The multilang package*

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Abstract

Maintaining a LaTeX document with translations for multiple languages can be cumbersome and error-prone. The multilang package provides a set of macros for defining macros and environments as wrappers around existing macros and environments. These wrappers allow one to clearly specify multiple translations for the arguments to the wrapped macros and environments while only the translation of the document's language is actually shown. Choosing a translation then is as simple as choosing the document's language via babel or polyglossia.

1 Introduction

The main goal of the multilang package is to facilitate the definition of macros and environments with which documents can be provisioned in multiple languages. To be more concrete, multilang facilitates

1. the specification of content translations:

   - Arguments to macros are specified by their name such that multiple translations do not clutter up the LaTeX code that easily.
   - If you forget to specify a mandatory argument in a language, multilang shows an error when you compile for that language.

2. the maintenance of translations:

   Translations of content that is passed as an argument to a macro can be kept closely together such that you can keep track of which units belong together and can keep consistency among translations across content changes.

3. the selection of a document language:

   You simply specify the language with babel or polyglossia and multilang selects the translation you provided for the language.

*This document corresponds to multilang v0.9, dated 2017/08/30. The package is available online at http://www.ctan.org/pkg/multilang and https://github.com/Ri-Ga/multilang.

The motivating example that lead to the development of this package are CVs (curricula vitae). Suppose you want to maintain a CV document that contains the union of all your relevant personal data, education, achievements, etc. You update the CV from time to time with new achievements. Since you want to prepare for the possibility that you might apply nationally as well as internationally, you maintain the CV document in multiple languages (e.g., your mother language and English). When you use the CV in a concrete job application, you (1) filter out all details that are irrelevant for the position that you apply for and (2) select a suitable language for the employer.

This package provides a set of basic macros for the definition of multilingual macros and multilingual environments. The following example illustrates such a macro and how it could be used.

```
% ...
\usepackage[german,english]{babel}
\usepackage[languages={english,german}]
           {multilang}
% ...
\begin{document}
\Sec{
  title/english={Foobar},
  title/german ={Dingsda}
}
...
\end{document}
```

1 Foobar

...

Section 2 describes how a macro such as `\Sec` in the above example can be defined with multilang. The section also describes how analogous environments can be defined. Section 3 describes extensible argument types. Section 4 describes two extension packages, multilang-sect and multilang-tags for multilingual sectioning and, respectively, for filtering multilingual macros and environments.

2 Usage

2.1 Package Options

`languages` The multilang package has a single option: `languages`. This option expects a comma-separated list of language names. The ordering of the list does not make a difference. Through this option, one sets the languages for which translations can be provided. By default, the list is empty such that no translations can be specified. The example in Section 1 demonstrates how this option can be used.

2.2 Multilingual Macros

`\NewMultilangCmd{`⟨*command*⟩`}{`⟨*options*⟩`}`

A multilingual macro can be defined via the `\NewMultilangCmd` macro. The macro defines ⟨*command*⟩ as a macro that accepts a single argument. That is,

the signature of ⟨*command*⟩ is ⟨*command*⟩`{`⟨*kvarg*⟩`}`. The argument, ⟨*kvarg*⟩, is a comma-separated key-value list. The ⟨*options*⟩ argument takes the form of a comma-separated key-value list and specifies what ⟨*command*⟩ does, including how ⟨*kvarg*⟩ is interpreted. The following keys are defined for ⟨*options*⟩:

`command`: This key is to be used in the form "`command=`⟨*c*⟩", where ⟨*c*⟩ is an already existing command. The key specifies that ⟨*command*⟩ is defined to invoke ⟨*c*⟩ with some arguments. Example: see Section 2.2.1.

`margs`: This key is to be used in the form "`margs={`⟨*csvlist*⟩`}`", where ⟨*csvlist*⟩ is a comma-separated list of names. The key specifies names for the mandatory arguments of ⟨*c*⟩, in the order specified. If ⟨*c*⟩ is a macro that takes n mandatory arguments, then ⟨*csvlist*⟩ should be a list of n names. If ⟨*arg-i*⟩ is the i-th entry in ⟨*csvlist*⟩, then the i-th mandatory argument to ⟨*c*⟩ can be specified as ⟨*v*⟩ in the invocation of ⟨*command*⟩ as follows: "⟨*command*⟩`{...,`⟨*arg-i*⟩`=`⟨*v*⟩`,...}`". Example: see Section 2.2.1.

`oargs`: This key is to be used in the form "`oargs={`⟨*csvlist*⟩`}`", where ⟨*csvlist*⟩ is a comma-separated list of names. This key is analogous to `margs`, but for optional arguments to ⟨*c*⟩. Example: see Section 2.2.2.

`starred`: This key is to be used simply as "`starred=`⟨*bool*⟩", where ⟨*bool*⟩ must be `true` or `false`, or just as "`starred`", which is equivalent to "`starred=true`". If ⟨*bool*⟩ is `true`, then "⟨*command*⟩`*{...}`" can be used to invoke "⟨*c*⟩`*...`". Example: see Section 2.2.3.

`disablable`: This key is to be used simply as "`disablable=`⟨*bool*⟩", where ⟨*bool*⟩ must be `true` or `false`, or just as "`disablable`", which is equivalent to "`disablable=true`". If ⟨*bool*⟩ is `true`, then the invocation of ⟨*c*⟩ in ⟨*command*⟩ can be suppressed via "⟨*command*⟩`{...,disabled,...}`". Example: see Section 2.2.4.

`defaults`: This key is to be used as "`defaults={...,`⟨*arg*⟩`=`⟨*value*⟩`,...}`". Each key ⟨*arg*⟩ should be the name of an optional or mandatory argument and ⟨*value*⟩ should be the intended default value for this argument. Example: see Section 2.2.5.

`alias/...`: This key is to be used as "`alias/`⟨*name*⟩`={`⟨*arglist*⟩`}`", where ⟨*name*⟩ specifies the name of the alias and ⟨*arglist*⟩ is a possibly empty comma-separated list of argument names (optional or mandatory arguments allowed). Example: see Section 2.2.6.

The remainder of Section 2.2 provides examples based on the `\section` macro.

2.2.1 Basic Usage

The following example shows how the `\Section` macro used in the example of Section 1 can be defined. We leave out the `babel` code in this section for more concise example code.

```
\NewMultilangCmd{\Sec}{
  command=\section, margs=title}
\Sec{
  title/english={Foobar},
  title/german ={Dingsda}
}
```

1 Foobar

Language-independent arguments. Sometimes, arguments to macros need no translation. For instance, if an argument is a technical term or a name, it can remain in the original language. To avoid redundancy, in such instances the language part of a mandatory or optional argument can be omitted to specify the argument for all languages.

```
\Sec{title=multilang}
```

1 multilang

Forced foreign-language arguments. A particular instance of a language-independent argument is the case in which the argument shall explicitly be type-set in a particular language. For instance, the argument might use macros that internally determine the display based on the selected language. The following example shows the case of forcing German display of the `\enquote` macro.

```
\usepackage[autostyle=true]{csquotes}
%...
\Sec{title/german!=\enquote{multilang}}
```

1 „multilang“

2.2.2 Optional Arguments

Macros like `\section` don't just have a mandatory argument (the section title) but also an optional argument (a short title for the table of contents). We can make this optional argument accessible via the `oargs` option as follows. The displayed result does not show any difference as we don't have the table of contents here.

```
\NewMultilangCmd{\Sec}{
  command=\section, margs=title, oargs=short}
\Sec{
  title/english={Foobar},
  title/german ={Dingsda},
  short/english={F},
  short/german ={D},
}
```

1 Foobar

2.2.3 Starred Macros

Some macros can be altered in their behavior with a star ("`*`") after the macro. The `\section` command is an example of such a macro: `\section*` suppresses the display of the section number. The star can be transferred to the command defined via `\NewMultilangCmd` as the following example illustrates. Note the exclamation mark after "`german`".

```
\NewMultilangCmd{\Sec}{starred,
  command=\section, margs=title, oargs=short}
\Sec{title=Foo}
\Sec*{title=Bar}
```

1 Foo

Bar

2.2.4 Disabling Display

When a macro is defined with the `disablable` option, it can be passed the `disabled` argument which disables the display of the macro. One might consider this a nicer way to disable content than commenting out the macro.

```
\NewMultilangCmd{\Sec}{disablable,
  command=\section, margs=title, oargs=short}
\Sec{title=Foo}
\Sec{title=Bar,disabled}
```

1 Foo

2.2.5 Default Arguments

When a mandatory or optional argument shall by default assume a particular value if no value is specified for the argument in the argument to ⟨*command*⟩, this can be specified via the `defaults` key as the following example demonstrates.

```
\NewMultilangCmd{\Sec}{
  command=\section, margs=title,
  defaults={title={???}}}
\Sec{}
```

1 ???

Defaults can be particularly useful for mandatory arguments of commands that take multiple arguments and that can often be left empty. Essentially, argument defaults turn mandatory arguments of macros to optional arguments.

2.2.6 Argument Aliases

Aliases allow one to specify argument names of three different kinds:

direct aliases: A direct alias declares an argument name that can then be used as a substitute for some mandatory or optional argument. The `heading` argument in the following example shows how direct aliases can be declared.

combiner aliases: A combiner alias declares an argument name that acts as a substitute for a sequence of mandatory or optional arguments. Such aliases particularly help maintaining concise LaTeX source code when argument values are rather short, as `both` in the following example shows.

comment aliases: A comment alias declares an argument name that represents no mandatory or optional argument. That is, a value specified for a comment alias is not used as an argument to the `command` and can, hence, be used for capturing comments or values for future use.

```
\NewMultilangCmd{\Sec}{
  command=\section, margs=title, oargs=short,
  alias/heading=title,
  alias/both={title,short},
  alias/remark}
\Sec{
  both/english={Foobar}{Foo},
  both/german ={Dingsda}{Dings}}
\Sec{
  heading=Baz,
  remark={select heading+translate}}
```

1 Foobar

2 Baz

2.3 Multilingual Environments

`\NewMultilangEnv{`⟨*environment*⟩`}{`⟨*options*⟩`}`

The usage of the `\NewMultilangEnv` macro is analogous to the usage of the macro `\NewMultilangCmd`, except for the following differences:

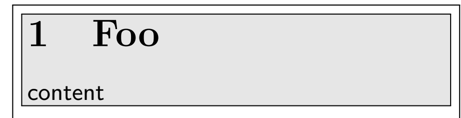
- The first argument, ⟨*environment*⟩, expects the name of an environment that shall be defined.
- In the ⟨*options*⟩, the `environment` key substitutes the `command` key and expects an environment name.
- The `starred` key is not available. Following standard LaTeX practices, if you want to define a starred environment, simply use the starred name for ⟨*environment*⟩.

Due to the similarity to `\NewMultilangCmd`, we don't provide separate examples for all the individual features. Continuing the line of examples started before, we again use an example about sections – just now with an environment for section boxes, as provided by the sectionbox package.

```
\usepackage{sectionbox}
\NewMultilangEnv{SecBox}{
  environment=sectionbox,
  disablable, margs=title, oargs=width}

\begin{SecBox}{title=Foo}
  content
\end{SecBox}

\begin{SecBox}{disabled,title=Bar}
  disabled content
\end{SecBox}
```



3 Extensible Argument Types

By default, an argument `arg` in a multilingual macro can be specified in three ways: just "`arg=...`", "`arg/`⟨*language*⟩`=...`", or "`arg/`⟨*language*⟩`!=...`". The multilang package enables one to declare further so called 'types'. These types can be used in place of ⟨*language*⟩ in the argument syntax. They can be used for uniformly enabling a special formatting if an argument is of a particular type (rather than just being text).

`\NewMultilangType[`⟨*argcount*⟩`]{`⟨*typename*⟩`}{`⟨*format*⟩`}`

The `\NewMultilangType` macro declares the ⟨*typename*⟩ type. Values passed to arguments of this type must consist of ⟨*argcount*⟩ arguments (default: 1). The value is then formatted with ⟨*format*⟩ when displayed. The ⟨*format*⟩ can (and should) contain positional parameters such as "`#1`" for the first argument. The remainder of this section demonstrates the use of the macro by examples.

3.1 Dates via datetime2

The datetime2 package supports regional (language-specific) formatting of dates. We can build on this feature such that we don't have to provide translations of dates. To keep the display smaller, we here use `\textbf` rather than `\section`.

```
\usepackage[useregional]{datetime2}

\NewMultilangType{date}{\DTMdate{#1}}
\NewMultilangType[2]{daterange}
   {\DTMdate{#1}--\DTMdate{#2}}

\NewMultilangCmd{\Bold}
   {margs=title, command=\textbf}

Date:  \Bold{title/date={2017-08-01}}\\
Range: \Bold{title/daterange=
         {2017-01-01}{2017-08-01}}
```

Date: **August 1, 2017**
Range: **January 1, 2017–August 1, 2017**

3.2 Nesting Multilingual Macros

Multilingual macros can be used in arguments to multilingual macros. Coming back to the original motivation for developing multilang– CVs – you might want a translated two-column layout in which the right column might be filled with translated list items. The following example shows how this can be realized.

```
\usepackage{enumitem}% for "nosep"

\newcommand\entry[2]{%
   \begin{tabular}{p{1cm}p{4cm}}#1&#2
   \end{tabular}}

\NewMultilangType{list}{%
   \begin{minipage}[t]{4cm}
   \begin{itemize}[nosep]#1
   \end{itemize}\end{minipage}}
\NewMultilangCmd{\Entry}
   {margs={head,text}, command=\entry}
\NewMultilangCmd{\Item}
   {margs=name, command=\item}

\Entry{head=2017,
  text/list={
    \Item{name/english=foobar,
          name/german =Dingsda}
    \Item{name=multilang}}}
```

2017
- foobar
- multilang

4 Extension Packages

The multilang package comes bundled with a few generic packages that build on multilang. These packages are described below.

4.1 Sectioning Environments

Sectioning environments are provided by the multilang-sect package. That package defines, for each of LaTeX's sectioning macros (`\section`, ..., `\subparagraph`) an environment and a starred environment.

`\begin{Section(*)}{⟨data⟩}`
`\end{Section(*)}`

This environment shows a section. It has a single, mandatory argument, named `title`. It is a disablable environment, i.e., the argument `disabled` can be used in ⟨*data*⟩ to disable the display of the whole section. This environment acts as a proxy for the `\section` macro as it is used by multilang (i.e., without optional argument and without the star).

`\begin{SubSection(*)}{⟨data⟩}`
`\end{SubSection(*)}`

This environment is analogous to the `Section` environment, just for sub-sections.

`\begin{SubSubSection(*)}{⟨data⟩}`
`\end{SubSubSection(*)}`

This environment is analogous to the `Section` environment, just for sub-sub-sections.

`\begin{Paragraph(*)}{⟨data⟩}`
`\end{Paragraph(*)}`

This environment is analogous to the `Section` environment, just for paragraphs.

`\begin{SubParagraph(*)}{⟨data⟩}`
`\end{SubParagraph(*)}`

This environment is analogous to the `Section` environment, just for sub-paragraphs. Examples:

```
\usepackage{multilang-sect}

\begin{Section}{
    title/english = Usage,
    title/german  = Benutzung,
  }
  (section content)
  \begin{SubSection*}{
      title/english = Package Options,
      title/german  = Paketoptionen,
    }
    (subsection content)
  \end{SubSection*}
\end{Section}
```

1 Usage

(section content)

Package Options

(subsection content)

4.2 Tags

Tags are an alternative to individually disabling macros or environments. They are provided by the multilang-tags package. A tag is just a word and sets of tags can be assigned to individual usages of multilingual macros and environments. As long as no tag filter policy is setup, specifying tags does not influence what is displayed.

`\SetTagFilter[⟨default⟩]{⟨policy⟩}`

The `\SetTagFilter[`⟨*default*⟩`]{`⟨*policy*⟩`}` sets up a tag filter policy. The ⟨*policy*⟩ is a comma-separated list of `accept`/`deny` rules. The ⟨*default*⟩ argument is either `accept` (the default) or `deny` and specifies the default policy. The following toy example demonstrates tag filtering:

```
\usepackage{multilang-tags}
\NewMultilangCmd{\Item}{disablable,
  command=\item,oargs=dd,margs=dt,
  alias/both={dd,dt}}
\SetTagFilter{accept={A}, deny={D}}

\begin{description}
\Item{tags=A,     both={1}{tagged A}}
\Item{tags={A,D}, both={2}{tagged A,D}}
\Item{tags=D,     both={3}{tagged D}}
\Item{tags={D,X}, both={4}{tagged D,X}}
\Item{tags=!D,    both={5}{tagged !D}}
\Item{tags=X,     both={6}{tagged X}}
\end{description}
```

1 tagged A

2 tagged A,D

5 tagged !D

6 tagged X

When a multilingual macro, such as `\BasicEntry` in the above example, is used, whether the macro content is displayed is determined as follows:

- If no `tags` are specified or no tag policy is setup, then the macro content is displayed.
- Otherwise, the rules of the tag policy are processed in sequential order until the specified `tags` match a rule. A `tags` list matches a rule if at least one tag in the `tags` occurs in the rule (with or without "`!`" prefix). Let t be the last tag in `tags` that occurs in the rule.
  - The macro content is displayed if the rule is an `accept` rule and t is not prefixed with "`!`", or if the rule is a `deny` rule and t is prefixed with "`!`".
  - Otherwise the display of the macro content is disabled.
- If the specified `tags` match no rule in the ⟨*policy*⟩, then the macro content is displayed if and only if the ⟨*default*⟩ is `accept`.

Rather than directly setting up a filter policy, one can also use the following macros to first define filter policies and then select one for use.

`\DefineTagFilter{`⟨*name*⟩`}{`⟨*default*⟩`}{`⟨*policy*⟩`}`

This macro defines a tag filter policy with name ⟨*name*⟩ to represent the given ⟨*policy*⟩ and ⟨*default*⟩.

`\UseTagFilter{`⟨*name*⟩`}`

This macro uses the tag filter policy with name ⟨*name*⟩.

Further examples:

```
\DefineTagFilter{Show}{accept}{}
\DefineTagFilter{Hide}{deny}{}
\DefineTagFilter{OnlyA}{accept}{accept=A,
                                deny={D,X}}
\begin{description}
\UseTagFilter{Hide}
\Item{            both={1}{no tag}}
\Item{tags=D,     both={2}{tagged D}}
\UseTagFilter{OnlyA}
\Item{tags={D,!X},both={3}{tagged D,!X}}
\Item{tags={!X,D},both={4}{tagged !X,D}}
\end{description}
```

1 no tag

3 tagged D,!X

5 Questions and Answers

Can't I achieve the same thing simpler? To some extent, you can. A variety of ad-hoc solutions to managing translations in LaTeX documents exist.[1] An obvious approach is the following:

```
\newcommand\inEnglish[1]{#1}
\newcommand\inGerman[1]{}

\inEnglish{\section{Foobar}}
\inGerman{\section{Dingsda}}
% or
\section{\inEnglish{Foobar}
         \inGerman{Dingsda}}
```

1 Foobar

2 Foobar

That is, for each translation language you define a macro with one argument; the macro for the "selected" language expands to the argument while all other macros have an empty expansion. An obvious advantage of this approach over multilang is that it does not require learning how to use multilang. However, in my opinion, the approach has the following disadvantages:

- Both the first variant and the second variant in the example make the code more difficult to read due to the nesting of macros and the curly braces.
- The first variant even requires the `\section` macro to be repeated for each language.
- The second variant easily gets chaotic if instead of `\section` a macro with several arguments is used.

Solutions with conditionals (e.g., `\ifEnglish ...\else ...\fi`) share the disadvantages of above approach (except the curly braces) and additionally have an inherent asymmetry that becomes particularly apparent if more than two languages are involved. Similar arguments apply to other ad-hoc solutions I have seen. That is, I find documents based on such approaches cumbersome to maintain and, hence, requiring more careful checks for ensuring consistency.

[1] see, e.g., https://tex.stackexchange.com/q/5076

Can I use multilang with polyglossia instead of babel? Yes, you can use either one for selecting the language of your document.

Can I switch the language mid-document? You can switch the language mid-document (e.g., using Babel's `selectlanguage` environment), but this does not effect what the multilingual macros or environments defined via multilang. The language that is displayed by a macro or environment is determined at the time of loading multilang. Future versions of multilang might add support for switching languages mid-document, though.

Are language dialects supported? No, currently they are not supported.

Can I store the "result" of a multilingual macro in another macro? No. You can store the macro itself (e.g., via `\newcommand`), but storing the result of the multilingual macro in a macro (e.g., via `\edef`) is not possible, as the multilingual macros are not expandable.

6 Related Packages

I'm not aware of any LaTeX packages that pursue similar goals or provide similar functionality. CTAN provides a list of many packages for supporting more than one language.[2] In the following, we compare against some of these packages.

babel, polyglossia: These package provide support for selecting a document language and switching the document language within a document. The selected language is then used for hyphenation and other layouting aspects. Providing multiple translations of pieces of content is not particularly facilitated by the two packages.

The multilang package builds on babel or polyglossia for determining the selected language and for forced foreign-language formatting (as illustrated in Section 2.2.1).

translations: This package aims primarily aims at package authors, providing them an easy interface for providing translations of package-specific terms. Essentially, one declares translations for terms up-front and then later can use these translations.

The separation of translations and the use of terms is beneficial for the maintenance of packages and documents in which individual terms occur multiple times. However, I assume that this separation would make it harder to maintain documents in which most translated units occur only once and at a particular location in the document.

One could combine the virtues of translations and multilang as follows:

[2] https://www.ctan.org/topic/multilingual

```
% in preamble
\usepackage{translations}
\DeclareTranslation{english}{foo}{Foobar}
\DeclareTranslation{german}{foo}{Dingsda}
\NewMultilangType{translate}
                 {\GetTranslation{#1}}
\NewMultilangCmd{\Sec}{
   margs=title, command=\section}

% in document
\Sec{title/translate=foo}
```

1 Foobar

xt_capts: This package is similar to the translations package, even though the package's documentation does not explicitly refer to package authors as the target users. That is, it provides commands for declaring and using translations of terms. The main difference to translations, as far as I understand, is that the user interface of translations is larger and supports language dialects. Comparing with multilang, the same remarks as for translations apply.

7 Implementation

7.1 Dependencies

We use pgfkeys for the options parsing, both for the macros defined by multilang and for the macro defined via the macros in multilang. We use etoolbox to simplify the internal code.

```
1 \RequirePackage{pgfkeys,pgfopts}
2 \RequirePackage{etoolbox}
```

We use the environ package for scanning and later forgetting the body of disabled multilingual environments.

```
3 \RequirePackage{environ}
```

7.2 Package Options

The "`languages`" option selects the languages that multilang knows about.

```
4 \newcommand\multilang@@langs{}
5 \pgfqkeys{/multilang/pkg}{
6   languages/.code={\forcsvlist{\listadd\multilang@@langs}{#1}},
7 }
8 \ProcessPgfOptions{/multilang/pkg}
```

7.3 Main Macros

`\NewMultilangCmd`

The `\NewMultilangCmd{`⟨*command*⟩`}{`⟨*options*⟩`}` macro defines ⟨*command*⟩ to be a single-argument macro. The argument to ⟨*command*⟩ specifies, in a key-value list style, the mandatory and optional arguments that are passed to a command specified in ⟨*options*⟩.

```
9 \newcommand\NewMultilangCmd[2]{%
10   \bgroup
```

The following line processes the ⟨*options*⟩ given and, as its result, defines the macros `\multilang@@actuals`, `\multilang@@checks`, and `\multilang@@keys`.

```
11   \multilang@processargs{#1}{/multilang/newcommand}{defaults={},#2}%
```

To handle starred macros, we store the actual macro code into an auxiliary macro and define ⟨*command*⟩ to be an interface to the auxiliary macro. The next line stores the name of the internal macro.

```
12   \expandafter\def\expandafter\multilang@@intcmd\expandafter{%
13     \csname multilang@intcmd@\expandafter\@gobble\string#1\endcsname}%
```

Finally, we create the ⟨*command*⟩. The `\edef` starting with the `\egroup` shall expand the three macros constructed above but nothing else such that none of the `\pgfqkeys` result for `#1` spills outside the `\NewMultilangCmd`.

```
14   \edef\do{\egroup
15     \expandonce{\multilang@@keys}%
16     \ifbool{multilang@@starred}{%
```

The following handles the case of a `starred` macro. We define the macro that scans for the star (⟨*command*⟩) as well as the internal macro that does the actual work.

```
17        \unexpanded{\newcommand#1}{%
18          \noexpand\@ifstar
19            {\expandonce{\multilang@@intcmd}{*}}%
20            {\expandonce{\multilang@@intcmd}{}}}%
21      }{%
```

The following handles the case of a non-`starred` macro. Here we make ⟨*command*⟩ directly resort to the internal macro.

```
22        \unexpanded{\newcommand#1}{\expandonce{\multilang@@intcmd}{}}%
23      }%
```

The remainder of the macro code defines the internal macro, with signature ⟨`\multilang@@keys`⟩`{`⟨*decoration*⟩`}{`⟨*kvarg*⟩`}`. The ⟨*decoration*⟩ can assume any symbols that shall directly be put after the command encapsulated by `command`. A particular use for the ⟨*decoration*⟩ argument is the "`*`" symbol for a `starred` macro.

```
24      \noexpand\newcommand{\expandonce{\multilang@@intcmd}}[2]{%
```

First, ⟨*command*⟩ parses its argument using pgfkeys.

```
25        \bgroup
26        \noexpand\boolfalse{multilang@cmd@@disabled}%
27        \noexpand\pgfqkeys{\multilang@keyof{#1}}{%
28          \expandonce{\multilang@@defaults},####2}%
29        \noexpand\ifbool{multilang@cmd@@disabled}%
```

If the macro is disabled, simply use an empty invocation `\multilang@@invok`.

```
30          {\unexpanded{\def\multilang@@invok{}}}%
```

Otherwise, first check the arguments and afterwards define `\multilang@@invok` to contain ⟨*command*⟩, ⟨*decoration*⟩ (in `####1`), and the actual arguments (in `\multilang@@actuals`).

```
31          {\expandonce{\multilang@@checks}%
32            \unexpanded{\edef\multilang@@invok}{%
33              \noexpand\unexpanded{\expandonce{\multilang@@cmd}}####1%
34                \expandonce{\multilang@@actuals}}}%
```

Finally, ⟨*command*⟩ invokes the command specified via the `command` key. The invocation happens outside the local group, just for the case that makes a difference with the `command`.

```
35        \unexpanded{\expandafter\egroup\multilang@@invok}%
36      }%
37    }\do}
```

`\NewMultilangEnv` The `\NewMultilangEnv{`⟨*environment*⟩`}{`⟨*options*⟩`}` macro defines ⟨*environment*⟩ to be a single-argument environment. The argument to ⟨*environment*⟩ specifies, in a key-value list style, the mandatory and optional arguments that are passed to an environment specified in ⟨*options*⟩.

```
38 \newcommand\NewMultilangEnv[2]{%
39   \bgroup
```

The following line processes the ⟨*options*⟩ given and, as its result, defines the macros `\multilang@@actuals`, `\multilang@@checks`, and `\multilang@@keys`.

```
40   \multilang@processargs{#1}{/multilang/newenvir}{defaults={},#2}%
```

Finally, we create the ⟨*environment*⟩. The `\edef` starting with the `\egroup` shall expand the three macros constructed above but nothing else such that none of the `\pgfqkeys` result for `#1` spills outside the `\NewMultilangEnv`. We also pay attention that as few as possible internal macros spill into the environment or even the code that begins the environment.

```
41   \edef\do{\egroup
42     \expandonce{\multilang@@keys}%
43     \unexpanded{\newenvironment{#1}}[1]{%
```

First, ⟨*command*⟩ parses its argument using pgfkeys.

```
44       \bgroup
45       \noexpand\boolfalse{multilang@cmd@@disabled}%
46       \noexpand\pgfqkeys{\multilang@keyof{#1}}{####1}%
47       \noexpand\ifbool{multilang@cmd@@disabled}%
```

If the body shall be disabled, then we don't perform checks on the arguments, don't open `environment` but rather collect the body of the environment and finally also ignore the code for closing `environment` (via `\multilang@noend`). Through this trick, we avoid defining an additional macro for switching in the end-block of the environment.

```
48         {\unexpanded{%
49           \def\multilang@@invok{\Collect@Body{\multilang@noend}}}}%
```

First check the arguments and afterwards define `\multilang@@invok` to contain the opening code for the environment, including the actual arguments (in `\multilang@@actuals`).

```
50         {\expandonce{\multilang@@checks}%
51         \unexpanded{\edef\multilang@@invok}{%
52           \noexpand\noexpand\noexpand\begin{\multilang@@env}%
53             \expandonce{\multilang@@actuals}}}%
```

Finally, ⟨*environment*⟩ begins the environment specified via the `environment` key. This happens outside the local group, such that the internal macros set via `\pgfqkeys` are not visible anymore when the environment is started.

```
54       \unexpanded{\expandafter\egroup\multilang@@invok}%
55     }{%
```

The following implements the closing of the environment.

```
56       \noexpand\end{\multilang@@env}%
57     }%
58   }\do}
```

7.3.1 Option Keys

We first setup the shared keys for the ⟨*options*⟩ argument of `\NewMultilangCmd` and `\NewMultilangEnv`.

```
59 \pgfqkeys{/multilang/cmd-or-env}{
60   margs/.store in={\multilang@@margs},
61   oargs/.store in={\multilang@@oargs},
62   alias/.is family,
63   alias/.unknown/.code={%
64     \listeadd{\multilang@@aliases}{\pgfkeyscurrentname}%
65     \csdef{multilang@@alias@\pgfkeyscurrentname}{#1}},
66   defaults/.store in={\multilang@@defaults},
67   disablable/.is if={multilang@@disablable},
68 }
69 \newbool{multilang@@disablable}
70 \newbool{multilang@cmd@@disabled}
```

Next, we setup the specific keys for `\NewMultilangCmd`.

```
71 \pgfqkeys{/multilang/newcommand}{
72   .search also={/multilang/cmd-or-env},
73   command/.store in={\multilang@@cmd},
74   starred/.is if={multilang@@starred},
75   alias/.search also={/multilang/cmd-or-env},
76 }
77 \newbool{multilang@@starred}
```

Finally, the specific keys for `\NewMultilangEnv`.

```
78 \pgfqkeys{/multilang/newenvir}{
79   .search also={/multilang/cmd-or-env},
80   environment/.store in={\multilang@@env},
81   alias/.search also={/multilang/cmd-or-env},
82 }
```

7.4 Registration of Datatypes

`\NewMultilangType` The `\NewMultilangType[`⟨*argcount*⟩`]{`⟨*typename*⟩`}{`⟨*format*⟩`}` macro registers the name ⟨*typename*⟩ as a type that can be used for specifying multilang arguments. The type has ⟨*argcount*⟩ arguments (default: 1) and is formatted according to code ⟨*format*⟩. Note that the definition of types is group-local. That is, if `\NewMultilangType` is used within a group, ⟨*typename*⟩ is only available inside that group.

```
83 \newcommand\NewMultilangType[3][1]{%
```

We first record the new type's name (in `\multilang@@types`) and store both ⟨*argcount*⟩ and ⟨*format*⟩ in macros.

```
84   \listadd\multilang@@types{#2}%
85   \expandafter\newcommand\csname multilang@@typecmd@#2\endcsname[#1]{#3}%
86   \csdef{multilang@@typeargc@#2}{#1}%
```

Finally, we also store the invocation of the ⟨*format*⟩ code macro. This is a bit cumbersome, as for all possible argument counts we provide the respective number of arguments. I did not yet find a more elegant way to achieve that the `style n args` code in `\multilang@regfieldtype` invokes ⟨*format*⟩ properly with ⟨*argcount*⟩ arguments. ⟨*argcount*⟩ and ⟨*format*⟩ in macros.

```
87   \ifcase#1\relax
88       \csdef{multilang@@runcmd@#2}{\csuse{multilang@@typecmd@#2}}%
```

For one argument, we check a special case: ⟨*format*⟩ is the identity function. In this case, we directly expand to the argument itself, i.e., we unfold ⟨*format*⟩. We do this such that emptiness of optional arguments can be checked by a `command` or `environment` without having to expand the ⟨*format*⟩ (which might not work out if ⟨*format*⟩ is not expansible). For instance, KOMA's `\section` macro hides the TOC entry for `\section[]{...}` but not for `\section[\X]{...}` even if `\X` expands to an empty result.

```
89   \or\ifcsequal{multilang@@typecmd@#2}{@firstofone}%
90     {\csdef{multilang@@runcmd@#2}{####1}}%
91     {\csdef{multilang@@runcmd@#2}{\csuse{multilang@@typecmd@#2}%
92       {####1}}}%
93   \or\csdef{multilang@@runcmd@#2}{\csuse{multilang@@typecmd@#2}%
94       {####1}{####2}}%
95   \or\csdef{multilang@@runcmd@#2}{\csuse{multilang@@typecmd@#2}%
96       {####1}{####2}{####3}}%
97   \or\csdef{multilang@@runcmd@#2}{\csuse{multilang@@typecmd@#2}%
98       {####1}{####2}{####3}{####4}}%
99   \or\csdef{multilang@@runcmd@#2}{\csuse{multilang@@typecmd@#2}%
100      {####1}{####2}{####3}{####4}{####5}}%
101  \or\csdef{multilang@@runcmd@#2}{\csuse{multilang@@typecmd@#2}%
102      {####1}{####2}{####3}{####4}{####5}{####6}}%
103  \or\csdef{multilang@@runcmd@#2}{\csuse{multilang@@typecmd@#2}%
104      {####1}{####2}{####3}{####4}{####5}{####6}{####7}}%
105  \or\csdef{multilang@@runcmd@#2}{\csuse{multilang@@typecmd@#2}%
106      {####1}{####2}{####3}{####4}{####5}{####6}{####7}{####8}}%
107  \or\csdef{multilang@@runcmd@#2}{\csuse{multilang@@typecmd@#2}%
108      {####1}{####2}{####3}{####4}{####5}{####6}{####7}{####8}{####9}}%
109  \else\multilang@error{Argument count expected to be between 0 and 9, %
110                            but is '#1'}\fi}
```

`\multilang@@types` The `\multilang@@types` macro collects and holds an etoolbox list of datatypes defined via `\NewMultilangType`.

```
111 \newcommand\multilang@@types{}
```

`\NewMultilangType@code` The `\NewMultilangType@code[`⟨*argcount*⟩`]{`⟨*typename*⟩`}{`⟨*format*⟩`}` macro is an internal counterpart to `\NewMultilangType` with which not not the `.style` but the `.code` property of the ⟨*typename*⟩ key is defined. This is indicated by defining the `\multilang@@codetype@`⟨*typename*⟩ macro here and checking whether this macro is defined in `\multilang@regfieldtype`.

```
112 \newcommand\NewMultilangType@code[3][1]{%
```

```
113   \csdef{multilang@@codetype@#2}{true}%
114   \NewMultilangType[#1]{#2}{#3}}
```

\multilang@regfield The `\multilang@regfield{`⟨*cmd-or-env*⟩`}{`⟨*fieldname*⟩`}` macro registers the respective pgfkeys keys for ⟨*fieldname*⟩ for all registered datatypes.

```
115 \newcommand\multilang@regfield[2]{%
116   \pgfqkeys{\multilang@keyof{#1}}{%
117     #2/.code={\csdef{multilang@@val@#2}{##1}}}%
118   \forlistloop{\multilang@regfieldtype{#1}{#2}}{\multilang@@types}}
```

\multilang@regfieldtype The `\multilang@regfieldtype{`⟨*cmd-or-env*⟩`}{`⟨*fieldname*⟩`}{`⟨*typename*⟩`}` macro registers the pgfkeys key for ⟨*typename*⟩ of ⟨*fieldname*⟩.

```
119 \newcommand\multilang@regfieldtype[3]{%
120   \bgroup
```

In the following, we check whether the number of arguments for the ⟨*typename*⟩ macro is 1, because for some reason `style n args` seems not to work as we want it to work if $n = 1$.

```
121   \ifnumequal{\csuse{multilang@@typeargc@#3}}{1}{%
122     \ifcsdef{multilang@@codetype@#3}{%
123       \edef\do{\egroup\noexpand\pgfqkeys{\multilang@keyof{#1}}{%
124         #2/#3/.code={\csexpandonce{multilang@@runcmd@#3}}%
125       }}%
126     }{%
127       \edef\do{\egroup\noexpand\pgfqkeys{\multilang@keyof{#1}}{%
128         #2/#3/.style={#2={\csexpandonce{multilang@@runcmd@#3}}}%
129       }}%
130     }%
131   }{%
132     \ifcsdef{multilang@@codetype@#3}{%
133       \edef\do{\egroup\noexpand\pgfqkeys{\multilang@keyof{#1}}{%
134         #2/#3/.code n args={\csuse{multilang@@typeargc@#3}}%
135                           {\csexpandonce{multilang@@runcmd@#3}}}}%
136     }{%
137       \edef\do{\egroup\noexpand\pgfqkeys{\multilang@keyof{#1}}{%
138         #2/#3/.style n args={\csuse{multilang@@typeargc@#3}}%
139                           {#2={\csexpandonce{multilang@@runcmd@#3}}}}}%
140     }%
141   }\do}
```

7.4.1 Argument Aliases

\multilang@regcomb The `\multilang@regcomb{`⟨*cmd-or-env*⟩`}{`⟨*alias*⟩`}{`⟨*fields*⟩`}` macro registers an ⟨*alias*⟩ argument for ⟨*fields*⟩.

```
142 \newcommand\multilang@regcomb[3]{%
143   \multilang@regcombtype{#1}{#2}{#3}{}%
144   \forlistloop{\multilang@regcomb@i{#1}{#2}{#3}}{\multilang@@types}}
```

\multilang@regcomb@i The \multilang@regcomb@i{⟨*cmd-or-env*⟩}{⟨*alias*⟩}{⟨*fields*⟩}{⟨*type*⟩} macro is an auxiliary front-end to \multilang@regcombtype that transforms ⟨*type*⟩ to a key ⟨*suffix*⟩ (by prepending a "/").

```
145 \newcommand\multilang@regcomb@i[4]{%
146   \multilang@regcombtype{#1}{#2}{#3}{/#4}}
```

\multilang@regcombtype The \multilang@regcombtype{⟨*cmd-or-env*⟩}{⟨*alias*⟩}{⟨*fields*⟩}{⟨*suffix*⟩} registers the ⟨*alias*⟩ with the given type-⟨*suffix*⟩.

```
147 \newcommand\multilang@regcombtype[4]{%
148   \bgroup
```

We count the number of field names in ⟨*fields*⟩ (in \@tempcnta) and, in the same loop, gather the individual field assignments (in \toks@).

```
149   \toks@{}\@tempcnta=0\relax
150   \forcsvlist{%
151     \advance\@tempcnta by1\relax
152     \expandafter\multilang@regcomb@set\expandafter{\the\@tempcnta}{#4}%
153   }{#3}%
```

Finally, we set the style for the ⟨*alias*⟩⟨*suffix*⟩ key. Again we separately handle the case of a single field. Additionally, we treat also the case of *no* field special: It gets a style (with 1 argument), but the argument is essentially ignored (as \toks@ is empty). This makes ⟨*alias*⟩ a "comment" field that is not passed to the command or environment.

```
154   \ifnumgreater{\the\@tempcnta}{1}{%
155     \edef\do{\egroup\noexpand\pgfqkeys{\multilang@keyof{#1}}{%
156       #2#4/.style n args={\the\@tempcnta}{\the\toks@}}}%
157   }{%
158     \edef\do{\egroup\noexpand\pgfqkeys{\multilang@keyof{#1}}{%
159       #2#4/.style={\the\toks@}}}%
160   }%
161   \do}
```

\multilang@regcomb@set The \multilang@regcomb@set{⟨*index*⟩}{⟨*suffix*⟩}{⟨*field*⟩} macro appends the sequence "⟨*field*⟩⟨*suffix*⟩={#⟨*index*⟩}" to the toks@ register. When used in a .style n args key, this sets the "⟨*field*⟩⟨*suffix*⟩" key to the ⟨*index*⟩-th positional parameter.

```
162 \newcommand\multilang@regcomb@set[3]{%
163   \toks@\expandafter{\the\toks@,#3#2={###1}}}
```

7.4.2 Language "Types"

\multilang@addlanguage The \multilang@addlanguage{⟨*language*⟩} registers ⟨*language*⟩, essentially registering "⟨*language*⟩" and "⟨*language*⟩!" as argument datatypes.

```
164 \newcommand\multilang@addlanguage[1]{%
```

The following checks the current language (\languagename) against ⟨*language*⟩. In the following, ##1 is the argument to the key when the key is used.

```
165   \ifdefstring{\languagename}{#1}%
```

```
166     {\NewMultilangType{#1}{##1}}%
167     {\NewMultilangType@code{#1}{}}%
```

The following defines the "⟨*language*⟩!" key for forcing an argument to be formatted in language ⟨*language*⟩.

```
168   \NewMultilangType{#1!}{\foreignlanguage{#1}{##1}}
```

Register all languages passed as argument to the package.

```
169 \forlistloop{\multilang@addlanguage}{\multilang@@langs}
```

7.5 Auxiliary Macros

`\multilang@keyof` The `\multilang@keyof{`⟨*cmd-or-env*⟩`}`, when fully expanded such as in the first argument of the `\pgfqkeys` macro, represents the key under which the parameter keys of the command or environment ⟨*cmd-or-env*⟩ are stored. Note that the branching in the code below checks whether ⟨*cmd-or-env*⟩ is a command sequence (`true` case) or not (`false` case).

```
170 \newcommand\multilang@keyof[1]{%
171   \ifcat\relax\noexpand#1%
172     /multilang/cmd/\expandafter\@gobble\string#1%
173   \else
174     /multilang/env/#1%
175   \fi}
```

`\multilang@error` The `\multilang@error{`⟨*message*⟩`}` macro shows ⟨*message*⟩ as an error message of the multilang package.

```
176 \newcommand\multilang@error[1]{\PackageError{multilang}{#1}{}}
```

`\multilang@processargs` The `\multilang@processargs{`⟨*cmd-or-env*⟩`}{`⟨*opt-key*⟩`}{`⟨*options*⟩`}` macro processes the ⟨*options*⟩ in key ⟨*opt-key*⟩. Afterwards, it post-processes the arguments `margs`, `oargs`, `alias/...`, and `disablable`. It stores the result of the post-processing in the macros `\multilang@@actuals`, `\multilang@@checks`, and `\multilang@@keys`.

```
177 \newcommand\multilang@processargs[3]{%
178   \let\multilang@@aliases=\empty
179   \pgfqkeys{#2}{#3}%
```

In the following, we iteratively construct three macros: `\multilang@@actuals`, `\multilang@@checks`, and `\multilang@@keys`.

- In `\multilang@@actuals`, we step by step construct the arguments that shall be passed to ⟨*cmd-or-env*⟩.
- In `\multilang@@checks`, we construct a list of preliminary checks that ⟨*cmd-or-env*⟩ shall perform on its arguments.
- In `\multilang@@keys`, we construct a list of `\pgfqkeys` commands that set up the keys for ⟨*cmd-or-env*⟩'s one argument.

The following first initializes the three macros.

```
180   \edef\multilang@@actuals{}%
181   \def\multilang@@checks{}%
182   \def\multilang@@keys{}%
```

We first process the optional arguments. We process them before the mandatory arguments because they must come first in `\multilang@@actuals`. In the following `\do` macro, `##1` iterates over all optional argument names in the `margs` list.

```
183 \ifdefvoid{\multilang@@oargs}{}{%
184   \def\do##1{%
185     \appto{\multilang@@actuals}{%
186       \ifcsmacro{multilang@@val@##1}%
187         {[\csexpandonce{multilang@@val@##1}]}%
188         {}%
189     }%
190     \appto{\multilang@@keys}{\multilang@regfield{#1}{##1}}%
191   }%
192   \expandafter\docsvlist\expandafter{\multilang@@oargs}}%
```

Next, we append the mandatory arguments, specified by the `margs` list. In the following `\do` macro, `##1` iterates over all mandatory argument names in the `margs` list.

```
193 \ifdefvoid{\multilang@@margs}{}{%
194   \def\do##1{%
195     \appto{\multilang@@actuals}{%
196       {\csexpandonce{multilang@@val@##1}}%
197     }%
198     \appto{\multilang@@checks}{%
199       \ifcsmacro{multilang@@val@##1}%
200         {}%
201         {\multilang@error{mandatory argument ##1 missing}}%
202     }%
203     \appto{\multilang@@keys}{\multilang@regfield{#1}{##1}}%
204   }%
205   \expandafter\docsvlist\expandafter{\multilang@@margs}}%
```

Afterwards, we handle argument aliases. The list of aliases' names is in `\multilang@@aliases` and the list of arguments that a ⟨*alias*⟩ combines is in `\multilang@@alias@`⟨*alias*⟩. Note that aliases only modify `\multilang@@keys` – i.e., not `\multilang@@actuals` or `\multilang@@checks`.

```
206 \def\do##1{%
207   \eappto{\multilang@@keys}{%
208     \unexpanded{\multilang@regcomb{#1}{##1}}%
209       {\csuse{multilang@@alias@##1}}}}%
210 \expandafter\dolistloop\expandafter{\multilang@@aliases}%
```

To handle `disablable` macros, we simply add the `disabled` key. This key is a Boolean key that just sets a conditional.

```
211 \ifbool{multilang@@disablable}%
212   {\eappto{\multilang@@keys}{%
213     \noexpand\pgfqkeys{\multilang@keyof{#1}}{%
214       disabled/.is if={multilang@cmd@@disabled}}}}%
215   {}%
```

Invoke the hook. To avoid macro arguments to the hook, we store the command or environment name in \multilang@@cmdorenv and store the pgfkeys key for the command or environment in \multilang@@cekey.

```
216   \def\multilang@@cmdorenv{#1}%
217   \edef\multilang@@cekey{\multilang@keyof{#1}}%
218   \multilang@hook@processargs
219 }
```

\multilang@hook@processargs The \multilang@hook@processargs macro is a hook that enables extensions to the \multilang@processargs.

```
220 \newcommand\multilang@hook@processargs{}
```

\multilang@noend The \multilang@noend{⟨*body*⟩} macro is intended to be used as the argument to \Collect@Body (or \collect@body) of the environ package. In this context, it performs the following: Firstly, it ignores the collected ⟨*body*⟩ of the environment. Secondly, it temporarily disables the \end-code of the environment in which the \Collect@Body is expanded.

```
221 \newcommand\multilang@noend[1]{\cslet{end\@currenvir}{\relax}}
```

8 Implementation of Tags

\SetTagFilter The \SetTagFilter[⟨*default*⟩]{⟨*policy*⟩} sets the tag filter policy based on accept/deny rules in ⟨*policy*⟩.

```
222 \newcommand\SetTagFilter[2][accept]{%
223   \kcvml@parsepolicy{kcvml@@tagfilter}{#1}{#2}}
224 \newcommand\kcvml@@tagfilter{}
```

\DefineTagFilter The \DefineTagFilter{⟨*name*⟩}{⟨*default*⟩}{⟨*policy*⟩} macro defines a tag filter policy under name ⟨*name*⟩.

```
225 \newcommand\DefineTagFilter[3]{%
226   \kcvml@parsepolicy{kcvml@filter@@#1}{#2}{#3}}
```

\UseFilter The \UseTagFilter{⟨*name*⟩} macro uses the previously defined tag filter policy with name ⟨*name*⟩.

```
227 \newcommand\UseTagFilter[1]{%
228   \letcs\kcvml@@tagfilter{kcvml@filter@@#1}}
```

\kcvml@parsepolicy The \kcvml@parsepolicy{⟨*csname*⟩}{⟨*default*⟩}{⟨*policy*⟩} parses a tag filter policy, ⟨*policy*⟩ with default ⟨*default*⟩, and stores the resulting filter in the control sequence ⟨*csname*⟩.

```
229 \newcommand\kcvml@parsepolicy[3]{%
```

We first reset the temporary filter variable \kcvml@@tmptagfilter then populate it via \pgfqkeys, first with the ⟨*policy*⟩ list and subsequently with the ⟨*default*⟩ policy.

```
230   \bgroup
231   \def\kcvml@@tmptagfilter{}%
232   \pgfqkeys{kcvml/tagfilter}{#3,default/#2}%
```

Now we export the temporary \kcvml@@tmptagfilter to outside the local group and into the control sequence ⟨*csname*⟩.

```
233   \edef\do{\egroup
234     \unexpanded{\csdef{#1}}{\expandonce{\kcvml@@tmptagfilter}}}%
235   \do}
```

The following lines specify how \kcvml@@tmptagfilter is modified when accept or deny filter rules are specified.

```
236 \pgfqkeys{kcvml/tagfilter}{%
237   accept/.code={\kcvml@appendrule{#1}{\boolfalse}{\booltrue}},
238   deny/.code  ={\kcvml@appendrule{#1}{\booltrue}{\boolfalse}},
239   default/accept/.code n args={0}{\appto\kcvml@@tmptagfilter{%
240     \kcvml@applydefault{\boolfalse}}},
241   default/deny/.code n args={0}{\appto\kcvml@@tmptagfilter{%
242     \kcvml@applydefault{\booltrue}}},
243 }
```

\kcvml@appendrule

The \kcvml@appendrule{⟨*ruletags*⟩}{⟨*flagmacro*⟩}{⟨*invmacro*⟩} macro appends a filter rule to the overall tag filter. The rule filters for the given comma-separated list ⟨*ruletags*⟩. The ⟨*flagmacro*⟩ specifies whether a match shall be disabled (if \booltrue) or enabled (if \boolfalse). The ⟨*invmacro*⟩ must be the inverse of ⟨*flagmacro*⟩.

```
244 \newcommand\kcvml@appendrule[3]{%
245   \bgroup
```

For simplified later processing, we turn ⟨*ruletags*⟩ into an etoolbox list (in \kcvml@@ruletags) first.

```
246   \def\kcvml@@ruletags{}%
247   \forcsvlist{\listadd{\kcvml@@ruletags}}{#1}%
```

Now we append to the overall filter (in \kcvml@@tmptagfilter) outside the local group and use the cascade of \expandafters to get \cvmkl@@ruletags out of the group without polluting the outer scope.

```
248   \expandafter\egroup
249   \expandafter\listadd\expandafter\kcvml@@tmptagfilter\expandafter{%
250     \expandafter\kcvml@applyrule\expandafter{\kcvml@@ruletags}{#2}{#3}}}
```

We add the additional tags key to every disablable multilingual macro and environment. For this, we use multilang's \multilang@hook@processargs hook.

```
251 \appto\multilang@hook@processargs{%
252   \ifbool{multilang@@disablable}%
253     {\eappto{\multilang@@keys}{%
```

Note that in \multilang@@cekey, the parent key of the command or environment is stored. Whenever the tags argument is used, we make it invoke \kcvml@applyfilter with the given ⟨*tags*⟩ (##1).

```
254       \noexpand\pgfqkeys{\multilang@@cekey}{%
255         tags/.code={\noexpand\kcvml@applyfilter{##1}}}}}
256     {}}
```

\kcvml@applyfilter The \kcvml@applyfilter{⟨*tags*⟩} macro applies the current filter, which is in the \kcvml@@tagfilter etoolbox list, to the comma-separated list ⟨*tags*⟩ of tags to check whether the entity with the ⟨*tags*⟩ should be disabled or not. The result of the check is stored in the Boolean flag multilang@cmd@@disabled for further use in with multilang code.

```
257 \newcommand\kcvml@applyfilter[1]{%
258   \ifbool{multilang@cmd@@disabled}{}{%
```

We check the filter only if the entry has not already explicitly been marked as disabled. I.e., explicit disabling takes precedence, no matter whether it is specified before or after a tags element. In the Boolean flag kcvml@@match, we store whether a tag in ⟨*tags*⟩ matched one of the accept/deny filters already. After initializing this flag, we iterate through \kcvml@@tagfilter with \do{⟨*rule*⟩}, and we stop iterating after a match has been found.

```
259   \boolfalse{kcvml@@match}%
260   \def\do##1{%
```

Note that ⟨*rule*⟩ is a curried macro whose missing last argument, ⟨*tags*⟩, is added here.

```
261     ##1{#1}%
262     \ifbool{kcvml@@match}{\listbreak}{}}%
263   \dolistloop{\kcvml@@tagfilter}}}
264 \newbool{kcvml@@match}
```

\kcvml@applyrule The \kcvml@applyrule{⟨*ruletags*⟩}{⟨*flagmacro*⟩}{⟨*invmacro*⟩}{⟨*tags*⟩} macro applies a single filter rule to the given ⟨*tags*⟩. The ⟨*flagmacro*⟩ must be either \booltrue or \boolfalse. If it is \booltrue, this specifies that a match of ⟨*tags*⟩ against ⟨*ruletags*⟩ disables the display of the respective entity; If it is \boolfalse, this specifies that a match enables the display. The ⟨*invmacro*⟩ must be the inverse of ⟨*flagmacro*⟩. We just check each tag in ⟨*tags*⟩ individually.

```
265 \newcommand\kcvml@applyrule[4]{%
266   \forcsvlist{\kcvml@applyrule@i{#1}{#2}{#3}}{#4}}
```

\kcvml@applyrule@i The \kcvml@applyrule@i{⟨*ruletags*⟩}{⟨*flagmacro*⟩}{⟨*invmacro*⟩}{⟨*tag*⟩} macro applies a single filter rule to the given ⟨*tag*⟩. It checks whether the ⟨*tag*⟩ is inverted (i.e., starting with "!") and hands over the actual check to \kcvml@applyrule@ii.

```
267 \newcommand\kcvml@applyrule@i[4]{%
268   \if !\@car#4\@nil
269     \expandafter\kcvml@applyrule@ii\expandafter{\@cdr#4\@nil}{#1}{#3}%
270   \else
271     \kcvml@applyrule@ii{#4}{#1}{#2}\fi}
```

\kcvml@applyrule@ii The \kcvml@applyrule@ii{⟨*tag*⟩}{⟨*ruletags*⟩}{⟨*flagmacro*⟩} macro applies a single filter rule to the given ⟨*tag*⟩. We check whether ⟨*tag*⟩ in in the etoolbox list ⟨*ruletags*⟩. Since \ifinlist expects a list macro for its second argument (which it then expands once), we just give it \empty to eat (expand) and then use ⟨*ruletags*⟩ as it is.

```
272 \newcommand\kcvml@applyrule@ii[3]{%
273   \ifinlist{#1}{\empty #2}%
```

If we have a match, we apply ⟨*flagmacro*⟩ to `multilang@cmd@@disabled` and then record, in `kcvml@@match`, that we found a match.

```
274     {#3{multilang@cmd@@disabled}\booltrue{kcvml@@match}}{}}
```

`\kcvml@applydefault` The `\kcvml@applydefault{`⟨*flagmacro*⟩`}{`⟨*tags*⟩`}` macro applies a default filter to ⟨*tags*⟩. A ⟨*flagmacro*⟩ of `\booltrue` corresponds to a "default deny"; `\boolfalse` corresponds to "default accept".

```
275 \newcommand\kcvml@applydefault[2]{%
276   #1{multilang@cmd@@disabled}}
```

9 Implementation of Sectioning Environments

The sectioning environments are proxies for the corresponding sectioning macros. They are defined as environments such that the whole environments rather than just the headings can be disabled. Each of the environments has one optional argument, `short` (for a short title), and one mandatory argument, `title` (for the actual title).

`Section` `Section*` The `Section` and `Section*` environments are multilingual proxies to `\section` and, respectively, `\section*`.

```
277 \NewMultilangEnv{Section}{disablable,
278   environment=section, oargs=short, margs=title}
279 \NewMultilangEnv{Section*}{disablable,
280   environment=multilang@secstar, oargs=short, margs=title}
281 \newenvironment{multilang@secstar}{\section*}{}
```

`SubSection` `SubSection*` The `SubSection` and `SubSection*` environments are multilingual proxies to `\subsection` and, respectively, `\subsection*`.

```
282 \NewMultilangEnv{SubSection}{disablable,
283   environment=subsection, oargs=short, margs=title}
284 \NewMultilangEnv{SubSection*}{disablable,
285   environment=multilang@ssecstar, oargs=short, margs=title}
286 \newenvironment{multilang@ssecstar}{\subsection*}{}
```

`SubSubSection` `SubSubSection*` The `SubSubSection` and `SubSubSection*` environments are multilingual proxies to `\subsubsection` and, respectively, `\subsubsection*`.

```
287 \NewMultilangEnv{SubSubSection}{disablable,
288   environment=subsubsection, oargs=short, margs=title}
289 \NewMultilangEnv{SubSubSection*}{disablable,
290   environment=multilang@sssecstar, oargs=short, margs=title}
291 \newenvironment{multilang@sssecstar}{\subsubsection*}{}
```

`Paragraph` `Paragraph*` The `Paragraph` and `Paragraph*` environments are multilingual proxies to `\paragraph` and, respectively, `\paragraph*`.

```
292 \NewMultilangEnv{Paragraph}{disablable,
293   environment=paragraph, oargs=short, margs=title}
294 \NewMultilangEnv{Paragraph*}{disablable,
```

```
295   environment=multilang@parstar, oargs=short, margs=title}
296 \newenvironment{multilang@parstar}{\paragraph*}{}
```

SubParagraph
SubParagraph*

The SubParagraph and SubParagraph* environments are multilingual proxies to \subparagraph and, respectively, \subparagraph*.

```
297 \NewMultilangEnv{SubParagraph}{disablable,
298   environment=subparagraph, oargs=short, margs=title}
299 \NewMultilangEnv{SubParagraph*}{disablable,
300   environment=multilang@sparstar, oargs=short, margs=title}
301 \newenvironment{multilang@sparstar}{\subparagraph*}{}
```

Change History

v0.9

General: Initial version 1

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