfmeta_standard_pdf/A-3U_prop }{unicode}{ }
254
255 %A-3a =====
256 \prop_new:c { g__pdfmeta_standard_pdf/A-3A_prop }

```

```

256 \prop_gset_eq:cc
257 { g__pdfmeta_standard_pdf/A-3A_prop }
258 { g__pdfmeta_standard_pdf/A-3B_prop }
259 \prop_gput:cnn
260 { g__pdfmeta_standard_pdf/A-3A_prop }{name}{pdf/A-3A}
261 \prop_gput:cnn
262 { g__pdfmeta_standard_pdf/A-3A_prop }{conformance}{A}
263 \prop_gput:cnn
264 { g__pdfmeta_standard_pdf/A-3A_prop }{tagged}{ }
265
266 %A-4 =====
267 \prop_new:c { g__pdfmeta_standard_pdf/A-4_prop }
268 \prop_gset_eq:cc
269 { g__pdfmeta_standard_pdf/A-4_prop }
270 { g__pdfmeta_standard_pdf/A-3U_prop }
271 \prop_gput:cnn
272 { g__pdfmeta_standard_pdf/A-4_prop }{name}{pdf/A-4}
273 \prop_gput:cnn
274 { g__pdfmeta_standard_pdf/A-4_prop }{level}{4}
275 \prop_gput:cnn
276 { g__pdfmeta_standard_pdf/A-4_prop }{min_pdf_version}{2.0}
277 \prop_gput:cnn
278 { g__pdfmeta_standard_pdf/A-4_prop }{year}{2020}
279 \prop_gput:cnn
280 { g__pdfmeta_standard_pdf/A-4_prop }{Trailer_no_Info}{ }
281 \prop_gremove:cn
282 { g__pdfmeta_standard_pdf/A-4_prop }{conformance}
283 \prop_gremove:cn
284 { g__pdfmeta_standard_pdf/A-4_prop }{max_pdf_version}

```

(End definition for \g__pdfmeta_standard_pdf/A-1B_prop and others.)

3.1.5 Colorprofiles and Outputintents

The following provides a minimum of interface to add a color profile and an outputintent need for PDF/A for now. There will be need to extend it later, so we try for enough generality.

Adding a profile and an intent is technically easy:

1. Embed the profile as stream with

```
\pdf_object_unnamed_write:nn{fstream} {{/N~4}{XXX.icc}}
```

2. Write a /OutputIntent dictionary for this

```

\pdf_object_unnamed_write:nx {dict}
{
  /Type /OutputIntent
  /S /GTS_PDFA1 % or GTS_PDFX or ISO_PDFE1 or ...
  /DestOutputProfile \pdf_object_ref_last: % ref the color profile
  /OutputConditionIdentifier ...
  ... %more info
}

```

3. Reference the dictionary in the catalog:

```
\pdfmanagement_add:nx {Catalog}{OutputIntents}{\pdf_object_ref_last:}
```

But we need to do a bit more work, to get the interface right. The object for the profile should be named, to allow l3color to reuse it if needed. And we need container to store the profiles, to handle the standard requirements.

`\g_pdfmeta_outputintents_prop` This variable will hold the profiles for the subtypes. We assume that every subtype has only only color profile.

```
285 \prop_new:N \g_pdfmeta_outputintents_prop
```

(End definition for `\g_pdfmeta_outputintents_prop`.)

Some keys to fill the property.

```
286 \keys_define:nn { document / metadata }
287 {
288   colorprofiles .code:n =
289   {
290     \keys_set:nn { document / metadata / colorprofiles }{#1}
291   }
292 }
293 \keys_define:nn { document / metadata / colorprofiles }
294 {
295   ,A .code:n =
296   {
297     \tl_if_blank:nF {#1}
298     {
299       \prop_gput:Nnn \g_pdfmeta_outputintents_prop
300       { GTS_PDFA1 } {#1}
301     }
302   }
303   ,a .code:n =
304   {
305     \tl_if_blank:nF {#1}
306     {
307       \prop_gput:Nnn \g_pdfmeta_outputintents_prop
308       { GTS_PDFA1 } {#1}
309     }
310   }
311   ,X .code:n =
312   {
313     \tl_if_blank:nF {#1}
314     {
315       \prop_gput:Nnn \g_pdfmeta_outputintents_prop
316       { GTS_PDFX } {#1}
317     }
318   }
319   ,x .code:n =
320   {
321     \tl_if_blank:nF {#1}
322     {
323       \prop_gput:Nnn \g_pdfmeta_outputintents_prop
324       { GTS_PDFX } {#1}
325     }
326   }
327   ,unknown .code:n =
```



```

328     {
329         \tl_if_blank:nF {#1}
330         {
331             \exp_args:NNo
332             \prop_gput:Nnn \g__pdfmeta_outputintents_prop
333             { \l_keys_key_str } {#1}
334         }
335     }
336 }

```

At first we setup our two default profiles. This is internal as the public interface is still undecided.

```

337 \pdfdict_new:n {l_pdfmeta/outputintent}
338 \pdfdict_put:nnn {l_pdfmeta/outputintent}
339 {Type}/{OutputIntent}
340 \prop_const_from_keyval:cn { c__pdfmeta_colorprofile_sRGB.icc}
341 {
342     ,OutputConditionIdentifier=IEC~sRGB
343     ,Info=IEC-61966-2.1~Default~RGB~colour~space~~~sRGB
344     ,RegistryName=http://www.iec.ch
345     ,N = 3
346 }
347 \prop_const_from_keyval:cn { c__pdfmeta_colorprofile_FOGRA39L_coated.icc}
348 {
349     ,OutputConditionIdentifier=FOGRA39L~Coated
350     ,Info={Offset~printing,~according~to~ISO~12647-2:2004/Amd~1,~OFCOM,~ %
351         paper~type~1~or~2~~~coated~art,~115~g/m2,~tone~value~increase~
352         curves~A~(CMY)~and~B~(K)}
353     ,RegistryName=http://www.fogra.org
354     ,N = 4
355 }

```

_pdfmeta_embed_colorprofile:n
_pdfmeta_write_outputintent:nn

The commands embed the profile, and write the dictionary and add it to the catalog. The first command should perhaps be moved to l3color as it needs such profiles too. We used named objects so that we can check if the profile is already there. This is not full proof if pathes are used.

```

356 \cs_new_protected:Npn \__pdfmeta_embed_colorprofile:n #1%#1 file name
357 {
358     \pdf_object_if_exist:nF { __color_icc_ #1 }
359     {
360         \pdf_object_new:n { __color_icc_ #1 }
361         \pdf_object_write:nnx { __color_icc_ #1 } { fstream }
362         {
363             {/N\c_space_tl
364             \prop_item:cn{c__pdfmeta_colorprofile_#1}{N}
365             }
366         {#1}
367     }
368 }
369 }
370
371 \cs_new_protected:Npn \__pdfmeta_write_outputintent:nn #1 #2 %#1 file name, #2 subtype
372 {
373     \group_begin:

```

```

374 \pdfdict_put:nnx {l_pdfmeta/outputintent}{S}{/\str_convert_pdfname:n{#2}}
375 \pdfdict_put:nnx {l_pdfmeta/outputintent}
376 {DestOutputProfile}
377 {\pdf_object_ref:n{ __color_icc_ #1 }}
378 \clist_map_inline:nn { OutputConditionIdentifier, Info, RegistryName }
379 {
380   \prop_get:cnNT
381   { c__pdfmeta_colorprofile_#1}
382   { ##1 }
383   \l__pdfmeta_tmpa_tl
384   {
385     \pdf_string_from_unicode:nVN {utf8/string}\l__pdfmeta_tmpa_tl\l__pdfmeta_tmpa_st
386     \pdfdict_put:nnx
387     {l_pdfmeta/outputintent}{##1}{\l__pdfmeta_tmpa_str}
388   }
389 }
390 \pdf_object_unnamed_write:nx {dict}{\pdfdict_use:n {l_pdfmeta/outputintent} }
391 \pdfmanagement_add:nnx {Catalog}{OutputIntents}{\pdf_object_ref_last:}
392 \group_end:
393 }

```

(End definition for `__pdfmeta_embed_colorprofile:n` and `__pdfmeta_write_outputintent:nn`.)

Now the verifying code. If no requirement is set we simply loop over the property

```

394
395 \AddToHook{begindocument/end}
396 {
397   \pdfmeta_standard_verify:nTF {outputintent_A}
398   {
399     \prop_map_inline:Nn \g__pdfmeta_outputintents_prop
400     {
401       \__pdfmeta_embed_colorprofile:n
402       {#2}
403       \__pdfmeta_write_outputintent:nn
404       {#2}
405       {#1}
406     }
407   }

```

If an output intent is required for pdf/A we need to ensure, that the key of default subtype has a value, as default we take sRGB.icc. Then we loop but take always the same profile.

```

408   {
409     \exp_args:NNx
410     \prop_if_in:NnF
411     \g__pdfmeta_outputintents_prop
412     { \pdfmeta_standard_item:n { outputintent_A } }
413     {
414       \exp_args:NNx
415       \prop_gput:Nnn
416       \g__pdfmeta_outputintents_prop
417       { \pdfmeta_standard_item:n { outputintent_A } }
418       { sRGB.icc }
419     }
420     \exp_args:NNx

```

```

421     \prop_get:NnN
422     \g__pdfmeta_outputintents_prop
423     { \pdfmeta_standard_item:n { outputintent_A } }
424     \l__pdfmeta_tmpb_tl
425     \exp_args:NV \__pdfmeta_embed_colorprofile:n \l__pdfmeta_tmpb_tl
426     \prop_map_inline:Nn \g__pdfmeta_outputintents_prop
427     {
428       \exp_args:NV
429       \__pdfmeta_write_outputintent:nn
430       \l__pdfmeta_tmpb_tl
431       { #1 }
432     }
433   }
434 }

```

3.2 Regression test

This is simply a copy of the backend function.

```

435 \cs_new_protected:Npn \pdfmeta_set_regression_data:
436   { \__pdf_backend_set_regression_data: }

```

4 XMP-Metadata implementation

`\g__pdfmeta_xmp_bool` This boolean decides if the metadata are included

```

437 \bool_new:N\g__pdfmeta_xmp_bool
438 \bool_gset_true:N \g__pdfmeta_xmp_bool

```

(End definition for `\g__pdfmeta_xmp_bool`.)

Preset the two fields to avoid problems with standards.

```

439 \hook_gput_code:nnn{pdfmanagement/add}{pdfmanagement}
440 {
441   \pdfmanagement_add:nnx {Info}{Producer}{(\c_sys_engine_exec_str-\c_sys_engine_version_str)}
442   \pdfmanagement_add:nnx {Info}{Creator}{(LaTeX)}
443 }

```

4.1 New document keys

```

444 \keys_define:nn { document / metadata }
445 {
446   _pdfstandard / X-4 .code:n =
447     {\AddToDocumentProperties [document]{pdfstandard-X}{PDF/X-4}},
448   _pdfstandard / X-4p .code:n =
449     {\AddToDocumentProperties [document]{pdfstandard-X}{PDF/X-4p}},
450   _pdfstandard / X-5g .code:n =
451     {\AddToDocumentProperties [document]{pdfstandard-X}{PDF/X-5g}},
452   _pdfstandard / X-5n .code:n =
453     {\AddToDocumentProperties [document]{pdfstandard-X}{PDF/X-5n}},
454   _pdfstandard / X-5pg .code:n =
455     {\AddToDocumentProperties [document]{pdfstandard-X}{PDF/X-5pg}},
456   _pdfstandard / X-6 .code:n =
457     {\AddToDocumentProperties [document]{pdfstandard-X}{PDF/X-6p}},
458   _pdfstandard / X-6n .code:n =

```

```

459     {\AddToDocumentProperties [document]{pdfstandard-X}{PDF/X-6n}},
460     _pdfstandard / X-6p .code:n =
461     {\AddToDocumentProperties [document]{pdfstandard-X}{PDF/X-6p}},
462     _pdfstandard / UA-1 .code:n =
463     {\AddToDocumentProperties [document]{pdfstandard-UA}{1}},
464     xmp .bool_gset:N = \g__pdfmeta_xmp_bool
465 }

```

XMP debugging option

```

466 \bool_new:N \g__pdfmeta_xmp_export_bool
467 \str_new:N \g__pdfmeta_xmp_export_str
468
469 \keys_define:nn { document / metadata }
470 {
471     ,debug / xmp-export .choice:
472     ,debug / xmp-export / true .code:n=
473     {
474         \bool_gset_true:N \g__pdfmeta_xmp_export_bool
475         \str_gset_eq:NN \g__pdfmeta_xmp_export_str \c_sys_jobname_str
476     }
477     ,debug / xmp-export / false .code:n =
478     {
479         \bool_gset_false:N \g__pdfmeta_xmp_export_bool
480     }
481     ,debug / xmp-export / unknown .code:n =
482     {
483         \bool_gset_true:N \g__pdfmeta_xmp_export_bool
484         \str_gset:Nn \g__pdfmeta_xmp_export_str { #1 }
485     }
486     ,debug / xmp-export .default:n = true
487 }

```

4.2 Messages

```

488 \msg_new:nnn{pdfmeta}{namespace-defined}{The~xmlns~namespace~‘#1’~is~already~declared}

```

4.3 Some helper commands

4.3.1 Generate a BOM

__pdfmeta_xmp_generate_bom:

```

489 \bool_lazy_or:nnTF
490 { \sys_if_engine luatex_p: }
491 { \sys_if_engine xetex_p: }
492 {
493     \cs_new:Npn \__pdfmeta_xmp_generate_bom:
494     { \char_generate:nn {"FEFF"}{12} }
495 }
496 {
497     \cs_new:Npn \__pdfmeta_xmp_generate_bom:
498     {
499         \char_generate:nn {"EF"}{12}
500         \char_generate:nn {"BB"}{12}
501         \char_generate:nn {"BF"}{12}
502     }
503 }

```

(End definition for _pdfmeta_xmp_generate_bom:.)

4.3.2 Indentation

We provide a command which indents the xml based on a counter, and one which accepts a fix number. The counter can be increased and decreased.

```
\l__pdfmeta_xmp_indent_int
504 \int_new:N \l__pdfmeta_xmp_indent_int
(End definition for \l__pdfmeta_xmp_indent_int.)

\_pdfmeta_xmp_indent:
\_pdfmeta_xmp_indent:n
505 \cs_new:Npn \_pdfmeta_xmp_indent:
506 {
507   \iow_newline:
508   \prg_replicate:nn {\l__pdfmeta_xmp_indent_int}{\c_space_tl}
509 }
510
511 \cs_new:Npn \_pdfmeta_xmp_indent:n #1
512 {
513   \iow_newline:
514   \prg_replicate:nn {#1}{\c_space_tl}
515 }
516
517 \cs_new_protected:Npn \_pdfmeta_xmp_incr_indent:
518 {
519   \int_incr:N \l__pdfmeta_xmp_indent_int
520 }
521
522 \cs_new_protected:Npn \_pdfmeta_xmp_decr_indent:
523 {
524   \int_decr:N \l__pdfmeta_xmp_indent_int
525 }
(End definition for \_pdfmeta_xmp_indent: and others.)
```

4.3.3 Date and time handling

If the date is given in PDF format we have to split it to create the XMP format. We use a precompiled regex for this. To some extend the regex can also handle incomplete dates.

```
\l__pdfmeta_xmp_date_regex
526 \regex_new:N \l__pdfmeta_xmp_date_regex
527 \regex_set:Nn \l__pdfmeta_xmp_date_regex
528 {D:(\d{4})(\d{2})(\d{2})(\d{2})?(\d{2})?(\d{2})?([Z+|-])?(?:\d{2})\'}?(\d{2})\'}?}
(End definition for \l__pdfmeta_xmp_date_regex.)
```

`_pdfmeta_xmp_date_split:nN` This command takes a date in PDF format, splits it with the regex and stores the captures in a sequence.

```

529 \cs_new_protected:Npn \_pdfmeta_xmp_date_split:nN #1 #2 {%#1 date, #2 seq
530 {
531   \regex_split:NnN \l__pdfmeta_xmp_date_regex {#1} #2
532 }
533 \cs_generate_variant:Nn \_pdfmeta_xmp_date_split:nN {VN,eN}

```

(End definition for _pdfmeta_xmp_date_split:nN.)

`_pdfmeta_xmp_print_date:N` This prints the date stored in a sequence as created by the previous command.

```

534 \cs_new:Npn \_pdfmeta_xmp_print_date:N #1 % seq
535 {
536   \tl_if_blank:eTF { \seq_item:Nn #1 {1} }
537   {
538     \seq_item:Nn #1 {2} %year
539     -
540     \seq_item:Nn #1 {3} %month
541     -
542     \seq_item:Nn #1 {4} % day
543     \tl_if_blank:eF
544     { \seq_item:Nn #1 {5} }
545     { T \seq_item:Nn #1 {5} } %hour
546     \tl_if_blank:eF
547     { \seq_item:Nn #1 {6} }
548     { : \seq_item:Nn #1 {6} } %minutes
549     \tl_if_blank:eF
550     { \seq_item:Nn #1 {7} }
551     { : \seq_item:Nn #1 {7} } %seconds
552     \seq_item:Nn #1 {8} %Z,+, -
553     \seq_item:Nn #1 {9}
554     \tl_if_blank:eF
555     { \seq_item:Nn #1 {10} }
556     { : \seq_item:Nn #1 {10} }
557   }
558   {
559     \seq_item:Nn #1 {1}
560   }
561 }

```

(End definition for _pdfmeta_xmp_print_date:N.)

`\l_pdfmeta_xmp_currentdate_tl`
`\l_pdfmeta_xmp_currentdate_seq` The `tl` var contains the date of the log-file in PDF format, the `seq` the result splitted with the regex.

```

562 \tl_new:N \l__pdfmeta_xmp_currentdate_tl
563 \seq_new:N \l__pdfmeta_xmp_currentdate_seq

```

(End definition for \l_pdfmeta_xmp_currentdate_tl and \l_pdfmeta_xmp_currentdate_seq.)

`_pdfmeta_xmp_date_get:nNN` This checks a document property and if empty uses the current date.

```

564 \cs_new_protected:Npn \_pdfmeta_xmp_date_get:nNN #1 #2 #3
565 {%#1 property, #2 tl var with PDF date, #3 seq for splitted date
566 {
567   \tl_set:Nx #2 { \GetDocumentProperties{#1} }

```

```

568 \tl_if_blank:VTF #2
569 {
570   \seq_set_eq:NN #3 \l__pdfmeta_xmp_currentdate_seq
571   \tl_set_eq:NN #2 \l__pdfmeta_xmp_currentdate_tl
572 }
573 {
574   \__pdfmeta_xmp_date_split:VN #2 #3
575 }
576 }

```

(End definition for `__pdfmeta_xmp_date_get:nNN`.)

4.3.4 UUID

We need a command to generate an uuid

```

\__pdfmeta_xmp_create_uuid:nN

577 \cs_new_protected:Npn \__pdfmeta_xmp_create_uuid:nN #1 #2
578 {
579   \str_set:Nx#2 {\str_lowercase:f{\tex_mdffivesum:D{#1}}}
580   \str_set:Nx#2
581   {
582     \str_range:Nnn #2{1}{8}
583     -\str_range:Nnn#2{9}{12}
584     -4\str_range:Nnn#2{13}{15}
585     -8\str_range:Nnn#2{16}{18}
586     -\str_range:Nnn#2{19}{30}
587   }
588 }

```

(End definition for `__pdfmeta_xmp_create_uuid:nN`.)

4.3.5 Purifying and escaping of strings

`__pdfmeta_xmp_sanitize:nN` We have to sanitize the user input. For this we pass it through `\text_purify` and then replace a few special chars.

```

589 \cs_new_protected:Npn \__pdfmeta_xmp_sanitize:nN #1 #2
590 %#1 input string, #2 str with the output
591 {
592   \group_begin:
593   \text_declare_purify_equivalent:Nn \& {\tl_to_str:N & }
594   \text_declare_purify_equivalent:Nn \texttilde {\c_tilde_str}
595   \tl_set:Nx \l__pdfmeta_tmpa_tl { \text_purify:n {#1} }
596   \str_gset:Nx \g__pdfmeta_tmpa_str { \tl_to_str:N \l__pdfmeta_tmpa_tl }
597   \str_greplace_all:Nnn\g__pdfmeta_tmpa_str {\&}{\&}
598   \str_greplace_all:Nnn\g__pdfmeta_tmpa_str {\<}{\<}
599   \str_greplace_all:Nnn\g__pdfmeta_tmpa_str {\>}{\>}
600   \str_greplace_all:Nnn\g__pdfmeta_tmpa_str {\"}{\"}
601   \group_end:
602   \str_set_eq:NN #2 \g__pdfmeta_tmpa_str
603 }
604
605 \cs_generate_variant:Nn\__pdfmeta_xmp_sanitize:nN {VN}

```

(End definition for `__pdfmeta_xmp_sanitize:nN`.)

4.4 Language handling

The language of the metadata is used in various attributes, so we store it in command.

```
\l__pdfmeta_xmp_doclang_tl  
\l__pdfmeta_xmp_metalang_tl
```

```
606 \tl_new:N \l__pdfmeta_xmp_doclang_tl  
607 \tl_new:N \l__pdfmeta_xmp_metalang_tl
```

(End definition for \l__pdfmeta_xmp_doclang_tl and \l__pdfmeta_xmp_metalang_tl.)

The language is retrieved at the start of the packet. We assume that `lang` is always set and so don't use the x-default value of `hyperxmp`.

```
\l__pdfmeta_xmp_lang_regex
```

```
608 \regex_new:N \l__pdfmeta_xmp_lang_regex  
609 \regex_set:Nn \l__pdfmeta_xmp_lang_regex {\A\([A-Za-z\-\_]+\)(.*)}
```

(End definition for \l__pdfmeta_xmp_lang_regex.)

```
610 \cs_new_protected:Npn \__pdfmeta_xmp_lang_get:nNN #1 #2 #3  
611 % #1 text, #2 tl var for lang match (or default), #3 tl var for text  
612 {  
613   \regex_extract_once:NnN \l__pdfmeta_xmp_lang_regex {#1} \l__pdfmeta_tmpa_seq  
614   \seq_if_empty:NTF \l__pdfmeta_tmpa_seq  
615   {  
616     \tl_set:Nn #2 \l__pdfmeta_xmp_metalang_tl  
617     \tl_set:Nn #3 {#1}  
618   }  
619   {  
620     \tl_set:Nx #2 {\seq_item:Nn \l__pdfmeta_tmpa_seq{2}}  
621     \tl_set:Nx #3 {\seq_item:Nn \l__pdfmeta_tmpa_seq{3}}  
622   }  
623 }  
624 \cs_generate_variant:Nn \__pdfmeta_xmp_lang_get:nNN {eNN,VNN}
```

4.5 Filling the packet

This tl var that holds the whole packet

```
\g__pdfmeta_xmp_packet_tl
```

```
625 \tl_new:N \g__pdfmeta_xmp_packet_tl
```

(End definition for \g__pdfmeta_xmp_packet_tl.)

4.5.1 Helper commands to add lines and lists

```
\__pdfmeta_xmp_add_packet_chunk:n
```

This is the most basic command. It is meant to produce a line and will use the current indent.

```
626 \cs_new_protected:Npn \__pdfmeta_xmp_add_packet_chunk:n #1  
627 {  
628   \tl_gput_right:Nx \g__pdfmeta_xmp_packet_tl  
629   {  
630     \__pdfmeta_xmp_indent: \exp_not:n{#1}  
631   }  
632 }  
633 \cs_generate_variant:Nn \__pdfmeta_xmp_add_packet_chunk:n {e}
```


(End definition for _pdfmeta_xmp_add_packet_chunk:n.)

_pdfmeta_xmp_add_packet_chunk:nN This is the most basic command. It is meant to produce a line and will use the current indent.

```

634 \cs_new_protected:Npn \_pdfmeta_xmp_add_packet_chunk:nN #1 #2
635 {
636   \tl_put_right:Nx#2
637   {
638     \_pdfmeta_xmp_indent: \exp_not:n{#1}
639   }
640 }
641 \cs_generate_variant:Nn \_pdfmeta_xmp_add_packet_chunk:nN {eN}

```

(End definition for _pdfmeta_xmp_add_packet_chunk:nN.)

_pdfmeta_xmp_add_packet_open:nn This commands opens a xml structure and increases the indent.

```

642 \cs_new_protected:Npn \_pdfmeta_xmp_add_packet_open:nn #1 #2 %1 prefix #2 name
643 {
644   \_pdfmeta_xmp_add_packet_chunk:n {<#1:#2>}
645   \_pdfmeta_xmp_incr_indent:
646 }
647 \cs_generate_variant:Nn \_pdfmeta_xmp_add_packet_open:nn {ne}

```

(End definition for _pdfmeta_xmp_add_packet_open:nn.)

_pdfmeta_xmp_add_packet_open_attr:nnn This commands opens a xml structure too but allows also to give an attribute.

```

648 \cs_new_protected:Npn \_pdfmeta_xmp_add_packet_open_attr:nnn #1 #2 #3
649 %1 prefix #2 name #3 attr
650 {
651   \_pdfmeta_xmp_add_packet_chunk:n {<#1:#2~#3>}
652   \_pdfmeta_xmp_incr_indent:
653 }
654 \cs_generate_variant:Nn \_pdfmeta_xmp_add_packet_open_attr:nnn {nne}

```

(End definition for _pdfmeta_xmp_add_packet_open_attr:nnn.)

_pdfmeta_xmp_add_packet_close:nn This closes a structure and decreases the indent.

```

655 \cs_new_protected:Npn \_pdfmeta_xmp_add_packet_close:nn #1 #2 %1 prefix #2:name
656 {
657   \_pdfmeta_xmp_decr_indent:
658   \_pdfmeta_xmp_add_packet_chunk:n {</#1:#2>}
659 }

```

(End definition for _pdfmeta_xmp_add_packet_close:nn.)

_pdfmeta_xmp_add_packet_line:nnn This will produce a full line with open and closing xml. The content is sanitized. We test if there is content to be able to suppress data which has not be set.

```

660 \cs_new_protected:Npn \_pdfmeta_xmp_add_packet_line:nnn #1 #2 #3
661 %1 prefix #2 name #3 content
662 {
663   \tl_if_blank:nF {#3}
664   {
665     \_pdfmeta_xmp_sanitize:nN {#3}\l_pdfmeta_tmpa_str
666     \_pdfmeta_xmp_add_packet_chunk:e {<#1:#2>\l_pdfmeta_tmpa_str</#1:#2>}
667   }

```

```

668 }
669 \cs_generate_variant:Nn \__pdfmeta_xmp_add_packet_line:nnn {nne,nnV,nee}

```

(End definition for __pdfmeta_xmp_add_packet_line:nnn.)

__pdfmeta_xmp_add_packet_line:nnnN

This will produce a full line with open and closing xml and store it in the given tl-var. This allows to prebuild blocks and then to test if there are empty. The content is sanitized. We test if there is content to be able to suppress data which has not be set.

```

670 \cs_new_protected:Npn \__pdfmeta_xmp_add_packet_line:nnnN #1 #2 #3 #4
671   % #1 prefix #2 name #3 content #4 tl_var to prebuilt.
672   {
673     \tl_if_blank:nF {#3}
674     {
675       \__pdfmeta_xmp_sanitiz:nN {#3}\l__pdfmeta_tmpa_str
676       \__pdfmeta_xmp_add_packet_chunk:eN {<#1:#2>\l__pdfmeta_tmpa_str</#1:#2>} #4
677     }
678   }
679 \cs_generate_variant:Nn \__pdfmeta_xmp_add_packet_line:nnnN {nneN}

```

(End definition for __pdfmeta_xmp_add_packet_line:nnnN.)

__pdfmeta_xmp_add_packet_line_attr:nnnn

A similar command with attribute

```

680 \cs_new_protected:Npn \__pdfmeta_xmp_add_packet_line_attr:nnnn #1 #2 #3 #4
681   % #1 prefix #2 name #3 attribute #4 content
682   {
683     \tl_if_blank:nF {#4}
684     {
685       \__pdfmeta_xmp_sanitiz:nN {#4}\l__pdfmeta_tmpa_str
686       \__pdfmeta_xmp_add_packet_chunk:e {<#1:#2~#3>\l__pdfmeta_tmpa_str</#1:#2>}
687     }
688   }
689 \cs_generate_variant:Nn \__pdfmeta_xmp_add_packet_line_attr:nnnn {nnee,nnV}

```

(End definition for __pdfmeta_xmp_add_packet_line_attr:nnnn.)

__pdfmeta_xmp_add_packet_line_default:nnnn

```

690 \cs_new_protected:Npn \__pdfmeta_xmp_add_packet_line_default:nnnn #1 #2 #3 #4
691   % #1 prefix #2 name #3 default #4 content
692   {
693     \tl_if_blank:nTF { #4 }
694     {
695       \tl_set:Nn \l__pdfmeta_tmpa_tl {#3}
696     }
697     {
698       \tl_set:Nn \l__pdfmeta_tmpa_tl {#4}
699     }
700     \__pdfmeta_xmp_add_packet_line:nnV {#1}{#2}\l__pdfmeta_tmpa_tl
701   }
702 \cs_generate_variant:Nn \__pdfmeta_xmp_add_packet_line_default:nnnn {nnee}

```

(End definition for __pdfmeta_xmp_add_packet_line_default:nnnn.)

Some data are stored as unordered (Bag) or ordered lists (Seq) or (Alt). The first variant are for simple text without language support:

```

703 \cs_new_protected:Npn \__pdfmeta_xmp_add_packet_list_simple:nnnn #1 #2 #3 #4

```

```

704 % #1 prefix, #2 name, #3 type (Seq/Bag/Alt) #4 a clist
705 {
706   \clist_if_empty:nF { #4 }
707   {
708     \__pdfmeta_xmp_add_packet_open:nn {#1}{#2}
709     \__pdfmeta_xmp_add_packet_open:nn {rdf}{#3}
710     \clist_map_inline:nn {#4}
711     {
712       \__pdfmeta_xmp_add_packet_line:nnn
713       {rdf}{li}{##1}
714     }
715     \__pdfmeta_xmp_add_packet_close:nn{rdf}{#3}
716     \__pdfmeta_xmp_add_packet_close:nn {#1}{#2}
717   }
718 }
719 \cs_generate_variant:Nn \__pdfmeta_xmp_add_packet_list_simple:nnnn {nnnV,nnne}

```

Here we check also for the language.

```

720 \cs_new_protected:Npn \__pdfmeta_xmp_add_packet_list:nnnn #1 #2 #3 #4
721 % #1 prefix, #2 name, #3 type (Seq/Bag/Alt) #4 a clist
722 {
723   \clist_if_empty:nF { #4 }
724   {
725     \__pdfmeta_xmp_add_packet_open:nn {#1}{#2}
726     \__pdfmeta_xmp_add_packet_open:nn {rdf}{#3}
727     \clist_map_inline:nn {#4}
728     {
729       \__pdfmeta_xmp_lang_get:nNN {##1}\l__pdfmeta_tmpa_tl\l__pdfmeta_tmpb_tl
730       \__pdfmeta_xmp_add_packet_line_attr:nneV
731       {rdf}{li}{xml:lang="\l__pdfmeta_tmpa_tl" }\l__pdfmeta_tmpb_tl
732     }
733     \__pdfmeta_xmp_add_packet_close:nn{rdf}{#3}
734     \__pdfmeta_xmp_add_packet_close:nn {#1}{#2}
735   }
736 }
737 \cs_generate_variant:Nn \__pdfmeta_xmp_add_packet_list:nnnn {nnne}

```

4.5.2 Building the main packet

`__pdfmeta_xmp_build_packet:` This is the main command to build the packet. As data has to be set and collected first, it will be expanded rather late in the document.

```

738 \cs_new_protected:Npn \__pdfmeta_xmp_build_packet:
739 {

```

Get the main languages

```

740   \tl_set:Nx \l__pdfmeta_xmp_doclang_tl {\GetDocumentProperties{document/lang}}
741   \tl_set:Nx \l__pdfmeta_xmp_metalang_tl {\GetDocumentProperties{hyperref/pdfmetalang}}
742   \tl_if_blank:VT \l__pdfmeta_xmp_metalang_tl
743   { \cs_set_eq:NN \l__pdfmeta_xmp_metalang_tl \l__pdfmeta_xmp_doclang_tl }

```

we preprocess a number of data to be able to suppress them and their schema if there are unused. Currently only done for iptc

```

744   \__pdfmeta_xmp_build_iptc_data:N \l__pdfmeta_xmp_iptc_data_tl
745   \tl_if_empty:NT \l__pdfmeta_xmp_iptc_data_tl

```

```

746     {
747     \seq_remove_all:Nn \l__pdfmeta_xmp_schema_seq { Iptc4xmpCore }
748     }

```

The start of the package. No need to try to juggle with catcode, this is fix text

```

749     \__pdfmeta_xmp_add_packet_chunk:e
750     {<?xpacket~begin="\__pdfmeta_xmp_generate_bom:"~id="W5MOMpCehiHzreSzNTczkc9d"?>}
751     \__pdfmeta_xmp_add_packet_open:nn{x}{xmpmeta~xmlns:x="adobe:ns:meta/"}
752     \__pdfmeta_xmp_add_packet_open:ne{rdf}
753     {RDF~xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns\c_hash_str"}

```

The rdf namespaces

```

754     \__pdfmeta_xmp_add_packet_open_attr:nne
755     {rdf}{Description}{rdf:about="" \g__pdfmeta_xmp_xmlns_tl}

```

The extensions

```

756     \__pdfmeta_xmp_add_packet_open:nn{pdfaExtension}{schemas}
757     \__pdfmeta_xmp_add_packet_open:nn {rdf}{Bag}
758     \seq_map_inline:Nn \l__pdfmeta_xmp_schema_seq
759     {
760         \tl_use:c { g__pdfmeta_xmp_schema_##1_tl }
761     }
762     \__pdfmeta_xmp_add_packet_close:nn {rdf}{Bag}
763     \__pdfmeta_xmp_add_packet_close:nn {pdfaExtension}{schemas}

```

Now starts the part with the data.

```

764     % data
765     \__pdfmeta_xmp_build_pdf:
766     \__pdfmeta_xmp_build_xmpRights:
767     \__pdfmeta_xmp_build_standards: %pdfaid,pdfxid,pdfuaid
768     \__pdfmeta_xmp_build_dc:
769     \__pdfmeta_xmp_build_photoshop:
770     \__pdfmeta_xmp_build_xmp:
771     \__pdfmeta_xmp_build_xmpMM:
772     \__pdfmeta_xmp_build_prism:
773     \__pdfmeta_xmp_build_iptc:
774     \__pdfmeta_xmp_build_user: %user additions
775     % end
776     \__pdfmeta_xmp_add_packet_close:nn {rdf}{Description}
777     \__pdfmeta_xmp_add_packet_close:nn {rdf}{RDF}
778     \__pdfmeta_xmp_add_packet_close:nn {x}{xmpmeta}
779     \int_set:Nn \l__pdfmeta_xmp_indent_int{20}
780     \prg_replicate:nn{10}{\__pdfmeta_xmp_add_packet_chunk:n {}}
781     \int_zero:N \l__pdfmeta_xmp_indent_int
782     \__pdfmeta_xmp_add_packet_chunk:n {<?xpacket~end="w"?>}
783 }

```

(End definition for __pdfmeta_xmp_build_packet:.)

4.6 Building the chunks: rdf namespaces

This is the list of external names spaces. They are rather simple, and we store them directly into a string. Special chars should be escaped properly, see e.g. \c_hash_str for the hash.

`\g__pdfmeta_xmp_xmlns_tl` The string will hold the prepared chunk, the prop stores the name spaces so that one can
`\g__pdfmeta_xmp_xmlns_prop` check on the user level for duplicates.

```
784 \str_new:N \g__pdfmeta_xmp_xmlns_tl
785 \prop_new:N \g__pdfmeta_xmp_xmlns_prop
```

(End definition for `\g__pdfmeta_xmp_xmlns_tl` and `\g__pdfmeta_xmp_xmlns_prop`.)

`__pdfmeta_xmp_xmlns_new:nn`
`__pdfmeta_xmp_xmlns_new:nx`

```
786 \cs_new_protected:Npn \__pdfmeta_xmp_xmlns_new:nn #1 #2
787 {
788   \prop_gput:Nnn \g__pdfmeta_xmp_xmlns_prop {#1}{#2}
789   \tl_gput_right:Nx \g__pdfmeta_xmp_xmlns_tl
790   {
791     \__pdfmeta_xmp_indent:n{4} xmlns:\exp_not:n{#1="#2"}
792   }
793 }
794 \cs_generate_variant:Nn \__pdfmeta_xmp_xmlns_new:nn {nx}
```

(End definition for `__pdfmeta_xmp_xmlns_new:nn`.)

Now we fill the data. The list is more or less the same as in hyperxmp

```
795 \__pdfmeta_xmp_xmlns_new:nn {pdf}      {http://ns.adobe.com/pdf/1.3/}
796 \__pdfmeta_xmp_xmlns_new:nn {xmpRights}{http://ns.adobe.com/xap/1.0/rights/}
797 \__pdfmeta_xmp_xmlns_new:nn {dc}       {http://purl.org/dc/elements/1.1/}
798 \__pdfmeta_xmp_xmlns_new:nn {photoshop}{http://ns.adobe.com/photoshop/1.0/}
799 \__pdfmeta_xmp_xmlns_new:nn {xmp}      {http://ns.adobe.com/xap/1.0/}
800 \__pdfmeta_xmp_xmlns_new:nn {xmpMM}    {http://ns.adobe.com/xap/1.0/mm/}
801 \__pdfmeta_xmp_xmlns_new:nx {stEvt}    {http://ns.adobe.com/xap/1.0/sType/ResourceEvent\c_hash_str}
802 {http://ns.adobe.com/xap/1.0/sType/ResourceEvent\c_hash_str}
803 \__pdfmeta_xmp_xmlns_new:nn {pdfaid}   {http://www.aiim.org/pdfa/ns/id/}
804 \__pdfmeta_xmp_xmlns_new:nn {pdfuaid}  {http://www.aiim.org/pdfua/ns/id/}
805 \__pdfmeta_xmp_xmlns_new:nn {pdfx}     {http://ns.adobe.com/pdfx/1.3/}
806 \__pdfmeta_xmp_xmlns_new:nn {pdfxid}   {http://www.npes.org/pdfx/ns/id/}
807 \__pdfmeta_xmp_xmlns_new:nn {prism}    {http://prismstandard.org/namespaces/basic/3.0/}
808 %\__pdfmeta_xmp_xmlns_new:nn {jav}      {http://www.niso.org/schemas/jav/1.0/}
809 %\__pdfmeta_xmp_xmlns_new:nn {xmpTPg}   {http://ns.adobe.com/xap/1.0/t/pg/}
810 \__pdfmeta_xmp_xmlns_new:nx {stFnt}    {http://ns.adobe.com/xap/1.0/sType/Font\c_hash_str}
811 \__pdfmeta_xmp_xmlns_new:nn {Iptc4xmpCore}{http://iptc.org/std/Iptc4xmpCore/1.0/xmlns/}
812 \__pdfmeta_xmp_xmlns_new:nn {pdfaExtension}{http://www.aiim.org/pdfa/ns/extension/}
813 \__pdfmeta_xmp_xmlns_new:nx {pdfaSchema}{http://www.aiim.org/pdfa/ns/schema\c_hash_str}
814 \__pdfmeta_xmp_xmlns_new:nx {pdfaProperty}{http://www.aiim.org/pdfa/ns/property\c_hash_str}
815 \__pdfmeta_xmp_xmlns_new:nx {pdfaType}  {http://www.aiim.org/pdfa/ns/type\c_hash_str}
816 \__pdfmeta_xmp_xmlns_new:nx {pdfaField}{http://www.aiim.org/pdfa/ns/field\c_hash_str}
```

4.7 Building the chunks: Extensions

In this part local name spaces or additional names in a name space can be declared. A “schema” declaration consist of the declaration of the name, uri and prefix which then surrounds a bunch of property declarations. The current code doesn’t support all syntax options but sticks to what is used in hyperxmp and pdfx. If needed it can be extended later.

`\l__pdfmeta_xmp_schema_seq` This variable will hold the list of prefix so that we can loop to produce the final XML

```
817 \seq_new:N \l__pdfmeta_xmp_schema_seq
```

(End definition for \l__pdfmeta_xmp_schema_seq.)

__pdfmeta_xmp_schema_new:nnn With this command a new schema can be declared. The main tl contains the XML wrapper code, it then includes the list of properties which are created with the next command.

```
818 \cs_new_protected:Npn \__pdfmeta_xmp_schema_new:nnn #1 #2 #3
819   % #1 name #2 prefix, #3 text
820   {
821     \seq_put_right:Nn \l__pdfmeta_xmp_schema_seq { #2 }
822     \tl_new:c { g__pdfmeta_xmp_schema_#2_tl }
823     \tl_new:c { g__pdfmeta_xmp_schema_#2_properties_tl }
824     \tl_gput_right:cn { g__pdfmeta_xmp_schema_#2_tl }
825     {
826       \__pdfmeta_xmp_add_packet_open_attr:nnn{rdf}{li}{rdf:parseType="Resource"}
827       \__pdfmeta_xmp_add_packet_line:nnn {pdfaSchema}{schema}{#1}
828       \__pdfmeta_xmp_add_packet_line:nnn {pdfaSchema}{prefix}{#2}
829       \__pdfmeta_xmp_add_packet_line:nnn {pdfaSchema}{namespaceURI}{#3}
830       \__pdfmeta_xmp_add_packet_open:nn {pdfaSchema}{property}
831       \__pdfmeta_xmp_add_packet_open:nn{rdf}{Seq}
832       \tl_use:c { g__pdfmeta_xmp_schema_#2_properties_tl }
833       \__pdfmeta_xmp_add_packet_close:nn{rdf}{Seq}
834       \__pdfmeta_xmp_add_packet_close:nn {pdfaSchema}{property}
835       \cs_if_exist_use:c {__pdfmeta_xmp_schema_#2_additions:}
836       \__pdfmeta_xmp_add_packet_close:nn{rdf}{li}
837     }
838   }
```

(End definition for __pdfmeta_xmp_schema_new:nnn.)

__pdfmeta_xmp_property_new:nnn This adds a property to a schema.

```
839 \cs_new_protected:Npn \__pdfmeta_xmp_property_new:nnnnn #1 #2 #3 #4 #5 %
840   % #1 schema #2 name, #3 type, #4 category #5 description
841   {
842     \tl_gput_right:cn { g__pdfmeta_xmp_schema_#1_properties_tl }
843     {
844       \__pdfmeta_xmp_add_packet_open:nn {rdf}{li~rdf:parseType="Resource"}
845       \__pdfmeta_xmp_add_packet_line:nnn {pdfaProperty}{name}{#2}
846       \__pdfmeta_xmp_add_packet_line:nnn {pdfaProperty}{valueType}{#3}
847       \__pdfmeta_xmp_add_packet_line:nnn {pdfaProperty}{category}{#4}
848       \__pdfmeta_xmp_add_packet_line:nnn {pdfaProperty}{description}{#5}
849       \__pdfmeta_xmp_add_packet_close:nn{rdf}{li}
850     }
851   }
```

(End definition for __pdfmeta_xmp_property_new:nnn.)

__pdfmeta_xmp_add_packet_field:nnn This adds a field to a schema.

```
852 \cs_new_protected:Npn \__pdfmeta_xmp_add_packet_field:nnn #1 #2 #3 %
853   % #1 name #2 valuetype #3 description
854   {
855     \__pdfmeta_xmp_add_packet_open_attr:nnn {rdf}{li}{rdf:parseType="Resource"}
856     \__pdfmeta_xmp_add_packet_line:nnn {pdfaField}{name}{#1}
857     \__pdfmeta_xmp_add_packet_line:nnn {pdfaField}{valueType}{#2}
858     \__pdfmeta_xmp_add_packet_line:nnn {pdfaField}{description}{#3}
```

```

859     \_pdfmeta_xmp_add_packet_close:nn{rdf}{li}
860 }

```

(End definition for _pdfmeta_xmp_add_packet_field:nnn.)

4.7.1 The extension data

The list of extension has been reviewed and compared with the list of namespaces which can be used in pdf/A-1⁷

[1] https://www.pdfa.org/wp-content/uploads/2011/08/tn0008_predefined_xmp_properties_in_pdfa-1_2008-03-20.pdf and the content of the namespaces as listed here [2] <https://developer.adobe.com/xmp/docs/XMPNamespaces/pdf/>

pdf property: Trapped. We ignore it, it seems to validate without it.

xmpMM properties DocumentID, InstanceID, VersionID, Renditionclass declared by hyperxmp. Properties InstanceID and OriginalDocumentID declared by pdfx (pdfx.xmp) With the exception of OriginalDocumentID all are already allowed and predefined. We ignore OriginalDocumentID until requested.

pdfaid properties part and conformance are declared by hyperxmp, but no here as already in <http://www.aiim.org/pdfa/ns/id/>. But we declare year so that it can be used also with older A-standards.

pdfaid~(schema)

```

861     \_pdfmeta_xmp_schema_new:nnn
862     {PDF/A-Identification-Schema}
863     {pdfaid}
864     {http://www.aiim.org/pdfa/ns/id/}
865     \_pdfmeta_xmp_property_new:nnnnn
866     {pdfaid}
867     {year}
868     {Integer}
869     {internal}
870     {Year~of~standard}

```

(End definition for pdfaid~(schema). This function is documented on page ??.)

pdfuaid here we need to declare the property “part”.

pdfuaid~(schema)

```

871     \_pdfmeta_xmp_schema_new:nnn
872     {PDF/UA-Universal-Accessibility-Schema}
873     {pdfuaid}
874     {http://www.aiim.org/pdfua/ns/id/}
875     \_pdfmeta_xmp_property_new:nnnnn
876     {pdfuaid}
877     {part}
878     {Integer}
879     {internal}
880     {Part~of~ISO~14289~standard}

```

⁷While A-1 builds on PDF 1.4 and so it probably no longer relevant, it is not quite clear if one can remove this for A-2 and newer, so we stay on the safe side.

(End definition for pdfuaid~(schema). This function is documented on page ??.)

pdfx According to [1] not an allowed schema, but it seems to validate and allow to set the pdf/X version, hyperxmp declares here the properties `GTS_PDFXVersion` and `GTS_PDFXConformance`. Ignored as only relevant for older pdf/X version not supported by the pdfmanagement.

pdfxid we set this so that we can add the pdf/X version for pdf/X-4 and higher

pdfxid~(schema)

```
881     \_pdfmeta_xmp_schema_new:nnn
882       {PDF/X-ID~Schema}
883       {pdfxid}
884       {http://www.npes.org/pdfx/ns/id/}
885     \_pdfmeta_xmp_property_new:nnnnn
886       {pdfxid}
887       {GTS_PDFXVersion}
888       {Text}
889       {internal}
890       {ID~of~PDF/X~standard}
```

(End definition for pdfxid~(schema). This function is documented on page ??.)

prism~(schema)

```
891     \_pdfmeta_xmp_schema_new:nnn
892       {PRISM~Basic~Metadata}
893       {prism}
894       {http://prismstandard.org/namespaces/basic/3.0/}
895     \_pdfmeta_xmp_property_new:nnnnn
896       {prism}
897       {complianceProfile}
898       {Text}
899       {internal}
900       {PRISM~specification~compliance~profile~to~which~this~document~adheres}
901     \_pdfmeta_xmp_property_new:nnnnn
902       {prism}
903       {publicationName}
904       {Text}
905       {external}
906       {Publication name}
907     \_pdfmeta_xmp_property_new:nnnnn
908       {prism}
909       {aggregationType}
910       {Text}
911       {external}
912       {Publication type}
913     \_pdfmeta_xmp_property_new:nnnnn
914       {prism}
915       {bookEdition}
916       {Text}
917       {external}
918       {Edition~of~the~book~in~which~the~document~was~published}
```



```

919 \_pdfmeta_xmp_property_new:nnnnn
920   {prism}
921   {volume}
922   {Text}
923   {external}
924   {Publication~volume~number}
925 \_pdfmeta_xmp_property_new:nnnnn
926   {prism}
927   {number}
928   {Text}
929   {external}
930   {Publication~issue~number~within~a~volume}
931 \_pdfmeta_xmp_property_new:nnnnn
932   {prism}
933   {pageRange}
934   {Text}
935   {external}
936   {Page~range~for~the~document~within~the~print~version~of~its~publication}
937 \_pdfmeta_xmp_property_new:nnnnn
938   {prism}
939   {issn}
940   {Text}
941   {external}
942   {ISSN~for~the~printed~publication~in~which~the~document~was~published}
943 \_pdfmeta_xmp_property_new:nnnnn
944   {prism}
945   {eIssn}
946   {Text}
947   {external}
948   {ISSN~for~the~electronic~publication~in~which~the~document~was~published}
949 \_pdfmeta_xmp_property_new:nnnnn
950   {prism}
951   {isbn}
952   {Text}
953   {external}
954   {ISBN for the publication in which the document was published}
955 \_pdfmeta_xmp_property_new:nnnnn
956   {prism}
957   {doi}
958   {Text}
959   {external}
960   {Digital~Object~Identifier~for~the~document}
961 \_pdfmeta_xmp_property_new:nnnnn
962   {prism}
963   {url}
964   {URL}
965   {external}
966   {URL~at~which~the~document~can~be~found}
967 \_pdfmeta_xmp_property_new:nnnnn
968   {prism}
969   {byteCount}
970   {Integer}
971   {internal}
972   {Approximate~file~size~in~octets}

```

```

973 \__pdfmeta_xmp_property_new:nnnnn
974   {prism}
975   {pageCount}
976   {Integer}
977   {internal}
978   {Number-of-pages-in-the-print-version-of-the-document}
979 \__pdfmeta_xmp_property_new:nnnnn
980   {prism}
981   {subtitle}
982   {Text}
983   {external}
984   {Document's subtitle}

```

(End definition for prism-(schema). This function is documented on page ??.)

iptc

```

985 \__pdfmeta_xmp_schema_new:nnn
986   {IPTC-Core-Schema}
987   {Iptc4xmpCore}
988   {http://iptc.org/std/Iptc4xmpCore/1.0/xmlns/}
989 \__pdfmeta_xmp_property_new:nnnnn
990   {Iptc4xmpCore}
991   {CreatorContactInfo}
992   {ContactInfo}
993   {external}
994   {Document-creator's-contact-information}
995 \cs_new_protected:cpn { __pdfmeta_xmp_schema_Iptc4xmpCore_additions: }
996   {
997     \__pdfmeta_xmp_add_packet_open:nn{pdfaSchema}{valueType}
998     \__pdfmeta_xmp_add_packet_open:nn{rdf}{Seq}
999       \__pdfmeta_xmp_add_packet_open_attr:nnn{rdf}{li}{rdf:parseType="Resource"}
1000       \__pdfmeta_xmp_add_packet_line:nnn{pdfaType}{type}{ContactInfo}
1001       \__pdfmeta_xmp_add_packet_line:nnn{pdfaType}{namespaceURI}
1002         {http://iptc.org/std/Iptc4xmpCore/1.0/xmlns/}
1003       \__pdfmeta_xmp_add_packet_line:nnn{pdfaType}{prefix}{Iptc4xmpCore}
1004       \__pdfmeta_xmp_add_packet_line:nnn{pdfaType}{description}
1005         {Basic-set-of-information-to-get-in-contact-with-a-person}
1006       \__pdfmeta_xmp_add_packet_open:nn{pdfaType}{field}
1007       \__pdfmeta_xmp_add_packet_open:nn{rdf}{Seq}
1008       \__pdfmeta_xmp_add_packet_field:nnn{CiAdrCity}{Text}
1009         {Contact-information-city}
1010       \__pdfmeta_xmp_add_packet_field:nnn{CiAdrCtry}{Text}
1011         {Contact-information-country}
1012       \__pdfmeta_xmp_add_packet_field:nnn{CiAdrExtadr}{Text}
1013         {Contact-information-address}
1014       \__pdfmeta_xmp_add_packet_field:nnn{CiAdrPcode}{Text}
1015         {Contact-information-local-postal-code}
1016       \__pdfmeta_xmp_add_packet_field:nnn{CiAdrRegion}{Text}
1017         {Contact-information-regional-information-such-as-state-or-province}
1018       \__pdfmeta_xmp_add_packet_field:nnn{CiEmailWork}{Text}
1019         {Contact-information-email-address(es)}
1020       \__pdfmeta_xmp_add_packet_field:nnn{CiTelWork}{Text}
1021         {Contact-information-telephone-number(s)}
1022       \__pdfmeta_xmp_add_packet_field:nnn{CiUrlWork}{Text}

```

```

1023         {Contact~information~Web~URL(s)}
1024         \_pdfmeta_xmp_add_packet_close:nn{rdf}{Seq}
1025         \_pdfmeta_xmp_add_packet_close:nn{pdfaType}{field}
1026         \_pdfmeta_xmp_add_packet_close:nn{rdf}{li}
1027         \_pdfmeta_xmp_add_packet_close:nn{rdf}{Seq}
1028         \_pdfmeta_xmp_add_packet_close:nn{pdfaSchema}{valueType}
1029     }

```

jav : currently ignored

4.8 The actual user / document data

4.8.1 pdf

This builds pdf related the data with the (prefix “pdf”).

```

\_pdfmeta_xmp_build_pdf:
  Producer/pdfproducer 1030 \cs_new_protected:Npn \_pdfmeta_xmp_build_pdf:
    PDFversion          1031 {

```

At first the producer. If not given manually we build it from the exec string plus the version number

```

1032   \_pdfmeta_xmp_add_packet_line_default:nnee
1033   {pdf}{Producer}
1034   {\c_sys_engine_exec_str-\c_sys_engine_version_str}
1035   {\GetDocumentProperties{hyperref/pdfproducer}}

```

Now the PDF version

```

1036   \_pdfmeta_xmp_add_packet_line:nne{pdf}{PDFVersion}{\pdf_version:}
1037 }

```

(End definition for _pdfmeta_xmp_build_pdf: , Producer/pdfproducer, and PDFversion. These functions are documented on page ??.)

4.8.2 xmp

This builds the data with the (prefix “xmp”).

```

\_pdfmeta_xmp_build_xmp:
  CreatorTool/pdfcreator 1038 \cs_new_protected:Npn \_pdfmeta_xmp_build_xmp:
    BaseUrl/baseurl      1039 {

```

The creator

```

1040   \_pdfmeta_xmp_add_packet_line_default:nnee
1041   {xmp}{CreatorTool}
1042   {LaTeX}
1043   { \GetDocumentProperties{hyperref/pdfcreator} }

```

The baseurl

```

1044   \_pdfmeta_xmp_add_packet_line_default:nnee
1045   {xmp}{BaseUrl}{ }
1046   { \GetDocumentProperties{hyperref/baseurl} }

```

CreationDate

```
1047 \__pdfmeta_xmp_date_get:nNN
1048 {document/creationdate}\l__pdfmeta_tmpa_tl\l__pdfmeta_tmpa_seq
1049 \__pdfmeta_xmp_add_packet_line:nne{xmp}{CreateDate}{\__pdfmeta_xmp_print_date:N\l__pdfme
1050 \pdfmanagement_add:nnx{Info}{CreateDate}{(\l__pdfmeta_tmpa_tl)}
```

ModifyDate

```
1051 \__pdfmeta_xmp_date_get:nNN
1052 {document/moddate}\l__pdfmeta_tmpa_tl\l__pdfmeta_tmpa_seq
1053 \__pdfmeta_xmp_add_packet_line:nne{xmp}{ModifyDate}{\__pdfmeta_xmp_print_date:N\l__pdfme
1054 \pdfmanagement_add:nnx{Info}{ModDate}{(\l__pdfmeta_tmpa_tl)}
```

MetadataDate

```
1055 \__pdfmeta_xmp_date_get:nNN
1056 {hyperref/pdfmetadate}\l__pdfmeta_tmpa_tl\l__pdfmeta_tmpa_seq
1057 \__pdfmeta_xmp_add_packet_line:nne{xmp}{MetadataDate}{\__pdfmeta_xmp_print_date:N\l__pdfme
1058 }
```

(End definition for __pdfmeta_xmp_build_xmp:, CreatorTool/pdfcreator, and BaseUrl/baseurl.
These functions are documented on page ??.)

4.8.3 Standards

The metadata for standards are taken from the pdfstandard key of \DocumentMetadata. The values for A-standards are taken from the property, X and UA are currently taken from the document container, this should be changed when merging of standards are possible.

__pdfmeta_xmp_build_standards:

```
1059 \cs_new_protected:Npn \__pdfmeta_xmp_build_standards:
1060 {
1061 \__pdfmeta_xmp_add_packet_line:nne {pdfaid}{part}{\pdfmeta_standard_item:n{n{level}}}
1062 \__pdfmeta_xmp_add_packet_line:nne
1063 {pdfaid}{conformance}{\pdfmeta_standard_item:n{n{conformance}}}
1064 \int_compare:nNnTF {0\pdfmeta_standard_item:n{n{level}}}<{4}
1065 {\__pdfmeta_xmp_add_packet_line:nne {pdfaid}{year} {\pdfmeta_standard_item:n{n{year}}}}
1066 {\__pdfmeta_xmp_add_packet_line:nne {pdfaid}{rev} {\pdfmeta_standard_item:n{n{year}}}}
1067 \__pdfmeta_xmp_add_packet_line:nne
1068 {pdfxid}{GTS_PDFXVersion}{\GetDocumentProperties{document/pdfstandard-X}}
1069 \__pdfmeta_xmp_add_packet_line:nne
1070 {pdfuaid}{part}{\GetDocumentProperties{document/pdfstandard-UA}}
1071 }
```

(End definition for __pdfmeta_xmp_build_standards:.)

4.8.4 Photoshop

__pdfmeta_xmp_build_photoshop:

```
1072 \cs_new_protected:Npn \__pdfmeta_xmp_build_photoshop:
1073 {
pdfauthortitle/photoshop:AuthorsPosition
1074 \__pdfmeta_xmp_add_packet_line:nne{photoshop}{AuthorsPosition}
1075 { \GetDocumentProperties{hyperref/pdfauthortitle} }
```

pdfcaptionwriter/photoshop:CaptionWriter

```
1076 \__pdfmeta_xmp_add_packet_line:nne{photoshop}{CaptionWriter}
1077 { \GetDocumentProperties{hyperref/pdfcaptionwriter} }
1078 }
```

(End definition for __pdfmeta_xmp_build_photoshop:.)

4.9 XMP Media Management

__pdfmeta_xmp_build_xmpMM:

```
1079 \cs_new_protected:Npn \__pdfmeta_xmp_build_xmpMM:
1080 {
pdfdocumentid / xmpMM:DocumentID
1081 \str_set:Nx\l__pdfmeta_tmpa_str {\GetDocumentProperties{hyperref/pdfdocumentid}}
1082 \str_if_empty:NT \l__pdfmeta_tmpa_str
1083 {
1084 \__pdfmeta_xmp_create_uuid:nN
1085 {\jobname\GetDocumentProperties{hyperref/pdftitle}}
1086 \l__pdfmeta_tmpa_str
1087 }
1088 \__pdfmeta_xmp_add_packet_line:nnV{xmpMM}{DocumentID}
1089 \l__pdfmeta_tmpa_str
```

pdfinstanceid / xmpMM:InstanceID

```
1090 \str_set:Nx\l__pdfmeta_tmpa_str {\GetDocumentProperties{hyperref/pdfinstanceid}}
1091 \str_if_empty:NT \l__pdfmeta_tmpa_str
1092 {
1093 \__pdfmeta_xmp_create_uuid:nN
1094 {\jobname\l__pdfmeta_xmp_currentdate_tl}
1095 \l__pdfmeta_tmpa_str
1096 }
1097 \__pdfmeta_xmp_add_packet_line:nnV{xmpMM}{InstanceID}
1098 \l__pdfmeta_tmpa_str
```

pdfversionid/xmpMM:VersionID

```
1099 \__pdfmeta_xmp_add_packet_line:nne{xmpMM}{VersionID}
1100 { \GetDocumentProperties{hyperref/pdfversionid} }
```

pdfrendition/xmpMM:RenditionClass

```
1101 \__pdfmeta_xmp_add_packet_line:nne{xmpMM}{RenditionClass}
1102 { \GetDocumentProperties{hyperref/pdfrendition} }
1103 }
```

(End definition for __pdfmeta_xmp_build_xmpMM:.)

4.10 Rest of dublin Core data

__pdfmeta_xmp_build_dc:
dc:creator/pdfauthor
dc:subject/pdfkeywords
dc:type/pdftype
dc:publisher/pdfpublisher
dc:description/pdfsubject
dc:language/lang/pdflang
dc:identifier/pdfidentifier
photoshop:AuthorsPosition/pdfauthoritle
photoshop:CaptionWriter/pdfcaptionwriter

```
1104 \cs_new_protected:Npn \__pdfmeta_xmp_build_dc:
1105 {
```

pdfauthor/dc:creator

```
1106    \__pdfmeta_xmp_add_packet_list:nnne {dc}{creator}{Seq}  
1107    { \GetDocumentProperties{hyperref/pdfauthor} }  
1108    \int_compare:nNnT {0\pdfmeta_standard_item:n{level}}={1}  
1109    { \pdfmanagement_remove:nn{Info}{Author} }
```

pdftitle/dc:title. This is rather complex as we want to support a list with different languages.

```
1110    \__pdfmeta_xmp_add_packet_list:nnne {dc}{title}{Alt}  
1111    { \GetDocumentProperties{hyperref/pdftitle} }
```

pdfkeywords/dc:subject

```
1112    \__pdfmeta_xmp_add_packet_list:nnne {dc}{subject}{Bag}  
1113    { \GetDocumentProperties{hyperref/pdfkeywords} }  
1114    \int_compare:nNnT {0\pdfmeta_standard_item:n{level}}={1}  
1115    { \pdfmanagement_remove:nn{Info}{Keywords} }
```

pdftype/dc:type

```
1116    \pdfmanagement_get_documentproperties:nNTF { hyperref/pdftype } \l__pdfmeta_tmpa_tl  
1117    {  
1118        \__pdfmeta_xmp_add_packet_list_simple:nnnV {dc}{type}{Bag}\l__pdfmeta_tmpa_tl  
1119    }  
1120    {  
1121        \__pdfmeta_xmp_add_packet_list_simple:nnnn {dc}{type}{Bag}{Text}  
1122    }
```

pdfpublisher/dc:publisher

```
1123    \__pdfmeta_xmp_add_packet_list:nnne {dc}{publisher}{Bag}  
1124    { \GetDocumentProperties{hyperref/pdfpublisher} }
```

pdfsubject/dc:description

```
1125    \__pdfmeta_xmp_add_packet_list:nnne  
1126    {dc}{description}{Alt}  
1127    { \GetDocumentProperties{hyperref/pdfsubject} }
```

lang/pdflang/dc:language

```
1128    \__pdfmeta_xmp_add_packet_list_simple:nnnV  
1129    {dc}{language}{Bag}\l__pdfmeta_xmp_doclang_tl
```

pdfidentifier/dc:identifier

```
1130    \__pdfmeta_xmp_add_packet_line:nne{dc}{identifier}  
1131    { \GetDocumentProperties{hyperref/pdfidentifier} }
```

pdfdate/dc:date

```
1132    \__pdfmeta_xmp_date_get:nNN {hyperref/pdfdate}\l__pdfmeta_tmpa_tl\l__pdfmeta_tmpa_seq  
1133    \__pdfmeta_xmp_add_packet_list_simple:nnne  
1134    {dc}{date}{Seq}{\__pdfmeta_xmp_print_date:N\l__pdfmeta_tmpa_seq}
```

The file format

```
1135    \__pdfmeta_xmp_add_packet_line:nnn{dc}{format}{application/pdf}
```

The source

```
1136    \__pdfmeta_xmp_add_packet_line_default:nnee  
1137    {dc}{source}  
1138    { \c_sys_jobname_str.tex }  
1139    { \GetDocumentProperties{hyperref/pdfsource} }
```

```

1140     \__pdfmeta_xmp_add_packet_list:nne{dc}{rights}{Alt}
1141     {\GetDocumentProperties{hyperref/pdfcopyright}}
1142 }

```

(End definition for __pdfmeta_xmp_build_dc: and others. These functions are documented on page ??.)

4.11 xmpRights

__pdfmeta_xmp_build_xmpRights:

```

1143 \cs_new_protected:Npn \__pdfmeta_xmp_build_xmpRights:
1144 {
1145     \__pdfmeta_xmp_add_packet_line:nne
1146     {xmpRights}
1147     {WebStatement}
1148     {\GetDocumentProperties{hyperref/pdflicenseurl}}
1149 }

```

(End definition for __pdfmeta_xmp_build_xmpRights:.)

4.12 IPTC

We want the block and also the resources only if they are actually used. So we pack them first in a local variable

\l__pdfmeta_xmp_iptc_data_tl

```

1150 \tl_new:N\l__pdfmeta_xmp_iptc_data_tl

```

(End definition for \l__pdfmeta_xmp_iptc_data_tl.)

__pdfmeta_xmp_build_iptc_data:N

```

1151 \cs_new_protected:Npn \__pdfmeta_xmp_build_iptc_data:N #1
1152 {
1153     \tl_clear:N #1
1154     \__pdfmeta_xmp_incr_indent:\__pdfmeta_xmp_incr_indent:\__pdfmeta_xmp_incr_indent:\__pdf
1155     \__pdfmeta_xmp_add_packet_line:nneN
1156     {Iptc4xmpCore}{CiAdrExtadr}
1157     {\GetDocumentProperties{hyperref/pdfcontactaddress}}
1158     #1
1159     \__pdfmeta_xmp_add_packet_line:nneN
1160     {Iptc4xmpCore}{CiAdrCity}
1161     {\GetDocumentProperties{hyperref/pdfcontactcity}}
1162     #1
1163     \__pdfmeta_xmp_add_packet_line:nneN
1164     {Iptc4xmpCore}{CiAdrPcode}
1165     {\GetDocumentProperties{hyperref/pdfcontactpostcode}}
1166     #1
1167     \__pdfmeta_xmp_add_packet_line:nneN
1168     {Iptc4xmpCore}{CiAdrCtry}
1169     {\GetDocumentProperties{hyperref/pdfcontactcountry}}
1170     #1
1171     \__pdfmeta_xmp_add_packet_line:nneN
1172     {Iptc4xmpCore}{CiTelWork}
1173     {\GetDocumentProperties{hyperref/pdfcontactphone}}

```

```

1174         #1
1175         \_pdfmeta_xmp_add_packet_line:nneN
1176         {Iptc4xmpCore}{CiEmailWork}
1177         {\GetDocumentProperties{hyperref/pdfcontactemail}}
1178         #1
1179         \_pdfmeta_xmp_add_packet_line:nneN
1180         {Iptc4xmpCore}{CiUrlWork}
1181         {\GetDocumentProperties{hyperref/pdfcontacturl}}
1182         #1
1183         \_pdfmeta_xmp_decr_indent:\_pdfmeta_xmp_decr_indent:\_pdfmeta_xmp_decr_indent:\_pdf
1184     }

```

(End definition for _pdfmeta_xmp_build_iptc_data:N.)

_pdfmeta_xmp_build_iptc:

```

1185 \cs_new_protected:Npn \_pdfmeta_xmp_build_iptc:
1186 {
1187     \tl_if_empty:NF\l__pdfmeta_xmp_iptc_data_tl
1188     {
1189         \_pdfmeta_xmp_add_packet_open_attr:nnn
1190         {Iptc4xmpCore}{CreatorContactInfo}{rdf:parseType="Resource"}
1191         \tl_gput_right:Nx\g__pdfmeta_xmp_packet_tl { \l__pdfmeta_xmp_iptc_data_tl }
1192         \_pdfmeta_xmp_add_packet_close:nn
1193         {Iptc4xmpCore}{CreatorContactInfo}
1194     }
1195 }

```

(End definition for _pdfmeta_xmp_build_iptc:.)

4.13 Prism

_pdfmeta_xmp_build_prism:
 complianceProfile
 prism:subtitle/pdfsubtitle

```

1196 \cs_new_protected:Npn \_pdfmeta_xmp_build_prism:
1197 {

```

The compliance profile is a fix value taken from hyperxmp

```

1198     \_pdfmeta_xmp_add_packet_line:nnn
1199     {prism}{complianceProfile}
1200     {three}

```

the next two values can take an optional language argument. First subtitle

```

1201     \_pdfmeta_xmp_lang_get:eNN
1202     {\GetDocumentProperties{hyperref/pdfsubtitle}}
1203     \l__pdfmeta_tmpa_tl\l__pdfmeta_tmpb_tl
1204     \_pdfmeta_xmp_add_packet_line_attr:nneV
1205     {prism}{subtitle}
1206     {xml:lang="\l__pdfmeta_tmpa_tl"}
1207     \l__pdfmeta_tmpb_tl

```

Then publicationName

```

1208     \_pdfmeta_xmp_lang_get:eNN
1209     {\GetDocumentProperties{hyperref/pdfpublication}}
1210     \l__pdfmeta_tmpa_tl\l__pdfmeta_tmpb_tl
1211     \_pdfmeta_xmp_add_packet_line_attr:nneV
1212     {prism}{publicationName}

```



```

1213     {xml:lang="\l__pdfmeta_tmpa_tl"}
1214     \l__pdfmeta_tmpb_tl

```

Now the rest

```

1215     \__pdfmeta_xmp_add_packet_line:nne
1216     {prism}{bookEdition}
1217     {\GetDocumentProperties{hyperref/pdfbookedition}}
1218     \__pdfmeta_xmp_add_packet_line:nne
1219     {prism}{aggregationType}
1220     {\GetDocumentProperties{hyperref/pdfpubtype}}
1221     \__pdfmeta_xmp_add_packet_line:nne
1222     {prism}{volume}
1223     {\GetDocumentProperties{hyperref/pdfvolumenum}}
1224     \__pdfmeta_xmp_add_packet_line:nne
1225     {prism}{number}
1226     {\GetDocumentProperties{hyperref/pdfissuenum}}
1227     \__pdfmeta_xmp_add_packet_line:nne
1228     {prism}{pageRange}
1229     {\GetDocumentProperties{hyperref/pdfpagerange}}
1230     \__pdfmeta_xmp_add_packet_line:nne
1231     {prism}{issn}
1232     {\GetDocumentProperties{hyperref/pdfissn}}
1233     \__pdfmeta_xmp_add_packet_line:nne
1234     {prism}{eIssn}
1235     {\GetDocumentProperties{hyperref/pdfeissn}}
1236     \__pdfmeta_xmp_add_packet_line:nne
1237     {prism}{doi}
1238     {\GetDocumentProperties{hyperref/pdfdoi}}
1239     \__pdfmeta_xmp_add_packet_line:nne
1240     {prism}{url}
1241     {\GetDocumentProperties{hyperref/pdfurl}}

```

The page count is take from the previous run or from pdfnumpages.

```

1242     \tl_set:Nx \l__pdfmeta_tmpa_tl { \GetDocumentProperties{hyperref/pdfnumpages} }
1243     \__pdfmeta_xmp_add_packet_line:nne
1244     {prism}{pageCount}
1245     {\tl_if_blank:VTF \l__pdfmeta_tmpa_tl { \PreviousTotalPages } { \l__pdfmeta_tmpa_tl }}
1246 }

```

(End definition for __pdfmeta_xmp_build_prism: , complianceProfile, and prism:subtitle/pdfsubtitle.
These functions are documented on page ??.)

4.13.1 User additions

\g__pdfmeta_xmp_user_packet_str

```

1247 \tl_new:N \g__pdfmeta_xmp_user_packet_tl

```

(End definition for \g__pdfmeta_xmp_user_packet_str.)

__pdfmeta_xmp_build_user:

```

1248 \cs_new_protected:Npn \__pdfmeta_xmp_build_user:
1249 {
1250     \int_zero:N \l__pdfmeta_xmp_indent_int
1251     \g__pdfmeta_xmp_user_packet_tl
1252     \int_set:Nn \l__pdfmeta_xmp_indent_int {3}
1253 }

```

(End definition for _pdfmeta_xmp_build_user:.)

4.14 Activating the metadata

We don't try to get the byte count. So we can put everything in the `shipout/lastpage` hook

```
1254 \AddToHook{shipout/lastpage}
1255 {
1256   \bool_if:NT\g__pdfmeta_xmp_bool
1257   {
1258     \file_get_timestamp:nN{\jobname.log}\l__pdfmeta_xmp_currentdate_tl
1259     \__pdfmeta_xmp_date_split:VN\l__pdfmeta_xmp_currentdate_tl\l__pdfmeta_xmp_currentdate_tl
1260     \__pdfmeta_xmp_build_packet:
1261     \exp_args:No
1262     \__pdf_backend_metadata_stream:n {\g__pdfmeta_xmp_packet_tl}
1263     \pdfmanagement_add:nnx {Catalog} {Metadata}{\pdf_object_ref_last:}
1264     \bool_if:NT \g__pdfmeta_xmp_export_bool
1265     {
1266       \iow_open:Nn\g_tmpa_iow{\g__pdfmeta_xmp_export_str.xmpi}
1267       \exp_args:NNo\iow_now:Nn\g_tmpa_iow{\g__pdfmeta_xmp_packet_tl}
1268       \iow_close:N\g_tmpa_iow
1269     }
1270   }
1271 }
```

4.15 User commands

`\pdfmeta_xmp_add:n`

```
1272 \cs_new_protected:Npn \pdfmeta_xmp_add:n #1
1273 {
1274   \tl_gput_right:Nn \g__pdfmeta_xmp_user_packet_tl
1275   {
1276     \__pdfmeta_xmp_add_packet_chunk:n { #1 }
1277   }
1278 }
```

(End definition for `\pdfmeta_xmp_add:n`. This function is documented on page 8.)

`\pdfmeta_xmp_xmlns_new:nn`

```
1279 \cs_new_protected:Npn \pdfmeta_xmp_xmlns_new:nn #1 #2
1280 {
1281   \prop_if_in:NnTF \g__pdfmeta_xmp_xmlns_prop {#1}
1282   {\msg_warning:nnn{pdfmeta}{namespace-defined}{#1}}
1283   {\__pdfmeta_xmp_xmlns_new:nn {#1}{#2}}
1284 }
```

(End definition for `\pdfmeta_xmp_xmlns_new:nn`. This function is documented on page 8.)

```
1285 </package>
```

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