# The `cleveref` package*

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**Abstract**

The `cleveref` package enhances LaTeX's cross-referencing features, allowing the format of cross-references to be determined automatically according to the "type" of cross-reference (equation, section, etc.) and the context in which the cross-reference is used. The formatting for each cross-reference type can be fully customised in the preamble of your document. In addition, `cleveref` can typeset cross-references to lists of multiple labels, automatically formatting them according to their types, sorting them, and compressing sequences of numerically consecutive labels. Again, the multiple-reference formatting is fully customisable.

Normally, the latest version of the `cleveref` package is available via CTAN. Occasionally, slightly newer "pre-release" versions are available at `www.dr-qubit.org/latex.php#cleveref` a little bit before they make their way onto CTAN.

*This document corresponds to cleveref 0.18.4, dated 2012/01/23.

# Contents

# 1 Introduction

When "clever" is used in the name of a computer program, it usually indicates that the programmer is overly smug about his own achievements! But at the heart of the LaTeX philosophy also lies the idea that it is clever to delegate as much of the typesetting as possible to the computer, in order to achieve a beautiful — and above all consistent — visual appearance.

Both of these probably apply to the `cleveref` package. Its goals are two-fold: to exploit all the information that LaTeX inherently already has about labels as intelligently as possible (clever processing); and to enable you to produce an attractive, consistent formatting of cross-references throughout your document, with the minimum of effort (you'd be clever to use it!).

The `cleveref` package enhances LaTeX's cross-referencing facilities by allowing cross-references to be formatted automatically according to the type of thing they refer to (chapter, section, equation, theorem, etc.) and the context in which the cross-reference is used. It can automatically format cross-references to multiple labels, sort lists of multiple cross-references, compress references to consecutive labels into a reference range, and all kinds of other clever wizardry. It also does similar things with page references.

In standard LaTeX, you have almost certainly found yourself writing things like `Eq.~(\ref{eq1})` and `Theorems~\ref{thm1} to~\ref{thm3}` over and over again. Tedium isn't the only downside to this. What happens if you later decide you want equation references to be typeset as `Equation~\ref{eq1}` instead (i.e. without the abbreviation and without the brackets)? What happens if you decide to change the theorem labelled `thm1` into a lemma? What if you move `thm3` so that it appears (and is numbered) before `thm1`, meaning that references to the sequence of theorems 1 through 3 should now be ordered `Theorems~\ref{thm3} to~\ref{thm1}` (i.e. the other way around)? What if you decide you prefer references to multiple theorems to be written as `Theorems~\ref{thm1}--\ref{thm3}`? Any such change requires you to search through the entire LaTeX source of your document, modifying all references to equations, updating all references to `thm1`, re-ordering all references to `thm1` and `thm3`, and changing all the formatting of references to multiple theorems!

The `cleveref` package allows you to define the format for the different types of cross-references once-and-for-all in the preamble of your document. (Of course, sane default formats are provided, so you only have to redefine the format if you don't like the default for a particular cross-reference type.) If you later decide to change the format of equation references, you only have to change one preamble definition. If you change a theorem into a lemma, you don't need to change any cross-references at all, because `cleveref` will automatically use the appropriate name when typesetting any cross-references to it. This makes it far easier to typeset cross-references uniformly across your whole document, as well as avoiding repetitively typing similar text for each and every cross-reference.

## 2 Usage

The `cleveref` package is loaded in the usual way, by putting the line

```
\usepackage{cleveref}
```

in your document's preamble. However, care must be taken when using `cleveref` in conjunction with other packages that modify LaTeX's referencing system (see Section 11). Basically, `cleveref` must be loaded *last*.

If you just want to get going quickly with `cleveref`, and come back later to read up on all the features it provides in more detail, here's what you need to do. Wherever you would previously have used `\ref`, use `\cref` instead. (Except at the beginning of a sentence, where you should use `\Cref`.) You no longer need to put the name of the thing you're referencing in front of the `\cref` command, because `cleveref` will sort that out for you: i.e. use `\cref{eq1}` instead of `eq.~(\ref{eq1})`. If you want to refer to a range of labels, use the `\crefrange` command: `\crefrange{eq1}{eq5}` gives `eqs.~(1) to~(5)`. If you want to refer to multiple things at once, you can simply throw them all into one cross-reference and leave `cleveref` to sort it out: e.g. `\cref{eq2,eq1,eq3,eq5,thm2,def1}` produces: `eqs.~(1) to~(3) and~(5), theorem~5, and definition~1`. Finally, if you want a page reference, use `\cpageref` (and don't write "page" in front), if you want a page range, use `\cpagerefrange`, and if you want to refer to multiple pages, simply throw them all into a single `\cpageref`, just as with `\cref` (above), and `cleveref` will sort it all out.

`Cleveref` supports a number of languages other than English, and also supports the `babel` package for those languages. Either pass the desired language as an option to `cleveref`, or pass it as a global option to `\documentclass`. Note that if you're writing in a language in which nouns decline, the `\cref` and `\cpageref` commands may be less useful, as they always produce the cross-reference name in the nominative case.[1] In such languages, you may instead prefer to use the `\labelcref` and `\labelcpageref` commands. Unlike `\cref` and `\cpageref`, these don't produce the name in front of the cross-reference, so you must supply it (in the appropriate case) yourself. But they do still cope with multi-references, so you still gain some benefit from using `cleveref`.

## 3 Comparison with Other Packages

Given how useful automated cross-reference typesetting is, there are naturally a number of other packages with similar goals to `cleveref`, most notably `varioref`, `fancyref`, `hyperref`'s `\autoref` command, and (for theorem-like environments) `ntheorem` (with the `thref` option). (There are many others, but these come closest to providing similar features to `cleveref`.) However, all have certain deficiencies which `cleveref` attempts to overcome.

[1] Trying to determine the appropriate case automatically would be tantamount to solving the full natural-language processing problem in `cleveref`. Check back in a century or so. Providing separate variants of the `cleveref` commands for each noun case quickly becomes more cumbersome than just typing the cross-reference name by hand.

The `fancyref` package doesn't automatically determine the type of thing being referred to. Instead, it relies on you adhering to a naming convention for labels. This is usually a good idea in any case, but it can occasionally be inconvenient. For example, if you change a theorem into a lemma, you have to change the label name, and therefore also all cross-references to it. So with `varioref`, you will at times be back to searching and replacing through the entire document. Not to mention missing out on all the other `cleveref` features, such as automatic sorting and compressing of consecutive references, `ntheorem` and `amsthm` support, precise control over hyperlinks, etc.

The enhanced referencing feature provided by the `varioref` package's `\labelformat` command decides how to format cross-references when the label is *defined*, rather than when it is *referenced*. Often this isn't a problem. But it makes it impossible to format cross-references differently according the context in which they are referenced, which can sometimes be very useful. For example, if you want cross-references at the beginning of a sentence formatted any other way than by capitalising the first letter of the cross-reference text, it is impossible using `varioref`. For example, you may want to use the abbreviation "eq.", but revert to "Equation" at the beginning of sentences (words at the start of sentences shouldn't be abbreviated in English). This is not possible with `varioref`. Perhaps even more significantly, `varioref`'s `\labelformat` implementation makes it impossible to typeset multiple references automatically; if you want to refer to equations `eq1` through `eq3`, with `varioref` you are back to typing `Eqs.~(\ref{eq1}) to~(\ref{eq3})` by hand. Not to mention missing out on all the other `cleveref` features. In fact, `cleveref` fully supports `varioref`, taking over responsibility for typesetting cross-references, whilst retaining all the `varioref` page-referencing magic.

The `hyperref` package's `\autoref` command typesets a name before a cross-reference, determined by the cross-reference type. This is less flexible than `cleveref`'s fully customisable cross-reference formatting, but, when combined with `varioref`, the two packages working together come pretty close. But surprisingly, even with `hyperref`, it is impossible to customise precisely which part of the cross-reference is made into a hyperlink in PDF documents; this is simple with `cleveref`. And it still remains impossible to typeset multiple references, have consecutive references sorted and compressed automatically, etc.

The `ntheorem` package (with the `thref` option) does things right with regards to how and when the format is defined... except that it only works for theorem-like environments. It is possible to use it for other environments, but only in a bastardized form, by manually supplying an optional argument to `\label` commands that specifies the label type. `Cleveref` works equally well when referencing any type of thing, as well as fully supporting `ntheorem`. And again, `cleveref` provides a number of additional features over `ntheorem`, such as multi-references, automatic sorting and compressing of consecutive cross-references, control over the placement of hyperlinks, etc.

# 4 Typesetting Cross-References

\cref To automatically typeset a cross-reference according to the type of thing referred to, simply refer to it using `\cref{`⟨*label*⟩`}`. `cleveref` imposes just one extra restriction on the names of labels: they are no longer allowed to contain commas ",". These are instead used to typeset multiple cross-references (see below).

\Cref As it is very difficult[2] for LaTeX to determine whether a cross-reference appears at the beginning of a sentence or not, a beginning-of-sentence variant exists: `\Cref{`⟨*label*⟩`}`. By default, this typesets the cross-reference with the first letter capitalised, and without using an abbreviation in those cases where the standard variant does use one. (However, the formatting of the `\cref` and `\Cref` forms can be fully and independently customised, see Section 7.)

\crefrange \Crefrange To typeset a cross-reference range, e.g. `Eqs.~(1.1) to~(1.5)`, use `\crefrange` or `\Crefrange` (depending on the capitalisation you require), which take the beginning and end of the range as arguments:

`\crefrange{`⟨*label1*⟩`}{`⟨*label2*⟩`}`

\cref \Cref To typeset multiple cross-references, simply list the labels inside the `\cref` or `\Cref` command, separated by commas (recall that you are not allowed to use commas in label names when using `cleveref`):

`\cref{`⟨*label1*⟩`,`⟨*label2*⟩`,`⟨*label3*⟩`,...}`

\cref* \Cref* \crefrange* \Crefrange* When `cleveref` is used along with the `hyperref` package (see Sections 7 and 11), additional starred variants of all the referencing commands are available. The standard referencing commands will make cross-references into hyperlinks; the starred variants prevent this, producing the same typeset text but without creating hyperlinks.

\cpageref \Cpageref To typeset a page reference, use `\cpageref{`⟨*label*⟩`}`, which is typeset e.g. as "page 3". At the beginning of a sentence, use `\Cpageref` instead. Since page references are always references to, well... pages, this doesn't gain you so much over `\pageref`. Where `\cpageref` comes into its own is in referring to multiple pages:

`\cpageref{`⟨*label1*⟩`,`⟨*label2*⟩`,`⟨*label3*⟩`,...}`

\cpagerefrange \Cpagerefrange Predictably enough, `\cpagerefrange` and `\Cpagerefrange` are used to typeset references to page ranges:

`\cpagerefrange{`⟨*label1*⟩`}{`⟨*label2*⟩`}`

\ref \pageref `cleveref` does *not* modify the standard `\ref` or `\pageref` commands, so you can still use them to typeset the formatted label counter or page number alone, without any additional text or formatting.

\namecref \nameCref \lcnamecref \namecrefs \nameCrefs \lcnamecrefs Occasionally, it's useful to produce just the name of a reference, without the label itself. For example, if you want to refer to "this section", but you're not sure

[2] Actually, very likely impossible!

whether you might later change the section into a chapter, it might be useful to produce just the name "section" associated with the section's label. If you later change the section into a chapter, the text will then automatically change to "this chapter". The `\namecref` and `\nameCref` do exactly this:

```
\namecref{sec1}
```

is typeset as "section" (assuming `sec1` labels a section). The `\namecrefs` and `\nameCrefs` commands produce the plural forms. The `\lcnamecref` and `\lcnamecrefs` commands force the reference name to lowercase, for use when the `capitalise` option is enabled (see Section 6.1). (When that option is set, `\namecref` produces an uppercase reference name.)

There is a slight pitfall that you should be aware of when using the `\namecref` commands. They get the reference name from the names defined for the label's reference type using `\crefname` or `\Crefname` (see Section 7.1.2). The default reference formats provide these definitions. However, it is possible to customise reference formats using lower-level commands that do not create `\crefname` definitions (see Section 7.2). If the `\crefname` definitions are missing for a particular reference type, `\namecref` and `\nameCref` will produce errors for labels of that type. You can fix the error by adding explicit `\crefname` definitions for these types.

`\labelcref` Conversely, it is occasionally convenient to produce just the label part of a reference, without the cross-reference name. For example, this can be useful when writing in a language in which nouns decline. The `\labelcref` command does exactly this, and can also cope with multi-references, processing them just as `\cref` does. However, since it typesets a multi-reference without any name, *all* labels in a `\labelcref` multi-reference *must* be of the same type.

The `\labelcref` command will typeset cross-reference labels using the default label format if no type-specific format is defined using `\creflabelformat` (see Sections 7.1.1 and 7.1.2). Note that, if you customise reference formats using the low-level commands, you may want to also explicitly define the `\labelcref` formats to match, using the `\labelcrefformat` etc. commands (see Section 7.2).

`\labelcpageref` Similarly, `\labelcpageref` typesets the page numbers alone, without inserting "page" in front. Like `\cpageref`, it also handles multi-references. Like `\labelcref`, by default `\labelcpageref` typesets the page numbers using the default label format, customised using `\crefdefaultlabelformat`. If you want to define a separate format for `\labelcpageref`, use `\creflabelformat` to customise the label format for the "page" cross-reference type. (see Section 7.2).

# 5 Sorting and Compressing

When `cleveref` typesets lists of multiple cross-references or page-references, the default behaviour is to automatically sort the list and compress sequences of consecutive cross-references or page numbers into a reference range. You can change this behaviour by supplying one of the following package options:

`sort` Sort lists of cross-references, but don't compress consecutive references.

`compress` Compress sequences of consecutive references into a reference range, but don't sort the list of cross-references.

`nosort` Neither sort lists of cross-references, *nor* compress consecutive references.

`sort&compress` Sort lists of cross-references, and compress sequences of consecutive references into a reference range (this is the default).

Occasionally, you may want to prevent a particular sequence of consecutive cross-references from being compressed to a reference range, without disabling this feature globally. To achieve this, you can separate the cross-references in the list by one or more empty references, at the point at which you want to prevent compression. For example,

```
\cref{eq1,eq2,eq3,,eq4}
```

will be typeset as

eqs. (1) to (3) and (4)

or

```
\cref{eq1,eq2,,eq3,eq4,eq5,,eq6,eq7,eq8}
```

will be typeset as

eqs. (1), (2), (3) to (5) and (6) to (8)

You can safely put an empty reference between cross-references that would never be compressed anyway; it will simply be ignored.

If lists of cross-references are also being sorted (the default), it can be a little confusing to work out where the empty reference should go in order to prevent compression of a particular consecutive sequence. It's best to think of the empty reference as being "attached" to the cross-reference preceding it. When the list is sorted, the empty reference will still appear after the same preceding reference, and will prevent it being compressed with any subsequent consecutive cross-references. In other words, an empty reference ensures that the preceding reference will appear explicitly in the final, typeset cross-reference:

```
\cref{eq3,,eq2,eq1,eq6,eq4,eq5}
```

will be typeset as

eqs. (1) to (3) and (4) to (6)

# 6 Options that Modify the Cross-Reference Format

## 6.1 Capitalising All Cross-Reference Names

`capitalise` Many authors prefer to always capitalise cross-reference names, regardless of where

they appear in the sentence, writing Theorem 1 and Equation 3 (as opposed to theorem 1 and equation 3). If you count yourself among this group, you can pass the `capitalise` option to the `cleveref` package (`capitalize` also works).

All the default cross-reference formats will then have the first letter capitalised, as will the automatically generated `\cref` variants (see Sections 7.1.2 and 7.2). (However, if you explicitly define a `\cref` variant to *not* be capitalised, `cleveref` will still honour your definition. In other words, you're responsible for defining the capitalisation correctly in your own format definitions.)

You should *still* use the `\Cref` variants at the beginning of sentences, for one thing, because abbreviations should not be used at the beginning of a sentence,[3] and for another, in case you later change your mind and remove the `capitalise` option.

## 6.2 Including Names in Hyperlink Targets

`nameinlink`

When using the `hyperref` package, `cleveref` automatically makes all cross-references into hyperlinks to the corresponding reference. By default, only the label itself forms part of the hyperlink target (i.e. the text you can click on to navigate to the cross-reference). The cross-reference name is not part of the hyperlink. By contrast, `hyperref`'s `\autoref` command *does* includes the name as part of the hyperlink. If you prefer to include the names in the hyperlinks when using `cleveref`, you can pass the `nameinlink` option to the `cleveref` package. (For even more control over the placement of the hyperlink target, use the commands for customising the cross-reference format. See Section 7.)

However, use of this option is discouraged on stylistic grounds. Firstly, when producing PDF output `hyperref` by default surrounds hyperlinks with red boxes, which looks particularly ugly when the entire cross-reference name is surrounded by a red box (though this unfortunate default can be changed using `hyperref` package options; see the `hyperref` documentation for details). Secondly, and more significantly, when using multi-references only the first reference in a group can include the cross-reference name as part of its hyperlink target, for obvious reasons. The hyperlink targets for the other references in the group will necessarily be just the labels. This makes for somewhat non-uniform typesetting of hyperlinks, with the first cross-reference in a multi-reference having a much larger hyperlink target than the others.

## 6.3 Avoiding Abbreviations in Cross-Reference Names

`noabbrev`

The default cross-reference names for some languages use common abbreviations for some of the names (e.g. in the default English format, `\cref{eq1}` will be typeset as `eq.~(1)`). Some authors may prefer to always use the full name, rather than an abbreviation (`equation~(1)` instead of `eq.~(1)`). To disable all use of abbreviations in the default cross-reference names, pass the `noabbrev` option to the `cleveref` package.

[3] At least in English; I'm not sure about other languages.

# 7 Customising the Cross-Reference Formats

The `cleveref` package allows you to take full control of the typesetting of cross-references, by allowing the formatting to be customised. Defaults appropriate for English documents are provided for the standard label types,[4] and support for a number of languages is provided via package options (see Section 7.3). But if you don't like the defaults, or are writing in a language that is not supported yet,[5] or you need to refer to something for which no default format is defined, then you can take charge and define your own formats.

If `cleveref` encounters a cross-reference to a type it does not know, it will produce a "reference type undefined" warning, and typeset the cross-reference as

**??** `\ref{`⟨*label*⟩`}`

i.e. the label counter preceded by a double question mark. The error message indicates the name of the unknown cross-reference type, which you will then probably want to define. (References to undefined labels still produce a "reference undefined" warning and appear as a double question mark, as usual.)

The cross-reference formats are usually constructed out of components: the cross-reference name (different for each type of cross-reference), the format for the label itself, and the conjunctions used in reference ranges and lists of multiple cross-references. There are two levels of customisation: you can either customise the components, or you can take full control and override the component-derived format entirely.

`cleveref` treats page references, as produced e.g. by `\cpageref`, as cross-references with the type "page". Therefore, all of the mechanisms for customising cross-references apply equally well to page references, simply by using "page" as the cross-reference type.

## 7.1 Customising the Cross-Reference Components

### 7.1.1 Global Customisation

The global customisation commands affect all cross-reference formats, unless they are overridden by lower-level customisation commands.

`\crefdefaultlabelformat` The format for the label counter itself can be customised globally using

`\crefdefaultlabelformat{`⟨*format*⟩`}`

The ⟨*format*⟩ argument can be any valid LaTeX code, though you will need to `\protect` fragile commands. It can (and almost certainly should!) contain three arguments, `#1`, `#2` and `#3`. The first argument is the formatted version of the

[4] For any pedantic classics scholars out there: "lemmas" is recognised as a valid plural form of "lemma" in all current versions of the Oxford English Dictionary. "Lemmata" was last heard in a mathematical debate that took place in a pub just around the corner from Hadrian's wall... a few years before the Romans pulled out of Britain. `Cleveref` might have "clever" in its name, but even that doesn't make it pretentious enough to use "lemmata" for the plural of "lemma".

[5] Any contributions of translations for missing languages are very welcome! See Section 14.12 for information on how to contribute translations.

label counter (e.g. `\theequation`). The other two are used to mark the beginning and end of the part of the cross-reference that should form the hyperlink when the `hyperref` package is used (see Section 11). For example, if you wanted to surround all labels with square brackets, without the square brackets themselves being part of the hyperlink, you would need:

```
\crefdefaultlabelformat{[#2#1#3]}
```

The hyperlink arguments `#2` and `#3` *must* appear in that order. (Leaving them out completely will not cause an error, but in that case no hyperlink will be created when `hyperref` is used, and there are better ways to achieve this. See Sections 4 and 11.)

Note that the default format for equation cross-references already overrides `\crefdefaultlabelformat` in order to surround the label by brackets, so the redefining `\crefdefaultlabelformat` will have no effect on equations. The label format for equations must be customised separately if you want to change it (see Section 7.1.2).

`\crefrangeconjunction`

The conjunction used in a reference range can be customised by defining `\crefrangeconjunction`:

```
\newcommand{\crefrangeconjunction}{⟨conjunction⟩}
```

It does not have to be an actual conjunction in the linguistic sense, e.g. it is perfectly reasonable to define it to be an endash "`--`". `\crefrangeconjunction` is used directly between the start and end references in a reference range, without any additional space surrounding it, e.g. `\crefrange{thm1}{thm2}` is typeset as

```
theorems~\ref{thm1}\crefrangeconjunction\ref{thm2}
```

so you may or may not want to include surrounding space, depending on the formatting you desire. For example,

```
\newcommand{\crefrangeconjunction}{ and~}
```

does require surrounding space, whereas

```
\newcommand{\crefrangeconjunction}{--}
```

does not.

`\crefrangepreconjunction`
`\crefrangepostconjunction`

There are two other "conjunction" commands available for customizing the formating for reference ranges. These are `\crefrangepreconjunction` and `\crefrangepostconjunction`, which insert text before the first label defining the range, and after the second label, respectively. For example, when these commands are defined, `\crefrange{thm1}{thm2}` is typeset as

```
theorems~\crefrangepreconjunction\ref{thm1}
  ➥ \crefrangeconjunction\ref{thm2}\crefrangepostconjunction
```

These commands are not used in the default English format definitions, but they are needed in some languages to correctly express a range. For example, the Italian format defines `\crefrangepreconjunction` to be "da", so that `\crefrange{thm1}{thm2}` produces

```
teorema da~\ref{thm1} a~\ref{thm2}
```

\crefpairconjunction
\crefmiddleconjunction
\creflastconjunction

The conjunctions used in lists of multiple cross-references can be customised by defining the commands \crefpairconjunction, \crefmiddleconjunction and \creflastconjunction:

```
\newcommand{\crefpairconjunction}{⟨conjunction⟩}
\newcommand{\crefmiddleconjunction}{⟨conjunction⟩}
\newcommand{\creflastconjunction}{⟨conjunction⟩}
```

\crefpairconjunction is used when there are only two cross-references in the list, \creflastconjunction is used between the penultimate and final cross-reference in a list of more than two, and \crefmiddleconjunction is used between all the others. Again, they do not have to be conjunctions in the linguistic sense, and the same considerations about surrounding space apply as in the case of \crefrangeconjunction. For example, the default definition of \crefmiddleconjunction is:

```
\newcommand{\crefmiddleconjunction}{, }
```

\crefpairgroupconjunction
\crefmiddlegroupconjunction
\creflastgroupconjunction

By default, the conjunctions used to separate sub-lists of different cross-reference types in a multi-reference are identical to those used to separate cross-references of the same type.[6] You can override this by defining the conjunction commands \crefpairgroupconjunction, \crefmiddlegroupconjunction and \creflastgroupconjunction.

For example,

```
\cref{eq1,eq2,eq3,thm1,thm2,fig1,thm3}
```

is typeset as

eqs. (1)\crefrangeconjunction(3)\crefmiddlegroupconjunction
theorems 1\crefpairconjunction2\crefmiddlegroupconjunction
fig. 1\creflastgroupconjunction{}theorem 3

### 7.1.2 Customising Individual Cross-Reference Types

\crefname
\Crefname

The cross-reference name for a given cross-reference type is customised using the \crefname and \Crefname commands:

```
\crefname{⟨type⟩}{⟨singular⟩}{⟨plural⟩}
\Crefname{⟨type⟩}{⟨singular⟩}{⟨plural⟩}
```

used by the \cref and \Cref commands, respectively. You must supply both ⟨*singular*⟩ and ⟨*plural*⟩ forms of the name. If the corresponding \Crefname is undefined when \crefname is called, it will automatically define \Crefname to be a

[6] More accurately, if you redefine \crefpairconjunction etc. in your preamble, \crefpairgroupconjunction etc. are automatically redefined so that they match. (In some languages, the default definition of \creflastgroupconjunction has an additional comma lacking in \creflastconjunction.)

capitalised version of `\crefname`, using `\MakeUppercase`. Conversely, if the corresponding `\crefname` is undefined when `\Crefname` is called, it will automatically define `\crefname` to be a lower-case version of `\Crefname`, using `\MakeLowercase`. Obviously, this will only work properly if the names begin with a letter. If the first letter is a special character construct, such as an accented character, you will need to surround it by braces. If the first thing in the name is *not* a letter at all (e.g. if it is a LaTeX command), you *must* define both capitalisation variants explicitly. Otherwise you will get strange and fatal errors when processing the document.

The cross-reference ⟨*type*⟩ is usually the name of the counter for the environment (equation, chapter, section, etc.). The exceptions are appendices, labels whose type has been overridden explicitly by supplying an optional argument (see Section 8), and theorem-like environments when the `ntheorem` of `amsthm` packages are loaded, for which ⟨*type*⟩ should instead be the environment name (lemma, corollary, definition, etc.) even when different environments are part of the same numbering sequence. (`ntheorem` and `amsthm` provide extra information about the environment when different theorem-like environments share a common counter, which `cleveref` makes use of to distinguish between them automatically.) In the case of appendices, the ⟨*type*⟩ is "appendix" for the top-level sectioning command (`\chapter` or `\section`, depending on the document class), "subappendix" for the sectioning command one level below (`\section` or `\subsection`), "subsubappendix" for the next level of sectioning command, etc.

For convenience, if they have not been otherwise customised by the end of the preamble, the cross-reference name (and label format) for `subsection` is by default inherited from that of `section`, and that of `subsubsection` is inherited from `subsection` (which might itself have been inherited from `section`). Similarly for `subappendix`, `subsubappendix` and `subsubsubappendix`, and also for `enumii`, `enumiii`, `enumiv` and `enumv`, which inherit from `enumi`. Finally, `subfigure` and `subtable` inherit from `figure` and `table`, respectively.

`\creflabelformat`

You may want the label format for a particular cross-reference type to differ from the global format set by `\crefdefaultlabelformat` (see Section 7.1.1). You can do this using

`\creflabelformat{`⟨*type*⟩`}{`⟨*format*⟩`}`

The ⟨*type*⟩ argument is the cross-reference type to customise, and the ⟨*format*⟩ argument defines the label format for cross-references of that type. As in the case of `\crefdefaultlabelformat`, the latter should contain the three arguments `#1`, `#2` and `#3`, the first being the formatted version of the label counter, the others determining the beginning and end of the portion that becomes a hyperlink when the `hyperref` package is loaded (see Section 11). `#2` and `#3` *must* appear in that order.

`\crefrangelabelformat`

Normally, the start and end references in a reference range are typeset using the usual label format (as defined by `\crefdefaultlabelformat` or `\creflabelformat`) separated by `\crefrangeconjunction` (Section 7.1.1). You can override this for a given cross-reference type using

`\crefrangelabelformat{`⟨*type*⟩`}{`⟨*format*⟩`}`

The ⟨*format*⟩ argument should contain six arguments: `#1`, `#2`, `#3`, `#4`, `#5`, `#6`. The first two (`#1` and `#2`) are the formatted versions of the two label counters defining the reference range. The next two (`#3` and `#4`) denote the beginning and end of the hyperlink for the first reference, the final two (`#5` and `#6`) the hyperlink for the second reference. The hyperlink arguments *must* appear in order. For example,

```
\crefrangelabelformat{equation}{(#3#1#4) to~(#5#2#6)}
```

### 7.1.3 Automatic `\newtheorem` Definitions

`\newtheorem` The standard LaTeX `\newtheorem` command for defining new theorem-like environments provides enough information to deduce a reasonable cross-reference name for the new environment. So `cleveref` automatically defines an appropriate cross-reference name for new theorem-like environments. This automatic definition is only used if no default definition is provided by `cleveref` itself, and if no `\crefname` or `\Crefname` definition is given explicitly (see Section 7.1.2).

The caveat with this automatic definition is that, although `\newtheorem` essentially provides the singular form of the cross-reference name, it doesn't provide the plural form. And there is no reliable way of constructing the plural form from the singular.[7] Therefore, if the plural form is ever required, `cleveref` will produce a "reference type undefined" warning, and typeset the cross-reference where the plural form is required as:

**??** `\ref{`⟨*label*⟩`}` ...

In this case, you will have to provide an explicit `\crefname` or `\Crefname` definition yourself, to define the plural form as well as the singular form.

## 7.2 Low-Level Customisation: Taking Full Control

If you need more precise control over the cross-reference format than is possible by customising the individual components, then you can take full control of the format for any given type, overriding the component-derived format entirely. The formats for single cross-references, reference ranges and multi-references are customised separately. If you only customise some of these, the other formats will be constructed from components, as usual.

Note that when deciding which cross-references should be grouped together for sorting and/or compressing, `cleveref` does something slightly more complicated than simply checking whether the reference types match. In fact, it checks whether the reference *formats* match.[8] This will always be the case for cross-references of the same type. But it could also be the case for cross-references that have different types, if the cross-reference formats happen to be identical.

[7] If you're a native English-speaker, you might think that just adding an 's' would work, though a moment's thought will provide examples of words where this will fail. If you're a non-English speaker, it probably won't even occur to you to claim that plurals can reliably be constructed automatically!

[8] To be precise, `cleveref` checks whether the `\crefformat` definitions match.

The reason for doing this is to allow cross-references to e.g. sections and subsections to be grouped together if they have identical formats. The default formats for the sectioning commands, figures and subfigures, tables and subtables, and enumerated lists are set up in this way. If you change any of them using the low-level customisation commands, but still want them to be grouped together, then you must ensure that the formats are *identical*. (It is *not* sufficient for the formats to produce identical typeset text; the format definitions must contain identical LaTeX code.)

Note that if you use the low-level customisation commands, you might still want to provide `\crefname` and `\Crefname` definitions too, so that the `\namecref` commands will work (see Section 4).

### 7.2.1 Single Cross-References

`\crefformat` `\Crefformat`

Cross-reference formats for *single* cross-references are defined or redefined using the `\crefformat` and `\Crefformat` commands, which are used by the `\cref` and `\Cref` commands respectively. These take two arguments: the cross-reference type, and the formatting code:

`\crefformat{`⟨*type*⟩`}{`⟨*format*⟩`}`
`\Crefformat{`⟨*type*⟩`}{`⟨*format*⟩`}`

The ⟨*type*⟩ is usually the name of the counter, except for labels whose type has been overridden explicitly (see Section 8), theorem-like environments when `ntheorem` or `amsthm` are loaded, in which case it is the environment name, and appendices. For the latter, the ⟨*type*⟩ is "appendix" for the top-level sectioning command (`\chapter` or `\section`, depending on the document class), "subappendix" for the sectioning command one level below (`\section` or `subsection`), "subsubappendix" for the next level of sectioning command, etc.

As in the case of the `\crefname` and `\Crefname` commands, if the corresponding `\Crefformat` is undefined when `\crefformat` is called, it will define the `\Crefformat` to produce a capitalised version of `\crefformat`, using `\MakeUppercase`. Conversely, if the corresponding `\crefformat` is undefined when `\Crefformat` is called, it will define the `\crefformat` to produce a lowercase version of `\Crefformat`, using `\MakeLowercase`. Obviously, this will only work properly if the format starts with a letter, and letter constructs (such as accented letter constructs) must be surrounded by braces (see Section 7.1.1).

The ⟨*format*⟩ argument can be any valid LaTeX code, though you will need to `\protect` fragile commands. It should contain three arguments, `#1`, `#2` and `#3`. The first argument is the formatted version of the label counter (e.g. `\theequation`). The other two are used to mark the beginning and end of the part of the cross-reference that forms the hyperlink when the `hyperref` package is used, and *must* appear in that order (see Section 11).

As an example,

```
\crefformat{equation}{Eq.~(#2#1#3)}
```

will typeset equation references as

Eq. (⟨*counter*⟩)

with the counter (excluding the brackets) forming the hyperlink.

Note that the hyperlink arguments are *not* letters, so if `#2` appears at the beginning of ⟨*format*⟩, `cleveref` will not be able to automatically define the other capitalisation variant automatically using `\MakeUppercase` or `\MakeLowercase`. In this case, you will have to define both variants separately. For example, if you wanted the "Eq." to be part of the hyperlink, you would have to explicitly define:

```
\crefformat{equation}{#2eq.~(#1)#3}
\Crefformat{equation}{#2Eq.~(#1)#3}
```

### 7.2.2 Reference Ranges

`\crefrangeformat` `\Crefrangeformat`

The format for reference ranges is defined by `\crefrangeformat` and `\Crefrangeformat`. Like `\creformat` and `\Crefformat`, the commands take two arguments: the cross-reference type, and the formatting code.

```
\crefrangeformat{⟨type⟩}{⟨format⟩}
\Crefrangeformat{⟨type⟩}{⟨format⟩}
```

The same comments apply as in the case of single cross-references: the ⟨*type*⟩ is usually the name of the counter, except for appendices, labels with explicitly overridden types, and theorem-like environments when `ntheorem` or `amsthm` are loaded. Again, if the other-capitalisation variant is not already defined, it will be defined automatically.

The ⟨*format*⟩ argument can again be any valid LaTeX code, with fragile commands `\protect`ed. However, this time it should contain *six* arguments, `#1`–`#6`. The first two (`#1` and `#2`) are the formatted versions of the label counters, the next two (`#3` and `#4`) are used to mark the beginning and end of the hyperlink for the first cross-reference, and the final two (`#5` and `#6`) mark the beginning and end of the second cross-reference's hyperlink.

As an example,

```
\crefrangeformat{equation}{eqs.~(#3#1#4) to~(#5#2#6)}
```

would typeset equation reference ranges as

eqs. (⟨*counter1*⟩) to (⟨*counter2*⟩)

with the counters (excluding the brackets) forming the hyperlinks.

### 7.2.3 Multiple Cross-References

`\crefmultiformat` `\Crefmultiformat` `\crefrangemultiformat` `\Crefrangemultiformat`

The format for multiple cross-references is defined by `\crefmultiformat` and `\Crefmultiformat`, and that of reference ranges within multiple cross-references by `\crefrangemultiformat` and `\Crefrangemultiformat`. Multi-references also require *all* the other cross-reference formats to be defined (see Sections 7.2.1 and 7.2.2), including the single reference range formats, even if you never use the `\crefrange` and `\Crefrange` commands.

The commands all take five arguments: the cross-reference type, the format for the first cross-reference in a list, the format for the second cross-reference in a list of two, the format for the middle cross-references in a list of more than two, and the format for the last cross-reference in a list of more than two.

```
\crefmultiformat{⟨type⟩}{⟨first⟩}{⟨second⟩}{⟨middle⟩}{⟨last⟩}
\Crefmultiformat{⟨type⟩}{⟨first⟩}{⟨second⟩}{⟨middle⟩}{⟨last⟩}
\crefrangemultiformat{⟨type⟩}{⟨first⟩}{⟨second⟩}{⟨middle⟩}{⟨last⟩}
\Crefrangemultiformat{⟨type⟩}{⟨first⟩}{⟨second⟩}{⟨middle⟩}{⟨last⟩}
```

The ⟨*type*⟩ is, as ever, the counter name, except for appendices, explicitly overridden label types, and theorem-like environments when the `ntheorem` or `amsthm` packages are loaded. The same considerations apply to the formatting arguments ⟨*first*⟩, ⟨*second*⟩, ⟨*middle*⟩ and ⟨*last*⟩ as for the ⟨*format*⟩ argument of `\crefformat` or `\crefrangeformat`, including the meaning of the arguments that should appear in the formatting code (`#1`, `#2` and `#3` for `\crefmultiformat` and `\Crefmultiformat`, `#1`–`#6` for `\crefmultiformat` and `\Crefmultiformat`). However, when the corresponding other-capitalisation variant is automatically defined, only the first letter of the ⟨*first*⟩ argument is upper- or lower-cased; the other arguments are defined to be identical for both variants.

Be careful to get the spaces at the beginning and end of the formatting code correct: the ⟨*first*⟩ and ⟨*second*⟩, or ⟨*first*⟩, ⟨*middle*⟩ and ⟨*last*⟩, LaTeX code is typeset one after another in a multi-reference, with no space separating them. You may or may not want spaces at the beginning and end of the formatting code, depending on the formatting you desire. For example, in the default equation format:

```
\crefmultiformat{equation}{eqs.~(#2#1#3)}%
  { and~(#2#1#3)}{, (#2#1#3)}{ and~(#2#1#3)}
```

the ⟨*middle*⟩ argument should *not* have a space at the beginning, whereas the ⟨*second*⟩ and ⟨*last*⟩ arguments *should* have a space.

### 7.2.4 Label Cross-References

If you define the format for a particular cross-reference type using the low-level customisation commands, and still want to use the `\labelcref` command to produce just the label part of the cross-reference, then you must also define the appropriate `\labelcref` formats for that type. This is done using the `\labelcrefformat`, `\labelcrefrangeformat`, `\labelcrefmultiformat` and `\labelcrefrangemultiformat` commands. Their syntax is identical to that of the corresponding `\crefformat`, `\crefrangmeformat`, `\crefmultiformat` or `\crefrangemultiformat` command. Typically, the `\labelcref` formats should be defined identically to the standard `\cref` formats, except for the ⟨*first*⟩ part, which should leave off the cross-reference name. This is not enforced, however.

## 7.3 Language and `babel` support

`cleveref` supports different languages via package options, in the usual way, though not all languages are supported yet.[9] The `babel` package is also supported when it is loaded, allowing you to change the language used in cross-references using the `babel` language switching commands, such as `\selectlanguage` and `\foreignlanguage`.

Note that, even when using `babel`, you still need to tell `cleveref` which language it should use for the default cross-reference formats. It is *not* sufficient to pass the language option to `babel` alone. You *must* also *either* pass the desired language option to the `cleveref` package directly when loading it:

```
\usepackage[⟨language⟩]{cleveref}
```

*or* specify the desired language globally as a document class option:

```
\documentclass[⟨language⟩]{⟨class⟩}
\usepackage{babel}
\usepackage{cleveref}
```

The latter method is strongly recommended. LaTeX automatically passes document class options to *every* loaded package. So specifying the language as a global option causes the appropriate language support to be enabled automatically in every package that supports it.

When writing multi-language documents, you may need to specify multiple language options in order to load `babel` support for all of them. In this case, `babel` sets the initial document language to the *last* language option. (See the `babel` documentation for more details.) `Cleveref` does the same: the last language in the option list determines the language for the initial cross-reference format definitions; all other language options are ignored by `cleveref`.

The `babel` support works by redefining the cross-reference names and conjunctions for the default cross-reference types. Any customisations you make to the default cross-reference names and conjunctions *in the preamble* apply to the main language (i.e. the last language listed in the options). A `\selectlanguage babel` command (or similar) in the document body will override these customisations, replacing them with the defaults for the newly selected language. If you later use `\selectlanguage` to switch back to the main language, any customisations from the preamble will be restored. If you want to customise cross-reference names or conjunctions for any language other than the main one, you either have to explicitly redefine them after every language switching command, or hook the redefinitions into `babel`'s language switching mechanism. (See Section 14.12 and the `babel` package documentation.)

If you have defined formats for new cross-reference types for which no defaults are provided, then you're on your own. `Cleveref` will not know how to redefine

[9] Contributions of translations for missing languages are very welcome! See Section 14.12 for information on how to contribute translations.

them for other languages, and again you will have to take care of it yourself, either by explicitly redefining them in your document after each language switch, or by hooking the redefinitions into `babel`'s language switching mechanism.

On the other hand, since the language switching commands only modify the cross-reference components, if you use the low-level customisation commands to take full control of the format for a particular cross-reference type, then (unless you're careful) you take it out of the control of `babel` entirely. If you want to use the low-level customisation commands, but *do* still want the language switching commands to work, then you have to use the component macros in your customised formats. The cross-reference names are stored in macros called `\cref@`⟨*type*⟩`@name`, `\Cref@`⟨*type*⟩`@name`, `\cref@`⟨*type*⟩`@name@plural`, and `\Cref@`⟨*type*⟩`@name@plural`.
(Note that since these macro names contain the "@" character, you must use `\makeatletter` and `\makeatother` to access them.)

For example, if you wanted to redefine the equation format so that the cross-reference name ("equation") was also part of the hyperlink, but you still want to be able to switch language using `babel`, you would need something like:

```
\makeatletter
\crefformat{equation}{#2\cref@equation@name~(#1)#3}
...
\makeatother
```

and similarly for `\crefrangeformat`, `\crefmultiformat`, `\Crefformat`, etc.

Note that if you define an empty cross-reference name for some type using an empty `\crefname`, e.g. for equations

```
\crefname{equation}{}{}
```

then the empty cross-reference name will be retained when switching languages. This is probably what you want anyway.

# 8 Overriding the Cross-Reference Type

`\label` As described previously, a label's "type" is usually determined by its counter, or in the case of `ntheorem` or `amsthm` theorem-like environments by the environment name. However, sometimes it is useful to override the type. `Cleveref` provides two different mechanisms for accomplishing this.

You can alias a counter to a different cross-reference type using the `\crefalias` command:

`\crefalias{`⟨*counter*⟩`}{`⟨*type*⟩`}`

⟨*counter*⟩ will then use the cross-reference formatting of ⟨*type*⟩. This can be useful if you want multiple counters to use the same cross-reference format.

Occasionally, you may want to override the cross-reference type for one particular label, one-off. You can do this by supplying the desired type as an optional argument to the `\label` command:

`\label[`⟨*type*⟩`]{`⟨*label*⟩`}`

One circumstance in which is useful is when you want to define a special cross-reference format for certain labels of a given type. By supplying a type that doesn't already exist as the optional argument to `\label`, you can then define the cross-reference format for that new type in whatever way you like, without affecting other cross-references of the same type. For example, if a particular equation contains multiple expressions and you want it to always be referred to in the plural, you could use:

```
\crefname{pluralequation}{eqs.}{eqs.}
...
\label[pluralequation]{eq1}
```

You can of course reuse this format for other plural equations, too.

If you need to do this frequently, it can become tedious specifying the label explicitly each time. An alternative is to use the `aliascnt` package. This lets you define one counter to be an alias for another, so that effectively the same counter has two names. Since `cleveref` determines the label type from the counter name, the two counter aliases can have different cross-reference formats whilst really being the same counter. You have to somehow arrange for the correct counter alias to be used depending on which cross-reference format you want (probably by defining two variants of the environment in question). But the effort involved might be worth the convenience of not having to remember to pass an explicit optional argument to a large number of labels.

You can use this trick to get different cross-reference formats for different theorem-like environments,[10] *without* using the `amsthm` or `ntheorem` package (although using one of those packages is a better solution if available). For example,

```
\usepackage{aliascnt}
\usepackage{cleveref}
\newaliascnt{lemma}{theorem}
\newtheorem{lemma}[lemma]{Lemma}
\aliascntresetthe{lemma}
\crefname{lemma}{lemma}{lemmas}
```

Note that `aliascnt` must be loaded before `cleveref`, and any `\newaliascnt` commands *must* come *after* `cleveref` has been loaded.

# 9 The `cleveref.cfg` File

If `cleveref` finds a `cleveref.cfg` file somewhere in the LaTeX search path, it automatically loads any definitions found in that file. (For details of which directories LaTeX searches, consult the documentation for your site's TeX installation.)

[10] This trick seems to belong to LaTeX mythology, and certainly isn't my own idea! But I haven't been able to definitively track down who originally came up with it.

The main use of `cleveref.cfg` is to store any cross-reference format customisations that you want to use in every document you write, so that you don't have to include them explicitly in every document's preamble.

# 10 Poor Man's `cleveref`

Sometimes you may need to send your LaTeX source to someone who can't or won't install the `cleveref` package themselves. For example, many academic journals accept papers in LaTeX format, but only support a small subset of the packages available on CTAN. The `poorman` option was designed specifically to help in this situation.

When the `poorman` option is supplied, your document will be processed as normal. But in addition, a `sed` script will automatically be written, containing rules for replacing all the `cleveref` commands with the LaTeX code that they would produce, and using the standard `\ref` command to produce the cross-references themselves. I.e. the script rewrites your document as you would have done if you had had to do it manually!

The advantage, of course, is that you *don't* have to do it manually. Instead, you can use all the features of `cleveref`, and once you've created a version of your document that you want to send elsewhere, you can process it through the `sed` script to completely remove the `cleveref` dependency. The recipient won't even realise you used `cleveref`!

The `sed` script is written to the same directory as the (main) LaTeX source file, and given the same name as that source file but with the extension `.sed`. To process your document through the script, all you need to do is run the following from your shell:

sed -f ⟨*name*⟩`.sed` ⟨*name*⟩`.tex` >⟨*newname*⟩`.tex`

where ⟨*name*⟩ is the name of the file containing your LaTeX source file minus the `.tex` extension, and ⟨*newname*⟩ is whatever you want to call the new version. *Do not* make ⟨*newname*⟩ the same as ⟨*name*⟩: it won't work. (It's in any case wise to keep the original LaTeX source file containing the `cleveref` commands, in case you need to produce an updated version of your document in the future. Think of the ⟨*newname*⟩`.tex` file in the same way as a `DVI` file: something you can always reproduce from the original source.)

If your document is composed of a number of separate LaTeX source files, combined with `\include` commands, only one `sed` script will be generated, but you will need to run *each* source file through that *same* script (and probably modify the `\include` commands to match the new file names). However, using `babel`'s language switching commands in a document split across multiple separate source files is beyond the capabilities of the `poorman` option. You will almost certainly need to manually tweak the `sed` script in that case.

Note that the `poorman` script cannot fully reproduce the typesetting of the original `cleveref` cross-references in all cases.[11] In particular, if you're using the

[11] At least, not without resorting to inserting low-level LaTeX code in your document, which

hyperref package (see Section 11) to turn cross-references into hyperlinks, any customisation of hyperlinks will be lost. And if you're using the varioref package (see Section 11), you may need to manually tweak the spacing in front of some of the varioref commands in the document produced by the sed script.

# 11 Interaction with Other Packages

The cleveref package *must* be loaded *after* all other packages that don't specifically support it,[12] i.e. the

```
\usepackage{cleveref}
```

line should usually be the last \usepackage command in your document's preamble.

cleveref tries as far as possible to minimise its impact on the standard LaTeX cross-referencing machinery, allowing it to work alongside many of the other packages that also enhance LaTeX's cross-referencing features, though it can occasionally interact badly with packages that redefine the same core LaTeX commands. Beyond peacefully co-existing with many packages, cleveref includes specific support for a number other packages, allowing it to integrate its clever cross-referencing features with the features provided by these packages: babel, hyperref, varioref, ntheorem, amsthm, aliascnt, subfig, algorithm, algorithm2e, listings.

cleveref implements a significantly enhanced version of the features found in the fancyref package, ntheorem's thref option, and varioref's \labelformat command. Although these features may (or may not) work correctly alongside cleveref, there is no good reason to use them when using cleveref, and their use is unsupported. (Note that varioref *is* fully supported by cleveref, just that cleveref's features supersede varioref's \labelformat feature. Similarly, ntheorem is fully supported and even recommended, only the thref option is superseded by cleveref.)

\thref
\vref
\Vref
\vrefrange
\Vrefrange
\fullref
\Fullref

In fact, if ntheorem is loaded with the thref option, cleveref redefines ntheorem's \thref command for you, to be an alias for \cref. Similarly, if varioref is loaded, cleveref redefines the \vref, \vrefrange, \fullref commands and variants to instead use the cleveref features for cross-reference formatting, whilst retaining all the varioref page-referencing magic. You can continue to use the other varioref and ntheorem commands (other than \labelformat and the thref option) whilst using cleveref, as long as cleveref is loaded *last*.

\vref*
\Vref*
\vrefrange*
\Vrefrange*
\fullref*
\Fullref*

Note that, whilst in the business of redefining the varioref commands, cleveref seizes the opportunity to get rid of the irritating spacing behaviour of the \vref and \Vref commands, instead making it consistent with the other cleveref cross-referencing commands. This also frees up the starred variants of

would somewhat defeat the purpose of the poorman option.

[12] At the time of writing, the only package I'm aware of that should be loaded after cleveref is the hypdvips package.

the varioref commands to be used for suppressing hyperlinks when the hyperref package is loaded, as usual. (Unfortunately, due to lack of support for this in varioref, the page references will still sometimes be hyperlinks, even when using the starred variants. Go bug the varioref maintainer about this if you don't like it.)

# 12 Known Bugs and Possible Improvements

## 12.1 Known Bugs, Non-Bugs, and Work-Arounds

In no particular order:

- If you are using both varioref and hyperref, *make sure you are loading them in the correct order*, otherwise cross-references will reference completely the wrong thing *without any warning in the LaTeX output or log!* The packages *must* be loaded in the following order: varioref, hyperref, cleveref.
- If you are using babel, you *must still* pass the appropriate language option to cleveref, as well as to babel. Passing it to babel alone is *not* sufficient (you will get the default English cross-reference formats). The best way to set the document language is as a global option in the \documentclass line.
- cleveref will not work properly with the standard LaTeX eqnarray environment. There is no intention to fix this. The eqnarray environment is poorly implemented, making it difficult to get it to work properly with cleveref. You're better off using the amsmath replacements in any case, such as gather, align, multline and split, which *do* work properly with cleveref. (See http://www.tug.org/pracjourn/2006-4/madsen/).
- cleveref can't cope with active characters being present in cross-reference label names. For example, if French babel support is loaded, the commonly used ":" in label names will often fail, spewing the usual random selection of mysterious TeX errors that accompany such deep-seated errors. The solution is to avoid using active characters in label names. (You may need to consult the babel documentation to discover which active characters are defined in your language.)
- When both the amsmath *and* hyperref packages are loaded at the same time, the cleveref cross-referencing commands do not work when used within section titles. If anyone can figure out why, let me know! As a work-around, use \ref within section titles when your document uses both amsmath and hyperref.
- When using varioref and hyperref with cleveref, the cleveref nameinlink option will not cause the word "page" in the page-reference part of a \vref (or other varioref) command to be included in the hyperlink, nor will the "on the previous page" (or similar) text produced by \vref

be hyperlinked. This is not strictly speaking a `cleveref` issue. It is the normal behaviour of the `hyperref`-enhanced version of `varioref`'s `\vpageref` command, which `cleveref` uses to produce the page references in its enhanced `\vref` command. (This *might* be improved in a future version by partially overriding `hyperref`.)

- `cleveref` doesn't know about the `subfloat` package, so you have to revert to using `\ref` for cross-references to sub-figures. (This will be fixed in a future version.)
- The `beamer` document class redefines the `\label` command in a particularly devious way that breaks `cleveref`'s optional argument to that command. (This will be fixed in a future version.)
- `cleveref` is incompatible with the `showonlyrefs` option of the `mathtools` package, though it should be compatible with the rest of `mathtools`. (This will be fixed in a future version.)
- `cleveref` doesn't include support for all languages yet. Please contribute translations for missing languages![13]
- `cleveref` assumes that counters are only ever reset by the standard sectioning commands (`\chapter`, `\section`, etc.). If this is not the case, the automatic compression of consecutive cross-references into a reference range may be incorrect. Making this more flexible would be a simple task, but so far there doesn't seem to be much need for it.
- The `poorman sed` script loses any custom `cleveref` hyperlink formatting you might have defined, and does not always reproduce the original spacing around the `varioref` commands when `varioref` is used. This is not a bug; it is a side-effect of the intended purpose of the `poorman` option. The philosophy behind `poorman` is to replace `cleveref`'s enhanced cross-referencing with standard LaTeX cross-reference commands that are guaranteed to work with any standard LaTeX installation. Although it would be simple to fix these "bugs", it's almost certainly impossible without using low-level LaTeX code that is unlikely to be supported by academic journals, for example, thereby defeating the whole purpose of the `poorman` option.

## 12.2 Possible New Features and Other Improvements

In no particular order:

- The `poorman` option could be enhanced to allow a choice of scripting language rather than just `sed` (e.g. `awk`, `perl`, ...?), but these are unlikely to be much better for those apt to complain about the use of `sed`. The portable option

[13] See Section 14.12 for information on how to contribute translations.

would be to output a TEX "script", but this would be *much* more work[14] than I'm prepared to invest.

# 13 Thanks

A number of people have helped improve `cleveref` by contributing code and translations. Thanks to Michael Ummels for contributing the `amsthm` support code, and to Stefan Pinnow, Gonzalo Medina, Massimo Redaelli, Philip Hölzenspies, Aleksander Gorohovski and Benjamin Høyer for contributing translations. Thanks also to Susanna Goldschmidt for additional help with the translations. Many people have suggested improvements or reported bugs, indeed many have put significant effort into helping investigate and fix them. So thanks (in alphabetical order) to: Alan Munn, Aleksander Gorohovski, Anand Deopurkar, Arne Meier, Bas Ploeger, Dan Luecking, David Gleich, Denis Bitouzé, Domenic Denicola, Donald Arseneau, Hendrik Maryns, Iain Cunningham, James Sharam, Jens Mueller, Joel C. Salomon, Joris Pinkse, Kristian Debrabant, Leo Shidai Liu, Lev Bishop, Mak Trifkovic, Matej Batic, Matt Gately, Matthew Skala, Michael Barber, Michael Gorven, Michal Kaut, Mico Loretan, Olivier Roy, Patrick Häcker, Paul Gomme, Ricardo de Aldama Sánchez, Robert Fischer, Stefan Pinnow, Ted Pavlic, Thomas Arildsen, and Uwe Lück for their help. (If I missed you out, please let me know!)

[14] LATEX *really* isn't suited to that kind of pattern matching task – just take a look at the code for escaping regexp special characters in this package!

# 14 Implementation

Essentially, the core of the implementation consists of causing an extra piece of information — the label "type" — to be written to the `aux` file, and defining `\cref` commands which use this extra information to typeset the cross-reference.

The least invasive previous implementation of this kind of thing seems to be that used by the `varioref` package. Namely, to redefine the `\refstepcounter` command so that the `\@currentlabel` macro, which usually just contains the typeset version of the counter, now contains the additional type information.

However, even less invasive than `varioref`'s implementation is to leave `\@currentlabel` alone, and define a new `\cref@currentlabel` macro to hold the extra information. (In fact, we store three extra pieces of information: the type, the counter value itself, and the value of the counter that causes the label's counter to be reset, which we call the "prefix" from now on.) The standard `\@currentlabel` contents eventually get written to the `aux` file as an argument to `\newlabel` by the usual LaTeX label mechanisms. In order to also get the information in `\cref@currentlabel` into the `aux` file, we have to redefine the `\label` macro so that it writes *two* `\newlabel` lines to the `aux` file for *each* label: the standard one, plus an additional one which contains the extra information in `\cref@currentlabel`. The additional `\newlabel` line has the suffix `@cref` added to the label name. Thus the extra information in `\cref@currentlabel` will end up in `\r@`⟨*label*⟩`@cref` when the `aux` file is re-read on the next pass.

Doing things this way involves less hacking to get everything else working again, since the standard cross-reference mechanism and `\ref` command are left entirely intact. `Cleveref` can then do what it likes with its own parallel set of labels, without getting in the way of other packages that play around with the cross-reference mechanism. The only downside is the additional memory resources this uses, but on modern TeX implementations this is unlikely to be a problem.

## 14.1 Redefinitions of LaTeX Kernel Macros

`\refstepcounter`
`\cref@currentlabel`
`\cref@old@refstepcounter`

We store the original `\refstepcounter` in `\cref@old@refstepcounter`, then redefine `\refstepcounter` so that it first calls the old version to define the standard `\@currentlabel` macro, before defining `cleveref`'s `\cref@currentlabel`, which contains the extra information. The cross-reference "type" stored in `\ref@currentlabel` is usually inferred from the counter. This can be overridden by aliasing the counter name to a different type using `\crefalias`. The new `\refstepcounter` can also take an optional argument, which always overrides the type.

```
\def\cref@currentlabel{}
\let\cref@old@refstepcounter\refstepcounter
\def\refstepcounter{%
  \@ifnextchar[{\refstepcounter@optarg}{\refstepcounter@noarg}%]
}
\def\refstepcounter@noarg#1{%
  \cref@old@refstepcounter{#1}%
```

```
  \cref@constructprefix{#1}{\cref@result}%
  \@ifundefined{cref@#1@alias}%
    {\def\@tempa{#1}}%
    {\def\@tempa{\csname cref@#1@alias\endcsname}}%
  \protected@edef\cref@currentlabel{%
    [\@tempa][\arabic{#1}][\cref@result]%
    \csname p@#1\endcsname\csname the#1\endcsname}}
\def\refstepcounter@optarg[#1]#2{%
  \cref@old@refstepcounter{#2}%
  \cref@constructprefix{#2}{\cref@result}%
  \protected@edef\cref@currentlabel{%
    [#1][\arabic{#2}][\cref@result]%
    \csname p@#2\endcsname\csname the#2\endcsname}}
```

`\label` `\cref@label` `\label@optarg` `\label@noarg`

We redefine the `\label` command to make it define *two* labels each time it's called: the standard one, and an additional `cleveref`-specific one with the suffix `@cref` added to the label name, which contains the extra information from `\ref@currentlabel`. We call the original `\label` command, stored in `\cref@old@label`, to write the standard label to the `aux` file. However, to avoid other packages messing around with the content of the parallel set of `cleveref`-specific labels, we write those directly to the `aux` file ourselves. We also allow `\label` to take an optional argument which overrides the default reference type in `\cref@currentlabel`.

The redefinition of `\label` has to be postponed until the beginning of the document because some other packages postpone their own `\label` redefinitions too, and we need to override their redefinitions.

```
\AtBeginDocument{%
  \let\cref@old@label\label
  \def\label{\@ifnextchar[\label@optarg\label@noarg}%]
  \let\cref@label\label
  \def\label@noarg#1{%
    \@bsphack%
    \cref@old@label{#1}%
    \protected@write\@auxout{}%
      {\string\newlabel{#1@cref}{{\cref@currentlabel}{\thepage}}}%
    \@esphack}%
  \def\label@optarg[#1]#2{%
    \@bsphack%
    \cref@old@label{#2}%
    \protected@edef\cref@currentlabel{%
      \expandafter\cref@override@label@type%
        \cref@currentlabel\@nil{#1}}%
    \protected@write\@auxout{}%
      {\string\newlabel{#2@cref}{{\cref@currentlabel}{\thepage}}}%
    \@esphack}
}% end of AtBeginDocument
```

`\@makefntext`

Footnotes don't use the `\refstepcounter` mechanism, but instead set `\@currentlabel` directly inside the footnote insertion item. Thus we need to

explicitly set \cref@currentlabel in footnotes. To avoid the definition spilling out of the footnote, we need to set it inside \insert's implicit insertion item grouping level. To this end, we add the explicit \cref@currentlabel redefinition to \@makefntext, which gets called from within \insert by both \@footnotetext and \@mpfootnotentext.

```
\let\cref@old@makefntext\@makefntext
\long\def\@makefntext#1{%
  \cref@constructprefix{footnote}{\cref@result}%
  \protected@edef\cref@currentlabel{%
    [footnote][\arabic{footnote}][\cref@result]%
    \p@footnote\@thefnmark}%
  \cref@old@makefntext{#1}}
```

\newtheorem A \newtheorem command provides sufficient information to automatically define a reasonable cross-reference name for theorem-like environments (ntheorem's thmref does essentially this). So we modify \newtheorem (actually, the lower-level \@othm, \@xnthm and \@ynthm macros) so that it does so. We do this in such a way that default definitions or explicit \crefname definitions for theorem-like environments override those produced automatically by our modified \newtheorem.

The catch is that, although the \newtheorem command provides the singular form, there's no way of reliably deducing the plural form from this. Rather than implement some half-baked attempt at this which will be wrong more often than it's right (especially in languages other than English) and generally cause more trouble than it's worth, we simply define the singular form but leave the plural form undefined. If the latter is ever needed, it will produce a "undefined cross-reference type" warning, prompting the author to provide an appropriate \crefname definition themselves.

\@othm \@xnthm \@ynthm After sorting out its arguments, \newtheorem calls one of \@othm, \@xthm or \@ythm. We add automatic definitions of \cref@⟨*type*⟩@name and \Cref@⟨*type*⟩@name to all three of these, and add the theorem-like environment to the list of cross-reference types that need to be defined from components at \begin{document}. Since we want explicit \crefname's to override these automatic definitions, we store the definitions in \cref@⟨*type*⟩@name@preamble, which are processed at \begin{document}) if they haven't been overridden. The default definitions also get stored in \cref@⟨*type*⟩@name@preamble later on, so they too will override these automatic definitions, which is what we want.

All this means that these automatic \newtheorem definitions will only work when \newtheorem is used in the preamble. However, this is also true of (new) cross-reference types defined using \crefname, so it doesn't seem worth the significant effort of getting the automatic definitions to work within the document body.

```
\let\cref@old@othm\@othm
\def\@othm#1[#2]#3{%
  \edef\@tempa{\expandafter\noexpand%
    \csname cref@#1@name@preamble\endcsname}%
  \edef\@tempb{\expandafter\noexpand%
```

```
      \csname Cref@#1@name@preamble\endcsname}%
  \def\@tempc{#3}%
  \ifx\@tempc\@empty\relax%
    \expandafter\gdef\@tempa{}%
    \expandafter\gdef\@tempb{}%
  \else%
    \if@cref@capitalise%
      \expandafter\expandafter\expandafter\gdef\expandafter%
        \@tempa\expandafter{\MakeUppercase #3}%
    \else%
      \expandafter\expandafter\expandafter\gdef\expandafter%
        \@tempa\expandafter{\MakeLowercase #3}%
    \fi%
    \expandafter\expandafter\expandafter\gdef\expandafter%
      \@tempb\expandafter{\MakeUppercase #3}%
  \fi%
  \cref@stack@add{#1}{\cref@label@types}%
  \cref@old@othm{#1}[#2]{#3}}
\let\cref@old@xnthm\@xnthm
\def\@xnthm#1#2[#3]{%
  \edef\@tempa{\expandafter\noexpand%
    \csname cref@#1@name@preamble\endcsname}%
  \edef\@tempb{\expandafter\noexpand%
      \csname Cref@#1@name@preamble\endcsname}%
  \def\@tempc{#2}%
  \ifx\@tempc\@empty\relax%
    \expandafter\gdef\@tempa{}%
    \expandafter\gdef\@tempb{}%
  \else%
    \if@cref@capitalise%
      \expandafter\expandafter\expandafter\gdef\expandafter%
        \@tempa\expandafter{\MakeUppercase #2}%
    \else%
      \expandafter\expandafter\expandafter\gdef\expandafter%
        \@tempa\expandafter{\MakeLowercase #2}%
    \fi%
    \expandafter\expandafter\expandafter\gdef\expandafter%
      \@tempb\expandafter{\MakeUppercase #2}%
  \fi%
  \cref@stack@add{#1}{\cref@label@types}%
  \cref@old@xnthm{#1}{#2}[#3]}
\let\cref@old@ynthm\@ynthm
\def\@ynthm#1#2{%
  \edef\@tempa{\expandafter\noexpand%
    \csname cref@#1@name@preamble\endcsname}%
  \edef\@tempb{\expandafter\noexpand%
      \csname Cref@#1@name@preamble\endcsname}%
  \def\@tempc{#2}%
  \ifx\@tempc\@empty\relax%
    \expandafter\gdef\@tempa{}%
```

```
    \expandafter\gdef\@tempb{}%
  \else%
    \if@cref@capitalise%
      \expandafter\expandafter\expandafter\gdef\expandafter%
        \@tempa\expandafter{\MakeUppercase #2}%
    \else%
      \expandafter\expandafter\expandafter\gdef\expandafter%
        \@tempa\expandafter{\MakeLowercase #2}%
    \fi%
    \expandafter\expandafter\expandafter\gdef\expandafter%
      \@tempb\expandafter{\MakeUppercase #2}%
  \fi%
  \cref@stack@add{#1}{\cref@label@types}%
  \cref@old@ynthm{#1}{#2}}
```

\appendix
\cref@old@appendix

The \appendix command causes the top-level sectioning commands (\chapter or \section, depending on the document class) to produce appendices instead. Since we want to be able to format references to appendices separately from references to normal top-level sections, we add to the tasks that \appendix does: it redefines \refstepcounter@noarg to exceptionally override the label type for chapters or sections, as appropriate, setting it to "appendix" instead. There are two alternative definitions: one if "section" is the top-level sectioning command, and one if "chapter" fulfils that role.

```
\@ifundefined{appendix}{}{%
  \let\cref@old@appendix\appendix
  \renewcommand\appendix{%
    \cref@old@appendix%
    \@ifundefined{chapter}{%
      \gdef\refstepcounter@noarg##1{%
        \cref@old@refstepcounter{##1}%
        \cref@constructprefix{##1}{\cref@result}%
```

We add a large value to the front of the counter data, to force references to anything in appendices to be sorted after everything else.

```
        \ifx\cref@result\@empty%
          \def\cref@result{2147483647}%
        \else%
          \edef\cref@result{2147483647,\cref@result}%
        \fi%
```

Override the cross-reference type of sectioning commands.

```
        \def\@tempa{##1}%
        \def\@tempb{section}%
        \ifx\@tempa\@tempb%
          \protected@edef\cref@currentlabel{%
            [appendix][\arabic{##1}][\cref@result]%
            \csname p@##1\endcsname\csname the##1\endcsname}%
        \else%
          \def\@tempa{##1}%
          \def\@tempb{subsection}%
```

```
      \ifx\@tempa\@tempb%
        \protected@edef\cref@currentlabel{%
          [subappendix][\arabic{##1}][\cref@result]%
          \csname p@##1\endcsname\csname the##1\endcsname}%
      \else%
        \def\@tempa{##1}%
        \def\@tempb{subsubsection}%
        \ifx\@tempa\@tempb%
          \protected@edef\cref@currentlabel{%
            [subsubappendix][\arabic{##1}][\cref@result]%
            \csname p@##1\endcsname\csname the##1\endcsname}%
        \else%
          \@ifundefined{cref@##1@alias}%
            {\def\@tempa{##1}}%
            {\def\@tempa{\csname cref@##1@alias\endcsname}}%
          \protected@edef\cref@currentlabel{%
            [\@tempa][\arabic{##1}][\cref@result]%
            \csname p@##1\endcsname\csname the##1\endcsname}
        \fi%
      \fi%
    \fi}%
  }{%
    \def\refstepcounter@noarg##1{%
      \cref@old@refstepcounter{##1}%
      \cref@constructprefix{##1}{\cref@result}%
```

Again, the large value added to the front of the counter data forces references to appendix items to be sorted last.

```
      \ifx\cref@result\@empty%
        \def\cref@result{2147483647}%
      \else%
        \edef\cref@result{2147483647,\cref@result}%
      \fi%
```

Override the cross-reference type of sectioning commands.

```
      \def\@tempa{##1}%
      \def\@tempb{chapter}%
      \ifx\@tempa\@tempb%
        \protected@edef\cref@currentlabel{%
          [appendix][\arabic{##1}][\cref@result]%
          \csname p@##1\endcsname\csname the##1\endcsname}%
      \else%
        \def\@tempa{##1}%
        \def\@tempb{section}%
        \ifx\@tempa\@tempb%
          \protected@edef\cref@currentlabel{%
            [subappendix][\arabic{##1}][\cref@result]%
            \csname p@##1\endcsname\csname the##1\endcsname}%
        \else%
          \def\@tempa{##1}%
          \def\@tempb{subsection}%
```

```
            \ifx\@tempa\@tempb%
              \protected@edef\cref@currentlabel{%
                [subsubappendix][\arabic{##1}][\cref@result]%
                \csname p@##1\endcsname\csname the##1\endcsname}%
            \else%
              \def\@tempa{##1}%
              \def\@tempb{subsubsection}%
              \ifx\@tempa\@tempb%
                \protected@edef\cref@currentlabel{%
                  [subsubsubappendix][\arabic{##1}][\cref@result]%
                  \csname p@##1\endcsname\csname the##1\endcsname}%
              \else%
                \@ifundefined{cref@##1@alias}%
                  {\def\@tempa{##1}}%
                  {\def\@tempa{\csname cref@##1@alias\endcsname}}%
                \protected@edef\cref@currentlabel{%
                  [\@tempa][\arabic{##1}][\cref@result]%
                  \csname p@##1\endcsname\csname the##1\endcsname}
              \fi%
            \fi%
          \fi%
        \fi}%
    }%
  }%
}% end of \@ifundefined{appendix}
```

## 14.2 Utility Macros

### 14.2.1 miscellaneous

`\@gobble@optarg` A basic macro that gobbles one argument plus, if present, one optional argument.

```
\def\@gobble@optarg{\@ifnextchar[\@@gobble@optarg\@gobble@orig}%]
\def\@gobble@orig#1{}
\def\@@gobble@optarg[#1]#2{}
```

`\cref@append@toks` A basic utility macro for appending tokens to a token register.

```
\def\cref@append@toks#1#2{\toks0={#2}%
  \edef\act{\noexpand#1={\the#1\the\toks0}}%
  \act}%
```

### 14.2.2 aux file information

`\cref@getlabel` `\cref@gettype` `\cref@getcounter` `\cref@getprefix` Define some utility macros for extracting label, type, and counter information from the contents of `\cref@currentlabel`, as written to the `aux` file and stored in `\r@`⟨*label*⟩`@cref` when this is re-read on the next pass. Some other packages commandeer the referencing system to write label information to the `aux` file for other purposes, and probably use `\ref` to recover it later. We still want them to work, so our utility macros must cope with the type information being absent. However, since we need them to be fully expandable in various places,

and `\@ifnextchar` is definitely *not* fully expandable, we use the work-around of having the macros store their result in another macro, whose name is passed as the second argument. This other macro *will* then be fully expandable, and can be used e.g. inside an `\edef` or `\csname`...`\endcsname`.

```
\def\cref@getref#1#2{%
  \expandafter\let\expandafter#2\csname r@#1@cref\endcsname%
  \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter#2%
    \expandafter\expandafter\expandafter{%
      \expandafter\@firstoftwo#2}}
\def\cref@getpageref#1#2{%
  \expandafter\let\expandafter#2\csname r@#1@cref\endcsname%
  \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter#2%
    \expandafter\expandafter\expandafter{%
      \expandafter\@secondoftwo#2}}
\def\cref@getlabel#1#2{%
  \cref@getref{#1}{\@tempa}%
  \expandafter\@cref@getlabel\@tempa\@nil#2}%
\def\@cref@getlabel{\@ifnextchar[%]
  \@@cref@getlabel{\@@cref@getlabel[][][]}}
\def\@@cref@getlabel[#1][#2][#3]#4\@nil#5{\def#5{#4}}
\def\cref@gettype#1#2{%
  \cref@getref{#1}{\@tempa}%
  \expandafter\@cref@gettype\@tempa\@nil#2}%
\def\@cref@gettype{\@ifnextchar[%]
  \@@cref@gettype{\@@cref@gettype[][][]}}
\def\@@cref@gettype[#1][#2][#3]#4\@nil#5{\def#5{#1}}
\def\cref@getcounter#1#2{%
  \cref@getref{#1}{\@tempa}%
  \expandafter\@cref@getcounter\@tempa\@nil#2}
\def\@cref@getcounter{\@ifnextchar[%]
  \@@cref@getcounter{\@@cref@getcounter[][][]}}
\def\@@cref@getcounter[#1][#2][#3]#4\@nil#5{\def#5{#2}}
\def\cref@getprefix#1#2{%
  \cref@getref{#1}{\@tempa}%
  \expandafter\@cref@getprefix\@tempa\@nil#2}
\def\@cref@getprefix{\@ifnextchar[%]
  \@@cref@getprefix{\@@cref@getprefix[][][]}}
\def\@@cref@getprefix[#1][#2][#3]#4\@nil#5{\def#5{#3}}
```

`\cref@override@label@type` is a convenience macro for overriding the label type stored in `\cref@currentlabel`.

`\cref@override@label@type`

```
\def\cref@override@label@type[#1][#2][#3]#4\@nil#5{[#5][#2][#3]#4}
```

`\cref@constructprefix` The `\cref@constructprefix` macro constructs the prefix information stored in `\cref@currentlabel` (retrieved using `\cref@getprefix`). This information con-

sists of the numerical value of each counter that's involved in resetting the label's counter, i.e. it contains the numerical values of the chapter, section, subsection... numbers that (ought to) make up the formatted label produced by `\the`⟨*counter*⟩. E.g. if `\theequation` produces "B.1.3", this utility macro will return "2,1" (the "3" corresponds to the equation number itself, which is stored separately in `\cref@currentlabel`). The first argument is the counter in question; the return value is stored in the second argument, which should be a macro name.

The real work is done by the recursive `\@cref@constructprefix` macro, which works its way upwards through the counters' reset lists until it reaches a counter that isn't reset by any other.

```
\def\cref@constructprefix#1#2{%
  \cref@stack@init{\@tempstack}%
```

We fully expand the first argument (the counter name) because sometimes a counter name containing a macro gets passed to us.

```
  \edef\@tempa{\noexpand{#1\noexpand}}%
  \expandafter\def\expandafter\@tempa\expandafter{\@tempa{#2}}%
  \expandafter\@cref@constructprefix\@tempa%
  \cref@stack@to@list{\@tempstack}{\@tempa}%
  \expandafter\def\expandafter#2\expandafter{\@tempa}}
\def\@cref@constructprefix#1#2{%
  \cref@resetby{#1}{#2}%
  \ifx#2\relax%
  \else%
    \edef\@tempa{\the\csname c@#2\endcsname}%
    \expandafter\cref@stack@push\expandafter{\@tempa}{\@tempstack}%
    \edef\@tempa{{#2}}%
    \expandafter\expandafter\expandafter\@cref@constructprefix%
      \expandafter\@tempa\expandafter{\expandafter#2\expandafter}%
  \fi}
```

### 14.2.3 Stack data structures

`\cref@stack@init` `\cref@stack@top` `\cref@stack@pop` `\cref@stack@push` `\cref@stack@topandbottom` `\cref@stack@add` `\cref@stack@to@list`

We treat multiple references, supplied as a comma-separated list to `\cref` or `\Cref`, as a stack structure. So we define some utility macros for manipulating stacks (`\@nil` is used as an end-of-stack delimiter).

```
\def\cref@stack@init#1{\def#1{\@nil}}
\def\cref@stack@top#1{\expandafter\@cref@stack@top#1}
\def\@cref@stack@top#1,#2\@nil{#1}
\def\cref@stack@pop#1{\expandafter\@cref@stack@pop#1#1}
\def\@cref@stack@pop#1,#2\@nil#3{\def#3{#2\@nil}}
\def\cref@stack@push#1#2{%
  \expandafter\@cref@stack@push\expandafter{#2}{#1}{#2}}
\def\@cref@stack@push#1#2#3{\def#3{#2,#1}}
\def\cref@stack@pull#1#2{\expandafter\@cref@stack@pull#2{#1}{#2}}
\def\@cref@stack@pull#1\@nil#2#3{\def#3{#1#2,\@nil}}
\def\cref@stack@to@list#1#2{%
```

```
  \cref@isstackfull{#1}%
  \if@cref@stackfull%
    \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter#2%
    \expandafter\expandafter\expandafter{%
      \expandafter\@cref@stack@to@list#1}%
  \else%
    \def#2{}%
  \fi}
\def\@cref@stack@to@list#1,\@nil{#1}
\def\cref@stack@topandbottom#1#2#3{%
  \def#2{}%
  \def#3{}%
  \cref@isstackfull{#1}%
  \if@cref@stackfull%
    \edef#2{\cref@stack@top{#1}}%
    \cref@stack@pop{#1}%
    \cref@isstackfull{#1}%
    \@whilesw\if@cref@stackfull\fi{%
      \edef#3{\cref@stack@top{#1}}%
      \cref@stack@pop{#1}%
      \cref@isstackfull{#1}}%
  \fi}
\def\cref@stack@add#1#2{%
  \begingroup%
    \def\@arg1{#1}%
    \let\@tempstack#2%
    \newif\if@notthere%
    \@nottheretrue%
    \cref@isstackfull{\@tempstack}%
    \@whilesw\if@cref@stackfull\fi{%
      \edef\@tempb{\cref@stack@top{\@tempstack}}%
      \def\@tempa{#1}%
      \ifx\@tempa\@tempb%
        \@cref@stackfullfalse%
        \@nottherefalse%
      \else%
        \cref@stack@pop{\@tempstack}%
        \cref@isstackfull{\@tempstack}%
      \fi}%
  \expandafter\endgroup%
  \if@notthere\cref@stack@push{#1}{#2}\fi}
```

`\if@cref@stackempty` `\if@cref@stackfull` `\cref@isstackempty` `\cref@isstackfull`

The `\cref@isstackempty` and `\cref@isstackfull` macros test whether a stack is empty or full, respectively, and set the corresponding conditionals `\if@cref@stackempty` and `\if@cref@stackfull`.

```
\newif\if@cref@stackempty
\newif\if@cref@stackfull
\def\cref@isstackempty#1{%
  \def\@tempa{\@nil}%
```

```
  \ifx#1\@tempa\@cref@stackemptytrue%
  \else\@cref@stackemptyfalse\fi}
\def\cref@isstackfull#1{%
  \def\@tempa{\@nil}%
  \ifx#1\@tempa\@cref@stackfullfalse%
  \else\@cref@stackfulltrue\fi}
```

`\cref@stack@sort` The `\cref@stack@sort` macro sorts a stack, using the comparison macro passed in the second argument, which we use later to sort lists of references. We use insertion sort despite its $O(n^2)$ scaling because it's simpler to code, and because we're very unlikely to encounter lists of more than ten or so references, so in practice a more complicated $O(n \log n)$ sorting algorithm will very likely be slower anyway in practice.

```
\def\cref@stack@sort#1#2{%
  \begingroup%
  \cref@stack@init{\@sortstack}%
```

Push first element into sorted stack.

```
  \edef\@element{\cref@stack@top{#1}}%
  \expandafter\cref@stack@push\expandafter{\@element}{\@sortstack}%
  \cref@stack@pop{#1}%
```

If empty elements follow first one, need to add them after it in sorted stack.

```
  \cref@isstackfull{#1}%
  \if@cref@stackfull%
    \edef\@tempa{\cref@stack@top{#1}}%
    \@whilesw\ifx\@tempa\@empty\fi{%
      \cref@stack@pull{}{\@sortstack}%
      \cref@stack@pop{#1}%
      \cref@isstackempty{#1}%
      \if@cref@stackempty%
        \let\@tempa\relax%
      \else%
        \edef\@tempa{\cref@stack@top{#1}}%
      \fi}%
  \fi%
```

Process elements from stack.

```
  \cref@isstackfull{#1}%
  \@whilesw\if@cref@stackfull\fi{%
    \edef\@element{\cref@stack@top{#1}}%
    \cref@stack@pop{#1}%
```

If empty elements follow current one, need to add them to sorted stack, right after element we're currently dealing with.

```
    \def\@empties{}%
    \cref@isstackfull{#1}%
    \if@cref@stackfull%
      \edef\@tempa{\cref@stack@top{#1}}%
      \@whilesw\ifx\@tempa\@empty\fi{%
        \edef\@empties{\@empties,}%
```

```
        \cref@stack@pop{#1}%
        \cref@isstackempty{#1}%
        \if@cref@stackempty%
          \let\@tempa\relax%
        \else%
          \edef\@tempa{\cref@stack@top{#1}}%
        \fi}%
    \fi%
```

Insert current element into sorted stack, appending any following empty elements.

```
    \edef\@tempa{{\expandafter\noexpand\@element}%
      {\expandafter\noexpand\@empties}%
      {\noexpand\@sortstack}{\noexpand#2}}%
    \expandafter\cref@stack@insert\@tempa%
    \cref@isstackfull{#1}}%
  \expandafter\endgroup\expandafter%
  \def\expandafter#1\expandafter{\@sortstack}}
```

`\cref@stack@insert` `\cref@stack@insert{#1}{#2}{#3}{#4}` inserts `#1` into the appropriate location in the sorted stack `#3` (appending `#2` onto the end of `#1` when it's inserted), using the comparison macro `#4`.

```
\def\cref@stack@insert#1#2#3#4{%
  \let\@cmp#4%
  \@cref@stack@insert{}{#1}{#2}{#3}%
  \cref@stack@pop{#3}}
```

`\@cref@stack@insert` `\@cref@stack@insert{#1}{#2}{#3}{#4}` prepends `#1` to the stack resulting from inserting `#2` (with `#3` appended to it) into the sorted stack `#4`.

```
\def\@cref@stack@insert#1#2#3#4{%
  \let\cref@iterate\relax%
  \cref@isstackempty{#4}%
  \if@cref@stackempty%
    \cref@stack@push{#1,#2#3}{#4}%
  \else%
    \edef\cref@elem{\cref@stack@top{#4}}%
    \expandafter\@cmp\expandafter{\cref@elem}{#2}{\cref@result}%
    \ifnum\cref@result=2\relax%
      \cref@stack@push{#1,#2#3}{#4}%
    \else%
      \cref@stack@pop{#4}%
      \edef\cref@elem{{\noexpand#1,\cref@elem}{\noexpand#2}%
        {\noexpand#3}{\noexpand#4}}%
      \expandafter\def\expandafter\cref@iterate\expandafter%
        {\expandafter\@cref@stack@insert\cref@elem}%
    \fi%
  \fi%
  \cref@iterate}
```

### 14.2.4 Sorting and comparison of counters

\cref@countercmp The \cref@countercmp macro compares two references according to their respective sets of counter data, as returned by \cref@getcounter. It \chardef's its third argument to 0 if they're equal, 1 if the first comes earlier than the second, or 2 if the first comes later than the second. This is used later for sorting references.

```
\def\cref@counter@first#1#2\@nil{#1}
\def\cref@counter@rest#1#2\@nil{#2}
\def\cref@countercmp#1#2#3{%
  \begingroup%
  \def\@tempa{#1}%
```

In order to ensure empty references end up in the right place when sorting lists of multiple references, we make the comparison macro sort them before a non-empty reference.

```
  \ifx\@tempa\@empty%
    \def\cref@result{1}%
  \else%
    \def\@tempa{#2}%
    \ifx\@tempa\@empty%
      \def\cref@result{2}%
    \else%
```

Conversely, undefined references come after everything else.

```
      \expandafter\ifx\csname r@#1@cref\endcsname\relax%
        \def\cref@result{2}%
      \else%
        \expandafter\ifx\csname r@#2@cref\endcsname\relax%
          \def\cref@result{1}%
        \else%
```

The real work of comparing two references is done by \@cref@countercmp.

```
          \cref@getcounter{#1}{\@countera}%
          \cref@getprefix{#1}{\@prefixa}%
          \cref@getcounter{#2}{\@counterb}%
          \cref@getprefix{#2}{\@prefixb}%
          \cref@stack@init{\@countstacka}%
          \expandafter\cref@stack@push\expandafter%
            {\@countera}{\@countstacka}%
          \ifx\@prefixa\@empty\else%
            \expandafter\cref@stack@push\expandafter%
              {\@prefixa}{\@countstacka}%
          \fi%
          \cref@stack@init{\@countstackb}%
          \expandafter\cref@stack@push\expandafter%
            {\@counterb}{\@countstackb}%
          \ifx\@prefixb\@empty\else%
            \expandafter\cref@stack@push\expandafter%
              {\@prefixb}{\@countstackb}%
          \fi%
          \@cref@countercmp%
```

```
      \fi%
    \fi%
  \fi%
\fi%
\expandafter\endgroup\expandafter%
\chardef\expandafter#3\expandafter=\cref@result\relax}
```

`\@cref@countercmp` The `\@cref@countercmp` macro recursively compares counter components until it runs out of components for one of the references, or finds two corresponding components that are unequal.

```
\def\@cref@countercmp{%
  \let\@iterate\relax%
  \cref@isstackempty{\@countstacka}%
  \if@cref@stackempty%
    \cref@isstackempty{\@countstackb}%
    \if@cref@stackempty%
      \def\cref@result{0}%
    \else%
      \def\cref@result{1}%
    \fi%
  \else%
    \cref@isstackempty{\@countstackb}%
    \if@cref@stackempty%
      \def\cref@result{2}%
    \else%
      \edef\@tempa{\cref@stack@top{\@countstacka}}%
      \cref@stack@pop{\@countstacka}%
      \edef\@tempb{\cref@stack@top{\@countstackb}}%
      \cref@stack@pop{\@countstackb}%
      \ifnum\@tempa<\@tempb\relax%
        \def\cref@result{1}%
      \else%
        \ifnum\@tempa>\@tempb\relax%
          \def\cref@result{2}%
        \else%
          \def\@iterate{\@cref@countercmp}%
        \fi%
      \fi%
    \fi%
  \fi%
  \@iterate}
```

`\cref@pagecmp` The `\cref@pagecmp` macro compares two references according to their page numbers, as returned by `\cref@getpage`. It `\chardef`'s its third argument to 0 if they're equal, 1 if the first comes earlier than the second, or 2 if the first comes later than the second. This is used later for sorting page references.

```
\def\cref@pagecmp#1#2#3{%
  \begingroup%
  \def\@tempa{#1}%
```

In order to ensure empty references end up in the right place when sorting lists of multiple references, we make the comparison macro sort them before a non-empty reference.

```
\ifx\@tempa\@empty%
  \def\cref@result{1}%
\else%
  \def\@tempa{#2}%
  \ifx\@tempa\@empty%
    \def\cref@result{2}%
  \else%
```

Conversely, undefined references come after everything else.

```
    \expandafter\ifx\csname r@#1@cref\endcsname\relax%
      \def\cref@result{2}%
    \else%
      \expandafter\ifx\csname r@#2@cref\endcsname\relax%
        \def\cref@result{1}%
      \else%
```

If both references are non-empty and are defined, we compare their page numbers.

```
        \cref@getpageref{#1}{\@tempa}%
        \cref@getpageref{#2}{\@tempb}%
        \ifnum\@tempa<\@tempb\relax%
          \def\cref@result{1}\relax%
        \else%
          \ifnum\@tempa>\@tempb\relax%
            \def\cref@result{2}\relax%
              \else%
            \def\cref@result{0}\relax%
          \fi%
        \fi%
      \fi%
    \fi%
  \fi%
\fi%
\expandafter\endgroup\expandafter%
\chardef\expandafter#3\expandafter=\cref@result\relax}
```

`\if@cref@inresetlist` `\cref@isinresetlist` `\cref@resetby`

We need to be able to determine which counter is used to reset a given counter. Usually, resets are done by sectioning counters, and we assume that to be the case here. `\cref@isinresetlist` searches through one counter's reset list, stored in `\cl@`⟨*counter*⟩, to determine whether another counter appears there, and sets the new conditional appropriately. `\cref@reset@by` searches through all the sectioning counters' reset lists, from lowest-level (subsubsection) to highest (part), checking whether the given counter is in the list, and returns the first sectioning counter in whose list it appears. (The value is returned by defining its second argument, which should be a macro name.)

```
\newif\if@cref@inresetlist
\def\cref@isinresetlist#1#2{%
```

```
\begingroup%
  \def\@counter{#1}%
```

We locally redefine `\@elt`, which appears at the head of the expansion of `\cl@`⟨*counter*⟩, so that entries in the reset list end up separated by commas, thus can be treated as a stack.

```
  \def\@elt##1{##1,}%
  \expandafter\ifx\csname cl@#2\endcsname\relax%
    \def\cref@resetstack{,\@nil}%
  \else%
    \edef\cref@resetstack{\csname cl@#2\endcsname\noexpand\@nil}%
  \fi%
  \let\@nextcounter\relax%
  \cref@isstackfull{\cref@resetstack}%
  \@whilesw\if@cref@stackfull\fi{%
    \edef\@nextcounter{\cref@stack@top{\cref@resetstack}}%
    \ifx\@nextcounter\@counter%
      \@cref@stackfullfalse%
    \else%
      \let\@nextcounter\relax%
      \cref@stack@pop{\cref@resetstack}%
      \cref@isstackfull{\cref@resetstack}%
    \fi}%
  \ifx\@nextcounter\relax%
    \def\@next{\@cref@inresetlistfalse}%
  \else%
    \def\@next{\@cref@inresetlisttrue}%
  \fi%
\expandafter%
\endgroup%
\@next}
```

FIXME: We could easily remove the hard-coded search order in `\cref@resetby` and, say, replace it with a customisable list of counters to search in order. But, so far, I've yet to encounter a need for anything other than the hard-coded default.

```
\def\cref@resetby#1#2{%
  \let#2\relax%
```

If counter in question is `subfigure` or `subtable`, check if it's reset by `figure` or `table`, respectively.

```
  \def\@tempa{#1}%
  \def\@tempb{subfigure}%
  \ifx\@tempa\@tempb%
    \cref@isinresetlist{#1}{figure}%
    \if@cref@inresetlist%
      \def#2{figure}%
    \fi%
  \fi%
  \def\@tempa{#1}%
  \def\@tempb{subtable}%
  \ifx\@tempa\@tempb%
```

```
    \cref@isinresetlist{#1}{table}%
    \if@cref@inresetlist%
      \def#2{table}%
    \fi%
  \fi%
```

If counter in question is `equation`, and the counter `parentequation` is defined, check if it's reset by that. The `parentequation` counter is used by `amsmath`'s `subequations` environment. Although `amsmath` doesn't implement `subequations` using counter reset lists, `cleveref`'s `amsmath` support (above) tweaks the reset lists inside `subequations` environments to hook into this mechanism. We should really only check this when `amsmath` is loaded, but checking it anyway might catch other packages that independently implement amsmath's `subequations` environment (are there any?).

```
  \@ifundefined{cl@parentequation}{}{%
    \def\@tempa{#1}%
    \def\@tempb{equation}%
    \ifx\@tempa\@tempb%
      \cref@isinresetlist{#1}{parentequation}%
      \if@cref@inresetlist%
        \expandafter\ifnum\c@parentequation=0\else%
          \def#2{parentequation}%
        \fi%
      \fi%
    \fi}%
```

If counter in question is `enum`$\langle x \rangle$, check if it's reset by a higher-level `enum`$\langle x \rangle$.

```
  \def\@tempa{#1}%
  \def\@tempb{enumii}%
  \ifx\@tempa\@tempb%
    \def#2{enum}%
  \fi%
  \def\@tempb{enumiii}%
  \ifx\@tempa\@tempb%
    \def#2{enum}%
  \fi%
  \def\@tempb{enumiv}%
  \ifx\@tempa\@tempb%
    \def#2{enum}%
  \fi%
  \def\@tempb{enumv}%
  \ifx\@tempa\@tempb%
    \def#2{enum}%
  \fi%
  \def\@tempb{enum}%
  \ifx#2\@tempb%
    \cref@isinresetlist{#1}{enumiv}%
    \if@cref@inresetlist%
      \def#2{enumiv}%
    \else%
```

```
      \cref@isinresetlist{#1}{enumiii}%
      \if@cref@inresetlist%
        \def#2{enumiii}%
      \else%
        \cref@isinresetlist{#1}{enumii}%
        \if@cref@inresetlist%
          \def#2{enumii}%
        \else%
          \cref@isinresetlist{#1}{enumi}%
          \if@cref@inresetlist%
            \def#2{enumi}%
          \else%
           \cref@isinresetlist{#1}{part}%
            \if@cref@inresetlist%
              \def#2{part}%
            \else%
              \let#2\relax%
            \fi%
          \fi%
        \fi%
      \fi%
    \fi%
  \fi%
```

If we haven't found anything so far, check if it's reset by a sectioning command.

```
  \ifx#2\relax%
    \cref@isinresetlist{#1}{table}%
    \if@cref@inresetlist%
      \def#2{table}%
    \else%
      \cref@isinresetlist{#1}{subsubsection}%
      \if@cref@inresetlist%
        \def#2{subsubsection}%
      \else%
        \cref@isinresetlist{#1}{subsection}%
        \if@cref@inresetlist%
          \def#2{subsection}%
        \else%
          \cref@isinresetlist{#1}{section}%
          \if@cref@inresetlist%
            \def#2{section}%
          \else%
            \cref@isinresetlist{#1}{chapter}%
            \if@cref@inresetlist%
              \def#2{chapter}%
            \else%
             \cref@isinresetlist{#1}{part}%
              \if@cref@inresetlist%
                \def#2{part}%
              \else%
```

```
                \let#2\relax%
              \fi%
            \fi%
          \fi%
        \fi%
      \fi%
    \fi%
  \fi}
```

`\if@cref@refconsecutive` `\cref@isrefconsecutive`

Define a new conditional to test whether two references are consecutive (needed when typesetting reference ranges). This uses the counter and prefix (i.e. formatted version of the counter that resets the label's counter) information provided by `\r@`⟨*label*⟩`@cref` (via the `aux` file) to check if the prefices are identical (i.e. the references come from the same chapter, section or whatever), and that the label counters differ by 0 or 1.

```
\newif\if@cref@refconsecutive%
\def\cref@isrefconsecutive#1#2{%
  \begingroup%
    \countdef\refa@counter=0%
    \countdef\refb@counter=1%
    \cref@getcounter{#1}{\cref@result}%
    \refa@counter=\cref@result%
    \cref@getcounter{#2}{\cref@result}%
    \refb@counter=\cref@result%
    \cref@getprefix{#1}{\refa@prefix}%
    \cref@getprefix{#2}{\refb@prefix}%
    \def\@after{\@cref@refconsecutivefalse}%
    \ifx\refa@prefix\refb@prefix%
      \ifnum\refa@counter=\refb@counter\relax%
        \def\@after{\@cref@refconsecutivetrue}%
      \else%
        \advance\refa@counter 1\relax%
        \ifnum\refa@counter=\refb@counter\relax%
          \def\@after{\@cref@refconsecutivetrue}%
        \fi%
      \fi%
    \fi%
  \expandafter\endgroup\@after}
```

`\cref@ispagerefconsecutive`

Similarly, define a test for whether two page references are consecutive (needed when typesetting page ranges). We use the same `\if@cref@refconsecutive` conditional as above.

```
\def\cref@ispagerefconsecutive#1#2{%
  \begingroup%
  \countdef\refa@counter=0%
  \countdef\refb@counter=1%
  \cref@getpageref{#1}{\cref@result}%
  \refa@counter=\cref@result%
  \cref@getpageref{#2}{\cref@result}%
```

```
  \refb@counter=\cref@result%
  \def\@after{\@cref@refconsecutivefalse}%
  \ifnum\refa@counter=\refb@counter\relax%
    \def\@after{\@cref@refconsecutivetrue}%
  \else%
    \advance\refa@counter 1\relax%
    \ifnum\refa@counter=\refb@counter\relax%
      \def\@after{\@cref@refconsecutivetrue}%
    \fi%
  \fi%
  \expandafter\endgroup\@after}
```

### 14.2.5 Reference stack processing

`\cref@processgroup` `\cref@processgroup` processes the first group of references from the stack passed in argument `#1`, by moving references to the stack passed in argument `#2` until it encounters a reference that has a different type to those that came before. Note that empty references are treated as having the same type as the preceding one.

```
\def\cref@processgroup#1#2{%
  \edef\@nextref{\cref@stack@top{#1}}%
  \expandafter\ifx\csname r@\@nextref @cref\endcsname\relax%
    \def\@grouptype{\@undefined}%
    \def\@groupformat{\@undefined}%
  \else%
    \expandafter\cref@gettype\expandafter{\@nextref}{\@grouptype}%
    \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@groupformat%
      \expandafter\expandafter\expandafter{%
        \csname cref@\@grouptype @format\endcsname%
        {\@dummya}{\@dummyb}{\@dummyc}}%
  \fi%
  \let\@nexttype\@grouptype%
  \let\@nextformat\@groupformat%
%
  \@whilesw\ifx\@nextformat\@groupformat\fi{%
    \expandafter\cref@stack@pull\expandafter{\@nextref}{#2}%
    \cref@stack@pop{#1}%
    \cref@isstackempty{#1}%
    \if@cref@stackempty%
      \let\@nexttype\relax%
      \let\@nextformat\relax%
    \else%
      \edef\@nextref{\cref@stack@top{#1}}%
      \ifx\@nextref\@empty%
        \let\@nexttype\@grouptype%
        \let\@nextforamt\@groupformat%
      \else%
        \expandafter\ifx\csname r@\@nextref @cref\endcsname\relax%
          \def\@nexttype{\@undefined}%
```

```
          \def\@nextformat{\@undefined}%
        \else%
          \expandafter\cref@gettype\expandafter%
            {\@nextref}{\@nexttype}%
          \def\@tempa{\@undefined}%
          \ifx\@nexttype\@tempa%
            \def\@nextformat{\@undefined}%
          \else%
            \expandafter\expandafter\expandafter\def%
              \expandafter\expandafter\expandafter\@nextformat%
              \expandafter\expandafter\expandafter{%
                \csname cref@\@nexttype @format\endcsname%
                {\@dummya}{\@dummyb}{\@dummyc}}%
          \fi%
        \fi%
      \fi%
    \fi}%
}
```

`\cref@processgroupall` `\cref@processgroupall` processes the first group of references from the stack passed in argument `#1`, by moving all references with the same type as the first one into the stack passed in argument `#2`.

```
\def\cref@processgroupall#1#2{%
  \cref@stack@init{\@tempstack}%
  \edef\@nextref{\cref@stack@top{#1}}%
  \expandafter\ifx\csname r@\@nextref @cref\endcsname\relax%
    \def\@grouptype{\@undefined}%
    \def\@groupformat{\@undefined}%
  \else%
    \expandafter\cref@gettype\expandafter{\@nextref}{\@grouptype}%
    \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@groupformat%
      \expandafter\expandafter\expandafter{%
        \csname cref@\@grouptype @format\endcsname%
        {\@dummya}{\@dummyb}{\@dummyc}}%
  \fi%
  \let\@lasttype\@grouptype%
  \let\@lastformat\@groupformat%
  \cref@isstackfull{#1}%
%
  \@whilesw\if@cref@stackfull\fi{%
    \edef\@nextref{\cref@stack@top{#1}}%
    \ifx\@nextref\@empty%
      \ifx\@lastformat\@groupformat%
        \let\@nexttype\@grouptype%
        \let\@nextformat\@groupformat%
      \else%
        \let\@nexttype\relax%
        \let\@nextformat\relax%
      \fi%
```

```
    \else%
      \expandafter\ifx\csname r@\@nextref @cref\endcsname\relax%
        \def\@nexttype{\@undefined}%
        \def\@nextformat{\@undefined}%
      \else%
        \expandafter\cref@gettype\expandafter%
          {\@nextref}{\@nexttype}%
        \def\@tempa{\@undefined}%
        \ifx\@nexttype\@tempa%
          \def\@nextformat{\@undefined}%
        \else%
          \expandafter\expandafter\expandafter\def%
            \expandafter\expandafter\expandafter\@nextformat%
            \expandafter\expandafter\expandafter{%
              \csname cref@\@nexttype @format\endcsname%
              {\@dummya}{\@dummyb}{\@dummyc}}%
        \fi%
      \fi%
    \fi%
%
    \ifx\@nextformat\@groupformat%
      \expandafter\cref@stack@pull\expandafter{\@nextref}{#2}%
    \else%
      \expandafter\cref@stack@pull\expandafter{\@nextref}{\@tempstack}%
    \fi%
    \cref@stack@pop{#1}%
    \let\@lasttype\@nexttype%
    \let\@lastformat\@nextformat%
    \cref@isstackfull{#1}}%
  \let#1\@tempstack}
```

`\cref@processconsecutive` `\cref@processconsecutive` processes the first sequence of consecutive references from the stack passed in `#1`, sets the macro passed as `#2` to the first reference in the sequence, sets `#3` to the last reference, and sets the counter passed in `#4` to the number of consecutive references in the sequence.

```
\def\cref@processconsecutive#1#2#3#4#5{%
  #4=0%
  \edef\@nextref{\cref@stack@top{#1}}%
  \cref@stack@pop{#1}%
```

If stack only contains one reference, set appropriate return values.

```
  \cref@isstackempty{#1}%
  \if@cref@stackempty%
    \edef#2{\@nextref}%
    \let#3\relax%
    #4=1\relax%
```

If stack contains multiple references, find end of consecutive references.

```
  \else%
    \edef#2{\@nextref}%
```

```
    \let#3\relax%
    \edef\@nextref{\cref@stack@top{#1}}%
    #4=1\relax%
    \expandafter\ifx\csname r@#2@cref\endcsname\relax%
      \@cref@refconsecutivefalse%
    \else%
```

If next reference in substack is empty, it indicates that no further compression should take place. Having served its purpose, the empty reference and any consecutive empty references are removed from the stack.

```
      \ifx\@nextref\@empty%
        \@cref@refconsecutivefalse%
        \@whilesw\ifx\@nextref\@empty\fi{%
          \cref@stack@pop{#1}%
          \cref@isstackempty{#1}%
          \if@cref@stackempty%
            \let\@nextref\relax%
          \else%
            \edef\@nextref{\cref@stack@top{#1}}%
          \fi}%
```

Otherwise, test whether next reference is consecutive or not.

```
      \else%
        \expandafter\ifx\csname r@\@nextref @cref\endcsname\relax%
          \@cref@refconsecutivefalse%
        \else%
          \edef\@tempa{{#2}{\@nextref}}%
          \expandafter#5\@tempa%
        \fi%
      \fi%
    \fi%
```

Remove references from the stack until we find end of consecutive sequence.

```
    \@whilesw\if@cref@refconsecutive\fi{%
      \advance#4 1%
      \let#3\@nextref%
      \cref@stack@pop{#1}%
      \cref@isstackempty{#1}%
      \if@cref@stackempty%
        \@cref@refconsecutivefalse%
      \else%
        \edef\@nextref{\cref@stack@top{#1}}%
```

If next reference is empty, remove any consecutive empty references and we're done.

```
        \ifx\@nextref\@empty%
          \@cref@refconsecutivefalse%
          \@whilesw\ifx\@nextref\@empty\fi{%
            \cref@stack@pop{#1}%
            \cref@isstackempty{#1}%
            \if@cref@stackempty%
```

```
            \let\@nextref\relax%
          \else%
            \edef\@nextref{\cref@stack@top{#1}}%
          \fi}%
```

Otherwise, test whether next reference is consecutive or not.

```
        \else%
          \expandafter\ifx\csname r@\@nextref @cref\endcsname\relax%
            \@cref@refconsecutivefalse%
          \else%
            \edef\@tempa{{#3}{\@nextref}}%
            \expandafter#5\@tempa%
          \fi%
        \fi%
      \fi}%
  \fi}
```

## 14.3 Cross-Referencing Commands

`\cref` `\Cref` `\crefrange` `\Crefrange`

Define the main referencing command `\cref` and the start-of-sentence variant `\Cref`, along with the reference range commands `\crefrange` and `\Crefrange`.

```
\DeclareRobustCommand{\cref}[1]{\@cref{cref}{#1}}
\DeclareRobustCommand{\Cref}[1]{\@cref{Cref}{#1}}
\DeclareRobustCommand{\crefrange}[2]{\@setcrefrange{#1}{#2}{cref}{}}
\DeclareRobustCommand{\Crefrange}[2]{\@setcrefrange{#1}{#2}{Cref}{}}
```

`\if@crefstarred`

The `\if@crefstarred` flag is set within starred variants of `cleveref` commands. Starred variants are only defined if either the `hyperref` or `varioref` package is loaded, so we only define it in those cases. We need to `\let \if@crefstarred` to something even when not using it, otherwise TEX gets confused when parsing code that contains `\if@crefstarred` inside a nested if.

```
\@ifpackageloaded{hyperref}{\newif\if@crefstarred}{%
  \@ifpackageloaded{varioref}{\newif\if@crefstarred}{}}
\let\if@crefstarred\iffalse%
```

`\@cref`

To save duplicating code, the referencing macros pass an argument determining the variant to an auxiliary macro `\@cref`, which does the real work. The `\@cref` macro is the behemoth at the heart of all the clever referencing features. It deals with grouping references by type, typesetting the conjunctions between groups, choosing the right formatting macro to use for each reference, and compressing consecutive references into ranges.

```
\def\@cref#1#2{%
  \leavevmode%
  \begingroup%
```

Initialise some things, and put all the references into a stack called `\@refstack`. Note that we fully expand the second argument, in case it contains commands that *expand to* label names, rather than label names per se.

```
  \countdef\count@consecutive=0%
```

```
\countdef\count@group=1%
\count@group=1%
\def\cref@variant{#1}%
\newif\if@secondref%
\cref@stack@init{\@refstack}%
\edef\@tempa{#2}%
\expandafter\cref@stack@push\expandafter{\@tempa}{\@refstack}%
\cref@isstackfull{\@refstack}%
```

Loop until the reference stack is empty.

```
\@whilesw\if@cref@stackfull\fi{%
```

Move next group of references with same type into `\@refsubstack`.

```
  \cref@stack@init{\@refsubstack}%
  \if@cref@sort%
    \cref@processgroupall{\@refstack}{\@refsubstack}%
    \cref@stack@sort{\@refsubstack}{\cref@countercmp}%
  \else%
    \cref@processgroup{\@refstack}{\@refsubstack}%
  \fi%
```

typeset appropriate conjunction between groups of reference types.

```
  \ifnum\count@group=1\relax%
    \advance\count@group 1%
  \else%
    \cref@isstackfull{\@refstack}%
    \if@cref@stackfull%
      \@setcref@middlegroupconjunction%
    \else%
      \ifnum\count@group=2\relax%
        \@setcref@pairgroupconjunction%
      \else%
        \@setcref@lastgroupconjunction%
      \fi%
    \fi%
    \advance\count@group 1%
    \def\cref@variant{cref}%
  \fi%
```

Process first group of consecutive references.

```
  \if@cref@compress%
    \cref@processconsecutive%
      {\@refsubstack}{\@beginref}{\@endref}{\count@consecutive}%
      {\cref@isrefconsecutive}%
  \else%
    \edef\@beginref{\cref@stack@top{\@refsubstack}}%
    \cref@stack@pop{\@refsubstack}%
```

Empty references serve no purpose when we're not compressing consecutive references, so we simply remove them.

```
    \@whilesw\ifx\@beginref\@empty\fi{%
      \cref@stack@pop{\@refsubstack}%
```

```
      \cref@isstackempty{\@refsubstack}%
      \if@cref@stackempty%
        \let\@beginref\relax%
      \else%
        \edef\@beginref{\cref@stack@top{\@refsubstack}}%
      \fi}%
    \let\@endref\relax%
    \count@consecutive=1\relax%
  \fi%
```

If there were no consecutive references, typeset the first reference;

```
  \ifnum\count@consecutive=1\relax%
    \cref@isstackfull{\@refsubstack}%
    \if@cref@stackfull%
      \expandafter\@setcref%
        \expandafter{\@beginref}{\cref@variant}{@first}%
    \else%
      \expandafter\@setcref%
        \expandafter{\@beginref}{\cref@variant}{}%
    \fi%
```

if there were only two consecutive references, typeset the first one and return the second to the substack (we add an empty reference after it just to make sure there's no further compression);

```
  \else%
    \ifnum\count@consecutive=2\relax%
      \expandafter\@setcref%
        \expandafter{\@beginref}{\cref@variant}{@first}%
      \expandafter\cref@stack@push\expandafter%
        {\@endref,}{\@refsubstack}%
```

otherwise, typeset a reference range.

```
    \else%
      \edef\@tempa{{\@beginref}{\@endref}}%
      \if@cref@stackempty%
        \expandafter\@setcrefrange\@tempa{\cref@variant}{}%
      \else%
        \expandafter\@setcrefrange\@tempa{\cref@variant}{@first}%
      \fi%
    \fi%
  \fi%
```

Process further groups of consecutive references, until substack is empty.

```
  \@secondreftrue%
  \cref@isstackfull{\@refsubstack}%
  \@whilesw\if@cref@stackfull\fi{%
    \if@cref@compress%
      \cref@processconsecutive%
        {\@refsubstack}{\@beginref}{\@endref}{\count@consecutive}%
        {\cref@isrefconsecutive}%
    \else%
```

```
      \edef\@beginref{\cref@stack@top{\@refsubstack}}%
      \cref@stack@pop{\@refsubstack}%
```

Empty references serve no purpose when we're not compressing consecutive references, so we simply remove them.

```
      \@whilesw\ifx\@beginref\@empty\fi{%
        \cref@stack@pop{\@refsubstack}%
        \cref@isstackempty{\@refsubstack}%
        \if@cref@stackempty%
          \let\@beginref\relax%
        \else%
          \edef\@beginref{\cref@stack@top{\@refsubstack}}%
        \fi}%
      \let\@endref\relax%
      \count@consecutive=1\relax%
    \fi%
```

If the substack is now empty, we will need to typeset an "end" reference, otherwise we will need to typeset a "middle" reference.

```
    \cref@isstackempty{\@refsubstack}%
    \if@cref@stackempty%
      \if@secondref%
        \def\@pos{@second}%
      \else%
        \def\@pos{@last}%
      \fi%
    \else%
      \def\@pos{@middle}%
    \fi%
```

If there were no consecutive references, just typeset the next reference;

```
    \ifnum\count@consecutive=1\relax%
      \edef\@tempa{{\@beginref}{cref}{\@pos}}%
      \expandafter\@setcref\@tempa%
    \else%
```

if there were only two consecutive references, typeset the first one, and return the second one to the substack,

```
      \ifnum\count@consecutive=2\relax%
        \expandafter\@setcref\expandafter%
          {\@beginref}{cref}{@middle}%
        \expandafter\cref@stack@push\expandafter%
          {\@endref}{\@refsubstack}%
```

otherwise, typeset a reference range.

```
      \else%
        \edef\@tempa{{\@beginref}{\@endref}{cref}{\@pos}}%
        \expandafter\@setcrefrange\@tempa%
      \fi%
    \fi%
    \@secondreffalse%
```

```
      \cref@isstackfull{\@refsubstack}%
    }% end loop over reference substack
    \cref@isstackfull{\@refstack}%
```

If we're typesetting a `\labelcref` reference and references in stack have different types, throw a warning and stop processing.

```
    \if@cref@stackfull%
      \def\@tempa{#1}\def\@tempb{labelcref}%
      \ifx\@tempa\@tempb\relax%
        \protect\G@refundefinedtrue%
        \nfss@text{\reset@font\bfseries\space ??}%
        \@latex@warning{References in label reference on page \thepage
          \space have different types}%
        \@cref@stackfullfalse%
      \fi%
    \fi%
  }% end loop over main reference stack
  \endgroup}
```

`\@setcref` The internal `\@setcref` macro deals with actually typesetting the reference, by calling the appropriate type-dependent formatting macro defined by `\crefformat` etc. `#1` contains the reference itself, `#2` is either "cref" or "Cref" and determines the capitalisation variant, and `#3` is either empty or one of "@second", "@middle" or "@last", determining the type of reference group to typeset.

```
\def\@setcref#1#2#3{%
  \expandafter\ifx\csname r@#1@cref\endcsname\relax%
    \protect\G@refundefinedtrue%
    \nfss@text{\reset@font\bfseries ??}%
    \@latex@warning{Reference `#1' on page \thepage \space undefined}%
  \else%
    \cref@gettype{#1}{\@temptype}%  puts label type in \@temptype
    \cref@getlabel{#1}{\@templabel}%  puts label in \@templabel
    \expandafter\ifx\csname #2@\@temptype @format#3\endcsname\relax%
```

If reference format is undefined, but we're typesetting a `\labelcref`, fall back to default `\labelcref` format.

```
      \edef\@tempa{#2}\def\@tempb{labelcref}%
      \ifx\@tempa\@tempb\relax%
        \expandafter\@@setcref\expandafter%
          {\csname #2@default@format#3\endcsname}{#1}%
      \else%
        \protect\G@refundefinedtrue%
        \nfss@text{\reset@font\bfseries ??}~\@templabel%
        \@latex@warning{#2 \space reference format for label type
          `\@temptype' undefined}%
      \fi%
    \else%
      \expandafter\@@setcref\expandafter%
        {\csname #2@\@temptype @format#3\endcsname}{#1}%
    \fi%
```

```
\fi}
```

`\@@setcref` We separate out the very final typesetting step into a separate macro, in order to make it easier to redefine things later to make them work with the `hyperref` package.

```
\def\@@setcref#1#2{\cref@getlabel{#2}{\@templabel}#1{\@templabel}{}{}}
```

`\@setcrefrange` The internal `\@setcrefrange` macro deals with typesetting reference ranges, just as `\@setcref` does for normal references. The actual typesetting is no more complicated in the range case; it's the error checking that makes the code so much longer. We now have to check whether *two* references are undefined, whether *two* reference formats are undefined, whether the reference types are consistent, and also combinations of these various errors.

```
\def\@setcrefrange#1#2#3#4{%
  \begingroup%
```

Check if both references are defined.

```
    \expandafter\ifx\csname r@#1@cref\endcsname\relax%
      \protect\G@refundefinedtrue%
      \@latex@warning{Reference `#1' on page \thepage \space%
        undefined}%
      \expandafter\ifx\csname r@#2@cref\endcsname\relax%
        \nfss@text{\reset@font\bfseries ??}--%
        \nfss@text{\reset@font\bfseries ??}%
        \@latex@warning{Reference `#2' on page \thepage \space%
          undefined}%
      \else%
        \cref@getlabel{#2}{\@labelb}%
        \nfss@text{\reset@font\bfseries ??}--\@labelb%
      \fi%
    \else%
      \expandafter\ifx\csname r@#2@cref\endcsname\relax%
        \protect\G@refundefinedtrue%
        \cref@getlabel{#1}{\@labela}%
        \@labela--\nfss@text{\reset@font\bfseries ??}%
        \@latex@warning{Reference `#2' on page \thepage %
          \space undefined}%
```

If both references are defined, check that the reference format is defined.

```
      \else%
        \cref@gettype{#1}{\@typea}%
        \cref@gettype{#2}{\@typeb}%
        \cref@getlabel{#1}{\@labela}%
        \cref@getlabel{#2}{\@labelb}%
        \edef\@formata{\expandafter\noexpand%
          \csname #3range@\@typea @format#4\endcsname}%
        \edef\@formatb{\expandafter\noexpand%
          \csname #3range@\@typeb @format#4\endcsname}%
        \expandafter\ifx\@formata\relax%
```

If reference format is undefined, but we're typesetting a `\labelcref`, fall back to default `\labelcref` formats.

```
          \edef\@tempa{#3}\def\@tempb{labelcref}%
          \ifx\@tempa\@tempb\relax%
            \expandafter\@@setcrefrange\expandafter%
              {\csname #3range@default@format#4\endcsname}{#1}{#2}%
          \else%
            \protect\G@refundefinedtrue%
            \nfss@text{\reset@font\bfseries ??}~\@labela--\@labelb%
            \@latex@warning{#3\space reference range format for label
              type `\@typea' undefined}%
          \fi%
        \else%
```

If reference types are identical, typeset reference range, otherwise display warning. (Note: there's no need to check if reference format for second type is defined, since if it isn't it will be caught here as a non-identical type.)

```
          \ifx\@formata\@formatb%
            \expandafter\@@setcrefrange\expandafter{\@formata}{#1}{#2}%
          \else%
            \protect\G@refundefinedtrue%
            \nfss@text{\reset@font\bfseries ??}~\@labela--\@labelb%
            \@latex@warning{References `#1' and `#2' in reference range
              on page \thepage have different types}%
          \fi%
        \fi%
      \fi%
    \fi%
  \endgroup}
```

`\@@setcrefrange` We again separate out the very final typesetting step into a separate macro, in order to make it easier to redefine things later to make them work with the `hyperref` package.

```
\def\@@setcrefrange#1#2#3{%
  \cref@getlabel{#2}{\@labela}%
  \cref@getlabel{#3}{\@labelb}%
  #1{\@labela}{\@labelb}{}{}{}{}}
```

The typesetting of conjunctions is also separated out into separate macros, for the same reason.

```
\def\@setcref@pairgroupconjunction{\crefpairgroupconjunction}
\def\@setcref@middlegroupconjunction{\crefmiddlegroupconjunction}
\def\@setcref@lastgroupconjunction{\creflastgroupconjunction}
```

`\labelcref` `\namecref` `\nameCref` `\lcnamecref` `\namecrefs` `\nameCrefs` `\lcnamecrefs` Finally, we define a `\labelcref` command that returns just the typeset label part of a (multi-)reference, without the reference name, and conversely `\namecref`, `\nameCref`, `\namecrefs` and `\nameCrefs` commands that return just the typeset name of a reference, without the reference label. The latter four retrieve the reference name from the corresponding `\crefname` or `\Crefname` definition, so

they only work when this has been defined. We also define `\lcnamecref` and `\lcnamecrefs` commands which force the reference name to lowercase, for use when the `capitalise` option is enabled.

```
\DeclareRobustCommand{\labelcref}[1]{\@cref{labelcref}{#1}}
\DeclareRobustCommand{\namecref}[1]{%
  \@setnamecref{cref}{#1}{}{}}
\DeclareRobustCommand{\nameCref}[1]{%
  \@setnamecref{Cref}{#1}{}{}}
\DeclareRobustCommand{\lcnamecref}[1]{%
  \@setnamecref{Cref}{#1}{}{\MakeLowercase}}
\DeclareRobustCommand{\namecrefs}[1]{%
  \@setnamecref{cref}{#1}{@plural}{}}
\DeclareRobustCommand{\nameCrefs}[1]{%
  \@setnamecref{Cref}{#1}{@plural}{}}
\DeclareRobustCommand{\lcnamecrefs}[1]{%
  \@setnamecref{Cref}{#1}{@plural}{\MakeLowercase}}
```

`\@setnamecref` `\@setnamecref` is the real macro underlying all the `\amecref` commands.

```
\def\@setnamecref#1#2#3#4{%
  \expandafter\ifx\csname r@#2@cref\endcsname\relax%
    \protect\G@refundefinedtrue%
    \nfss@text{\reset@font\bfseries ??}%
    \@latex@warning{Reference `#1' on page \thepage \space undefined}%
  \else%
    \cref@gettype{#2}{\@tempa}%
    \@ifundefined{#1@\@tempa @name#3}{%
      \protect\G@refundefinedtrue%``
      \nfss@text{\reset@font\bfseries ??}%
      \@latex@warning{Reference name for
        label type `\@tempa' undefined}%
    }{%
      \edef\@tempa{%
        \expandafter\noexpand\csname #1@\@tempa @name#3\endcsname}%
      \expandafter\@@setnamecref\expandafter{\@tempa}{#4}%
    }%
  \fi}
```

`\@@setnamecref` We again separate out the final typesetting step of the `\namecref` commands.

```
\def\@@setnamecref#1#2{%
  \expandafter\def\expandafter\@tempa\expandafter{#1}%
  \expandafter#2\@tempa}
```

## 14.4 Page-Referencing Commands

`\cpageref` `\Cpageref` `\cpagerefrange` `\Cpagerefrange` Define the main page referencing command `\cpageref` and the start-of-sentence variant `\Cpageref`, along with the `\cpagerefrange` and `\Cpagerefrange` page range referencing commands, and `\labelcpageref` (the counterpart to `\labelcref`).

```
\DeclareRobustCommand{\cpageref}[1]{%
```

```
  \@cpageref{cref}{#1}{\@setcpageref}{\@setcpagerefrange}}
\DeclareRobustCommand{\Cpageref}[1]{%
  \@cpageref{Cref}{#1}{\@setcpageref}{\@setcpagerefrange}}
\DeclareRobustCommand{\cpagerefrange}[2]{%
  \@setcpagerefrange{#1}{#2}{cref}{}}
\DeclareRobustCommand{\Cpagerefrange}[2]{%
  \@setcpagerefrange{#1}{#2}{Cref}{}}
\DeclareRobustCommand{\labelcpageref}[1]{%
  \@cpageref{labelcref}{#1}{\@setcpageref}{\@setcpagerefrange}}
```

`\@cpageref` The `\@cpageref` macro is the work-horse of the clever page referencing features (analogous to the role of `\@cref` for cross-references, though slightly simpler as it does not have to deal with grouping references by type, all page references being references to pages!). It deals with typesetting the conjunctions between groups of page references, and any sorting and compressing of the page references. `#1` contains the list of references, `#2` is "cref" or "Cref" and determines the capitalisation variant, `#3` and `#4` are the macros to use for typesetting page references and page range references, respectively. (The `\cpageref` and `\Cpageref` commands always set these to `\@setcpageref` and `\@setcpagerangeref`; the `varioref` package support uses these arguments to integrate the `cleveref` and `varioref` page referencing features.)

```
\def\@cpageref#1#2#3#4{%
  \leavevmode%
  \begingroup%
```

Initialise some things, and put all the references into a stack called `\@refstack`. Note that we fully expand the second argument, in case it contains commands that *expand to* label names, rather than label names per se.

```
  \countdef\count@consecutive=0%
  \countdef\count@group=1%
  \countdef\@counta=2%
  \countdef\@countb=3%
  \count@group=0%
  \cref@stack@init{\@refstack}%
  \edef\@tempa{#2}%
  \expandafter\cref@stack@push\expandafter{\@tempa}{\@refstack}%
  \if@cref@sort%
    \cref@stack@sort{\@refstack}{\cref@pagecmp}%
  \fi%
```

Loop until the reference stack is empty.

```
  \cref@isstackfull{\@refstack}%
  \@whilesw\if@cref@stackfull\fi{%
    \if@cref@compress%
      \cref@processconsecutive%
        {\@refstack}{\@beginref}{\@endref}{\count@consecutive}%
        {\cref@ispagerefconsecutive}%
    \else%
      \edef\@beginref{\cref@stack@top{\@refstack}}%
      \cref@stack@pop{\@refstack}%
```

Empty references serve no purpose when we're not compressing consecutive references, so we simply remove them.

```
    \@whilesw\ifx\@beginref\@empty\fi{%
      \cref@stack@pop{\@refstack}%
      \cref@isstackempty{\@refstack}%
      \if@cref@stackempty%
        \let\@beginref\relax%
      \else%
        \edef\@beginref{\cref@stack@top{\@refstack}}%
      \fi}%
    \let\@endref\relax%
    \count@consecutive=1\relax%
  \fi%
```

If the start and end pages of a reference range are the same, treat it as a single page reference instead of a page range. If start and end pages of a reference range differ by 1, treat it as a pair of page references instead of a range.

```
  \ifx\@endref\relax\else%
    \expandafter\ifx\csname r@\@beginref @cref\endcsname\relax\else%
      \expandafter\ifx\csname r@\@endref @cref\endcsname\relax\else%
        \cref@getpageref{\@beginref}{\@tempa}%
        \cref@getpageref{\@endref}{\@tempb}%
        \ifx\@tempa\@tempb\relax%
          \count@consecutive=1%
          \let\@endref\relax%
        \else%
          \@counta=\@tempa\relax%
          \@countb=\@tempb\relax%
          \advance\@counta 1\relax%
          \ifnum\@counta=\@countb\relax%
            \count@consecutive=2%
          \fi%
        \fi%
      \fi%
    \fi%
  \fi%
```

Determine whereabouts the current group of page references comes in the overall list of page references.

```
  \cref@isstackempty{\@refstack}%
  \if@cref@stackempty%
    \ifcase\count@group\relax%
      \ifnum\count@consecutive=2\relax%
        \def\@pos{@first}%
      \else%
        \def\@pos{}%
      \fi%
    \or%
      \ifnum\count@consecutive=2\relax%
        \def\@pos{@middle}%
```

```
        \else%
          \def\@pos{@second}%
        \fi%
      \else%
        \def\@pos{@last}%
      \fi%
    \else%
      \ifnum\count@group=0\relax%
        \def\@pos{@first}%
      \else%
        \def\@pos{@middle}%
      \fi%
    \fi%
```

If there were no consecutive references, just typeset the next reference;

```
    \ifnum\count@consecutive=1\relax%
      \def\@tempa{#3}%
      \edef\@tempb{{\@beginref}{#1}{\@pos}}%
      \expandafter\@tempa\@tempb%
    \else%
```

if there were only two consecutive references, typeset the first one and return the second to the substack (we add an empty reference after it just to make sure there's no further compression);

```
      \ifnum\count@consecutive=2\relax%
        \def\@tempa{#3}%
        \edef\@tempb{{\@beginref}{#1}{\@pos}}%
        \expandafter\@tempa\@tempb%
        \expandafter\cref@stack@push\expandafter%
          {\@endref,}{\@refstack}%
```

otherwise, typeset a reference range.

```
      \else%
        \def\@tempa{#4}%
        \edef\@tempb{{\@beginref}{\@endref}{#1}{\@pos}}%
        \expandafter\@tempa\@tempb%
      \fi%
    \fi%
    \advance\count@group 1%
    \cref@isstackfull{\@refstack}%
  }% end loop over reference stack
  \endgroup}
```

`\@setcpageref` The internal `\@setcpageref` macro deals with actually typesetting the page reference, by calling the appropriate type-dependent formatting macro defined by `\crefformat` etc. `#1` contains the reference itself, `#2` is either "cref" or "Cref" and determines the capitalisation variant, and `#3` is either empty or one of "@second", "@middle" or "@last", determining the type of reference group to typeset.

```
\def\@setcpageref#1#2#3{%
  \expandafter\ifx\csname r@#1@cref\endcsname\relax%
```

```
    \protect\G@refundefinedtrue%
    \nfss@text{\reset@font\bfseries ??}%
    \@latex@warning{Reference ‘#1’ on page \thepage \space undefined}%
  \else%
    \cref@getpageref{#1}{\@temppage}%
    \expandafter\ifx\csname #2@page@format#3\endcsname\relax%
```

If reference format is undefined, but we're typesetting a `\labelcpageref`, fall back to default `\labelcref` format.

```
      \edef\@tempa{#2}\def\@tempb{labelcref}%
      \ifx\@tempa\@tempb\relax%
        \expandafter\@@setcpageref\expandafter%
          {\csname #2@default@format#3\endcsname}{#1}%
      \else%
        \protect\G@refundefinedtrue%
        \nfss@text{\reset@font\bfseries ??}~\@temppage%
        \@latex@warning{#2 \space reference format for
          page references undefined}%
      \fi%
    \else%
      \expandafter\@@setcpageref\expandafter%
        {\csname #2@page@format#3\endcsname}{#1}%
    \fi%
  \fi}
```

`\@@setcpageref` We separate out the very final typesetting step into a separate macro, in order to make it easier to redefine things later to make them work with the `hyperref` package.

```
\def\@@setcpageref#1#2{%
  \cref@getpageref{#2}{\@temppage}#1{\@temppage}{}{}}
```

`\@setcpagerefrange` The internal `\@setcpagerefrange` macro deals with typesetting page range references, just as `\@setcpageref` does for normal page references.

```
\def\@setcpagerefrange#1#2#3#4{%
  \begingroup%
```

Check if both references are defined.

```
    \expandafter\ifx\csname r@#1@cref\endcsname\relax%
      \protect\G@refundefinedtrue%
      \@latex@warning{Reference ‘#1’ on page \thepage \space%
        undefined}%
      \expandafter\ifx\csname r@#2@cref\endcsname\relax%
        \nfss@text{\reset@font\bfseries ??}--%
        \nfss@text{\reset@font\bfseries ??}%
        \@latex@warning{Reference ‘#2’ on page \thepage \space%
          undefined}%
      \else%
        \cref@getpageref{#2}{\@pageb}%
        \nfss@text{\reset@font\bfseries ??}--\@pageb%
      \fi%
```

```
    \else%
      \expandafter\ifx\csname r@#2@cref\endcsname\relax%
        \protect\G@refundefinedtrue%
        \cref@getpageref{#1}{\@pagea}%
        \@pagea--\nfss@text{\reset@font\bfseries ??}%
        \@latex@warning{Reference `#2' on page \thepage %
          \space undefined}%
```

If both references are defined, check that the reference format is defined.

```
      \else%
        \cref@getpageref{#1}{\@pagea}%
        \cref@getpageref{#2}{\@pageb}%
        \edef\@format{\expandafter\noexpand%
          \csname #3range@page@format#4\endcsname}%
        \expandafter\ifx\@format\relax%
```

If page reference format is undefined, but we're typesetting a `\labelcpageref`, fall back to default `\labelcref` formats.

```
          \edef\@tempa{#3}\def\@tempb{labelcref}%
          \ifx\@tempa\@tempb\relax%
            \expandafter\@@setcpagerefrange\expandafter%
              {\csname #3range@default@format#4\endcsname}{#1}{#2}%
          \else%
            \protect\G@refundefinedtrue%
            \nfss@text{\reset@font\bfseries ??}~\@pagea--\@pageb%
            \@latex@warning{#3\space reference range format for page
              references undefined}%
          \fi%
        \else%
```

typeset page reference range,

```
          \expandafter\@@setcpagerefrange\expandafter{\@format}{#1}{#2}%
        \fi%
      \fi%
    \fi%
  \endgroup}
```

`\@@setcpagerefrange` We again separate out the very final typesetting step into a separate macro, in order to make it easier to redefine things later to make them work with the `hyperref` package.

```
\def\@@setcpagerefrange#1#2#3{%
  \cref@getpageref{#2}{\@pagea}%
  \cref@getpageref{#3}{\@pageb}%
  #1{\@pagea}{\@pageb}{}{}{}{}}
```

## 14.5 Reference Format Customisation Commands

### 14.5.1 Format component commands

`\cref@label@types` The reference formats are usually constructed out of components defined by the user-level `\crefname`, `\Crefname`, `\creflabel` and `\crefrangelabel` commands.

`\cref@label@types` keeps track of label types for which components have been defined, and therefore need constructing at `\begindocument` (see below).

FIXME: We don't check if the label type is already in the list, so some formats may needlessly be redefined identically, multiple times.

```
\cref@stack@init{\cref@label@types}
```

`\crefdefaultlabelformat` `\crefname` `\Crefname` `\creflabelformat` `\crefrangelabelformat`

The component customisation commands simply use the supplied arguments to define appropriately named macros containing the formatting components. If the corresponding `\Crefname` or `\crefname` variant is not already defined, `\crefname` and `\Crefname` define it to be a version with the first letter capitalised or lower-cased, respectively.

```
\newcommand{\crefdefaultlabelformat}[1]{%
  \def\cref@default@label##1##2##3{#1}}
\newcommand{\crefname}[3]{%
  \@crefname{cref}{#1}{#2}{#3}{}}
\newcommand{\Crefname}[3]{%
  \@crefname{Cref}{#1}{#2}{#3}{}}
\newcommand{\creflabelformat}[2]{%
  \expandafter\def\csname cref@#1@label\endcsname##1##2##3{#2}%
  \cref@stack@add{#1}{\cref@label@types}}
\newcommand{\crefrangelabelformat}[2]{%
  \expandafter\def\csname cref@#1@rangelabel\endcsname%
    ##1##2##3##4##5##6{#2}%
  \cref@stack@add{#1}{\cref@label@types}}
```

`\crefalias`

The `\crefalias` command aliases a counter name to another cross-reference type, so can be used to make the same cross-reference format apply to multiple different counters.

```
\newcommand{\crefalias}[2]{%
  \expandafter\def\csname cref@#1@alias\endcsname{#2}}
```

`\crefname@preamble` `\Crefname@preamble`

The `\crefname@preamble` and `\Crefname@preamble` commands are very like the `\crefname` and `\Crefname` commands, but they tag "`@preamble`" onto the end of the generated macro names. They are used when defining the default formats for different languages (see Section 14.12).

```
\newcommand{\crefname@preamble}[3]{%
  \@crefname{cref}{#1}{#2}{#3}{@preamble}}
\newcommand{\Crefname@preamble}[3]{%
  \@crefname{Cref}{#1}{#2}{#3}{@preamble}}
```

`cref@othervariant`

The following utility macro sets up the appropriate definitions for the other capitalisation variant. It defines the macro passed in `#2` to be the other variant ("cref" or "Cref") to the one specified in `#1`, and defines `#3` to be the appropriate capitalisation-changing command. It makes use of the fact that the first character of #1 is "c" for the lower-case variant and "C" for the upper-case one.

```
\def\cref@othervariant#1#2#3{\cref@@othervariant#1\@nil#2#3}
\def\cref@@othervariant#1#2\@nil#3#4{%
```

```
\if#1c%
  \def#3{C#2}%
  \def#4{\MakeUppercase}%
\else%
  \def#3{c#2}%
  \if@cref@capitalise%
    \def#4{}%
  \else%
    \def#4{\MakeLowercase}%
  \fi%
\fi}
```

`\@crefname` The `\@crefname` utility macro does the real work of defining format names, by defining an appropriately named command to contain the format component, and using the additional first argument ("cref" or "Cref") to determine how to define the corresponding command with the other capitalisation. The extra fifth argument gets tagged onto the end of the generated macro names. Note that `\@crefname` *must not* create global definitions, or else it will break `babel`'s `\otherlanguage`, `\otherlanguage*` and `\foreignlanguage` commands.

```
\def\@crefname#1#2#3#4#5{%
  \expandafter\def\csname #1@#2@name#5\endcsname{#3}%
  \expandafter\def\csname #1@#2@name@plural#5\endcsname{#4}%
```

If the other capitalisation variant is not already defined...

```
  \cref@othervariant{#1}{\@tempc}{\@tempd}%
  \@ifundefined{\@tempc @#2@name#5}{%
```

Define `\@tempa` and `\tmpb` to be partial expansions (expanded just once) of the macros for the capitalisation variant we've just defined above.

```
    \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter\@tempa%
    \expandafter\expandafter\expandafter{%
      \csname#1@#2@name\endcsname}%
    \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter\@tempb%
    \expandafter\expandafter\expandafter{%
      \csname#1@#2@name@plural\endcsname}%
```

Add the case-change command stored in `\@tempd` to the front of the definitions of `\@tempa` and `\@tempb`.

```
    \expandafter\ifx\@tempa\@empty\else%
      \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@tempa%
      \expandafter\expandafter\expandafter{%
        \expandafter\@tempd\@tempa}%
      \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@tempb%
      \expandafter\expandafter\expandafter{%
        \expandafter\@tempd\@tempb}%
    \fi%
```

Define the other capitalisation variants to be the partial expansions (expanded just once) of `\@tempa` and `\@tempb`. The `\@toksa` token register just makes the code less verbose.

```
    \toksdef\@toksa=0%
    \@toksa={%
      \expandafter\def\csname\@tempc @#2@name#5\endcsname}%
    \expandafter\the\expandafter\@toksa\expandafter{\@tempa}%
    \@toksa={%
      \expandafter\def\csname\@tempc @#2@name@plural#5\endcsname}%
    \expandafter\the\expandafter\@toksa\expandafter{\@tempb}%
  }{}%
```

Add label type to list of types that need defining from components.

```
  \cref@stack@add{#2}{\cref@label@types}}
```

`\@crefconstructcomponents` The `\@crefconstructcomponents` utility macro puts the reference format components for the specified reference type into temporary macros, for use by later macros. The ridiculous number of "#" characters ensure that the correct number remain when they come to be used later (recall that pairs "##" are collapsed to a single "#" each time the code is expanded).

```
\def\@crefconstructcomponents#1{%
```

Single cross-reference label format.

```
  \@ifundefined{cref@#1@label}{%
    \let\@templabel\cref@default@label%
  }{%
    \expandafter\let\expandafter\@templabel%
    \csname cref@#1@label\endcsname%
  }%
```

Reference range label format.

```
  \@ifundefined{cref@#1@rangelabel}{%
    \expandafter\def\expandafter\@tempa\expandafter{%
      \@templabel{####1}{####3}{####4}}%
    \expandafter\def\expandafter\@tempb\expandafter{%
      \@templabel{####2}{####5}{####6}}%
    \toksdef\@toksa=0%
    \@toksa={\def\@temprangelabel##1##2##3##4##5##6}%
    \expandafter\expandafter\expandafter\the%
    \expandafter\expandafter\expandafter\@toksa%
    \expandafter\expandafter\expandafter{%
      \expandafter\expandafter\expandafter\crefrangepreconjunction%
      \expandafter\@tempa\expandafter\crefrangeconjunction\@tempb%
      \crefrangepostconjunction}%
  }{%
    \expandafter\let\expandafter\@temprangelabel%
    \csname cref@#1@rangelabel\endcsname%
  }%
```

If we're including names in hyperlinks, define variants of temporary label macros which lack the hyperlink start argument (it will instead be included in the temporary name macros).

```
\if@cref@nameinlink%
  \expandafter\def\expandafter\@templabel@first\expandafter{%
    \@templabel{########1}{}{########3}}%
  \expandafter\def\expandafter\@temprangelabel@first\expandafter{%
    \@temprangelabel{########1}{########2}%
      {}{########4}{########5}{########6}}%
\fi%
```

Get the correct number of "#"'s into the label format definitions.

```
\expandafter\def\expandafter\@templabel\expandafter{%
  \@templabel{########1}{########2}{########3}}%
\expandafter\def\expandafter\@temprangelabel\expandafter{%
  \@temprangelabel{########1}{########2}{########3}%
  {########4}{########5}{########6}}%
```

If we're not including names in hyperlinks, define all variants to be the same as standard temporary name macros.

```
\if@cref@nameinlink\else%
  \let\@templabel@first\@templabel%
  \let\@temprangelabel@first\@temprangelabel%
\fi%
```

If including names in hyperlinks, define temporary name macros to include hyperlink start argument.

```
\if@cref@nameinlink%
  \def\@tempa##1##2{##2##1}%
```

Lower-case singular cross-reference name.

```
    \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter\@tempname%
    \expandafter\expandafter\expandafter{%
      \expandafter\@tempa\expandafter%
        {\csname cref@#1@name\endcsname}{########2}}%
```

Upper-case singular cross-reference name.

```
    \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter\@tempName%
    \expandafter\expandafter\expandafter{%
      \expandafter\@tempa\expandafter%
        {\csname Cref@#1@name\endcsname}{########2}}%
```

Lower-case plural cross-reference name.

```
    \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter\@tempnameplural%
    \expandafter\expandafter\expandafter{%
      \expandafter\@tempa\expandafter%
        {\csname cref@#1@name@plural\endcsname}{########2}}%
```

Upper-case plural cross-reference name.

```
    \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter\@tempNameplural%
    \expandafter\expandafter\expandafter{%
      \expandafter\@tempa\expandafter%
        {\csname Cref@#1@name@plural\endcsname}{########2}}%
```

For cross-reference ranges, the hyperlink start argument is #3 instead of #2, so we need a different variant of the temporary plural name macros.

```
    \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter\@tempnameplural@range%
    \expandafter\expandafter\expandafter{%
      \expandafter\@tempa\expandafter%
        {\csname cref@#1@name@plural\endcsname}{########3}}%
    \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter\@tempNameplural@range%
    \expandafter\expandafter\expandafter{%
      \expandafter\@tempa\expandafter%
        {\csname Cref@#1@name@plural\endcsname}{########3}}%
```

If we're not including names in hyperlinks, temporary name macros don't include the hyperlink start argument.

```
  \else%
```

Lower-case singular cross-reference name.

```
    \expandafter\def\expandafter\@tempname\expandafter{%
      \csname cref@#1@name\endcsname}%
```

Upper-case singular cross-reference name.

```
    \expandafter\def\expandafter\@tempName\expandafter{%
      \csname Cref@#1@name\endcsname}%
```

Lower-case plural cross-reference name.

```
    \expandafter\def\expandafter\@tempnameplural\expandafter{%
      \csname cref@#1@name@plural\endcsname}%
```

Upper-case plural cross-reference name.

```
    \expandafter\def\expandafter\@tempNameplural\expandafter{%
      \csname Cref@#1@name@plural\endcsname}%
```

Define reference range variants to be identical to normal variants.

```
    \let\@tempnameplural@range\@tempnameplural%
    \let\@tempNameplural@range\@tempNameplural%
  \fi%
}
```

`\@crefdefineformat` The `\@crefdefineformat` et al. macros construct calls to `\crefformat` et al. for the supplied reference type, which define the corresponding formats in terms of the format components. This is mostly just an arduous exercise in controlling macro expansion order.

```
\def\@crefdefineformat#1{%
  \begingroup%
```

Put format components into tmp macros.

```
    \@crefconstructcomponents{#1}%
```

Assemble the arguments for `\crefformat`, `\Crefformat` and `\labelcrefformat` from the components.

```
    \ifx\@tempname\@empty\relax%
      \expandafter\def\expandafter\@tempfirst\expandafter{\@templabel}%
    \else%
      \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@tempfirst%
      \expandafter\expandafter\expandafter{%
        \expandafter\@tempname\expandafter\nobreakspace\@templabel@first}%
    \fi%
    \ifx\@tempName\@empty\relax%
      \expandafter\def\expandafter\@tempFirst\expandafter{\@templabel}%
    \else%
      \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@tempFirst%
      \expandafter\expandafter\expandafter{%
        \expandafter\@tempName\expandafter\nobreakspace\@templabel@first}%
    \fi%
    \expandafter\def\expandafter\@templabel\expandafter{\@templabel}%
```

Define `\crefformat` and `\Crefformat`.

```
    \toksdef\@toksa=0%
    \@toksa={\crefformat{#1}}%
    \expandafter\the\expandafter\@toksa\expandafter{\@tempfirst}%
    \@toksa={\Crefformat{#1}}%
    \expandafter\the\expandafter\@toksa\expandafter{\@tempFirst}%
```

Define `\labelcrefformat` if type has custom label format.

```
    \@ifundefined{cref@#1@label}{}{%
      \@toksa={\labelcrefformat{#1}}%
      \expandafter\the\expandafter\@toksa\expandafter{\@templabel}}%
  \endgroup}
```

`\@crefrangedefineformat` Construct call to `\crefrangeformat`.

```
\def\@crefrangedefineformat#1{%
  \begingroup%
```

Put format components into tmp macros.

```
    \@crefconstructcomponents{#1}%
```

Assemble the arguments for `\crefrangeformat`, `\Crefrangeformat` and `\labelcrefrangeformat` from the components.

```
    \ifx\@tempname\@empty\relax%
      \expandafter\def\expandafter\@tempfirst%
        \expandafter{\@temprangelabel}%
    \else%
      \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@tempfirst%
```

```
      \expandafter\expandafter\expandafter{%
        \expandafter\@tempnameplural@range%
        \expandafter\nobreakspace\@temprangelabel@first}%
    \fi%
    \ifx\@tempName\@empty\relax%
      \expandafter\def\expandafter\@tempFirst%
        \expandafter{\@temprangelabel}%
    \else%
      \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@tempFirst%
      \expandafter\expandafter\expandafter{%
        \expandafter\@tempNameplural@range%
        \expandafter\nobreakspace\@temprangelabel@first}%
    \fi%
    \expandafter\def\expandafter\@temprangelabel%
      \expandafter{\@temprangelabel}%
```

Define `\crefrangeformat` and `\Crefrangeformat`.

```
    \toksdef\@toksa=0%
    \@toksa={\crefrangeformat{#1}}%
    \expandafter\the\expandafter\@toksa\expandafter{\@tempfirst}%
    \@toksa={\Crefrangeformat{#1}}%
    \expandafter\the\expandafter\@toksa\expandafter{\@tempFirst}%
```

Define `\labelcrefrangeformat` if type has custom label format.

```
    \@ifundefined{cref@#1@rangelabel}{%
      \@ifundefined{cref@#1@label}{\let\@tempa\relax}{\def\@tempa{}}}%
      {\def\@tempa{}}%
    \ifx\@tempa\@empty\relax%
      \@toksa={\labelcrefrangeformat{#1}}%
      \expandafter\the\expandafter\@toksa\expandafter{%
        \@temprangelabel}%
    \fi%
  \endgroup}
```

`\@crefdefinemultiformat` Construct call to `\crefmultiformat`.

```
\def\@crefdefinemultiformat#1{%
  \begingroup%
```

Put format components into tmp macros.

```
    \@crefconstructcomponents{#1}%
```

Assemble the arguments for `\crefmultiformat`, `\Crefmultiformat` and `\labelcrefmultiformat` from the components.

```
    \ifx\@tempnameplural\@empty\relax%
      \expandafter\def\expandafter\@tempfirst%
        \expandafter{\@templabel}%
    \else%
      \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@tempfirst%
      \expandafter\expandafter\expandafter{%
```

```
      \expandafter\@tempnameplural%
      \expandafter\nobreakspace\@templabel@first}%
  \fi%
  \ifx\@tempNameplural\@empty\relax%
    \expandafter\def\expandafter\@tempFirst%
      \expandafter{\@templabel}%
  \else%
    \expandafter\expandafter\expandafter\def%
    \expandafter\expandafter\expandafter\@tempFirst%
    \expandafter\expandafter\expandafter{%
      \expandafter\@tempNameplural%
      \expandafter\nobreakspace\@templabel@first}%
  \fi%
  \expandafter\def\expandafter\@tempsecond\expandafter{%
    \expandafter\crefpairconjunction\@templabel}%
  \expandafter\def\expandafter\@tempmiddle\expandafter{%
    \expandafter\crefmiddleconjunction\@templabel}%
  \expandafter\def\expandafter\@templast\expandafter{%
    \expandafter\creflastconjunction\@templabel}%
  \expandafter\def\expandafter\@templabel\expandafter{\@templabel}%
```

Bundle all four arguments for `\crefmultiformat` in token register `\@toksb`, then call it.

```
  \toksdef\@toksa=0%
  \toksdef\@toksb=1%
  \@toksb={}%
  \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
    \expandafter{\@tempfirst}}%
  \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
    \expandafter{\@tempsecond}}%
  \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
    \expandafter{\@tempmiddle}}%
  \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
    \expandafter{\@templast}}%
  \@toksa={\crefmultiformat{#1}}%
  \expandafter\the\expandafter\@toksa\the\@toksb%
```

Bundle all four arguments for `\Crefmultiformat` in token register `\@toksb`, then call it.

```
  \@toksb={}%
  \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
    \expandafter{\@tempFirst}}%
  \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
    \expandafter{\@tempsecond}}%
  \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
    \expandafter{\@tempmiddle}}%
  \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
    \expandafter{\@templast}}%
  \@toksa={\Crefmultiformat{#1}}%
  \expandafter\the\expandafter\@toksa\the\@toksb%
```

If type has custom label format, bundle all four arguments for `\labelcrefmultiformat` in token register `\@toksb`, then call it.

```
    \@ifundefined{cref@#1@label}{}{%
      \@toksb={}%
      \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
        \expandafter{\@templabel}}%
      \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
        \expandafter{\@tempsecond}}%
      \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
        \expandafter{\@tempmiddle}}%
      \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
        \expandafter{\@templast}}%
      \@toksa={\labelcrefmultiformat{#1}}%
      \expandafter\the\expandafter\@toksa\the\@toksb}%
  \endgroup}
```

`\@crefrangedefinemultiformat` Construct call to `\crefrangemultiformat`.

```
\def\@crefrangedefinemultiformat#1{%
  \begingroup%
```

Put format components into tmp macros.

```
    \@crefconstructcomponents{#1}%
```

Assemble the arguments that need to be passed to `\crefrangemultiformat`, `\Crefrangemultiformat` and `\labelcrefrangemultiformat` from the reference components.

```
    \ifx\@tempnameplural\@empty\relax%
      \expandafter\def\expandafter\@tempfirst%
        \expandafter{\@temprangelabel}%
    \else%
      \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@tempfirst%
      \expandafter\expandafter\expandafter{%
        \expandafter\@tempnameplural@range%
        \expandafter\nobreakspace\@temprangelabel@first}%
    \fi%
    \ifx\@tempNameplural\@empty\relax%
      \expandafter\def\expandafter\@tempFirst%
        \expandafter{\@temprangelabel}%
    \else%
      \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\expandafter\@tempFirst%
      \expandafter\expandafter\expandafter{%
        \expandafter\@tempNameplural@range%
        \expandafter\nobreakspace\@temprangelabel@first}%
    \fi%
    \expandafter\def\expandafter\@tempsecond\expandafter{%
      \expandafter\crefpairconjunction\@temprangelabel}%
    \expandafter\def\expandafter\@tempmiddle\expandafter{%
      \expandafter\crefmiddleconjunction\@temprangelabel}%
```

```
    \expandafter\def\expandafter\@templast\expandafter{%
      \expandafter\creflastconjunction\@temprangelabel}%
    \expandafter\def\expandafter\@temprangelabel%
      \expandafter{\@temprangelabel}%
```

Bundle all four arguments for `\crefrangemultiformat` in token register `\@toksb`, then call it.

```
    \toksdef\@toksa=0%
    \toksdef\@toksb=1%
    \@toksb={}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@tempfirst}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@tempsecond}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@tempmiddle}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@templast}}%
    \@toksa={\crefrangemultiformat{#1}}%
    \expandafter\the\expandafter\@toksa\the\@toksb%
```

Bundle all four arguments for `\Crefrangemultiformat` in token register `\@toksb`, then call it.

```
    \@toksb={}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@tempFirst}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@tempsecond}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@tempmiddle}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@templast}}%
    \@toksa={\Crefrangemultiformat{#1}}%
    \expandafter\the\expandafter\@toksa\the\@toksb%
```

If type has custom label format, bundle all four arguments for `\labelcrefrangemultiformat` in token register `\@toksb`, then call it.

```
    \@ifundefined{cref@#1@rangelabel}{%
      \@ifundefined{cref@#1@label}{\let\@tempa\relax}{\def\@tempa{}}}%
        {\def\@tempa{}}%
    \ifx\@tempa\@empty\relax%
      \@toksb={}%
      \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
        \expandafter{\@temprangelabel}}%
      \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
        \expandafter{\@tempsecond}}%
      \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
        \expandafter{\@tempmiddle}}%
      \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
        \expandafter{\@templast}}%
      \@toksa={\labelcrefrangemultiformat{#1}}%
```

```
    \expandafter\the\expandafter\@toksa\the\@toksb%
  \fi%
\endgroup}
```

\@labelcrefdefinedefaultformats `\@labelcrefdefinedefaultformats` defines the default formats for the `\labelcref` command, which are used when no type-specific formats are defined.

```
\def\@labelcrefdefinedefaultformats{%
  \begingroup%
    \toksdef\@toksa=0%
    \toksdef\@toksb=1%
```

Assemble the arguments that need to be passed to `\labelcrefformat`, `\labelcrefrangeformat`, `\labelcrefmultiformat` and `\labelcrefrangemultiformat`.

```
    \let\@templabel\cref@default@label%
    \expandafter\def\expandafter\@tempa\expandafter{%
      \@templabel{####1}{####3}{####4}}%
    \expandafter\def\expandafter\@tempb\expandafter{%
      \@templabel{####2}{####5}{####6}}%
    \@toksa={\def\@temprangelabel##1##2##3##4##5##6}%
    \expandafter\expandafter\expandafter\the%
    \expandafter\expandafter\expandafter\@toksa%
    \expandafter\expandafter\expandafter{%
      \expandafter\expandafter\expandafter\crefrangepreconjunction%
      \expandafter\@tempa\expandafter\crefrangeconjunction\@tempb%
      \crefrangepostconjunction}%
    \expandafter\def\expandafter\@templabel\expandafter{%
      \@templabel{########1}{########2}{########3}}%
    \expandafter\def\expandafter\@temprangelabel\expandafter{%
      \@temprangelabel{########1}{########2}{########3}%
      {########4}{########5}{########6}}%
    \expandafter\def\expandafter\@tempsecond\expandafter{%
      \expandafter\crefpairconjunction\@templabel}%
    \expandafter\def\expandafter\@tempmiddle\expandafter{%
      \expandafter\crefmiddleconjunction\@templabel}%
    \expandafter\def\expandafter\@templast\expandafter{%
      \expandafter\creflastconjunction\@templabel}%
    \expandafter\def\expandafter\@temprangesecond\expandafter{%
      \expandafter\crefpairconjunction\@temprangelabel}%
    \expandafter\def\expandafter\@temprangemiddle\expandafter{%
      \expandafter\crefmiddleconjunction\@temprangelabel}%
    \expandafter\def\expandafter\@temprangelast\expandafter{%
      \expandafter\creflastconjunction\@temprangelabel}%
    \expandafter\def\expandafter\@templabel\expandafter{\@templabel}%
    \expandafter\def\expandafter\@temprangelabel%
      \expandafter{\@temprangelabel}%
```

Define default `\labelcrefformat`.

```
    \@toksa={\labelcrefformat{default}}%
    \expandafter\the\expandafter\@toksa\expandafter{\@templabel}%
```

Define default \labelcrefrangeformat.

```
    \@toksa={\labelcrefrangeformat{default}}%
    \expandafter\the\expandafter\@toksa\expandafter{\@temprangelabel}%
```

Bundle all four arguments for \labelcrefmultiformat in token register \@toksb, then call it to define default formats.

```
    \@toksb={}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@templabel}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@tempsecond}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@tempmiddle}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@templast}}%
    \@toksa={\labelcrefmultiformat{default}}%
    \expandafter\the\expandafter\@toksa\the\@toksb%
```

Bundle all four arguments for \labelcrefrangemultiformat in token register \@toksb, then call it to define default formats.

```
    \@toksb={}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@temprangelabel}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@temprangesecond}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@temprangemiddle}}%
    \expandafter\cref@append@toks\expandafter\@toksb\expandafter{%
      \expandafter{\@temprangelast}}%
    \@toksa={\labelcrefrangemultiformat{default}}%
    \expandafter\the\expandafter\@toksa\the\@toksb%
  \endgroup}
```

\@crefdefineallformats

\@crefdefineallformats calls each of the above, to define all formats for the given type from the corresponding components.

```
\def\@crefdefineallformats#1{%
  \@crefdefineformat{#1}%
  \@crefrangedefineformat{#1}%
  \@crefdefinemultiformat{#1}%
  \@crefrangedefinemultiformat{#1}}
```

### 14.5.2 Format definition commands

\crefformat
\Crefformat
\crefrangeformat
\Crefrangeformat
\crefmultiformat
\Crefmultiformat
\crefrangemultiformat
\Crefrangemultiformat

\crefformat et al. are lower-level commands that give complete control over the format of different reference types. They override the component-based formats, simply using the supplied arguments to define appropriately named formatting macros, which are called by \@setcref etc. If the corresponding \Crefformat or \crefformat variant is not already defined, they define it to be a version with the first letter capitalised or lower-cased.

```
\newcommand{\crefformat}[2]{\@crefformat{cref}{#1}{#2}}
\newcommand{\Crefformat}[2]{\@crefformat{Cref}{#1}{#2}}
\newcommand{\crefrangeformat}[2]{\@crefrangeformat{crefrange}{#1}{#2}}
\newcommand{\Crefrangeformat}[2]{\@crefrangeformat{Crefrange}{#1}{#2}}
\newcommand{\crefmultiformat}[5]{%
  \@crefmultiformat{cref}{#1}{#2}{#3}{#4}{#5}}
\newcommand{\Crefmultiformat}[5]{%
  \@crefmultiformat{Cref}{#1}{#2}{#3}{#4}{#5}}
\newcommand{\crefrangemultiformat}[5]{%
  \@crefrangemultiformat{crefrange}{#1}{#2}{#3}{#4}{#5}}
\newcommand{\Crefrangemultiformat}[5]{%
  \@crefrangemultiformat{Crefrange}{#1}{#2}{#3}{#4}{#5}}
\newcommand{\labelcrefformat}[2]{%
  \expandafter\gdef\csname labelcref@#1@format\endcsname##1##2##3{#2}}
\newcommand{\labelcrefrangeformat}[2]{%
  \expandafter\gdef\csname labelcrefrange@#1@format\endcsname%
  ##1##2##3##4##5##6{#2}}
\newcommand{\labelcrefmultiformat}[5]{%
  \expandafter\gdef\csname labelcref@#1@format@first\endcsname%
    ##1##2##3{#2}%
  \expandafter\gdef\csname labelcref@#1@format@second\endcsname%
    ##1##2##3{#3}%
  \expandafter\gdef\csname labelcref@#1@format@middle\endcsname%
    ##1##2##3{#4}%
  \expandafter\gdef\csname labelcref@#1@format@last\endcsname%
    ##1##2##3{#5}}
\newcommand{\labelcrefrangemultiformat}[5]{%
  \expandafter\gdef\csname labelcrefrange@#1@format@first\endcsname%
    ##1##2##3##4##5##6{#2}%
  \expandafter\gdef\csname labelcrefrange@#1@format@second\endcsname%
    ##1##2##3##4##5##6{#3}%
  \expandafter\gdef\csname labelcrefrange@#1@format@middle\endcsname%
    ##1##2##3##4##5##6{#4}%
  \expandafter\gdef\csname labelcrefrange@#1@format@last\endcsname%
    ##1##2##3##4##5##6{#5}}
```

The utility macros do the real work, by using the first argument ("cref" or "Cref", and "crefrange" or "Crefrange") to determine how to define the corresponding command with the other capitalisation.

`\@crefformat` `\@crefformat` defines the macros for single references.

```
\def\@crefformat#1#2#3{%
  \begingroup%
    \expandafter\gdef\csname #1@#2@format\endcsname##1##2##3{#3}%
```

If the other capitalisation variant is not already defined...

```
    \cref@othervariant{#1}{\@other}{\@changecase}%
    \@ifundefined{\@other @#2@format}{%
```

Define `\@tempa` to be a partial expansion (expanded just once) of the capitalisation variant we've just defined above. The `\@toska` token register just makes the code

less verbose.

```
      \toksdef\@toksa=0%
      \@toksa={\def\@tempa##1##2##3}%
      \expandafter\expandafter\expandafter\the%
      \expandafter\expandafter\expandafter\@toksa%
      \expandafter\expandafter\expandafter{%
        \csname#1@#2@format\endcsname{##1}{##2}{##3}}%
```

Add the `\@changecase` command to the front of the definition of `\@tempa`.

```
      \expandafter\expandafter\expandafter\the%
      \expandafter\expandafter\expandafter\@toksa%
      \expandafter\expandafter\expandafter{%
        \expandafter\@changecase\@tempa{##1}{##2}{##3}}%
```

Define the other capitalisation variant to be the partial expansion (expanded just once) of `\@tempa`.

```
      \@toksa={%
        \expandafter\gdef\csname\@other @#2@format\endcsname##1##2##3}%
      \expandafter\the\expandafter\@toksa\expandafter{%
        \@tempa{##1}{##2}{##3}}%
    }{}%
  \endgroup}
```

`\@crefrangeformat` `\@crefrangeformat` defines the macros for single reference ranges.

```
\def\@crefrangeformat#1#2#3{%
  \begingroup%
    \expandafter\gdef\csname #1@#2@format\endcsname%
      ##1##2##3##4##5##6{#3}%
```

If the other capitalisation variant is not already defined...

```
    \cref@othervariant{#1}{\@other}{\@changecase}%
    \@ifundefined{\@other @#2@format}{%
```

Define `\@tempa` to be a partial expansion (expanded just once) of the capitalisation variant we've just defined above. The `\@toska` token register just makes the code less verbose.

```
      \toksdef\@toksa=0%
      \@toksa={\def\@tempa##1##2##3##4##5##6}%
      \expandafter\expandafter\expandafter\the%
      \expandafter\expandafter\expandafter\@toksa%
      \expandafter\expandafter\expandafter{%
        \csname#1@#2@format\endcsname{##1}{##2}{##3}{##4}{##5}{##6}}%
```

Add the `\@changecase` command to the front of the definition of `\@tempa`.

```
      \expandafter\expandafter\expandafter\the%
      \expandafter\expandafter\expandafter\@toksa%
      \expandafter\expandafter\expandafter{%
        \expandafter\@changecase\@tempa{##1}{##2}{##3}{##4}{##5}{##6}}%
```

Define the other capitalisation variant to be the partial expansion (expanded just once) of `\@tempa`.

```
      \@toksa={\expandafter\gdef%
        \csname\@other @#2@format\endcsname##1##2##3##4##5##6}%
      \expandafter\the\expandafter\@toksa\expandafter{%
        \@tempa{##1}{##2}{##3}{##4}{##5}{##6}}%
    }{}%
  \endgroup}
```

`\@crefmultiformat` `\@crefmultiformat` defines the macros for multiple references.

```
\def\@crefmultiformat#1#2#3#4#5#6{%
  \begingroup%
    \expandafter\gdef\csname #1@#2@format@first\endcsname##1##2##3{#3}%
    \expandafter\gdef\csname #1@#2@format@second\endcsname##1##2##3{#4}%
    \expandafter\gdef\csname #1@#2@format@middle\endcsname##1##2##3{#5}%
    \expandafter\gdef\csname #1@#2@format@last\endcsname##1##2##3{#6}%
```

If the other capitalisation variant of the first part of the multi-format definition is not already defined...

```
    \cref@othervariant{#1}{\@other}{\@changecase}%
    \@ifundefined{\@other @#2@format@first}{%
```

Define `\@tempa` to be a partial expansion (expanded just once) of the capitalisation variant we've just defined above. The `\@toska` token register just makes the code less verbose.

```
      \toksdef\@toksa=0%
      \@toksa={\def\@tempa##1##2##3}%
      \expandafter\expandafter\expandafter\the%
      \expandafter\expandafter\expandafter\@toksa%
      \expandafter\expandafter\expandafter{%
        \csname#1@#2@format@first\endcsname{##1}{##2}{##3}}%
```

Add the `\@changecase` command to the front of the definition of `\@tempa`.

```
      \expandafter\expandafter\expandafter\the%
      \expandafter\expandafter\expandafter\@toksa%
      \expandafter\expandafter\expandafter{%
        \expandafter\@changecase\@tempa{##1}{##2}{##3}}%
```

Define the other capitalisation variant to be the partial expansion (expanded just once) of `\@tempa`.

```
      \@toksa={%
        \expandafter\gdef\csname\@other @#2@format@first\endcsname%
          ##1##2##3}%
      \expandafter\the\expandafter\@toksa\expandafter{%
        \@tempa{##1}{##2}{##3}}%
    }{}%
```

The other parts of the multi-format definition are defined to be identical for both capitalisation variants.

```
    \@ifundefined{\@other @#2@format@second}{%
      \@toksa={%
        \expandafter\global\expandafter\let%
        \csname\@other @#2@format@second\endcsname}%
```

```
      \expandafter\the\expandafter\@toksa%
        \csname #1@#2@format@second\endcsname%
    }{}%
    \@ifundefined{\@other @#2@format@middle}{%
      \@toksa={%
        \expandafter\global\expandafter\let%
        \csname\@other @#2@format@middle\endcsname}%
      \expandafter\the\expandafter\@toksa%
        \csname #1@#2@format@middle\endcsname%
    }{}%
    \@ifundefined{\@other @#2@format@last}{%
      \@toksa={%
        \expandafter\global\expandafter\let%
        \csname\@other @#2@format@last\endcsname}%
      \expandafter\the\expandafter\@toksa%
        \csname #1@#2@format@last\endcsname%
    }{}%
  \endgroup}
```

`\@crefrangemultiformat` `\@crefmultiformat` defines the macros for reference ranges within multiple references.

```
\def\@crefrangemultiformat#1#2#3#4#5#6{%
  \begingroup%
    \expandafter\gdef\csname #1@#2@format@first\endcsname%
      ##1##2##3##4##5##6{#3}%
    \expandafter\gdef\csname #1@#2@format@second\endcsname%
      ##1##2##3##4##5##6{#4}%
    \expandafter\gdef\csname #1@#2@format@middle\endcsname%
      ##1##2##3##4##5##6{#5}%
    \expandafter\gdef\csname #1@#2@format@last\endcsname%
      ##1##2##3##4##5##6{#6}%
```

If the other capitalisation variant of the first part of the multi-format definition is not already defined...

```
    \cref@othervariant{#1}{\@other}{\@changecase}%
    \@ifundefined{\@other @#2@format@first}{%
```

Define `\@tempa` to be a partial expansion (expanded just once) of the capitalisation variant we've just defined above. The `\@toska` token register just makes the code less verbose.

```
      \toksdef\@toksa=0%
      \@toksa={\def\@tempa##1##2##3##4##5##6}%
      \expandafter\expandafter\expandafter\the%
      \expandafter\expandafter\expandafter\@toksa%
      \expandafter\expandafter\expandafter{%
        \csname#1@#2@format@first\endcsname%
          {##1}{##2}{##3}{##4}{##5}{##6}}%
```

Add the `\@changecase` command to the front of the definition of `\@tempa`.

```
      \expandafter\expandafter\expandafter\the%
```

```
      \expandafter\expandafter\expandafter\@toksa%
      \expandafter\expandafter\expandafter{%
        \expandafter\@changecase\@tempa{##1}{##2}{##3}{##4}{##5}{##6}}%
```

Define the other capitalisation variant to be the partial expansion (expanded just once) of `\@tempa`.

```
      \@toksa={%
        \expandafter\gdef\csname\@other @#2@format@first\endcsname%
          ##1##2##3##4##5##6}%
      \expandafter\the\expandafter\@toksa\expandafter{%
        \@tempa{##1}{##2}{##3}{##4}{##5}{##6}}%
    }{}%
```

The other parts of the multi-format definition are defined to be identical for both capitalisation variants.

```
    \@ifundefined{\@other @#2@format@second}{%
      \@toksa={%
        \expandafter\global\expandafter\let%
        \csname\@other @#2@format@second\endcsname}%
      \expandafter\the\expandafter\@toksa%
        \csname #1@#2@format@second\endcsname%
    }{}%
    \@ifundefined{\@other @#2@format@middle}{%
      \@toksa={%
        \expandafter\global\expandafter\let%
        \csname\@other @#2@format@middle\endcsname}%
      \expandafter\the\expandafter\@toksa%
        \csname #1@#2@format@middle\endcsname%
    }{}%
    \@ifundefined{\@other @#2@format@last}{%
      \@toksa={%
        \expandafter\global\expandafter\let%
        \csname\@other @#2@format@last\endcsname}%
      \expandafter\the\expandafter\@toksa%
        \csname #1@#2@format@last\endcsname%
    }{}%
  \endgroup}
```

## 14.6 Support for Other Packages

### 14.6.1 `hyperref` support

`hyperref`

If the `hyperref` package is loaded, we add hyperlink support to `cleveref`. Since `hyperref` messes around with some of the same LaTeX internals as we do, we also have to override some of its redefinitions so that they work with `cleveref`.

```
\let\if@cref@hyperrefloaded\iffalse
\@ifpackageloaded{hyperref}{%
  \@ifpackagewith{hyperref}{implicit=false}{}{%
    \let\if@cref@hyperrefloaded\iftrue%
    \PackageInfo{cleveref}{`hyperref' support loaded}
```

\cref@hyperref We define a utility macro to extract the hyperlink supplied by `hyperref` (via the `aux` file). Note that `hyperref` adds the hyperlink information to the standard `\newlabel` line in the `aux` file, so we have to retrieve it from the standard `\@⟨label⟩`, *not* the one suffixed with `@cref` that we've created ourselves.

```
\def\cref@hyperref#1{\expandafter\expandafter\expandafter%
  \@fourthoffive\csname r@#1\endcsname}
```

\H@refstepcounter The `hyperref` package stores the original `\refstepcounter` definition as `\H@refstepcounter`. Unfortunately, it plasters `\@refstepcounter` all over the place, sometimes bypassing `\refstepcounter` entirely. So we're forced to modify `\H@refstepcounter` itself, in order to ensure that the extra information we need is stored in `\cref@currentlabel`.

```
\let\cref@old@H@refstepcounter\H@refstepcounter
\def\H@refstepcounter#1{%
  \cref@old@H@refstepcounter{#1}%
  \cref@constructprefix{#1}{\cref@result}%
  \@ifundefined{cref@#1@alias}%
    {\def\@tempa{#1}}%
    {\def\@tempa{\csname cref@#1@alias\endcsname}}%
  \protected@edef\cref@currentlabel{%
    [\@tempa][\arabic{#1}][\cref@result]%
    \csname p@#1\endcsname\csname the#1\endcsname}}
```

\refstepcounter@noarg
\refstepcounter@optarg `hyperref`'s `\refstepcounter`, which ends up stored in our `\cref@old@refstepcounter`, already calls `\H@refstepcounter`, and we just redefined the latter to store the extra information. So we only need to change `\cref@currentlabel` in *our* `\refstepcounter` if an optional argument was supplied. Note that, in this case, the mechanism for setting `\cref@currentlabel` is slightly different than it is without `hyperref`: `\cref@currentlabel` first gets set by our modified `\H@refstepcounter`, which gets called via `hyperref`'s original version, as stored in `\cref@old@refstepcounter`. The version of `\cref@refstepcounter@optarg` defined below then overrides the label type.

```
\let\refstepcounter@noarg\cref@old@refstepcounter%
\def\refstepcounter@optarg[#1]#2{%
  \cref@old@refstepcounter{#2}%
  \protected@edef\cref@currentlabel{%
    \expandafter\cref@override@label@type%
      \cref@currentlabel\@nil{#1}}}
```

\appendix We again make `\appendix` redefine things so that the label type for chapters or sections is exceptionally overridden and set to "appendix" instead. But this time, it is `\H@refstepcounter` that needs to be redefined.

```
\@ifundefined{appendix}{}{%
  \renewcommand\appendix{%
    \cref@old@appendix%
    \@ifundefined{chapter}{%
      \def\H@refstepcounter##1{%
        \cref@old@H@refstepcounter{##1}%
```

```
      \cref@constructprefix{##1}{\cref@result}%
```

We add a large value to the front of the counter data, to force references to anything in appendices to be sorted after everything else.

```
      \ifx\cref@result\@empty%
        \def\cref@result{2147483647}%
      \else%
        \edef\cref@result{2147483647,\cref@result}%
      \fi%
```

Override the cross-reference type of sectioning commands.

```
      \def\@tempa{##1}%
      \def\@tempb{section}%
      \ifx\@tempa\@tempb%
        \protected@edef\cref@currentlabel{%
          [appendix][\arabic{##1}][\cref@result]%
          \csname p@##1\endcsname\csname the##1\endcsname}%
      \else%
        \def\@tempa{##1}%
        \def\@tempb{subsection}%
        \ifx\@tempa\@tempb%
          \protected@edef\cref@currentlabel{%
            [subappendix][\arabic{##1}][\cref@result]%
            \csname p@##1\endcsname\csname the##1\endcsname}%
        \else%
          \def\@tempa{##1}%
          \def\@tempb{subsubsection}%
          \ifx\@tempa\@tempb%
            \protected@edef\cref@currentlabel{%
              [subsubappendix][\arabic{##1}][\cref@result]%
              \csname p@##1\endcsname\csname the##1\endcsname}%
          \else%
            \@ifundefined{cref@##1@alias}%
              {\def\@tempa{##1}}%
              {\def\@tempa{\csname cref@##1@alias\endcsname}}%
            \protected@edef\cref@currentlabel{%
              [\@tempa][\arabic{##1}][\cref@result]%
              \csname p@##1\endcsname\csname the##1\endcsname}
          \fi%
        \fi%
      \fi}%
  }{%
    \def\H@refstepcounter##1{%
      \cref@old@H@refstepcounter{##1}%
      \cref@constructprefix{##1}{\cref@result}%
```

Again, the large value added to the front of the counter data forces references to appendix items to be sorted last.

```
      \ifx\cref@result\@empty%
        \def\cref@result{2147483647}%
      \else%
```

```
              \edef\cref@result{2147483647,\cref@result}%
            \fi%
```

Override the cross-reference type of sectioning commands.

```
            \def\@tempa{##1}%
            \def\@tempb{chapter}%
            \ifx\@tempa\@tempb%
              \protected@edef\cref@currentlabel{%
                [appendix][\arabic{##1}][\cref@result]%
                \csname p@##1\endcsname\csname the##1\endcsname}%
            \else%
              \def\@tempa{##1}%
              \def\@tempb{section}%
              \ifx\@tempa\@tempb%
                \protected@edef\cref@currentlabel{%
                  [subappendix][\arabic{##1}][\cref@result]%
                  \csname p@##1\endcsname\csname the##1\endcsname}%
              \else%
                \def\@tempa{##1}%
                \def\@tempb{subsection}%
                \ifx\@tempa\@tempb%
                  \protected@edef\cref@currentlabel{%
                    [subsubappendix][\arabic{##1}][\cref@result]%
                    \csname p@##1\endcsname\csname the##1\endcsname}%
                \else%
                  \def\@tempa{##1}%
                  \def\@tempb{subsubsection}%
                  \ifx\@tempa\@tempb%
                    \protected@edef\cref@currentlabel{%
                      [subsubsubappendix][\arabic{##1}][\cref@result]%
                      \csname p@##1\endcsname\csname the##1\endcsname}%
                  \else%
                    \@ifundefined{cref@##1@alias}%
                      {\def\@tempa{##1}}%
                      {\def\@tempa{\csname cref@##1@alias\endcsname}}%
                    \protected@edef\cref@currentlabel{%
                      [\@tempa][\arabic{##1}][\cref@result]%
                      \csname p@##1\endcsname\csname the##1\endcsname}
                  \fi%
                \fi%
              \fi%
            \fi}%
        }%
      }%
    }% end of \@ifundefined{appendix}
```

`\cref*` `\Cref*` `\crefrange*` `\Crefrange*` `\cpageref*` `\Cpageref*` `\cpagerefrange*` `\Cpagerefrange*` `\labelcref*` `\labelcpageref*` `\@crefstar` `\@crefnostar` `\@crefrangestar` `\@crefrangenostar`

Redefine `\cref` and all the others to allow starred variants, which don't create hyperlinks. The starred variants simply set a flag, which is tested in the very final stage of reference typesetting in `\@@setcref`, `\@@setcrefrange`, `\@@setcpageref` and `\@@setcpagerefrange` (below).

```
\DeclareRobustCommand{\cref}{%
  \@ifstar{\@crefstar{cref}}{\@crefnostar{cref}}}
\DeclareRobustCommand{\Cref}{%
  \@ifstar{\@crefstar{Cref}}{\@crefnostar{Cref}}}
\def\@crefnostar#1#2{\@cref{#1}{#2}}
\def\@crefstar#1#2{%
  \@crefstarredtrue\@cref{#1}{#2}\@crefstarredfalse}
\DeclareRobustCommand{\crefrange}{%
  \@ifstar{\@crefrangestar{cref}}{\@crefrangenostar{cref}}}
\DeclareRobustCommand{\Crefrange}{%
  \@ifstar{\@crefrangestar{Cref}}{\@crefrangenostar{Cref}}}
\def\@crefrangenostar#1#2#3{\@setcrefrange{#2}{#3}{#1}{}}
\def\@crefrangestar#1#2#3{%
  \@crefstarredtrue\@setcrefrange{#2}{#3}{#1}{}\@crefstarredfalse}
\DeclareRobustCommand{\cpageref}{%
  \@ifstar{\@cpagerefstar{cref}}{\@cpagerefnostar{cref}}}
\DeclareRobustCommand{\Cpageref}{%
  \@ifstar{\@cpagerefstar{Cref}}{\@cpagerefnostar{Cref}}}
\def\@cpagerefnostar#1#2{%
  \@cpageref{#1}{#2}{\@setcpageref}{\@setcpagerefrange}}
\def\@cpagerefstar#1#2{%
  \@crefstarredtrue%
  \@cpageref{#1}{#2}{\@setcpageref}{\@setcpagerefrange}%
  \@crefstarredfalse}
\DeclareRobustCommand{\cpagerefrange}{%
  \@ifstar{\@cpagerefrangestar{cref}}{\@cpagerefrangenostar{cref}}}
\DeclareRobustCommand{\Cpagerefrange}{%
  \@ifstar{\@cpagerefrangestar{Cref}}{\@cpagerefrangenostar{Cref}}}
\def\@cpagerefrangenostar#1#2#3{\@setcpagerefrange{#2}{#3}{#1}{}}
\def\@cpagerefrangestar#1#2#3{%
  \@crefstarredtrue%
  \@setcpagerefrange{#2}{#3}{#1}{}%
  \@crefstarredfalse}
\DeclareRobustCommand{\labelcref}{%
  \@ifstar{\@labelcrefstar}{\@labelcrefnostar}}
\def\@labelcrefnostar#1{\@cref{labelcref}{#1}}
\def\@labelcrefstar#1{%
  \@crefstarredtrue%
  \@cref{labelcref}{#1}%
  \@crefstarredfalse}
\DeclareRobustCommand{\labelcpageref}{%
  \@ifstar{\@labelcpagerefstar}{\@labelcpagerefnostar}}
\def\@labelcpagerefnostar#1{%
  \@cpageref{labelcref}{#1}{\@setcpageref}{\@setcpagerefrange}}
\def\@labelcpagerefstar#1{%
  \@crefstarredtrue%
  \@cpageref{labelcref}{#1}{\@setcpageref}{\@setcpagerefrange}%
  \@crefstarredfalse}
```

`\@@setcref` `\@@setcrefrange` `\@@setcpageref` `\@@setcpagerefrange` Redefine the final reference typesetting macros to create hyperlinks (unless the

starred flag is set), using the extra arguments supplied in `\r@⟨label⟩` (via the `aux` file) by `hyperref`.

```
    \def\@@setcref#1#2{%
      \cref@getlabel{#2}{\@templabel}%
      \if@crefstarred%
        #1{\@templabel}{}{}%
      \else%
        \edef\@templink{\cref@hyperref{#2}}%
        #1{\@templabel}{\hyper@linkstart{link}{\@templink}}%
          {\hyper@linkend}%
      \fi}
    \def\@@setcrefrange#1#2#3{%
      \cref@getlabel{#2}{\@labela}%
      \cref@getlabel{#3}{\@labelb}%
      \if@crefstarred%
        #1{\@labela}{\@labelb}{}{}{}{}%
      \else%
        \edef\@linka{\cref@hyperref{#2}}%
        \edef\@linkb{\cref@hyperref{#3}}%
        #1{\@labela}{\@labelb}%
          {\hyper@linkstart{link}{\@linka}}{\hyper@linkend}%
          {\hyper@linkstart{link}{\@linkb}}{\hyper@linkend}%
      \fi}%
    \def\@@setcpageref#1#2{%
      \cref@getpageref{#2}{\@temppage}%
      \if@crefstarred%
        #1{\@temppage}{}{}%
      \else%
        \edef\@templink{\cref@hyperref{#2}}%
        #1{\@temppage}{\hyper@linkstart{link}{\@templink}}%
          {\hyper@linkend}%
      \fi}
    \def\@@setcpagerefrange#1#2#3{%
      \cref@getpageref{#2}{\@pagea}%
      \cref@getpageref{#3}{\@pageb}%
      \if@crefstarred%
        #1{\@pagea}{\@pageb}{}{}{}{}%
      \else%
        \edef\@linka{\cref@hyperref{#2}}%
        \edef\@linkb{\cref@hyperref{#3}}%
        #1{\@pagea}{\@pageb}%
          {\hyper@linkstart{link}{\@linka}}{\hyper@linkend}%
          {\hyper@linkstart{link}{\@linkb}}{\hyper@linkend}%
      \fi}%
  }%  end of false case of \@ifpackagewith{hyperref}{implicit=false}
```

The `revtex4-1` and `revtex4-1` document classes use `\H@refstepcounter` to increment section counters, even when `hyperref` isn't explicitly loaded. Therefore, for these docclasses we need to redefine `\H@refstepcounter` even when `hyperref` is not loaded.

```
}{% false case of \@ifpackageloaded{hyperref}
  \@ifclassloaded{revtex4}{\let\if@cref@hyperrefloaded\iftrue}{}%
  \@ifclassloaded{revtex4-1}{\let\if@cref@hyperrefloaded\iftrue}{}%
  \if@cref@hyperrefloaded\relax%
    \let\cref@old@H@refstepcounter\H@refstepcounter%
    \def\H@refstepcounter#1{%
      \cref@old@H@refstepcounter{#1}%
      \cref@constructprefix{#1}{\cref@result}%
      \@ifundefined{cref@#1@alias}%
        {\def\@tempa{#1}}%
        {\def\@tempa{\csname cref@#1@alias\endcsname}}%
      \protected@edef\cref@currentlabel{%
        [\@tempa][\arabic{#1}][\cref@result]%
        \csname p@#1\endcsname\csname the#1\endcsname}}%
  \fi%
  \let\if@cref@hyperrefloaded\iffalse%
}% end of \@ifpackageloaded{hyperref}
```

### 14.6.2 amsmath support

amsmath
\label
\label@in@display

The amsmath package redefines the \label command within equation environments, so if it is loaded we have to extend the behaviour to support the optional argument. With amsmath, the original \label command is stored in \ltx@label, and \label@in@display replaces \label inside equations. \label@in@display just saves the label for later, and defining it is left until the end of the equation, when \ltx@label is finally called.

To allow \label within equations to support an optional argument, we first store the original \label@in@display and the new \label macro we defined above (since \label will be clobbered inside equations). Then we redefine \abel@in@display so that it wraps all its arguments, including any optional argument, in an extra set of braces. These are stripped away again by \ltx@label before calling the cleveref \label command we defined previously (saved in \cref@label). As before, we must postpone the redefinition of \label until the beginning of the document, since other packages do so.

```
\@ifpackageloaded{amsmath}{%
  \AtBeginDocument{
    \let\cref@old@label@in@display\label@in@display
    \def\label@in@display{%
      \@ifnextchar[\label@in@display@optarg\label@in@display@noarg}%]
    \def\label@in@display@noarg#1{\cref@old@label@in@display{{#1}}}
    \def\label@in@display@optarg[#1]#2{%
      \cref@old@label@in@display{[#1]{#2}}}
    \def\ltx@label#1{\cref@label#1}
  }%  end of AtBeginDocument
```

\measure@
\gmeasure@

The amsmath multi-line equation environments scan their bodies twice: once to measure, once to typeset. In the measure phase, the \label command is disabled by letting it to \@gobble. But this isn't sufficient to gobble all the arguments any

more if an optional argument is supplied to our new `\label`, so we have to modify the `amsmath` measuring commands so that they let `\label` to `\@gobble@optarg` instead.

Unfortunately, `amsmath` wasn't designed with redefinitions of `\label` in mind, so there appears to be no safe way of doing this other than copying the `amsmath` definitions and making the modification directly in the macro's code. This is a recipe for future chaos if these commands are ever modified in a new version of `amsmath`, but it seems we have no choice. Luckily, `amsmath` isn't updated too often!

```
\def\measure@#1{%
  \begingroup
      \measuring@true
      \global\eqnshift@\z@
      \global\alignsep@\z@
      \global\let\tag@lengths\@empty
      \global\let\field@lengths\@empty
      \savecounters@
      \global\setbox0\vbox{%
          \let\math@cr@@@\math@cr@@@align@measure
          \everycr{\noalign{\global\tag@false
            \global\let\raise@tag\@empty \global\column@\z@}}%
          \let\label\@gobble@optarg%  <<< cleveref modification
          \global\row@\z@
          \tabskip\z@
          \halign{\span\align@preamble\crcr
              #1%
              \math@cr@@@
              \global\column@\z@
              \add@amps\maxfields@\cr
          }%
      }%
      \restorecounters@
      \ifodd\maxfields@
          \global\advance\maxfields@\@ne
      \fi
      \ifnum\xatlevel@=\tw@
          \ifnum\maxfields@<\thr@@
              \let\xatlevel@\z@
          \fi
      \fi
      \setbox\z@\vbox{%
        \unvbox\z@ \unpenalty \global\setbox\@ne\lastbox
      }%
      \global\totwidth@\wd\@ne
      \if@fleqn \global\advance\totwidth@\@mathmargin \fi
      \global\let\maxcolumn@widths\@empty
      \begingroup
        \let\or\relax
        \loop
```

```
            \global\setbox\@ne\hbox{%
              \unhbox\@ne \unskip \global\setbox\thr@@\lastbox
            }%
          \ifhbox\thr@@
           \xdef\maxcolumn@widths{ \or \the\wd\thr@@ \maxcolumn@widths}%
          \repeat
        \endgroup
        \dimen@\displaywidth
        \advance\dimen@-\totwidth@
        \ifcase\xatlevel@
            \global\alignsep@\z@
            \let\minalignsep\z@
            \@tempcntb\z@
            \if@fleqn
                \@tempcnta\@ne
                \global\eqnshift@\@mathmargin
            \else
                \@tempcnta\tw@
                \global\eqnshift@\dimen@
                \global\divide\eqnshift@\@tempcnta
            \fi
        \or
            \@tempcntb\maxfields@
            \divide\@tempcntb\tw@
            \@tempcnta\@tempcntb
            \advance\@tempcntb\m@ne
            \if@fleqn
                \global\eqnshift@\@mathmargin
                \global\alignsep@\dimen@
                \global\divide\alignsep@\@tempcnta
            \else
                \global\advance\@tempcnta\@ne
                \global\eqnshift@\dimen@
                \global\divide\eqnshift@\@tempcnta
                \global\alignsep@\eqnshift@
            \fi
        \or
            \@tempcntb\maxfields@
            \divide\@tempcntb\tw@
            \global\advance\@tempcntb\m@ne
            \global\@tempcnta\@tempcntb
            \global\eqnshift@\z@
            \global\alignsep@\dimen@
            \if@fleqn
                \global\advance\alignsep@\@mathmargin\relax
            \fi
            \global\divide\alignsep@\@tempcntb
        \fi
        \ifdim\alignsep@<\minalignsep\relax
            \global\alignsep@\minalignsep\relax
```

```
            \ifdim\eqnshift@>\z@
                \if@fleqn\else
                    \global\eqnshift@\displaywidth
                    \global\advance\eqnshift@-\totwidth@
                    \global\advance\eqnshift@-\@tempcntb\alignsep@
                    \global\divide\eqnshift@\tw@
                \fi
            \fi
        \fi
        \ifdim\eqnshift@<\z@
            \global\eqnshift@\z@
        \fi
        \calc@shift@align
        \global\tagshift@\totwidth@
        \global\advance\tagshift@\@tempcntb\alignsep@
        \if@fleqn
            \ifnum\xatlevel@=\tw@
                \global\advance\tagshift@-\@mathmargin\relax
            \fi
        \else
            \global\advance\tagshift@\eqnshift@
        \fi
        \iftagsleft@ \else
            \global\advance\tagshift@-\displaywidth
        \fi
        \dimen@\minalignsep\relax
        \global\advance\totwidth@\@tempcntb\dimen@
        \ifdim\totwidth@>\displaywidth
            \global\let\displaywidth@\totwidth@
        \else
            \global\let\displaywidth@\displaywidth
        \fi
    \endgroup
}
\def\gmeasure@#1{%
    \begingroup
        \measuring@true
        \totwidth@\z@
        \global\let\tag@lengths\@empty
        \savecounters@
        \setbox\@ne\vbox{%
            \everycr{\noalign{\global\tag@false
              \global\let\raise@tag\@empty \global\column@\z@}}%
            \let\label\@gobble%  <<< cleveref modification
            \halign{%
                \setboxz@h{$\m@th\displaystyle{##}$}%
                \ifdim\wdz@>\totwidth@
                    \global\totwidth@\wdz@
                \fi
               &\setboxz@h{\strut@{##}}%
```

```
                \savetaglength@
                \crcr
                #1%
                \math@cr@@@
            }%
        }%
        \restorecounters@
        \if@fleqn
            \global\advance\totwidth@\@mathmargin
        \fi
        \iftagsleft@
            \ifdim\totwidth@>\displaywidth
                \global\let\gdisplaywidth@\totwidth@
            \else
                \global\let\gdisplaywidth@\displaywidth
            \fi
        \fi
    \endgroup
}
```

`\multline@` `\mmeasure@` `\label@mmeasure@noarg` `\label@mmeasure@optarg`

The `multline` environment works a bit differently to the other `amsmath` environments, in that `\label` is *disabled* during the typesetting phase, and *enabled* during the measuring phase. To cope with `cleveref`'s optional argument, we have to define separate versions of `\label@in@display` specifically for `\mmeasure@`.

```
\def\multline@#1{%
  \Let@
  \@display@init{\global\advance\row@\@ne \global\dspbrk@lvl\m@ne}%
  \chardef\dspbrk@context\z@
  \restore@math@cr
  \let\tag\tag@in@align
  \global\tag@false \global\let\raise@tag\@empty
  \mmeasure@{#1}%
  \let\tag\gobble@tag \let\label\@gobble@optarg%  <<< cleveref modification
  \tabskip \if@fleqn \@mathmargin \else \z@skip \fi
  \totwidth@\displaywidth
  \if@fleqn
      \advance\totwidth@-\@mathmargin
  \fi
  \halign\bgroup
      \hbox to\totwidth@{%
          \if@fleqn
              \hskip \@centering \relax
          \else
              \hfil
          \fi
          \strut@
          $\m@th\displaystyle{}##\endmultline@math
          \hfil
      }% $
      \crcr
```

```
        \if@fleqn
            \hskip-\@mathmargin
            \def\multline@indent{\hskip\@mathmargin}%
        \else
            \hfilneg
            \def\multline@indent{\hskip\multlinegap}%
        \fi
        \iftagsleft@
            \iftag@
                \begingroup
                    \ifshifttag@
                        \rlap{\vbox{%
                                \normalbaselines
                                \hbox{%
                                    \strut@
                                    \make@display@tag
                                }%
                                \vbox to\lineht@{}%
                                \raise@tag
                        }}%
                        \multline@indent
                    \else
                        \setbox\z@\hbox{\make@display@tag}%
                        \dimen@\@mathmargin \advance\dimen@-\wd\z@
                        \ifdim\dimen@<\multlinetaggap
                          \dimen@\multlinetaggap
                        \fi
                        \box\z@ \hskip\dimen@\relax
                    \fi
                \endgroup
            \else
                \multline@indent
            \fi
        \else
            \multline@indent
        \fi
  #1%
}
\def\mmeasure@#1{%
  \begingroup
      \measuring@true
      \def\label{%                  <<< cleveref modification
        \@ifnextchar[\label@in@mmeasure@optarg%]
          \label@in@mmeasure@noarg}%
      \def\math@cr@@@{\cr}%
      \let\shoveleft\@iden \let\shoveright\@iden
      \savecounters@
      \global\row@\z@
      \setbox\@ne\vbox{%
          \global\let\df@tag\@empty
```

```
            \halign{%
                \setboxz@h{\@lign$\m@th\displaystyle{}##$}%
                \iftagsleft@
                    \ifnum\row@=\@ne
                        \global\totwidth@\wdz@
                        \global\lineht@\ht\z@
                    \fi
                \else
                    \global\totwidth@\wdz@
                    \global\lineht@\dp\z@
                \fi
                \crcr
                #1%
                \crcr
            }%
        }%
        \ifx\df@tag\@empty\else\global\tag@true\fi
        \if@eqnsw\global\tag@true\fi
        \iftag@
            \setboxz@h{%
                \if@eqnsw
                    \stepcounter{equation}%
                    \tagform@\theequation
                \else
                    \df@tag
                \fi
            }%
            \global\tagwidth@\wdz@
            \dimen@\totwidth@
            \advance\dimen@\tagwidth@
            \advance\dimen@\multlinetaggap
            \iftagsleft@\else
                \if@fleqn
                    \advance\dimen@\@mathmargin
                \fi
            \fi
            \ifdim\dimen@>\displaywidth
                \global\shifttag@true
            \else
                \global\shifttag@false
            \fi
        \fi
        \restorecounters@
    \endgroup
}
\def\label@in@mmeasure@noarg#1{%
    \begingroup%
      \measuring@false%
      \cref@old@label@in@display{{#1}}%
    \endgroup}
```

```
\def\label@in@mmeasure@optarg[#1]#2{%
  \begingroup%
    \measuring@false%
    \cref@old@label@in@display{[#1]{#2}}%
  \endgroup}
```

`subequations` In order for `subequations` to be sorted properly, `cleveref` needs to know that the `equation` counter is effectively reset by the `parentequation` counter within the `subequations` environment. This isn't how `amsmath` implements subequations (for obvious reasons!), but we harmlessly add the `equation` counter to the `parentequation` counter's reset list *within* `subequations` environments, so that `cleveref`'s sorting mechanism can figure things out. We also harmlessly make sure `parentequation` is reset by the same counter as `equation`.

```
\let\cref@old@subequations\subequations%
\let\cref@old@endsubequations\endsubequations%
\cref@resetby{equation}{\cref@result}%
\ifx\cref@result\relax\else%
  \@addtoreset{parentequation}{\cref@result}%
\fi%
\renewenvironment{subequations}{%
  \@addtoreset{equation}{parentequation}%
  \cref@old@subequations%
}{%
  \gdef\cl@parentequation{}%
  \cref@old@endsubequations%
  \setcounter{parentequation}{0}%
}%
```

`\make@df@tag@@` `\make@df@tag@@@` We override the internals of the `amsmath` `\tag` command to add the additional information to the label definition. Since labels produced by `\tag` have no logical ordering when sorting a list of references, we give them a large numerical value so that they get pushed to the end of sorted cross-reference lists.

```
\def\make@df@tag@@#1{%
  \gdef\df@tag{\maketag@@@{#1}\def\@currentlabel{#1}%
    \def\cref@currentlabel{[equation][2147483647][]#1}}}
\def\make@df@tag@@@#1{%
  \gdef\df@tag{\tagform@{#1}%
    \toks@\@xp{\p@equation{#1}}%
    \edef\@currentlabel{\the\toks@}%
    \edef\cref@currentlabel{[equation][2147483647][]\the\toks@}}}
}{}%  end of \@ifpackageloaded{amsmath}
```

### 14.6.3 `IEEEtrantools` support

`IEEEtrantools` The `IEEEeqnarray` environment and `\IEEEeqnarraccr` command call `\stepcounter` instead of `\refstepcounter` to increment the equation counters, so they fail to set the cross-reference type for `cleveref`. We patch in calls to `\refstepcounter` to fix this.

```
\@ifpackageloaded{IEEEtrantools}{%
  \PackageInfo{cleveref}{‘IEEEtrantools’ support loaded}
```

`\@@IEEEeqnarray` Rather than copying the whole of `\@@IEEEeqnarray` just to patch the `\stepcounter` line (which would be fragile and liable to breakage), we insert an extra step which calls `\refstepcounter` to set the cross-reference type, then decrements the `equation` counter by one, before calling the original `\@@IEEEeqnarray`.

```
\let\cref@orig@@IEEEeqnarray\@@IEEEeqnarray
\def\@@IEEEeqnarray[#1]#2{%
  \refstepcounter{equation}%
  \addtocounter{equation}{-1}%
  \cref@orig@@IEEEeqnarray[#1]{#2}}
```

We do the same thing with `\@IEEEeqnarrayXCR`, the last in the chain of macros that gets invoked by `\\` (let to `\IEEEeqnarraycr`) within `IEEEeqnarray` environments.

`\@IEEEeqnarrayXCR`

```
\let\cref@orig@IEEEeqnarrayXCR\@IEEEeqnarrayXCR
\def\@IEEEeqnarrayXCR[#1]{%
  \if@eqnsw%
    \if@IEEEissubequation%
      %\addtocounter{equation}{1}%
      \refstepcounter{IEEEsubequation}%
      \addtocounter{IEEEsubequation}{-1}%
    \else%
      \refstepcounter{equation}%
      \addtocounter{equation}{-1}%
    \fi%
  \fi%
\cref@orig@IEEEeqnarrayXCR[#1]}
```

`\IEEEyessubnumber` And again for `\EEEyessubnumber` (used to turn an equation into a subequation).

```
\let\cref@orig@IEEEyessubnumber\IEEEyessubnumber
\def\IEEEyessubnumber{%
  \if@IEEEeqnarrayISinner%
    \if@IEEElastlinewassubequation\else%
      \setcounter{IEEEsubequation}{0}%
      \refstepcounter{IEEEsubequation}%
    \fi%
  \fi%
  \cref@orig@IEEEyessubnumber}
```

`IEEEsubequation` To get the subequation formatting right, we harmlessly add the `IEEEsubequation` counter to the `equation` counter reset list so that `cleveref` can figure out the subnumbering relationship, and define `IEEEsubequation` to be an alias of the `equation` format.

```
\@addtoreset{IEEEsubequation}{equation}%
\crefalias{IEEEsubequation}{equation}%
```

```
}{}% end of \@ifpackageloaded{IEEEtrantools}
```

### 14.6.4 amsthm support

amsthm If amsthm is loaded, we need to modify its theorem referencing features so that they work with cleveref.

```
\@ifpackageloaded{amsthm}{%
\PackageInfo{cleveref}{`amsthm' support loaded}
```

\@thm We modify amsthm's version of the \@thm macro, to have it call \refstepcounter with an optional argument containing the theorem type.

```
\let\cref@thmnoarg\@thm
\def\@thm{\@ifnextchar[{\cref@thmoptarg}{\cref@thmnoarg}}%]
\def\cref@thmoptarg[#1]#2#3#4{%
  \ifhmode\unskip\unskip\par\fi%
  \normalfont%
  \trivlist%
  \let\thmheadnl\relax%
  \let\thm@swap\@gobble%
  \thm@notefont{\fontseries\mddefault\upshape}%
  \thm@headpunct{.}% add period after heading
  \thm@headsep 5\p@ plus\p@ minus\p@\relax%
  \thm@space@setup%
  #2% style overrides
  \@topsep \thm@preskip               % used by thm head
  \@topsepadd \thm@postskip           % used by \@endparenv
  \def\@tempa{#3}\ifx\@empty\@tempa%
    \def\@tempa{\@oparg{\@begintheorem{#4}{}}[]}%
  \else%
    \refstepcounter[#1]{#3}%  <<< cleveref modification
    \def\@tempa{\@oparg{\@begintheorem{#4}{\csname the#3\endcsname}}[]}%
  \fi%
  \@tempa}
```

\@ynthm We also have to modify amsthm's \@ynthm command so that it passes the optional argument to \@thm. Since amsmath's \@ynthm takes a different parameter list to the standard LaTeX \@ynthm macro, we deliberately override our previous redefinition, and add the code for the automatic \crefname definitions directly to this version.

```
\def\@ynthm#1[#2]#3{%
```

Here's the automatic \crefname definition.

```
  \edef\@tempa{\expandafter\noexpand%
    \csname cref@#1@name@preamble\endcsname}%
  \edef\@tempb{\expandafter\noexpand%
      \csname Cref@#1@name@preamble\endcsname}%
  \def\@tempc{#3}%
  \ifx\@tempc\@empty\relax%
    \expandafter\gdef\@tempa{}%
    \expandafter\gdef\@tempb{}%
```

```
\else%
  \expandafter\expandafter\expandafter\gdef\expandafter%
    \@tempa\expandafter{\MakeLowercase #3}%
  \expandafter\expandafter\expandafter\gdef\expandafter%
    \@tempa\expandafter{\MakeUppercase #3}%
\fi%
\cref@stack@add{#1}{\cref@label@types}%
```

Here's the original `amsthm` `\@ynthm` definition, with the `cleveref` modification.

```
\ifx\relax#2\relax%
  \def\@tempa{\@oparg{\@xthm{#1}{#3}}[]}%
\else%
  \@ifundefined{c@#2}{%
    \def\@tempa{\@nocounterr{#2}}%
  }{%
    \@xp\xdef\csname the#1\endcsname{\@xp\@nx\csname the#2\endcsname}%
    \toks@{#3}%
    \@xp\xdef\csname#1\endcsname{%
      \@nx\@thm[#1]{%  <<< new optional argument for theorem name
        \let\@nx\thm@swap%
          \if S\thm@swap\@nx\@firstoftwo\else\@nx\@gobble\fi%
        \@xp\@nx\csname th@\the\thm@style\endcsname}%
          {#2}{\the\toks@}}%
    \let\@tempa\relax%
  }%
\fi%
\@tempa}
```

`\@xnthm` Finally, we have to restore the `amsthm` version of `\@xnthm`, which we stored earlier in `\cref@old@xnthm` and redefined. With `amsthm`, `\@xnthm` calls `\@ynthm`, so the automatic `\crefname` definition is already taken care of.

```
\let\@xnthm\cref@old@xnthm
}{}%  end of \@ifpackageloaded{amsthm}
```

### 14.6.5 `ntheorem` support

`ntheorem` `thref` If `ntheorem` is loaded, we need to modify its theorem referencing features so that they work with `cleveref`.

```
\@ifpackageloaded{ntheorem}{%
\PackageInfo{cleveref}{`ntheorem' support loaded}
\@ifpackagewith{ntheorem}{thref}{%
  \PackageWarning{cleveref}{`cleveref' supersedes `ntheorem's `thref'
    option}%
  \renewcommand{\thref}{\cref}}{}
```

`\theorem@prework` Newer versions of `ntheorem` require a call to `\theorem@prework` when typesetting theorems. If an older version of `ntheorem` is being used, we just `\let` it to `\relax` to make sure it's defined.

```
\@ifundefined{theorem@prework}{\let\theorem@prework\relax}{}
```

`\@thm` We modify `ntheorem`'s version of the `\@thm` macro very slightly, to have it call `\refstepcounter` with an optional argument containing the theorem type.

```
\gdef\@thm#1#2#3{%
  \if@thmmarks%
    \stepcounter{end\InTheoType ctr}%
  \fi%
  \renewcommand{\InTheoType}{#1}%
  \if@thmmarks%
    \stepcounter{curr#1ctr}%
    \setcounter{end#1ctr}{0}%
  \fi%
  \refstepcounter[#1]{#2}%  <<< cleveref modification
  \theorem@prework%
  \thm@topsepadd \theorempostskipamount%
  \ifvmode \advance\thm@topsepadd\partopsep\fi%
  \trivlist%
  \@topsep \theorempreskipamount%
  \@topsepadd \thm@topsepadd%
  \advance\linewidth -\theorem@indent%
  \advance\@totalleftmargin \theorem@indent%
  \parshape \@ne \@totalleftmargin \linewidth%
  \@ifnextchar[{\@ythm{#1}{#2}{#3}}{\@xthm{#1}{#2}{#3}}%]
}
}{}%  end of \@ifpackageloaded{ntheorem}
```

### 14.6.6 `varioref` support

`varioref` If `varioref` is loaded, we redefine its commands to use `\cref` instead of `\ref` to produce the reference. Since `\cref` can cope with multiple references, we extend the page referencing magic of `\vref` et al. to use `\cpageref` instead, assisted by `\@setvpageref` and `\@vpagerefrange` (which typeset page references using `varioref` commands). The former takes care of multi-references, the latter take care of the `varioref` page referencing magic.

```
\@ifpackageloaded{varioref}{%
  \PackageInfo{cleveref}{`varioref' support loaded}
  \PackageInfo{cleveref}{`cleveref' supersedes `varioref's %
    \string\labelformat command}
```

`\cref@@vpageref` We first enhance the core `varioref` `\vpageref` macro to allow it to cope with lists of page references. This is done by defining our version in terms of `cleveref`'s `\cpageref` command, which handles multi-references, but telling `\cpageref` to typeset the actual page references themselves using `varioref`'s own page-referencing commands. (The alternative version of `\vpagerefrange` is there to facilitate later redefinitions.)

```
\def\cref@@vpageref#1[#2]#3{%
  \@cpageref{cref}{#3}%
    {\@setvpageref[#1][\vref@space]}{\@setvpagerefrange[#1]}}
```

\cref@vref
\cref@vrefrange
\cref@fullref

Now we define `cleveref`-enhanced versions of the other `varioref` cross-referencing commands, which use `\cref` et al. to type set the cross-references, and the `cleveref`-enhanced `\vpageref` et al. to typeset page references.

```
\def\cref@vref#1#2{%
  \leavevmode%
  \@cref{#1}{#2}\@setcref@space%
  \cref@@vpageref{\reftextcurrent}[]{#2}}
\def\cref@vrefrange#1#2#3{%
  \@setcrefrange{#2}{#3}{#1}{}\@setcref@space\vpagerefrange{#2}{#3}}
\def\cref@fullref#1#2{%
  \@cref{#1}{#2}\@setcref@space%
  \@cpageref{cref}{#2}{\@setfullpageref}{\@setfullpagerefrange}}
```

\cref@vpagerefconjunction

When typesetting multi-references, we need to add appropriate conjunctions to the page references produced by the `varioref` macros. Since we need this in various different commands, we separate it out into a self-contained macro.

```
\def\cref@vpagerefconjunction#1{%
  \def\@tempa{#1}%
  \def\@tempb{@second}%
  \ifx\@tempa\@tempb\relax%
    \@setcref@pairconjunction%
  \else%
    \def\@tempb{@middle}%
    \ifx\@tempa\@tempb\relax%
      \@setcref@middleconjunction%
    \else%
      \def\@tempb{@last}%
      \ifx\@tempa\@tempb\relax%
        \@setcref@lastconjunction%
      \fi%
    \fi%
  \fi}
```

\@setcref@space

We separate out the typesetting of the space between the cross-reference and page-reference into a separate macro, to make it easier to implement the `poorman` option.

```
\def\@setcref@space{ }
```

\@setvpageref

The `\@setvpageref` and `\@setvpagerefrange` macros typeset page references using `varioref` commands, tweaked to work with the enhanced `cleveref` page-referencing features. They are passed to `\@cpageref` by the `cleveref`-enhanced `\vpageref` command, thereby combining the `cleveref` and `varioref` page-referencing features.

`#1` and `#2` are `varioref` arguments that get passed straight through to the (original) `varioref \@@vpageref` macro. `#3` is the reference label itself. `#4` is either `cref` or `Cref`, identifying the capitalisation variant, and `#5` is either empty if we're typesetting a single page reference, or one of `@first`, `@second`, `@middle` or `@end`, identifying where the page reference comes in a multi-reference. The

arguments in square brackets are passed all the way through from the `cleveref`-enhanced `varioref` commands. The others are added by `\@cpageref` when it calls `\@setvpageref`.

```
\def\@setvpageref[#1][#2]#3#4#5{%
```

Add the appropriate conjunction before the page reference.

```
  \cref@vpagerefconjunction{#5}%
```

Undefining `\vref@space` prevents the original `varioref` `\@@vpageref` macro from `\unskip`ing any preceding space and inserting its own. We definitely don't want it to do that here when we're typesetting anything other than the first group of page references, as any preceding space then is part of the preceding conjunction, and should be strictly respected. But, since we're modifying the `varioref` commands anyway, we take this opportunity to get rid of the irritating `varioref` spacing behaviour even for the first group of page references.

```
  \def\vref@space{}%
```

Modify the `varioref` `\reftext`$\langle x \rangle$ commands as appropriate for the page reference we're currently typesetting, then typeset the page reference.

```
  \begingroup%
    \cref@patchreftexts{#5}%
    \@@setvpageref{#1}[#2]{#3}%
  \endgroup}
```

`\@@setvpageref` We separate out the final type setting step, as always, to make it easier to redefine things later.

```
\def\@@setvpageref#1[#2]#3{\cref@old@@vpageref{#1}[#2]{#3}}
```

`\@setvpagerefrange` `\@setvpagerefrange` is similar to `\@setvpageref`, but typesets page ranges. `#1` is a `varioref` spacing argument that get passed straight through to the `varioref` `\vpagerefrange` macro. `#2` and `#3` are the labels themselves. `#4` is either `cref` or `Cref`, identifying the capitalisation variant, and `#5` is either empty if we're typesetting a single page range, or one of `@first`, `@second`, `@middle` or `@end`, identifying where the page reference comes in a multi-reference. The arguments in square brackets are passed all the way through from the `cleveref`-enhanced `varioref` commands. The others are added by `\@cpageref` when it calls `\@setvpagerefrange`.

```
\def\@setvpagerefrange[#1]#2#3#4#5{%
```

Add the appropriate conjunction before the page range reference.

```
  \cref@vpagerefconjunction{#5}%
```

Unlike `\vpageref`, `varioref`'s `\vpagerefrange` command *doesn't* go in for quite the same space-mangling behaviour. We still undefine `\vref@space`, though.

```
  \let\vref@space\relax%
```

Modify the `varioref` `\reftext`$\langle x \rangle$ commands as appropriate for the page range we're currently typesetting, then typeset the page range.

```
  \begingroup%
    \cref@patchreftexts{#5}%
```

```
      \@@setvpagerefrange[#1]{#2}{#3}%
    \endgroup}
```

Again, we separate out the final typesetting step, to aid later redefinition.

```
\def\@@setvpagerefrange[#1]#2#3{\vpagerefrange[#1]{#2}{#3}}
```

`\@setfullpageref`

```
\def\@setfullpageref#1#2#3{%
```

Add the appropriate conjunction before the page reference.

```
  \cref@vpagerefconjunction{#3}%
```

Modify the `varioref` `\reftext`$\langle x \rangle$ commands as appropriate for the page reference we're currently typesetting, then typeset the page reference.

```
  \begingroup%
    \cref@patchreftexts{#3}%
    \@@setfullpageref{#1}%
  \endgroup}
```

Separate out the final typesetting step, as usual.

```
\def\@@setfullpageref#1{\reftextfaraway{#1}}
```

`\@setfullpagerefrange`

```
\def\@setfullpagerefrange#1#2#3#4{%
```

Add the appropriate conjunction before the page reference.

```
  \cref@vpagerefconjunction{#4}%
```

Modify the `varioref` `\reftext`$\langle x \rangle$ commands as appropriate for the page reference we're currently typesetting, then typeset the page reference.

```
  \begingroup%
    \cref@patchreftexts{#4}%
    \@@setfullpagerefrange{#1}{#2}%
  \endgroup}
```

Separate out the final typesetting step, as usual.

```
\def\@@setfullpagerefrange#1#2{\reftextpagerange{#1}{#2}}
```

`\cref@old@@vpageref` Unfortunately, `varioref`'s `\@@vpageref` macro calls a `\vref@label` *before* it typesets the page reference. The `\protected@write` within `\vref@label` seems to prevent an `\unskip` command coming after the `\vref@label` from removing any space that was inserted before the `\vref@label`. This means that setting a `\reftext`$\langle x \rangle$ command to `\unskip` won't work; it won't properly remove any preceding space in the event that the an empty page reference is typeset.

This didn't matter in the original `varioref` implementation, because it *always* removed any preceding space, then inserted its own space *after* the `\vref@label`, which the `\unskip` could then gobble. But we want to get rid of this irritating always-space-gobbling behaviour here. So we have to redefine `\@@vpageref` (here renamed `\cref@old@@vpageref`) in order to move the `\vref@label` to the end of the macro, after the page reference has been typeset. We also remove the `\unskip` from the start of `\@@vpageref`.

```
\def\cref@old@@vpageref#1[#2]#3{%
  \leavevmode%\unskip  <<<
  \global\advance\c@vrcnt\@ne
  \vref@pagenum\@tempa{\the\c@vrcnt @vr}%
  \vref@pagenum\@tempb{\the\c@vrcnt @xvr}%
  %\vref@label{\the\c@vrcnt @xvr}%  <<<
  \ifx\@tempa\@tempb\else
    \vref@err{\noexpand\vref or \noexpand\vpageref at page boundary
              \@tempb-\@tempa\space (may loop)%
              }%
  \fi
  \vrefpagenum\thevpagerefnum{#3}%
  \vref@space
  \ifx\@tempa\thevpagerefnum
    \def\@tempc{#1}%
    \ifx\@tempc\@empty
       \unskip
    \else
       #1%
    \fi
  \else
    #2%
    \is@pos@number\thevpagerefnum
       {%
        \is@pos@number\@tempa
        {\@tempcnta\@tempa
         \advance\@tempcnta\@ne
        }%
        {\@tempcnta\maxdimen}%
        \ifnum \thevpagerefnum =\@tempcnta
        \ifodd\@tempcnta
          \if@twoside
            \reftextfaceafter
          \else
            \reftextafter
          \fi
        \else
          \reftextafter
        \fi
       \else
         \advance\@tempcnta-2
         \ifnum \thevpagerefnum =\@tempcnta
           \ifodd\@tempcnta
             \reftextbefore
           \else
             \if@twoside
               \reftextfacebefore
             \else
               \reftextbefore
             \fi
```

```
            \fi
          \else
            \reftextfaraway{#3}%
          \fi
        \fi
      }%
      {\reftextfaraway{#3}}%
  \fi
  \vref@label{\the\c@vrcnt @xvr}%  <<<
  \vref@label{\the\c@vrcnt @vr}%
}
```

We save the default `varioref` `\reftext`$\langle x \rangle$ commands as `\creftext`$\langle x \rangle$, before the user's had any chance to redefine them. These are used if a `\reftext`$\langle x \rangle$ is redefined to produce an empty reference, to force a non-empty reference within multi-references.

```
\let\creftextcurrent\reftextcurrent
\let\creftextfaceafter\reftextfaceafter
\let\creftextfacebefore\reftextfacebefore
\let\creftextafter\reftextafter
\let\creftextbefore\reftextbefore
\let\creftextfaraway\reftextfaraway
\let\creftextpagerange\reftextpagerange
```

`\cref@patchreftexts` `\cref@restorereftexts` The `\cref@patchreftexts` command modifies `varioref` `\reftext`$\langle x \rangle$ commands, for use within `\@setvpageref` and `\@setvpagerefrange`.

```
\def\cref@patchreftexts#1{%
  \cref@patchreftext{reftextcurrent}{#1}%
  \cref@patchreftext{reftextfaceafter}{#1}%
  \cref@patchreftext{reftextfacebefore}{#1}%
  \cref@patchreftext{reftextafter}{#1}%
  \cref@patchreftext{reftextbefore}{#1}}
```

`\cref@patchreftext` `\cref@patchreftext` does the hard work of modifying the `\reftext`$\langle x \rangle$ command given in `#1` as appropriate for the `\@setvpageref` or `\@setvpagerefrange` command that it's called from. (It can only be called from within one of those commands.) `#2` is empty if we're typesetting a single page reference, or one of `@first`, `@second`, `@middle` or `@end` when typesetting a multi-reference.

```
\def\cref@patchreftext#1#2{%
  \def\@tempa{#2}%
```

If we're typesetting a single page reference...

```
  \ifx\@tempa\@empty%
```

if the reftext command produces an empty reference, redefine it to be `\unskip`.

```
    \def\@tempc{}%
    \expandafter\ifx\csname #1\endcsname\@tempc\relax%
      \expandafter\def\csname #1\endcsname{\unskip}%
        %{\advance\count@group -1\reftextcurrent@orig}%
```

```
    \else%
      \long\def\@tempc{}%
      \expandafter\ifx\csname #1\endcsname\@tempc\relax%
        \expandafter\def\csname #1\endcsname{\unskip}%
          %{\advance\count@group -1\reftextcurrent@orig}%
      \fi%
    \fi%
```

If we're typesetting a multi-reference...

```
  \else%
```

if the reftext command produces an empty page reference, patch it to instead use `\creftext`$\langle x \rangle$, which always produces a non-empty reference.

```
    \long\def\@tempc{\unskip}%
    \expandafter\ifx\csname #1\endcsname\@tempc\relax%
      \expandafter\expandafter\expandafter\def%
      \expandafter\expandafter\csname #1\endcsname\expandafter{%
        \csname c#1\endcsname}%
    \else%
      \long\def\@tempc{}%
      \expandafter\ifx\csname #1\endcsname\@tempc\relax%
        \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\csname #1\endcsname\expandafter{%
          \csname c#1\endcsname}%
      \else%
        \def\@tempc{\unskip}%
        \expandafter\ifx\csname #1\endcsname\@tempc\relax%
          \expandafter\expandafter\expandafter\def%
          \expandafter\expandafter\csname #1\endcsname\expandafter{%
            \csname c#1\endcsname}%
        \else%
          \def\@tempc{}%
          \expandafter\ifx\csname #1\endcsname\@tempc\relax%
            \expandafter\expandafter\expandafter\def%
            \expandafter\expandafter\csname #1\endcsname\expandafter{%
              \csname c#1\endcsname}%
          \fi%
        \fi%
      \fi%
    \fi%
  \fi}
```

`\@setcref@pairconjunction`
`\@setcref@middleconjunction`
`\@setcref@lastconjunction`

We also add an extra macro layer for typesetting the conjunctions, for the same reason. (Note that we only needed to do this for the group conjunctions previously, as the other conjunctions are never used directly in the normal `cleveref` commands. But `\@setvpageref` and `\@setvpagerefrange` *do* use them directly, so now we do need macros to separate out the final type setting of the rest of the conjunctions.)

```
  \def\@setcref@pairconjunction{\crefpairconjunction}
  \def\@setcref@middleconjunction{\crefmiddleconjunction}
```

```
\def\@setcref@lastconjunction{\creflastconjunction}
```

We now redefine the original `varioref` commands to use the `cleveref`-enhanced versions. The redefinition of `\@@vpageref` has to be postponed until the beginning of the document, to make sure it overrides `hyperref`'s redefinition (if loaded).

```
\AtBeginDocument{%
  \def\@@vpageref#1[#2]#3{\cref@@vpageref{#1}[#2]{#3}}
}
```

`\vpageref` `\vref` `\vref*` `\Vref` `\Vref*` `\vrefrange` `\vrefrange*` `\Vrefrange` `\Vrefrange*` `\fullref` `\fullref*` `\Fullref` `\Fullref*`

Since we're defining the spacing behaviour of `\vref` et al. to be consistent with the other `cleveref` referencing commands, this frees up the starred variants to be used to suppress hyperlinks when `hyperref` is loaded, as usual.

```
\if@cref@hyperrefloaded\relax%  hyperref loaded
  \DeclareRobustCommand{\vref}{%
    \@ifstar{\cref@vrefstar{cref}}{\cref@vref{cref}}}
  \DeclareRobustCommand{\Vref}{%
    \@ifstar{\cref@vrefstar{Cref}}{\cref@vref{Cref}}}
  \DeclareRobustCommand{\vrefrange}{%
    \@ifstar{\cref@vrefrangestar{cref}}{\cref@vrefrange{cref}}}
  \DeclareRobustCommand{\Vrefrange}{%
    \@ifstar{\cref@vrefrangestar{Cref}}{\cref@vrefrange{Cref}}}
  \DeclareRobustCommand{\fullref}{%
    \@ifstar{\cref@fullrefstar{cref}}{\cref@fullref{cref}}}
  \DeclareRobustCommand{\Fullref}{%
    \@ifstar{\cref@fullrefstar{Cref}}{\cref@fullref{Cref}}}
  \def\cref@vrefstar#1#2{%
    \@crefstarredtrue%
    \cref@vref{#1}{#2}%
    \@crefstarredfalse}
  \def\cref@vrefrangestar#1#2#3{%
    \@crefstarredtrue%
    \cref@vrefrange{#1}{#2}{#3}%
    \@crefstarredfalse}
  \def\cref@fullrefstar#1#2{%
    \@crefstarredtrue%
    \cref@fullref{#1}{#2}%
    \@crefstarredfalse}
\else%
  \DeclareRobustCommand{\vref}{\cref@vref{cref}}
  \DeclareRobustCommand{\Vref}{\cref@vref{Cref}}
  \DeclareRobustCommand{\vrefrange}{\cref@vrefrange{cref}}
  \DeclareRobustCommand{\Vrefrange}{\cref@vrefrange{Cref}}
  \DeclareRobustCommand{\fullref}{\cref@fullref{cref}}
  \DeclareRobustCommand{\Fullref}{\cref@fullref{Cref}}
\fi%  end of test for hyperref
}{}%  end of \@ifpackageloaded{varioref}
```

### 14.6.7 `algorithm` support

`algorithm` If `algorithm` is loaded, we modify its line numbering mechanism so that labels referring to line numbers in algorithms work with `cleveref`.

```
\@ifpackageloaded{algorithm}{%
\PackageInfo{cleveref}{`algorithm' support loaded}
```

`\ALG@step` We modify `algorithm`'s `\LG@step` macro, which increments the line number, so that it stores the necessary information in `\cref@currentlabel`. `\LG@step` already increments the line number counter `\LG@line` using `\addtocounter`, but to get `cleveref` support working, it's cleaner to hook into the `\refstepcounter` mechanism, so we first decrement the counter and then re-increment it using `\refstepcounter`.

```
\let\cref@old@ALG@step\ALG@step
\def\ALG@step{%
  \cref@old@ALG@step%
  \addtocounter{ALG@line}{-1}%
  \refstepcounter[line]{ALG@line}}
}{}%  end of \@ifpackageloaded{algorithm}
```

### 14.6.8 `listings` support

`listings` The only thing we need to do in order to support cross-references to line numbers and listings produced by the `listings` package is to alias the counters it uses, `\stnumber` and `\stlistings`, to the "line" and "listing" cross-reference types.

```
\@ifpackageloaded{listings}{%
  \PackageInfo{cleveref}{`listings' support loaded}
  \crefalias{lstnumber}{line}%
  \crefalias{lstlisting}{listing}%
}{}%  end of \@ifpackageloaded{listings}
```

### 14.6.9 `algorithm2e` support

`algorithm2e` Similarly, all we need to do to support the `algorithm2e` package is to alias *its* counters, `\lgocf` and `\lgocfline`, to the "algorithm and "line" cross-reference types.

```
\@ifpackageloaded{algorithm2e}{%
  \PackageInfo{cleveref}{`algorithm2e' support loaded}
  \crefalias{algocf}{algorithm}%
  \crefalias{algocfline}{line}%
}{}%  end of \@ifpackageloaded{listings}
```

### 14.6.10 `subfig` support

`subfig` The `subfig` package modifies `\refstepcounter` within floats. Most of the time, this isn't a problem for `cleveref`, as `subfig`'s modified `\efstepcounter` calls `cleveref`'s version after it's done its stuff. However, this breaks support the `\refstepcounter` optional argument, so we fix that here.

Subfig also redefines \label within subfloats, breaking cleveref's optional argument. We also fix that.

```
\@ifpackageloaded{subfig}{%
  \PackageInfo{cleveref}{`subfig' support loaded}
```

\refsteponlycounter subfig replaces \refstepcounter with \refsteponlycounter within floats, which calls the saved cleveref \refstepcounter after doing some extra subfig-related processing. We redefine \efsteponlycounter so that passing it an optional argument bypasses subfig's code entirely and just calls the cleveref code directly. Since only cleveref-specific commands will ever pass an optional argument to \refstepcounter, this won't affect subfig's use of \refstepcounter. We have to postpone this redefinition until the beginning of the document because subfig does.

```
  \AtBeginDocument{
    \let\cref@old@refsteponlycounter\refsteponlycounter
    \def\refsteponlycounter{%
      \@ifnextchar[{\refstepcounter@optarg}%
        {\cref@old@refsteponlycounter}%]
    }}
```

\sf@sub@label Inside a subfloat, subfig captures the current \label definition in \sf@oldlabel, then replaces \label with \subfloat@label, which does additional argument and subfloat-related processing before calling \sf@oldlabel. This breaks cleveref's \label optional argument.

We need to insert an extra layer of processing into the chain of redefined \label macro calls, to process cleveref's optional argument. We do this by redefining subfig's \sf@sub@label command to process subfig's optional argument (which uses brackets rather than square brackets) as usual, but then have it call \ref@label which stores cleveref's \label command (recall that we're inside a subfloat here, where subfig has overridden the \label macro itself), to process cleveref's own \abel optional argument.

\ref@label would normally call the original \label definition stored in \cref@old@label, whereas here we want it to instead call \f@@sub@label, the next layer of the subfig \label macro stack, otherwise we bypass the rest of the subfig processing and break it. So we temporarily let \cref@old@label to \sf@@sub@label, so that \cref@label hands back to subfig's \label processing when done. (We're inside a group, so \ref@old@label gets restored at the end of the subfloat.)

The final issue is that subfig captures the original \label definition in \sf@oldlabel at the beginning of the subfloat. But this captures cleveref's definition,[15] instead of the original \label definition that needs to be called after subfig has finished its stuff. So, we let \f@oldlabel to \ref@old@label before redefining the latter, so that the subfig \label stack calls the right thing once it's done its own processing. Oof!

[15] Actually, because subfig always loads the caption package, it captures cleveref's caption-related redefinition of \label.

```
\def\sf@sub@label(#1){%
  \ifhyperrefloaded
    \protected@edef\@currentlabelname{%
      \expandafter\strip@period #1\relax.\relax\@@@}%
  \fi%
  \let\sf@oldlabel\cref@old@label%
  \let\cref@old@label\sf@@sub@label%
  \cref@label}%

}{}%  end of \@ifpackageloaded{subfig}
```

### 14.6.11 `caption` support

`caption` The `caption` package redefines `\label` within floats. Since version 3.2c, it is careful to redefine `\label` in a way that doesn't break any optional arguments introduced by other packages (such as `cleveref`'s), so we no longer need to add any compatibility hacks.

Earlier versions of `caption` do break `cleveref`'s optional argument, however, so we have to fix things here for those verions.

```
\@ifpackageloaded{caption}{%
  \@ifpackagelater{caption}{2011/08/19}{}{%
    \PackageInfo{cleveref}{`caption' support loaded}
```

`\cref@old@caption@xlabel` `\cref@old@label` `\cref@ORI@label` `\caption@ORI@label` We fix the `\label` argument parsing by redefining `\caption@xlabel`, the macro which `\label` is let to inside floats, to juggle around the various `cleveref` and `caption` `\label`-processing macros so that everything ultimately gets processed correctly.

`\cref@label` stores `cleveref`'s `\label` redefinition (recall that we're inside a float here, where `\label` itself has been redefined by `caption`). `\cref@label` processes `cleveref`'s optional `\label` argument, if any. It then calls `\cref@old@label`. But we've let that to `\cref@old@caption@xlabel`, which stores the original `\caption@xlabel`. So the net effect is to insert an extra layer of optional argument processing between `\label` and `\aption@xlabel`, which can then proceed as before.

The final issue is that `caption` captures the original `\label` definition in `\caption@ORI@label`, but this picks up the `cleveref` redefinition, which is not what we want. So we let `\caption@ORI@label` to the original `\label` definition as captured by `cleveref`. Usually, that's stored in `\cref@old@label`, but we've temporarily redefined that. So we need to save what was originally preserved in `\cref@old@label` in `\cref@ORI@old@label`, and make `\caption@ORI@label` call that. Oof!

```
    \let\cref@old@caption@xlabel\caption@xlabel
    \def\caption@xlabel{%
      \let\cref@ORI@label\cref@old@label%
      \let\cref@old@label\cref@old@caption@xlabel%
      \let\caption@ORI@label\cref@ORI@label%
      \cref@label}%
```

```
    }% end of \@ifpackagelater
  }{}%  end of \@ifpackageloaded{caption}
```

### 14.6.12 `aliascnt` support

`aliascnt` For the `aliascnt` trick described in Section 8 of the documentation to work, we have to inform `cleveref` about how aliased counters get reset. `aliascnt`'s `\newaliascnt` command doesn't add the aliased counter to any reset list, but if the counter it's aliased to gets reset, the aliased counter will get reset too. In order for `cleveref` to correctly sort cross-references to the aliased counter, we have to add that counter to the appropriate reset list, even though that isn't necessary to actually reset the counter itself. We add this to the `\newaliascnt` command.

`\newaliascnt`

```
\@ifpackageloaded{aliascnt}{%
  \PackageInfo{cleveref}{`aliascnt' support loaded}
  \let\cref@old@newaliascnt\newaliascnt
  \renewcommand*{\newaliascnt}[2]{%
    \cref@old@newaliascnt{#1}{#2}%
    \cref@resetby{#2}{\cref@result}%
    \ifx\cref@result\relax\else%
      \@addtoreset{#1}{\cref@result}%
    \fi}
  }{}%  end of \@ifpackageloaded{aliascnt}
```

## 14.7 Poor Man's `cleveref`

`poorman` The `poorman` option causes a `sed` script to automatically be written. When the original LaTeX source file is processed through this script, it strips out all the `cleveref` commands, typesetting all the reference formatting explicitly, and using the standard `\ref` and `\ageref` commands to produce the references themselves.

```
\DeclareOption{poorman}{%
  \PackageInfo{cleveref}{option `poorman' loaded}
```

`\cref@poorman@text` Define global macro `\cref@poorman@text` to store the text produced by the `\cref` commands, and open an output stream for writing the script before starting to process the document body.

```
  \gdef\cref@poorman@text{}
  \AtBeginDocument{%
    \newwrite\@crefscript%
    \immediate\openout\@crefscript=\jobname.sed}
```

`select@language` `foreign@language` If `babel` is loaded, we add to the `\select@language` and `\foreign@language` commands to make them write substitution rules to the script that replace the cross-reference name and conjunction component macros with the appropriate language-dependent names. We use `sed` line-number addresses in the rules to

ensure they are only applied to the regions in which that particular language was in use.

Note that we write substitution rules for the *previous* language block when the language is changed, because we need the rules to appear in the script *after* all the cross-reference substitution rules for that language block. `\ref@inputlineno` stores the input-file line-number of the start of the previous language block.

We postpone the redefinitions until the beginning of the document not only to ensure that they don't get clobbered by other package's redefinitions, but also because we don't want the redefinitions to take effect until after `babel` has called `\selectlanguage` for the main language (remember, the substitution rules for this first language block will get written at the next language change).

Note that, since we're writing to the script file within `\AtBeginDocument` and `\AtEndDocument`, this code has to come *after* the above `\AtBeginDocument` code which opens the script file for writing, and *before* the later `\AtEndDocument` code (below) which closes it.

The `\if@cref@switched@language` flag is set when a `babel` language switching command is called. It is checked by `\cref@writelanguagerules` when writing substitution rules.

```
\newif\if@cref@switched@language
\@ifpackageloaded{babel}{%
  \AtBeginDocument{%
    \let\cref@old@select@language\select@language
    \def\select@language{%
      \@cref@switched@languagetrue%
      \cref@writelanguagerules%
      \cref@old@select@language}
    \let\cref@old@foreign@language\foreign@language
    \def\foreign@language{%
      \@cref@switched@languagetrue%
      \cref@writelanguagerules%
      \cref@old@foreign@language}
    \edef\cref@inputlineno{\the\inputlineno}}%
  }{}
```

The final set of substitution rules gets written at the end of the document. This is the only set of rules that gets written if `babel` is not loaded.

```
\AtEndDocument{%
  \let\select@language\cref@old@select@language%
  \let\foreign@language\cref@old@foreign@language%
  \cref@writelanguagerules}
```

`\cref@writelanguagerules` `\cref@writelanguagerules` does the grunt work of writing out the necessary substitution rules.

```
\def\cref@writelanguagerules{%
  \begingroup%
```

If `\if@cref@switched@language` hasn't been set, then we must be writing the final set of substitution rules at the end of a document in which no language

switching command was ever used. In which case, the substitution rules don't specify a line-number address.

```
\if@cref@switched@language%
  \edef\@address{\cref@inputlineno,\the\inputlineno}%
\else%
  \def\@address{}%
\fi%
\expandafter\def\expandafter\cref@poorman@text\expandafter{%
  \crefrangeconjunction}%
\expandafter\def\expandafter\@tempa\expandafter{%
  \expandafter{\@address}{\string\crefrangeconjunction}}%
\expandafter\cref@writescript\@tempa%
\expandafter\def\expandafter\cref@poorman@text\expandafter{%
  \crefrangepreconjunction}%
\expandafter\def\expandafter\@tempa\expandafter{%
  \expandafter{\@address}{\string\crefrangepreconjunction}}%
\expandafter\cref@writescript\@tempa%
\expandafter\def\expandafter\cref@poorman@text\expandafter{%
  \crefrangepostconjunction}%
\expandafter\def\expandafter\@tempa\expandafter{%
  \expandafter{\@address}{\string\crefrangepostconjunction}}%
\expandafter\cref@writescript\@tempa%
\expandafter\def\expandafter\cref@poorman@text\expandafter{%
  \crefpairconjunction}%
\expandafter\def\expandafter\@tempa\expandafter{%
  \expandafter{\@address}{\string\crefpairconjunction}}%
\expandafter\cref@writescript\@tempa%
\expandafter\def\expandafter\cref@poorman@text\expandafter{%
  \crefmiddleconjunction}%
\expandafter\def\expandafter\@tempa\expandafter{%
  \expandafter{\@address}{\string\crefmiddleconjunction}}%
\expandafter\cref@writescript\@tempa%
\expandafter\def\expandafter\cref@poorman@text\expandafter{%
  \creflastconjunction}%
\expandafter\def\expandafter\@tempa\expandafter{%
  \expandafter{\@address}{\string\creflastconjunction}}%
\expandafter\cref@writescript\@tempa%
\expandafter\def\expandafter\cref@poorman@text\expandafter{%
  \crefpairgroupconjunction}%
\expandafter\def\expandafter\@tempa\expandafter{%
  \expandafter{\@address}{\string\crefpairgroupconjunction}}%
\expandafter\cref@writescript\@tempa%
\expandafter\def\expandafter\cref@poorman@text\expandafter{%
  \crefmiddlegroupconjunction}%
\expandafter\def\expandafter\@tempa\expandafter{%
  \expandafter{\@address}{\string\crefmiddlegroupconjunction}}%
\expandafter\cref@writescript\@tempa%
\expandafter\def\expandafter\cref@poorman@text\expandafter{%
  \creflastgroupconjunction}%
```

```
      \expandafter\def\expandafter\@tempa\expandafter{%
        \expandafter{\@address}{\string\creflastgroupconjunction}}%
      \expandafter\cref@writescript\@tempa%
```

We write substitution rules for all component-derived cross-reference formats, as listed in `\cref@label@types`.

```
      \let\@tempstack\cref@label@types%
      \cref@isstackfull{\@tempstack}%
      \@whilesw\if@cref@stackfull\fi{%
```

`\cref@`⟨*type*⟩`@name` substitution rules.

```
        \edef\@tempa{\cref@stack@top{\@tempstack}}%
        \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\expandafter\cref@poorman@text%
        \expandafter\expandafter\expandafter{%
          \csname cref@\@tempa @name\endcsname}%
        \edef\@tempa{%
          \string\cref@\expandafter\noexpand\@tempa @name\space}%
        \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\expandafter\@tempa%
        \expandafter\expandafter\expandafter{%
          \expandafter\expandafter\expandafter{%
            \expandafter\@address\expandafter}%
          \expandafter{\@tempa}}%
        \expandafter\cref@writescript\@tempa%
```

`\cref@`⟨*type*⟩`@name@plural` substitution rules.

```
        \edef\@tempa{\cref@stack@top{\@tempstack}}%
        \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\expandafter\cref@poorman@text%
        \expandafter\expandafter\expandafter{%
          \csname cref@\@tempa @name@plural\endcsname}%
        \edef\@tempa{%
          \string\cref@\expandafter\noexpand\@tempa%
          @name@plural\space}%
        \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\expandafter\@tempa%
        \expandafter\expandafter\expandafter{%
          \expandafter\expandafter\expandafter{%
            \expandafter\@address\expandafter}%
          \expandafter{\@tempa}}%
        \expandafter\cref@writescript\@tempa%
```

`\Cref@`⟨*type*⟩`@name` substitution rules.

```
        \edef\@tempa{\cref@stack@top{\@tempstack}}%
        \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\expandafter\cref@poorman@text%
        \expandafter\expandafter\expandafter{%
          \csname Cref@\@tempa @name\endcsname}%
        \edef\@tempa{%
          \string\Cref@\expandafter\noexpand\@tempa @name\space}%
```

```
        \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\expandafter\@tempa%
        \expandafter\expandafter\expandafter{%
          \expandafter\expandafter\expandafter%
          {\expandafter\@address\expandafter}%
          \expandafter{\@tempa}}%
        \expandafter\cref@writescript\@tempa%
```

`\Cref@`⟨*type*⟩`@name@plural` substitution rules.

```
        \edef\@tempa{\cref@stack@top{\@tempstack}}%
        \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\expandafter\cref@poorman@text%
        \expandafter\expandafter\expandafter{%
          \csname Cref@\@tempa @name@plural\endcsname}%
        \edef\@tempa{%
          \string\Cref@\expandafter\noexpand\@tempa%
          @name@plural\space}%
        \expandafter\expandafter\expandafter\def%
        \expandafter\expandafter\expandafter\@tempa%
        \expandafter\expandafter\expandafter{%
          \expandafter\expandafter\expandafter%
          {\expandafter\@address\expandafter}%
          \expandafter{\@tempa}}%
        \expandafter\cref@writescript\@tempa%
```

After the loop over cross-reference types, we set `\cref@inputlineno` to the current input-file line, in preparation for the next language block.

```
        \cref@stack@pop{\@tempstack}%
        \cref@isstackfull{\@tempstack}}%
    \endgroup%
    \edef\cref@inputlineno{\the\inputlineno}}%
```

After processing the document body, we re-read in the temporary script file, and write it out again to the final `sed` script file, escaping regexp special characters in the process. The escaping is carried out by turning the regexp special characters into active characters, and defining them to expand to their escaped form. This involves a lot of juggling of catcodes and lccodes!

Both `\DeclareOption` and `\AtEndDocument` store their arguments in token lists, so all the following TEXcode is already tokenised long before it is expanded and evaluated. Thus there is no (easy) way to change the catcodes of the characters appearing here before they are tokenised. In one way this is convenient: the catcode changes we make don't "take" until evaluated, so we can continue to use the standard TEXcharacters (\, {, } etc.) even after the lines containing the catcode commands. But in another, more significant, way, it is very inconvenient: it makes it difficult to define the regexp special characters as active characters, since it's impossible to directly create tokens with the correct char- and catcodes.

We get around this by creating the unusual charcode/catcode combinations using the `\lowercase` trick (`\lowercase` changes the charcodes of all characters in its argument to their lccodes, but *leaves their catcodes alone*). That way,

the argument of `\AtEndDocument` is tokenised correctly, and when it comes to be expanded and evaluated, the `\lowercase` commands create tokens with the correct char- and catcodes.

```
\AtEndDocument{%
  \immediate\closeout\@crefscript%
  \newread\@crefscript%
  \immediate\openin\@crefscript=\jobname.sed%
  \begingroup%
    \newif\if@not@eof%
    \def\@eof{\par }%
```

Change catcodes of regexp special characters to make them active characters and define them to expand to their escaped forms. Change those of TEX special characters to make them normal letters.

```
    \catcode`.=13 \catcode`*=13
    \catcode`[=13 \catcode`]=13
    \catcode`^=13 \catcode`$=13 %$
    \catcode`\=0 \catcode`<=1 \catcode`>=2
    \catcode`\\=13 \catcode`\{=12 \catcode`\}=12 \catcode`_=12
    \lccode`/=92
    \lccode`~=92\lowercase{\def~{\string/\string/}}%
    \lccode`~=42\lowercase{\def~{\string/\string*}}%
    \lccode`~=46\lowercase{\def~{\string/\string.}}%
    \lccode`~=91\lowercase{\def~{\string/\string[}}%
    \lccode`~=93\lowercase{\def~{\string/\string]}}%
    \lccode`~=94\lowercase{\def~{\string/\string^}}%
    \lccode`~=36\lowercase{\def~{\string/\string$}}% $
    \lccode`~=0 \lccode`/=0 \catcode`~=12
```

Read lines from the temporary script file, expand them to escape regexp special characters, and store them in `\cref@poorman@text`.

```
    \def\cref@poorman@text{}%
    \immediate\read\@crefscript to \@tempa%
    \ifx\@tempa\@eof%
      \@not@eoffalse%
    \else%
      \@not@eoftrue%
      \edef\@tempa{\@tempa}%
    \fi%
    \@whilesw\if@not@eof\fi{%
      \expandafter\g@addto@macro\expandafter%
        \cref@poorman@text\expandafter{\@tempa^^J}%
      \immediate\read\@crefscript to \@tempa%
      \ifx\@tempa\@eof%
        \@not@eoffalse%
      \else%
        \@not@eoftrue%
        \edef\@tempa{\@tempa}%
      \fi}%
  \endgroup%
```

```
\immediate\closein\@crefscript%
```

Add some rules to remove other `cleveref` commands. We use the `\lowercase` trick again for writing the \, { and } characters. (This could be done in other ways, but since we're in `\lowercase` mood, why not stick with it.)

```
\begingroup%
  \lccode`|=92 \lccode`<=123 \lccode`>=125 \lccode`C=67
  \lowercase{\def\@tempa{%[
      s/||label|[[^]]*|]/||label/g}}
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{s/||usepackage|(|[.*|]|)|<0,1|><cleveref>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{s/||[cC]refformat<.*><.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{s/||[cC]refrangeformat<.*><.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{s/||[cC]refmultiformat<.*><.*><.*><.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{%
      s/||[cC]refrangemultiformat<.*><.*><.*><.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{s/||[cC]refname<.*><.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{s/||[cC]reflabelformat<.*><.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{s/||[cC]refrangelabelformat<.*><.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{s/||[cC]refdefaultlabelformat<.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{%
      s/||renewcommand<||crefpairconjunction><.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{%
      s/||renewcommand<||crefpairgroupconjunction><.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
    \cref@poorman@text\expandafter{\@tempa^^J}%
  \lowercase{\edef\@tempa{%
      s/||renewcommand<||crefmiddleconjunction><.*>//g}}%
  \expandafter\g@addto@macro\expandafter%
```

```
      \cref@poorman@text\expandafter{\@tempa^^J}%
    \lowercase{\edef\@tempa{%
        s/||renewcommand<||crefmiddlegroupconjunction><.*>//g}}%
    \expandafter\g@addto@macro\expandafter%
      \cref@poorman@text\expandafter{\@tempa^^J}%
    \lowercase{\edef\@tempa{%
        s/||renewcommand<||creflastconjunction><.*>//g}}%
    \expandafter\g@addto@macro\expandafter%
      \cref@poorman@text\expandafter{\@tempa^^J}%
    \lowercase{\edef\@tempa{%
        s/||renewcommand<||creflastgroupconjunction><.*>//g}}%
    \expandafter\g@addto@macro\expandafter%
      \cref@poorman@text\expandafter{\@tempa^^J}%
    \lowercase{\edef\@tempa{s/||renewcommand<||[cC]ref><.*>//g}}%
    \expandafter\g@addto@macro\expandafter%
      \cref@poorman@text\expandafter{\@tempa^^J}%
    \lowercase{\edef\@tempa{s/||renewcommand<||[cC]refrange><.*>//g}}%
    \expandafter\g@addto@macro\expandafter%
      \cref@poorman@text\expandafter{\@tempa^^J}%
  \endgroup%
```

Overwrite the script file with the new, escaped regexp rules.

```
  \newwrite\@crefscript%
  \immediate\openout\@crefscript=\jobname.sed%
  \immediate\write\@crefscript{\cref@poorman@text}%
  \immediate\closeout\@crefscript%
}%  end of \AtEndDocument
```

`\cref@writescript` The `\cref@writescript` utility macro does the actual writing of the substitution rule to the script. The first argument is the "address", the second argument is the regexp pattern to match, whilst the substitution text is whatever is currently stored in `\cref@poorman@text`.

```
\def\cref@getmeaning#1{\expandafter\@cref@getmeaning\meaning#1\@nil}
\def\@cref@getmeaning#1->#2\@nil{#2}
\def\cref@writescript#1#2{%
  \edef\@tempa{\cref@getmeaning{\cref@poorman@text}}%
  \immediate\write\@crefscript{#1 s/#2/\@tempa/g}}
```

`\cref` `\Cref` `\crefrange` `\Crefrange` `\@crefstar` `\@crefnostar` `\@crefrangestar` `\@crefrangenostar` To make use of all the `poorman` infrastructure defined above, we must redefine the `cleveref` referencing commands themselves. There are two parts to this: at the very top layer of the cross-referencing macro stack, we redefine the user-level commands to first initialise `\cref@poorman@text` to the empty string, then typeset the reference as usual, and finally write a substitution rule to the `sed` script containing whatever has been accumulated in `\cref@poorman@text`. At the very lowest layer of the macro stack, we redefine the macros that actually typeset the various parts of the references to additionally add a copy of whatever they typeset to `\cref@poorman@test`.

We first redefine the user-level referencing commands so that they write a substitution rule for the reference to the script, as well as typesetting the reference

itself. Most of the redefinitions differ slightly depending on whether `hyperref` is loaded.

```
\if@cref@hyperrefloaded\relax%  hyperref loaded
  \def\@crefnostar#1#2{%
    \gdef\cref@poorman@text{}%
    \@cref{#1}{#2}%
```

We use a temporary `\@tempa` macro here, which makes use of the fact that the first character of #1 is "c" for lower-case and "C" for upper-case in these commands, in order to write out the correct capitalisation in the substitution.

FIXME: We only resort to this because `\string\#1` doesn't work. But there *must* be a better way to get a backslash character into the token stream, obviating the need for the ugly `\@tempa` macro.

```
    \def\@tempa##1##2\@nil{%
      \if##1c%
        \cref@writescript{}{\string\cref\string{#2\string}}%
      \else%
        \cref@writescript{}{\string\Cref\string{#2\string}}%
      \fi}%
    \@tempa#1\@nil}
  \def\@crefstar#1#2{%
    \gdef\cref@poorman@text{}%
    \@crefstarredtrue\@cref{#1}{#2}\@crefstarredfalse%
    \def\@tempa##1##2\@nil{%
      \if##1c%
        \cref@writescript{}{\string\cref*\string{#2\string}}%
      \else%
        \cref@writescript{}{\string\Cref*\string{#2\string}}%
      \fi}%
    \@tempa#1\@nil}
  \def\@crefrangenostar#1#2#3{%
    \gdef\cref@poorman@text{}%
    \@setcrefrange{#2}{#3}{#1}{}%
    \def\@tempa##1##2\@nil{%
      \if##1c%
        \cref@writescript{}{%
          \string\crefrange\string{#2\string}\string{#3\string}}%
      \else%
        \cref@writescript{}{%
          \string\Crefrange\string{#2\string}\string{#3\string}}%
      \fi}%
    \@tempa#1\@nil}
  \def\@crefrangestar#1#2#3{%
    \gdef\cref@poorman@text{}%
    \@crefstarredtrue\@setcrefrange{#2}{#3}{#1}{}\@crefstarredfalse%
    \def\@tempa##1##2\@nil{%
      \if##1c%
        \cref@writescript{}{%
          \string\crefrange*\string{#2\string}\string{#3\string}}%
```

```
      \else%
        \cref@writescript{}{%
          \string\Crefrange*\string{#2\string}\string{#3\string}}%
      \fi}%
    \@tempa#1\@nil}
  \def\@cpagerefnostar#1#2{%
    \gdef\cref@poorman@text{}%
    \@cpageref{#1}{#2}{\@setcpageref}{\@setcpagerefrange}%
    \def\@tempa##1##2\@nil{%
      \if##1c%
        \cref@writescript{}{\string\cpageref\string{#2\string}}%
      \else%
        \cref@writescript{}{\string\Cpageref\string{#2\string}}%
      \fi}%
    \@tempa#1\@nil}
  \def\@cpagerefstar#1#2{%
    \gdef\cref@poorman@text{}%
    \@crefstarredtrue%
    \@cpageref{#1}{#2}{\@setcpageref}{\@setcpagerefrange}%
    \@crefstarredfalse%
    \def\@tempa##1##2\@nil{%
      \if##1c%
        \cref@writescript{}{\string\cpageref*\string{#2\string}}%
      \else%
        \cref@writescript{}{\string\Cpageref*\string{#2\string}}%
      \fi}%
    \@tempa#1\@nil}
  \def\@cpagerefrangenostar#1#2#3{%
    \gdef\cref@poorman@text{}%
    \@setcpagerefrange{#2}{#3}{#1}{}%
    \def\@tempa##1##2\@nil{%
      \if##1c%
        \cref@writescript{}{%
          \string\cpagerefrange\string{#2\string}\string{#3\string}}%
      \else%
        \cref@writescript{}{%
          \string\Cpagerefrange\string{#2\string}\string{#3\string}}%
      \fi}%
    \@tempa#1\@nil}
  \def\@cpagerefrangestar#1#2#3{%
    \gdef\cref@poorman@text{}%
    \@crefstarredtrue%
    \@setcpagerefrange{#2}{#3}{#1}{}%
    \@crefstarredfalse%
    \def\@tempa##1##2\@nil{%
      \if##1c%
        \cref@writescript{}{%
          \string\cpagerefrange*\string{#2\string}\string{#3\string}}%
      \else%
        \cref@writescript{}{%
```

```
            \string\Cpagerefrange*\string{#2\string}\string{#3\string}}%
        \fi}%
      \@tempa#1\@nil}
    \def\@labelcrefnostar#1{%
      \gdef\cref@poorman@text{}%
      \@cref{labelcref}{#1}%
      \cref@writescript{}{\string\labelcref\string{#1\string}}}
    \def\@labelcrefstar#1{%
      \gdef\cref@poorman@text{}%
      \@crefstarredtrue%
      \@cref{labelcref}{#1}%
      \@crefstarredfalse%
      \cref@writescript{}{\string\labelcref*\string{#1\string}}}
    \def\@labelcpagerefnostar#1{%
      \gdef\cref@poorman@text{}%
      \@cpageref{labelcref}{#1}{\@setcpageref}{\@setcpagerefrange}%
      \cref@writescript{}{\string\labelcpageref\string{#1\string}}}
    \def\@labelcpagerefstar#1{%
      \gdef\cref@poorman@text{}%
      \@crefstarredtrue%
      \@cpageref{labelcref}{#1}{\@setcpageref}{\@setcpagerefrange}%
      \@crefstarredfalse%
      \cref@writescript{}{\string\labelcpageref*\string{#1\string}}}
%
  \else%  hyperref not loaded
    \DeclareRobustCommand{\cref}[1]{%
      \gdef\cref@poorman@text{}%
      \@cref{cref}{#1}%
      \cref@writescript{}{\string\cref\string{#1\string}}}
    \DeclareRobustCommand{\Cref}[1]{%
      \gdef\cref@poorman@text{}%
      \@cref{Cref}{#1}%
      \cref@writescript{}{\string\Cref\string{#1\string}}}
    \DeclareRobustCommand{\crefrange}[2]{%
      \gdef\cref@poorman@text{}%
      \@setcrefrange{#1}{#2}{cref}{}%
      \cref@writescript{}{%
        \string\crefrange\string{#1\string}\string{#2\string}}}
    \DeclareRobustCommand{\Crefrange}[2]{%
      \gdef\cref@poorman@text{}%
      \@setcrefrange{#1}{#2}{Cref}{}%
      \cref@writescript{}{%
        \string\Crefrange\string{#1\string}\string{#2\string}}}
    \DeclareRobustCommand{\cpageref}[1]{%
      \gdef\cref@poorman@text{}%
      \@cpageref{cref}{#1}{\@setcpageref}{\@setcpagerefrange}%
      \cref@writescript{}{\string\cpageref\string{#1\string}}}
    \DeclareRobustCommand{\Cpageref}[1]{%
      \gdef\cref@poorman@text{}%
      \@cpageref{Cref}{#1}{\@setcpageref}{\@setcpagerefrange}%
```

```
      \cref@writescript{}{\string\Cpageref\string{#1\string}}}
    \DeclareRobustCommand{\cpagerefrange}[2]{%
      \gdef\cref@poorman@text{}%
      \@setcpagerefrange{#1}{#2}{cref}{}%
      \cref@writescript{}{%
        \string\cpagerefrange\string{#1\string}\string{#2\string}}}
    \DeclareRobustCommand{\Cpagerefrange}[2]{%
      \gdef\cref@poorman@text{}%
      \@setcpagerefrange{#1}{#2}{Cref}{}%
      \cref@writescript{}{%
        \string\Cpagerefrange\string{#1\string}\string{#2\string}}}
    \DeclareRobustCommand{\labelcref}[1]{%
      \gdef\cref@poorman@text{}%
      \@cref{labelcref}{#1}%
      \cref@writescript{}{\string\labelcref\string{#1\string}}}
    \DeclareRobustCommand{\labelcpageref}[1]{%
      \gdef\cref@poorman@text{}%
      \@cpageref{labelcref}{#1}{\@setcpageref}{\@setcpagerefrange}%
      \cref@writescript{}{\string\labelcpageref\string{#1\string}}}
  \fi%  end of test for hyperref
```

`\namecref` `\nameCref` `\lcnamecref` `\namecrefs` `\nameCrefs` `\lcnamecrefs`

The `\namecref` et al. commands don't do anything different when `hyperref` is loaded, so we don't need to test for `hyperref` when redefining them.

```
  \DeclareRobustCommand{\namecref}[1]{%
    \gdef\cref@poorman@text{}%
    \@setnamecref{cref}{#1}{}{}%
    \cref@writescript{}{\string\namecref\string{#1\string}}}
  \DeclareRobustCommand{\nameCref}[1]{%
    \gdef\cref@poorman@text{}%
    \@setnamecref{Cref}{#1}{}{}%
    \cref@writescript{}{\string\nameCref\string{#1\string}}}
  \DeclareRobustCommand{\lcnamecref}[1]{%
    \gdef\cref@poorman@text{}%
    \@setnamecref{Cref}{#1}{}{\MakeLowercase}%
    \cref@writescript{}{\string\lcnamecref\string{#1\string}}}
  \DeclareRobustCommand{\namecrefs}[1]{%
    \gdef\cref@poorman@text{}%
    \@setnamecref{cref}{#1}{@plural}{}%
    \cref@writescript{}{\string\namecrefs\string{#1\string}}}
  \DeclareRobustCommand{\nameCrefs}[1]{%
    \gdef\cref@poorman@text{}%
    \@setnamecref{Cref}{#1}{@plural}{}%
    \cref@writescript{}{\string\nameCrefs\string{#1\string}}}
  \DeclareRobustCommand{\lcnamecrefs}[1]{%
    \gdef\cref@poorman@text{}%
    \@setnamecref{Cref}{#1}{@plural}{\MakeLowercase}%
    \cref@writescript{}{\string\lcnamecrefs\string{#1\string}}}
```

`\@setcref@pairgroupconjunction` `\@setcref@middlegroupconjunction` `\@setcref@lastgroupconjunction`

Redefine `\@@setcref`, `\@@setcrefrange`, `\@@setcpageref` and `\@@setcpagerefrange`, as well as the conjunction macros

`\@setcref@middlegroupconjunction`, `\@setcref@lastgroupconjunction` and `\@setcref@pairgroupconjunction`, to append text they typeset to the `\cref@poorman@text` macro, as well as actually doing the typesetting.

```
\def\@setcref@pairgroupconjunction{%
  \crefpairgroupconjunction%
  \expandafter\g@addto@macro\expandafter\cref@poorman@text%
    \expandafter{\crefpairgroupconjunction}}
\def\@setcref@middlegroupconjunction{%
  \crefmiddlegroupconjunction%
  \expandafter\g@addto@macro\expandafter\cref@poorman@text%
    \expandafter{\crefmiddlegroupconjunction}}
\def\@setcref@lastgroupconjunction{%
  \creflastgroupconjunction%
  \expandafter\g@addto@macro\expandafter\cref@poorman@text%
    \expandafter{\creflastgroupconjunction}}
```

`\@@setcref` `\@@setcrefrange` `\@@setcpageref` `\@@setcpagerefrange`

The necessary redefinitions of most of the cross-referencing commands differ slightly depending on whether `hyperref` is loaded or not.

```
\let\old@@setcref\@@setcref
\let\old@@setcrefrange\@@setcrefrange
\let\old@@setcpageref\@@setcpageref
\let\old@@setcpagerefrange\@@setcpagerefrange
\if@cref@hyperrefloaded\relax%  hyperref loaded
  \def\@@setcref#1#2{%
    \old@@setcref{#1}{#2}%
    \if@crefstarred%
      \expandafter\g@addto@macro\expandafter\cref@poorman@text%
        \expandafter{#1{\ref*{#2}}{}{}}%
    \else%
      \expandafter\g@addto@macro\expandafter\cref@poorman@text%
        \expandafter{#1{\ref{#2}}{}{}}%
    \fi}
  \def\@@setcrefrange#1#2#3{%
    \old@@setcrefrange{#1}{#2}{#3}%
    \if@crefstarred%
      \expandafter\g@addto@macro\expandafter\cref@poorman@text%
        \expandafter{#1{\ref*{#2}}{\ref*{#3}}{}{}{}{}}%
    \else%
      \expandafter\g@addto@macro\expandafter\cref@poorman@text%
        \expandafter{#1{\ref{#2}}{\ref{#3}}{}{}{}{}}%
    \fi}
  \def\@@setcpageref#1#2{%
    \old@@setcpageref{#1}{#2}%
    \if@crefstarred%
      \expandafter\g@addto@macro\expandafter\cref@poorman@text%
        \expandafter{#1{\pageref*{#2}}{}{}}%
    \else%
      \expandafter\g@addto@macro\expandafter\cref@poorman@text%
        \expandafter{#1{\pageref{#2}}{}{}}%
```

```
      \fi}
    \def\@@setcpagerefrange#1#2#3{%
      \old@@setcpagerefrange{#1}{#2}{#3}%
      \if@crefstarred%
        \expandafter\g@addto@macro\expandafter\cref@poorman@text%
          \expandafter{#1{\pageref*{#2}}{\pageref*{#3}}{}{}{}{}}%
      \else%
        \expandafter\g@addto@macro\expandafter\cref@poorman@text%
          \expandafter{#1{\pageref{#2}}{\pageref{#3}}{}{}{}{}}%
      \fi}
%
  \else%  hyperref not loaded
    \def\@@setcref#1#2{%
      \old@@setcref{#1}{#2}%
      \expandafter\g@addto@macro\expandafter{%
        \expandafter\cref@poorman@text\expandafter}%
        \expandafter{#1{\ref{#2}}{}{}}}
    \def\@@setcrefrange#1#2#3{%
      \old@@setcrefrange{#1}{#2}{#3}%
      \expandafter\g@addto@macro%
        \expandafter{\expandafter\cref@poorman@text\expandafter}%
        \expandafter{#1{\ref{#2}}{\ref{#3}}{}{}{}{}}}
    \def\@@setcpageref#1#2{%
      \old@@setcpageref{#1}{#2}%
      \expandafter\g@addto@macro\expandafter{%
        \expandafter\cref@poorman@text\expandafter}%
        \expandafter{#1{\pageref{#2}}{}{}}}
    \def\@@setcpagerefrange#1#2#3{%
      \old@@setcpagerefrange{#1}{#2}{#3}%
      \expandafter\g@addto@macro%
        \expandafter{\expandafter\cref@poorman@text\expandafter}%
        \expandafter{#1{\pageref{#2}}{\pageref{#3}}{}{}{}{}}}
  \fi%  end of hyperref test
```

`\@@setnamecref` The `\namecref` et al. commands don't do anything different when `hyperref` is loaded, so we don't need to test for `hyperref` when redefining `\@@setnamecref`.

```
  \let\old@@setnamecref\@@setnamecref
  \def\@@setnamecref#1#2{%
    \old@@setnamecref{#1}{#2}%
    \expandafter\def\expandafter\@tempa\expandafter{#1}%
    \def\@tempb{#2}%
    \expandafter\expandafter\expandafter\g@addto@macro%
      \expandafter\expandafter\expandafter{%
      \expandafter\expandafter\expandafter\cref@poorman@text%
      \expandafter\expandafter\expandafter}%
      \expandafter\expandafter\expandafter{\expandafter\@tempb\@tempa}}
```

`varioref` If `varioref` is loaded, do the same for the `varioref` commands.

```
  \@ifpackageloaded{varioref}{%
    \AtBeginDocument{%
```

`\@@vpageref` We redefine `\@@vpageref` to make it write a substitution rule to the script, as well as typesetting the page reference.

```
\def\@@vpageref#1[#2]#3{%
  \gdef\cref@poorman@text{}%
  \cref@@vpageref{#1}[#2]{#3}%
  \cref@writescript{}{\string\vpageref\string{#3\string}}}
```

`\cref@vref` `\cref@vref` is similarly redefined to write a substitution rule.

```
\let\old@cref@vref\cref@vref
\def\cref@vref#1#2{%
  \gdef\cref@poorman@text{}%
  \old@cref@vref{#1}{#2}%
  \def\@tempa##1##2\@nil{%
    \if##1c%
      \if@crefstarred%
        \cref@writescript{}{\string\vref*\string{#2\string}}%
      \else%
        \cref@writescript{}{\string\vref\string{#2\string}}%
      \fi%
    \else%
      \if@crefstarred%
        \cref@writescript{}{\string\Vref*\string{#2\string}}%
      \else%
        \cref@writescript{}{\string\Vref\string{#2\string}}%
      \fi%
    \fi}%
  \@tempa#1\@nil}
```

`\cref@fullref` `\cref@vrefrange` `\cref@fullref` and `\ref@vrefrange` are also redefined so that they write substitution rules. Strictly speaking, the starred variants of `\fullref` and `\vrefrange` are not defined when `hyperref` isn't loaded, so we could avoid checking for them in that case. However, the redundant check does no harm, and avoids some code duplication.

```
\let\old@cref@fullref\cref@fullref
\def\cref@fullref#1#2{%
  \gdef\cref@poorman@text{}%
  \old@cref@fullref{#1}{#2}%
  \def\@tempa##1##2\@nil{%
    \if##1c%
      \if@crefstarred%
        \cref@writescript{}{\string\fullref*\string{#2\string}}%
      \else%
        \cref@writescript{}{\string\fullref\string{#2\string}}%
      \fi%
    \else%
      \if@crefstarred%
        \cref@writescript{}{\string\Fullref*\string{#2\string}}%
      \else%
        \cref@writescript{}{\string\Fullref\string{#2\string}}%
```

```
      \fi%
    \fi}%
  \@tempa#1\@nil}
%
\let\old@cref@vrefrange\cref@vrefrange
\def\cref@vrefrange#1#2#3{%
  \gdef\cref@poorman@text{}%
  \old@cref@vrefrange{#1}{#2}{#3}%
  \def\@tempa##1##2\@nil{%
    \if##1c%
      \if@crefstarred%
        \cref@writescript{}{%
          \string\vrefrange*\string{#2\string}\string{#3\string}}%
      \else%
        \cref@writescript{}{%
          \string\vrefrange\string{#2\string}\string{#3\string}}%
      \fi%
    \else%
      \if@crefstarred%
        \cref@writescript{}{%
          \string\Vrefrange*\string{#2\string}\string{#3\string}}%
      \else%
        \cref@writescript{}{%
          \string\Vrefrange\string{#2\string}\string{#3\string}}%
      \fi%
    \fi}%
  \@tempa#1\@nil}
```

`\@@setvpageref` `\@@setvpagerefrange`

In order to get the appropriate substitution for `varioref` commands appended to `\cref@poorman@text`, we have to redefine `\@@setvpageref` and `\@@setvpagerefrange`, which perform the final typesetting of `varioref` page references, so that they append an appropriate substitution for the page reference they're typesetting.

```
\def\@@setvpageref#1[#2]#3{%
  \cref@old@@vpageref{#1}[#2]{#3}%
  \g@addto@macro\cref@poorman@text{\vpageref{#3}}}
\def\@@setvpagerefrange[#1]#2#3{%
  \vpagerefrange[#1]{#2}{#3}%
  \g@addto@macro\cref@poorman@text{\vpagerefrange{#2}{#3}}}
\def\@@setfullpageref#1{%
  \reftextfaraway{#1}%
  \g@addto@macro\cref@poorman@text{\reftextfaraway{#1}}}
\def\@@setfullpagerefrange#1#2{%
  \reftextpagerange{#1}{#2}%
  \g@addto@macro\cref@poorman@text{\reftextpagerange{#1}{#2}}}
```

`\@setcref@space` `\@setcref@pairconjunction` `\@setcref@middleconjunction` `\@setcref@lastconjunction`

Finally, we make sure the conjunctions also get appended to the `\cref@poorman@text` substitution.

```
\def\@setcref@space{ % space here is deliberate
```

```
      \g@addto@macro\cref@poorman@text{ }}
    \def\@setcref@pairconjunction{%
      \crefpairconjunction%
      \expandafter\g@addto@macro\expandafter\cref@poorman@text%
        \expandafter{\crefpairconjunction}}
    \def\@setcref@middleconjunction{%
      \crefmiddleconjunction%
      \expandafter\g@addto@macro\expandafter\cref@poorman@text%
        \expandafter{\crefmiddleconjunction}}
    \def\@setcref@lastconjunction{%
      \creflastconjunction%
      \expandafter\g@addto@macro\expandafter\cref@poorman@text%
        \expandafter{\creflastconjunction}}
  }% end of \AtBeginDocument
 }{}% end of \@ifpackageloaded{varioref}
}%  end of poorman option
```

## 14.8 Sort and Compress Options

sort
compress
nosort

The `sort`, `compress` or `nosort` options determine whether to sort and/or compress lists of multiple references (default is to do both). They work simply by setting the `\if@cref@sort` and `\if@cref@compress` flags appropriately.

\if@cref@sort
\if@cref@compress

```
\newif\if@cref@sort
\newif\if@cref@compress
```

Default is to both sort and compress references.

```
\@cref@sorttrue
\@cref@compresstrue
```

Options override default.

```
\DeclareOption{sort}{%
  \PackageInfo{cleveref}{sorting but not compressing references}
  \@cref@sorttrue
  \@cref@compressfalse}
\DeclareOption{compress}{%
  \PackageInfo{cleveref}{compressing but not sorting references}
  \@cref@sortfalse
  \@cref@compresstrue}
\DeclareOption{sort&compress}{%
  \PackageInfo{cleveref}{sorting and compressing references}
  \@cref@sorttrue
  \@cref@compresstrue}
\DeclareOption{nosort}{%
  \PackageInfo{cleveref}{neither sorting nor compressing references}
  \@cref@sortfalse
  \@cref@compressfalse}
```

## 14.9 Capitalise Option

capitalise
\if@cref@capitalise

The `capitalise` option causes `cleveref` to always use the `\Cref*` variants for typesetting cross-references, so that cross-reference names are always capitalised.

```
\newif\if@cref@capitalise
```

Disabled by default.

```
\@cref@capitalisefalse
```

Option overrides default.

```
\DeclareOption{capitalise}{%
  \PackageInfo{cleveref}{always capitalise cross-reference names}
  \@cref@capitalisetrue}
\DeclareOption{capitalize}{%
  \PackageInfo{cleveref}{always capitalise cross-reference names}
  \@cref@capitalisetrue}
```

## 14.10 Nameinlink Option

nameinlink
\if@cref@nameinlink

The `nameinlink` option causes `cleveref` to include the cross-reference name as part of the hyperlink target when the `hyperref` package is used.

```
\newif\if@cref@nameinlink
```

Disabled by default.

```
\@cref@nameinlinkfalse
```

Option overrides default.

```
\DeclareOption{nameinlink}{%
  \PackageInfo{cleveref}{include cross-reference names in hyperlinks}
  \@cref@nameinlinktrue}
```

## 14.11 Noabbrev Option

noabbrev
\if@cref@abbrev

The `noabbrev` option causes `cleveref` to always use the full cross-reference names, instead of abbreviating some of the more common names in the middle of sentences.

```
\newif\if@cref@abbrev
```

Enabled by default.

```
\@cref@abbrevtrue
```

Option overrides default.

```
\DeclareOption{noabbrev}{%
  \PackageInfo{cleveref}{no abbreviation of names}
  \@cref@abbrevfalse}
```

## 14.12 Language and `babel` Support

Default reference formats for different languages are supported via package options, in the usual way.

Any contributions of translations for missing languages are most welcome! If you can contribute definitions for a missing language, ideally you should add them below the existing ones (using those as a model), generate a patch against the original `cleveref.dtx` file, and send the patch by email to the package author. However, if you don't know how to produce a patch, you can instead just send the translations as a plain text file.

`\cref@addto` Utility macro to use instead of `babel`'s flawed `\addto` (copied and modified from `varioref`).

```
\def\cref@addto#1#2{%
  \@temptokena{#2}%
  \ifx#1\undefined%
    \edef#1{\the\@temptokena}%
  \else%
    \toks@\expandafter{#1}%
    \edef#1{\the\toks@\the\@temptokena}%
  \fi%
  \@temptokena{}\toks@\@temptokena%
}
\@onlypreamble\cref@addto
```

Passing a language option to `cleveref` defines the cross-reference names and conjunctions as appropriate for that language. We can't make the definitions straight away, since they would prevent the automatic definition of the other capitalisation variant from working if the user chooses to change a default definition in the preamble, so we postpone them until the beginning of the document. However, if each language option were to simply define any formats that aren't already defined by the end of the preamble, the *first* language option would override all the others. Unfortunately, the convention in LaTeX and `babel` is for the *last* language option to take precedence. So we instead used the `\crefname@preamble` command to save the definitions in `\cref@`⟨*type*⟩`@name@preamble` etc., and after all the language options have been processed, use the contents of these to set the default definitions for any undefined formats.

For `babel` support, we add the appropriate redefinitions to the `\extras`⟨*language*⟩ macro, which is called by `babel`'s `\selectlanguage` et al. commands. The main language (the last one listed in the options) is set up by an automatic call to `\selectlanguage` at the beginning of the document, which would clobber any redefinitions made by the user in the preamble. To avoid this, we postpone adding the redefinitions to `\extras`⟨*language*⟩ until the beginning of the document. Since `cleveref` must always be loaded *after* `babel`, the redefinitions won't be added to `\extras`⟨*language*⟩ until *after* `babel` has already called `\selectlanguage` for the main language. Thus the redefinitions will only be in effect when `\selectlanguage` is called explicitly within the document. (The defi-

nitions for the main language are taken care of by the language options passed to `cleveref`, independently of `babel`.)

Note that we define both capitalisation variants explicitly throughout, rather than relying on the automatic definition of the other variant, in order to make the code produced by the poor man's `sed` script slightly cleaner.

### 14.12.1 English

`english` English definitions (these are used by default).

```
\DeclareOption{english}{%
  \PackageInfo{cleveref}{loaded 'english' language definitions}
```

First, we set up the definitions used at the beginning of the document to define the formats created by the document preamble.

```
  \AtBeginDocument{%
    \def\crefrangeconjunction@preamble{ to\nobreakspace}%
    \def\crefrangepreconjunction@preamble{}%
    \def\crefrangepostconjunction@preamble{}%
    \def\crefpairconjunction@preamble{ and\nobreakspace}%
    \def\crefmiddleconjunction@preamble{, }%
    \def\creflastconjunction@preamble{ and\nobreakspace}%
```

We have to define the group conjunctions explicitly here, rather than relying on fall-back definitions in terms of the above conjunctions (see Section 14.13), in case any other language option defines them explicitly and we need to override those.

```
    \def\crefpairgroupconjunction@preamble{ and\nobreakspace}%
    \def\crefmiddlegroupconjunction@preamble{, }%
    \def\creflastgroupconjunction@preamble{, and\nobreakspace}%
  %
    \Crefname@preamble{equation}{Equation}{Equations}%
    \Crefname@preamble{figure}{Figure}{Figures}%
    \Crefname@preamble{table}{Table}{Tables}%
    \Crefname@preamble{page}{Page}{Pages}%
    \Crefname@preamble{part}{Part}{Parts}%
    \Crefname@preamble{chapter}{Chapter}{Chapters}%
    \Crefname@preamble{section}{Section}{Sections}%
    \Crefname@preamble{appendix}{Appendix}{Appendices}%
    \Crefname@preamble{enumi}{Item}{Items}%
    \Crefname@preamble{footnote}{Footnote}{Footnotes}%
    \Crefname@preamble{theorem}{Theorem}{Theorems}%
    \Crefname@preamble{lemma}{Lemma}{Lemmas}%
    \Crefname@preamble{corollary}{Corollary}{Corollaries}%
    \Crefname@preamble{proposition}{Proposition}{Propositions}%
    \Crefname@preamble{definition}{Definition}{Definitions}%
    \Crefname@preamble{result}{Result}{Results}%
    \Crefname@preamble{example}{Example}{Examples}%
    \Crefname@preamble{remark}{Remark}{Remarks}%
    \Crefname@preamble{note}{Note}{Notes}%
    \Crefname@preamble{algorithm}{Algorithm}{Algorithms}%
```

```
    \Crefname@preamble{listing}{Listing}{Listings}%
    \Crefname@preamble{line}{Line}{Lines}%
%
    \if@cref@capitalise%  capitalise set
      \if@cref@abbrev%
        \crefname@preamble{equation}{Eq.}{Eqs.}%
        \crefname@preamble{figure}{Fig.}{Figs.}%
      \else%
        \crefname@preamble{equation}{Equation}{Equations}%
        \crefname@preamble{figure}{Figure}{Figures}%
      \fi%
      \crefname@preamble{page}{Page}{Pages}%
      \crefname@preamble{table}{Table}{Tables}%
      \crefname@preamble{part}{Part}{Parts}%
      \crefname@preamble{chapter}{Chapter}{Chapters}%
      \crefname@preamble{section}{Section}{Sections}%
      \crefname@preamble{appendix}{Appendix}{Appendices}%
      \crefname@preamble{enumi}{Item}{Items}%
      \crefname@preamble{footnote}{Footnote}{Footnotes}%
      \crefname@preamble{theorem}{Theorem}{Theorems}%
      \crefname@preamble{lemma}{Lemma}{Lemmas}%
      \crefname@preamble{corollary}{Corollary}{Corollaries}%
      \crefname@preamble{proposition}{Proposition}{Propositions}%
      \crefname@preamble{definition}{Definition}{Definitions}%
      \crefname@preamble{result}{Result}{Results}%
      \crefname@preamble{example}{Example}{Examples}%
      \crefname@preamble{remark}{Remark}{Remarks}%
      \crefname@preamble{note}{Note}{Notes}%
      \crefname@preamble{algorithm}{Algorithm}{Algorithms}%
      \crefname@preamble{listing}{Listing}{Listings}%
      \crefname@preamble{line}{Line}{Lines}%
%
    \else%  capitalise unset
      \if@cref@abbrev%
        \crefname@preamble{equation}{eq.}{eqs.}%
        \crefname@preamble{figure}{fig.}{figs.}%
      \else%
        \crefname@preamble{equation}{equation}{equations}%
        \crefname@preamble{figure}{figure}{figures}%
      \fi%
      \crefname@preamble{page}{page}{pages}%
      \crefname@preamble{table}{table}{tables}%
      \crefname@preamble{part}{part}{parts}%
      \crefname@preamble{chapter}{chapter}{chapters}%
      \crefname@preamble{section}{section}{sections}%
      \crefname@preamble{appendix}{appendix}{appendices}%
      \crefname@preamble{enumi}{item}{items}%
      \crefname@preamble{footnote}{footnote}{footnotes}%
      \crefname@preamble{theorem}{theorem}{theorems}%
      \crefname@preamble{lemma}{lemma}{lemmas}%
```

```
      \crefname@preamble{corollary}{corollary}{corollaries}%
      \crefname@preamble{proposition}{proposition}{propositions}%
      \crefname@preamble{definition}{definition}{definitions}%
      \crefname@preamble{result}{result}{results}%
      \crefname@preamble{example}{example}{examples}%
      \crefname@preamble{remark}{remark}{remarks}%
      \crefname@preamble{note}{note}{notes}%
      \crefname@preamble{algorithm}{algorithm}{algorithms}%
      \crefname@preamble{listing}{listing}{listings}%
      \crefname@preamble{line}{line}{lines}%
    \fi%
    \def\cref@language{english}%
```

Next, we add the definitions to `\extras...` so that `babel`'s `\selectlanguage` command will change the format appropriately.

```
    \cref@addto\extrasenglish{%
      \renewcommand{\crefrangeconjunction}{ to\nobreakspace}%
      \renewcommand\crefrangepreconjunction{}%
      \renewcommand\crefrangepostconjunction{}%
      \renewcommand{\crefpairconjunction}{ and\nobreakspace}%
      \renewcommand{\crefmiddleconjunction}{, }%
      \renewcommand{\creflastconjunction}{ and\nobreakspace}%
      \renewcommand{\crefpairgroupconjunction}{ and\nobreakspace}%
      \renewcommand{\crefmiddlegroupconjunction}{, }%
      \renewcommand{\creflastgroupconjunction}{, and\nobreakspace}%
%
      \Crefname{equation}{Equation}{Equations}%
      \Crefname{figure}{Figure}{Figures}%
      \Crefname{subfigure}{Figure}{Figures}%
      \Crefname{table}{Table}{Tables}%
      \Crefname{subtable}{Table}{Tables}%
      \Crefname{page}{Page}{Pages}%
      \Crefname{part}{Part}{Parts}%
      \Crefname{chapter}{Chapter}{Chapters}%
      \Crefname{section}{Section}{Sections}%
      \Crefname{subsection}{Section}{Sections}%
      \Crefname{subsubsection}{Section}{Sections}%
      \Crefname{appendix}{Appendix}{Appendices}%
      \Crefname{subappendix}{Appendix}{Appendices}%
      \Crefname{subsubappendix}{Appendix}{Appendices}%
      \Crefname{subsubsubappendix}{Appendix}{Appendices}%
      \Crefname{enumi}{Item}{Items}%
      \Crefname{enumii}{Item}{Items}%
      \Crefname{enumiii}{Item}{Items}%
      \Crefname{enumiv}{Item}{Items}%
      \Crefname{enumv}{Item}{Items}%
      \Crefname{footnote}{Footnote}{Footnotes}%
      \Crefname{theorem}{Theorem}{Theorems}%
      \Crefname{lemma}{Lemma}{Lemmas}%
      \Crefname{corollary}{Corollary}{Corollaries}%
```

```
      \Crefname{proposition}{Proposition}{Propositions}%
      \Crefname{definition}{Definition}{Definitions}%
      \Crefname{result}{Result}{Results}%
      \Crefname{example}{Example}{Examples}%
      \Crefname{remark}{Remark}{Remarks}%
      \Crefname{note}{Note}{Notes}%
      \Crefname{algorithm}{Algorithm}{Algorithms}%
      \Crefname{listing}{Listing}{Listings}%
      \Crefname{line}{Line}{Lines}%
%
      \if@cref@capitalise%  capitalise set
        \if@cref@abbrev%
          \crefname{equation}{Eq.}{Eqs.}%
          \crefname{figure}{Fig.}{Figs.}%
          \crefname{subfigure}{Fig.}{Figs.}%
        \else%
          \crefname{equation}{Equation}{Equations}%
          \crefname{figure}{Figure}{Figures}%
          \crefname{subfigure}{Figure}{Figures}%
        \fi%
        \crefname{page}{Page}{Pages}%
        \crefname{table}{Table}{Tables}%
        \crefname{subtable}{Table}{Tables}%
        \crefname{part}{Part}{Parts}%
        \crefname{chapter}{Chapter}{Chapters}%
        \crefname{section}{Section}{Sections}%
        \crefname{subsection}{Section}{Sections}%
        \crefname{subsubsection}{Section}{Sections}%
        \crefname{appendix}{Appendix}{Appendices}%
        \crefname{subappendix}{Appendix}{Appendices}%
        \crefname{subsubappendix}{Appendix}{Appendices}%
        \crefname{subsubsubappendix}{Appendix}{Appendices}%
        \crefname{enumi}{Item}{Items}%
        \crefname{enumii}{Item}{Items}%
        \crefname{enumiii}{Item}{Items}%
        \crefname{enumiv}{Item}{Items}%
        \crefname{enumv}{Item}{Items}%
        \crefname{footnote}{Footnote}{Footnotes}%
        \crefname{theorem}{Theorem}{Theorems}%
        \crefname{lemma}{Lemma}{Lemmas}%
        \crefname{corollary}{Corollary}{Corollaries}%
        \crefname{proposition}{Proposition}{Propositions}%
        \crefname{definition}{Definition}{Definitions}%
        \crefname{result}{Result}{Results}%
        \crefname{example}{Example}{Examples}%
        \crefname{remark}{Remark}{Remarks}%
        \crefname{note}{Note}{Notes}%
        \crefname{algorithm}{Algorithm}{Algorithms}%
        \crefname{listing}{Listing}{Listings}%
        \crefname{line}{Line}{Lines}%
```

```
%
      \else%  capitalise unset
        \if@cref@abbrev%
          \crefname{equation}{eq.}{eqs.}%
          \crefname{figure}{fig.}{figs.}%
          \crefname{subfigure}{fig.}{figs.}%
        \else%
          \crefname{equation}{equation}{equations}%
          \crefname{figure}{figure}{figures}%
          \crefname{subfigure}{figure}{figures}%
        \fi%
        \crefname{table}{table}{tables}%
        \crefname{subtable}{table}{tables}%
        \crefname{page}{page}{pages}%
        \crefname{part}{part}{parts}%
        \crefname{chapter}{chapter}{chapters}%
        \crefname{section}{section}{sections}%
        \crefname{subsection}{section}{sections}%
        \crefname{subsubsection}{section}{sections}%
        \crefname{appendix}{appendix}{appendices}%
        \crefname{subappendix}{appendix}{appendices}%
        \crefname{subsubappendix}{appendix}{appendices}%
        \crefname{subsubsubappendix}{appendix}{appendices}%
        \crefname{enumi}{item}{items}%
        \crefname{enumii}{item}{items}%
        \crefname{enumiii}{item}{items}%
        \crefname{enumiv}{item}{items}%
        \crefname{enumv}{item}{items}%
        \crefname{footnote}{footnote}{footnotes}%
        \crefname{theorem}{theorem}{theorems}%
        \crefname{lemma}{lemma}{lemmas}%
        \crefname{corollary}{corollary}{corollaries}%
        \crefname{proposition}{proposition}{propositions}%
        \crefname{definition}{definition}{definitions}%
        \crefname{result}{result}{results}%
        \crefname{example}{example}{examples}%
        \crefname{remark}{remark}{remarks}%
        \crefname{note}{note}{notes}%
        \crefname{algorithm}{algorithm}{algorithms}%
        \crefname{listing}{listing}{listings}%
        \crefname{line}{line}{lines}%
      \fi%
    }}}
```

### 14.12.2 German

`german` German translations kindly provided by Stefan Pinnow, with a few additions by the package author (so you know to blame the latter for any errors!).

```
\DeclareOption{german}{%
```

```
\PackageInfo{cleveref}{loaded 'german' language definitions}
```

First, we set up the definitions used at the beginning of the document to define the formats created by the document preamble.

```
\AtBeginDocument{%
  \def\crefrangeconjunction@preamble{ bis\nobreakspace}%
  \def\crefrangepreconjunction@preamble{}%
  \def\crefrangepostconjunction@preamble{}%
  \def\crefpairconjunction@preamble{ und\nobreakspace}%
  \def\crefmiddleconjunction@preamble{, }%
  \def\creflastconjunction@preamble{ und\nobreakspace}%
```

We don't want the extra comma before "und" that would be added by the default fall-back definitions in terms of the above conjunctions, so we define `\crefpairgroupconjunction` explicitly. In fact, we have to define the other group conjunctions explicitly too here, in case any other language option defines them explicitly and we need to override them.

```
  \def\crefpairgroupconjunction@preamble{ und\nobreakspace}%
  \def\crefmiddlegroupconjunction@preamble{, }%
  \def\creflastgroupconjunction@preamble{ und\nobreakspace}%
%
  \Crefname@preamble{equation}{Gleichung}{Gleichungen}%
  \Crefname@preamble{figure}{Abbildung}{Abbildungen}%
  \Crefname@preamble{table}{Tabelle}{Tabellen}%
  \Crefname@preamble{page}{Seite}{Seiten}%
  \Crefname@preamble{part}{Teil}{Teile}%
  \Crefname@preamble{chapter}{Kapitel}{Kapitel}%
  \Crefname@preamble{section}{Abschnitt}{Abschnitte}%
  \Crefname@preamble{appendix}{Anhang}{Anh\"ange}%
  \Crefname@preamble{enumi}{Punkt}{Punkte}%
  \Crefname@preamble{footnote}{Fu\ss note}{Fu\ss noten}%
  \Crefname@preamble{theorem}{Theorem}{Theoreme}%
  \Crefname@preamble{lemma}{Lemma}{Lemmata}%
  \Crefname@preamble{corollary}{Korollar}{Korollare}%
  \Crefname@preamble{proposition}{Satz}{S\"atze}%
  \Crefname@preamble{definition}{Definition}{Definitionen}%
  \Crefname@preamble{result}{Ergebnis}{Ergebnisse}%
  \Crefname@preamble{example}{Beispiel}{Beispiele}%
  \Crefname@preamble{remark}{Bemerkung}{Bemerkungen}%
  \Crefname@preamble{note}{Anmerkung}{Anmerkungen}%
  \Crefname@preamble{algorithm}{Algorithmus}{Algorithmen}%
  \Crefname@preamble{listing}{Listing}{Listings}%
  \Crefname@preamble{line}{Zeile}{Zeilen}%
%
  \crefname@preamble{equation}{Gleichung}{Gleichungen}%
  \crefname@preamble{figure}{Abbildung}{Abbildungen}%
  \crefname@preamble{table}{Tabelle}{Tabellen}%
  \crefname@preamble{page}{Seite}{Seiten}%
  \crefname@preamble{part}{Teil}{Teile}%
  \crefname@preamble{chapter}{Kapitel}{Kapitel}%
```

```
    \crefname@preamble{section}{Abschnitt}{Abschnitte}%
    \crefname@preamble{appendix}{Anhang}{Anh\"ange}%
    \crefname@preamble{enumi}{Punkt}{Punkte}%
    \crefname@preamble{footnote}{Fu\ss note}{Fu\ss noten}%
    \crefname@preamble{theorem}{Theorem}{Theoreme}%
    \crefname@preamble{lemma}{Lemma}{Lemmata}%
    \crefname@preamble{corollary}{Korollar}{Korollare}%
    \crefname@preamble{proposition}{Satz}{S\"atze}%
    \crefname@preamble{definition}{Definition}{Definitionen}%
    \crefname@preamble{result}{Ergebnis}{Ergebnisse}%
    \crefname@preamble{example}{Beispiel}{Beispiele}%
    \crefname@preamble{remark}{Bemerkung}{Bemerkungen}%
    \crefname@preamble{note}{Anmerkung}{Anmerkungen}%
    \crefname@preamble{algorithm}{Algorithmus}{Algorithmen}%
    \crefname@preamble{listing}{Listing}{Listings}%
    \crefname@preamble{line}{Zeile}{Zeilen}%
    \def\cref@language{german}%
```

Next, we add the definitions to `\extras`... so that `babel`'s `\selectlanguage` command will change the format appropriately.

```
    \cref@addto\extrasgerman{%
      \renewcommand{\crefrangeconjunction}{ bis\nobreakspace}%
      \renewcommand\crefrangepreconjunction{}%
      \renewcommand\crefrangepostconjunction{}%
      \renewcommand{\crefpairconjunction}{ und\nobreakspace}%
      \renewcommand{\crefmiddleconjunction}{, }%
      \renewcommand{\creflastconjunction}{ und\nobreakspace}%
      \renewcommand{\crefpairgroupconjunction}{ und\nobreakspace}%
      \renewcommand{\crefmiddlegroupconjunction}{, }%
      \renewcommand{\creflastgroupconjunction}{ und\nobreakspace}%
%
      \Crefname{equation}{Gleichung}{Gleichungen}%
      \Crefname{figure}{Abbildung}{Abbildungen}%
      \Crefname{subfigure}{Abbildung}{Abbildungen}%
      \Crefname{table}{Tabelle}{Tabellen}%
      \Crefname{subtable}{Tabelle}{Tabellen}%
      \Crefname{page}{Seite}{Seiten}%
      \Crefname{part}{Teil}{Teile}%
      \Crefname{chapter}{Kapitel}{Kapitel}%
      \Crefname{section}{Abschnitt}{Abschnitte}%
      \Crefname{subsection}{Abschnitt}{Abschnitte}%
      \Crefname{subsubsection}{Abschnitt}{Abschnitte}%
      \Crefname{appendix}{Anhang}{Anh\"ange}%
      \Crefname{subappendix}{Anhang}{Anh\"ange}%
      \Crefname{subsubappendix}{Anhang}{Anh\"ange}%
      \Crefname{subsubsubappendix}{Anhang}{Anh\"ange}%
      \Crefname{enumi}{Punkt}{Punkte}%
      \Crefname{enumii}{Punkt}{Punkte}%
      \Crefname{enumiii}{Punkt}{Punkte}%
      \Crefname{enumiv}{Punkt}{Punkte}%
```

```
      \Crefname{enumv}{Punkt}{Punkte}%
      \Crefname{footnote}{Fu\ss note}{Fu\ss noten}%
      \Crefname{theorem}{Theorem}{Theoreme}%
      \Crefname{lemma}{Lemma}{Lemmata}%
      \Crefname{corollary}{Korollar}{Korollare}%
      \Crefname{proposition}{Satz}{S\"atze}%
      \Crefname{definition}{Definition}{Definitionen}%
      \Crefname{result}{Ergebnis}{Ergebnisse}%
      \Crefname{example}{Beispiel}{Beispiele}%
      \Crefname{remark}{Bemerkung}{Bemerkungen}%
      \Crefname{note}{Anmerkung}{Anmerkungen}%
      \Crefname{algorithm}{Algorithmus}{Algorithmen}%
      \Crefname{listing}{Listing}{Listings}%
      \Crefname{line}{Zeile}{Zeilen}%
%
      \crefname{equation}{Gleichung}{Gleichungen}%
      \crefname{figure}{Abbildung}{Abbildungen}%
      \crefname{subfigure}{Abbildung}{Abbildungen}%
      \crefname{table}{Tabelle}{Tabellen}%
      \crefname{subtable}{Tabelle}{Tabellen}%
      \crefname{page}{Seite}{Seiten}%
      \crefname{part}{Teil}{Teile}%
      \crefname{chapter}{Kapitel}{Kapitel}%
      \crefname{section}{Abschnitt}{Abschnitte}%
      \crefname{subsection}{Abschnitt}{Abschnitte}%
      \crefname{subsubsection}{Abschnitt}{Abschnitte}%
      \crefname{appendix}{Anhang}{Anh\"ange}%
      \crefname{subappendix}{Anhang}{Anh\"ange}%
      \crefname{subsubappendix}{Anhang}{Anh\"ange}%
      \crefname{subsubsubappendix}{Anhang}{Anh\"ange}%
      \crefname{enumi}{Punkt}{Punkte}%
      \crefname{enumii}{Punkt}{Punkte}%
      \crefname{enumiii}{Punkt}{Punkte}%
      \crefname{enumiv}{Punkt}{Punkte}%
      \crefname{enumv}{Punkt}{Punkte}%
      \crefname{footnote}{Fu\ss note}{Fu\ss noten}%
      \crefname{theorem}{Theorem}{Theoreme}%
      \crefname{lemma}{Lemma}{Lemmata}%
      \crefname{corollary}{Korollar}{Korollare}%
      \crefname{proposition}{Satz}{S\"atze}%
      \crefname{definition}{Definition}{Definitionen}%
      \crefname{result}{Ergebnis}{Ergebnisse}%
      \crefname{example}{Beispiel}{Beispiele}%
      \crefname{remark}{Bemerkung}{Bemerkungen}%
      \crefname{note}{Anmerkung}{Anmerkungen}%
      \crefname{algorithm}{Algorithmus}{Algorithmen}%
      \crefname{listing}{Listing}{Listings}%
      \crefname{line}{Zeile}{Zeilen}%
    }}}
```

ngerman It so happens that none of the cross-reference names differ in the “Neuerechtschreibung”, so we make `ngerman` execute `german`. However, we still need to add the definitions to `\extrasngerman` (note the “n”) so that `\selectlanguage` etc. will work.

```
\DeclareOption{ngerman}{%
  \PackageInfo{cleveref}{loaded 'ngerman' language definitions}
  \ExecuteOptions{german}
  \def\cref@language{ngerman}
  \AtBeginDocument{%
    \cref@addto\extrasngerman{%
      \renewcommand{\crefrangeconjunction}{ bis\nobreakspace}%
      \renewcommand\crefrangepreconjunction{}%
      \renewcommand\crefrangepostconjunction{}%
      \renewcommand{\crefpairconjunction}{ und\nobreakspace}%
      \renewcommand{\crefmiddleconjunction}{, }%
      \renewcommand{\creflastconjunction}{ und\nobreakspace}%
      \renewcommand{\crefpairgroupconjunction}{ und\nobreakspace}%
      \renewcommand{\crefmiddlegroupconjunction}{, }%
      \renewcommand{\creflastgroupconjunction}{ und\nobreakspace}%
%
      \Crefname{equation}{Gleichung}{Gleichungen}%
      \Crefname{figure}{Abbildung}{Abbildungen}%
      \Crefname{subfigure}{Abbildung}{Abbildungen}%
      \Crefname{table}{Tabelle}{Tabellen}%
      \Crefname{subtable}{Tabelle}{Tabellen}%
      \Crefname{page}{Seite}{Seiten}%
      \Crefname{part}{Teil}{Teile}%
      \Crefname{chapter}{Kapitel}{Kapitel}%
      \Crefname{section}{Abschnitt}{Abschnitte}%
      \Crefname{subsection}{Abschnitt}{Abschnitte}%
      \Crefname{subsubsection}{Abschnitt}{Abschnitte}%
      \Crefname{appendix}{Anhang}{Anh\"ange}%
      \Crefname{subappendix}{Anhang}{Anh\"ange}%
      \Crefname{subsubappendix}{Anhang}{Anh\"ange}%
      \Crefname{subsubsubappendix}{Anhang}{Anh\"ange}%
      \Crefname{enumi}{Punkt}{Punkte}%
      \Crefname{enumii}{Punkt}{Punkte}%
      \Crefname{enumiii}{Punkt}{Punkte}%
      \Crefname{enumiv}{Punkt}{Punkte}%
      \Crefname{enumv}{Punkt}{Punkte}%
      \Crefname{footnote}{Fu\ss note}{Fu\ss noten}%
      \Crefname{theorem}{Theorem}{Theoreme}%
      \Crefname{lemma}{Lemma}{Lemmata}%
      \Crefname{corollary}{Korollar}{Korollare}%
      \Crefname{proposition}{Satz}{S\"atze}%
      \Crefname{definition}{Definition}{Definitionen}%
      \Crefname{result}{Ergebnis}{Ergebnisse}%
      \Crefname{example}{Beispiel}{Beispiele}%
      \Crefname{remark}{Bemerkung}{Bemerkungen}%
```

```
      \Crefname{note}{Anmerkung}{Anmerkungen}%
      \Crefname{algorithm}{Algorithmus}{Algorithmen}%
      \Crefname{listing}{Listing}{Listings}%
      \Crefname{line}{Zeile}{Zeilen}%
%
      \crefname{equation}{Gleichung}{Gleichungen}%
      \crefname{figure}{Abbildung}{Abbildungen}%
      \crefname{subfigure}{Abbildung}{Abbildungen}%
      \crefname{table}{Tabelle}{Tabellen}%
      \crefname{subtable}{Tabelle}{Tabellen}%
      \crefname{page}{Seite}{Seiten}%
      \crefname{part}{Teil}{Teile}%
      \crefname{chapter}{Kapitel}{Kapitel}%
      \crefname{section}{Abschnitt}{Abschnitte}%
      \crefname{subsection}{Abschnitt}{Abschnitte}%
      \crefname{subsubsection}{Abschnitt}{Abschnitte}%
      \crefname{appendix}{Anhang}{Anh\"ange}%
      \crefname{subappendix}{Anhang}{Anh\"ange}%
      \crefname{subsubappendix}{Anhang}{Anh\"ange}%
      \crefname{subsubsubappendix}{Anhang}{Anh\"ange}%
      \crefname{enumi}{Punkt}{Punkte}%
      \crefname{enumii}{Punkt}{Punkte}%
      \crefname{enumiii}{Punkt}{Punkte}%
      \crefname{enumiv}{Punkt}{Punkte}%
      \crefname{enumv}{Punkt}{Punkte}%
      \crefname{footnote}{Fu\ss note}{Fu\ss noten}%
      \crefname{theorem}{Theorem}{Theoreme}%
      \crefname{lemma}{Lemma}{Lemmata}%
      \crefname{corollary}{Korollar}{Korollare}%
      \crefname{proposition}{Satz}{S\"atze}%
      \crefname{definition}{Definition}{Definitionen}%
      \crefname{result}{Ergebnis}{Ergebnisse}%
      \crefname{example}{Beispiel}{Beispiele}%
      \crefname{remark}{Bemerkung}{Bemerkungen}%
      \crefname{note}{Anmerkung}{Anmerkungen}%
      \crefname{algorithm}{Algorithmus}{Algorithmen}%
      \crefname{listing}{Listing}{Listings}%
      \crefname{line}{Zeile}{Zeilen}%
    }}}
```

### 14.12.3 Dutch

`dutch` Dutch translations kindly contributed by Philip Hölzenspies.

```
\DeclareOption{dutch}{%
  \PackageInfo{cleveref}{loaded ‘dutch’ language definitions}
```

First, we set up the definitions used at the beginning of the document to define the formats created by the document preamble.

```
  \AtBeginDocument{%
```

```
    \def\crefrangeconjunction@preamble{ tot\nobreakspace}%
    \def\crefrangepreconjunction@preamble{}%
    \def\crefrangepostconjunction@preamble{}%
    \def\crefpairconjunction@preamble{ en\nobreakspace}%
    \def\crefmiddleconjunction@preamble{, }%
    \def\creflastconjunction@preamble{ en\nobreakspace}%
```

As in German, we don't want the extra comma before "en" that would be added by the default fall-back definitions in terms of the above conjunctions, so we define `\crefpairgroupconjunction` explicitly. In fact, we have to define the other group conjunctions explicitly too here, in case any other language option defines them explicitly and we need to override them.

```
    \def\crefpairgroupconjunction@preamble{ en\nobreakspace}%
    \def\crefmiddlegroupconjunction@preamble{, }%
    \def\creflastgroupconjunction@preamble{ en\nobreakspace}%
%
    \Crefname@preamble{equation}{Vergel\ij{}king}{Vergel\ij{}kingen}%
    \Crefname@preamble{figure}{Figuur}{Figuren}%
    \Crefname@preamble{table}{Tabel}{Tabellen}%
    \Crefname@preamble{page}{Pagina}{Pagina's}%
    \Crefname@preamble{part}{Deel}{Delen}%
    \Crefname@preamble{chapter}{Hoofdstuk}{Hoofdstuken}%
    \Crefname@preamble{section}{Paragraaf}{Paragrafen}%
    \Crefname@preamble{appendix}{Appendix}{Appendices}%
    \Crefname@preamble{enumi}{Punt}{Punten}%
    \Crefname@preamble{footnote}{Voetnote}{Voetnoten}%
    \Crefname@preamble{lemma}{Lemma}{Lemma's}%
    \Crefname@preamble{corollary}{Corollarium}{Corollaria}%
    \Crefname@preamble{proposition}{Bewering}{Beweringen}%
    \Crefname@preamble{definition}{Definitie}{Definities}%
    \Crefname@preamble{result}{Resultaat}{Resultaten}%
    \Crefname@preamble{example}{Voorbeeld}{Voorbeelden}%
    \Crefname@preamble{remark}{Opmerking}{Opmerkingen}%
    \Crefname@preamble{note}{Aantekening}{Aantekeningen}%
    \Crefname@preamble{algorithm}{Algoritme}{Algoritmen}%
    \Crefname@preamble{listing}{Listing}{Listings}%
    \Crefname@preamble{line}{Lijn}{Lijnen}%
%
    \if@cref@capitalise%  capitalise set
      \if@cref@abbrev%
        \crefname@preamble{equation}{Verg.}{Verg's.}%
        \crefname@preamble{figure}{Fig.}{Fig's.}%
      \else%
        \crefname@preamble{equation}{Vergel\ij{}king}{Vergel\ij{}kingen}%
        \crefname@preamble{figure}{Figuur}{Figuren}%
      \fi%
      \crefname@preamble{page}{Pagina}{Pagina's}%
      \crefname@preamble{table}{Tabel}{Tabellen}%
      \crefname@preamble{part}{Deel}{Delen}%
      \crefname@preamble{chapter}{Hoofdstuk}{Hoofdstukken}%
```

```
      \crefname@preamble{section}{Paragraaf}{Paragrafen}%
      \crefname@preamble{appendix}{Appendix}{Appendices}%
      \crefname@preamble{enumi}{Punt}{Punten}%
      \crefname@preamble{footnote}{Voetnote}{Voetnoten}%
      \crefname@preamble{theorem}{Theorema}{Theorema's}%
      \crefname@preamble{lemma}{Lemma}{Lemma's}%
      \crefname@preamble{corollary}{Corollarium}{Corollaria}%
      \crefname@preamble{proposition}{Bewering}{Beweringen}%
      \crefname@preamble{definition}{Definitie}{Definities}%
      \crefname@preamble{result}{Resultaat}{Resultaten}%
      \crefname@preamble{example}{Voorbeeld}{Voorbeelden}%
      \crefname@preamble{remark}{Opmerking}{Opmerkingen}%
      \crefname@preamble{note}{Aantekening}{Aantekeningen}%
      \crefname@preamble{algorithm}{Algoritme}{Algoritmen}%
      \crefname@preamble{listing}{Listing}{Listings}%
      \crefname@preamble{line}{Lijn}{Lijnen}%
%
    \else%  capitalise unset
      \if@cref@abbrev%
        \crefname@preamble{equation}{verg.}{verg's.}%
        \crefname@preamble{figure}{fig.}{fig's.}%
      \else%
        \crefname@preamble{equation}{vergel\ij{}king}{vergel\ij{}kingen}%
        \crefname@preamble{figure}{figuur}{figuren}%
      \fi%
      \crefname@preamble{page}{pagina}{pagina's}%
      \crefname@preamble{table}{tabel}{tabellen}%
      \crefname@preamble{part}{deel}{delen}%
      \crefname@preamble{chapter}{hoofdstuk}{hoofdstukken}%
      \crefname@preamble{section}{paragraaf}{paragrafen}%
      \crefname@preamble{appendix}{appendix}{appendices}%
      \crefname@preamble{enumi}{punt}{punten}%
      \crefname@preamble{footnote}{voetnote}{voetnoten}%
      \crefname@preamble{theorem}{theorema}{theorema's}%
      \crefname@preamble{lemma}{lemma}{lemma's}%
      \crefname@preamble{corollary}{corollarium}{corollaria}%
      \crefname@preamble{proposition}{bewering}{beweringen}%
      \crefname@preamble{definition}{definitie}{definities}%
      \crefname@preamble{result}{resultaat}{resultaten}%
      \crefname@preamble{example}{voorbeeld}{voorbeelden}%
      \crefname@preamble{remark}{opmerking}{opmerkingen}%
      \crefname@preamble{note}{aantekening}{aantekeningen}%
      \crefname@preamble{algorithm}{algoritme}{algoritmen}%
      \crefname@preamble{listing}{listing}{listings}%
      \crefname@preamble{line}{lijn}{lijnen}%
    \fi%
    \def\cref@language{dutch}%
```

Next, we add the definitions to `\extras...` so that `babel`'s `\selectlanguage` command will change the format appropriately.

```
    \cref@addto\extrasdutch{%
      \renewcommand{\crefrangeconjunction}{ tot\nobreakspace}%
      \renewcommand\crefrangepreconjunction{}%
      \renewcommand\crefrangepostconjunction{}%
      \renewcommand{\crefpairconjunction}{ en\nobreakspace}%
      \renewcommand{\crefmiddleconjunction}{, }%
      \renewcommand{\creflastconjunction}{ en\nobreakspace}%
      \renewcommand{\crefpairgroupconjunction}{ en\nobreakspace}%
      \renewcommand{\crefmiddlegroupconjunction}{, }%
      \renewcommand{\creflastgroupconjunction}{ en\nobreakspace}%
%
      \Crefname{equation}{Vergel\ij{}king}{Vergel\ij{}kingen}%
      \Crefname{figure}{Figuur}{Figuren}%
      \Crefname{subfigure}{Figuur}{Figuren}%
      \Crefname{table}{Tabel}{Tabellen}%
      \Crefname{subtable}{Tabel}{Tabellen}%
      \Crefname{page}{Pagina}{Pagina's}%
      \Crefname{part}{Deel}{Delen}%
      \Crefname{chapter}{Hoofdstuk}{Hoofdstuken}%
      \Crefname{section}{Paragraaf}{Paragrafen}%
      \Crefname{subsection}{Paragraaf}{Paragrafen}%
      \Crefname{subsubsection}{Paragraaf}{Paragrafen}%
      \Crefname{appendix}{Appendix}{Appendices}%
      \Crefname{subappendix}{Appendix}{Appendices}%
      \Crefname{subsubappendix}{Appendix}{Appendices}%
      \Crefname{subsubsubappendix}{Appendix}{Appendices}%
      \Crefname{enumi}{Punt}{Punten}%
      \Crefname{enumii}{Punt}{Punten}%
      \Crefname{enumiii}{Punt}{Punten}%
      \Crefname{enumiv}{Punt}{Punten}%
      \Crefname{enumv}{Punt}{Punten}%
      \Crefname{footnote}{Voetnote}{Voetnoten}%
      \Crefname{theorem}{Theorema}{Theorema's}%
      \Crefname{lemma}{Lemma}{Lemma's}%
      \Crefname{corollary}{Corollarium}{Corollaria}%
      \Crefname{proposition}{Bewering}{Beweringen}%
      \Crefname{definition}{Definitie}{Definities}%
      \Crefname{result}{Resultaat}{Resultaten}%
      \Crefname{example}{Voorbeeld}{Voorbeelden}%
      \Crefname{remark}{Opmerking}{Opmerkingen}%
      \Crefname{note}{Aantekening}{Aantekeningen}%
      \Crefname{algorithm}{Algoritme}{Algoritmen}%
      \Crefname{listing}{Listing}{Listings}%
      \Crefname{line}{Lijn}{Lijnen}%
%
      \if@cref@capitalise%  capitalise set
        \if@cref@abbrev%
          \crefname{equation}{Verg.}{Verg's.}%
          \crefname{figure}{Fig.}{Fig's.}%
          \crefname{subfigure}{Fig.}{Fig's.}%
```

```
        \else%
          \crefname{equation}{Vergel\ij{}king}{Vergel\ij{}kingen}%
          \crefname{figure}{Figuur}{Figuren}%
          \crefname{subfigure}{Figuur}{Figuren}%
        \fi%
        \crefname{table}{Tabel}{Tabellen}%
        \crefname{subtable}{Tabel}{Tabellen}%
        \crefname{page}{Pagina}{Pagina's}%
        \crefname{part}{Deel}{Delen}%
        \crefname{chapter}{Hoofdstuk}{Hoofdstukken}%
        \crefname{section}{Paragraaf}{Paragrafen}%
        \crefname{appendix}{Appendix}{Appendices}%
        \crefname{enumi}{Punt}{Punten}%
        \crefname{footnote}{Voetnote}{Voetnoten}%
        \crefname{theorem}{Theorema}{Theorema's}%
        \crefname{lemma}{Lemma}{Lemma's}%
        \crefname{corollary}{Corollarium}{Corollaria}%
        \crefname{proposition}{Bewering}{Beweringen}%
        \crefname{definition}{Definitie}{Definities}%
        \crefname{result}{Resultaat}{Resultaten}%
        \crefname{example}{Voorbeeld}{Voorbeelden}%
        \crefname{remark}{Opmerking}{Opmerkingen}%
        \crefname{note}{Aantekening}{Aantekeningen}%
        \crefname{algorithm}{Algoritme}{Algoritmen}%
        \crefname{listing}{Listing}{Listings}%
        \crefname{line}{Lijn}{Lijnen}%
%
      \else%  capitalise unset
        \if@cref@abbrev%
          \crefname{equation}{verg.}{verg's.}%
          \crefname{figure}{fig.}{fig's.}%
          \crefname{subfigure}{fig.}{fig's.}%
        \else%
          \crefname{equation}{vergel\ij{}king}{vergel\ij{}kingen}%
          \crefname{figure}{figuur}{figuren}%
          \crefname{subfigure}{figuur}{figuren}%
        \fi%
        \crefname{table}{tabel}{tabellen}%
        \crefname{subtable}{tabel}{tabellen}%
        \crefname{page}{pagina}{pagina's}%
        \crefname{part}{deel}{delen}%
        \crefname{chapter}{hoofdstuk}{hoofdstukken}%
        \crefname{section}{paragraaf}{paragrafen}%
        \crefname{appendix}{appendix}{appendices}%
        \crefname{enumi}{punt}{punten}%
        \crefname{footnote}{voetnote}{voetnoten}%
        \crefname{theorem}{theorema}{theorema's}%
        \crefname{lemma}{lemma}{lemma's}%
        \crefname{corollary}{corollarium}{corollaria}%
        \crefname{proposition}{bewering}{beweringen}%
```

```
      \crefname{definition}{definitie}{definities}%
      \crefname{result}{resultaat}{resultaten}%
      \crefname{example}{voorbeeld}{voorbeelden}%
      \crefname{remark}{opmerking}{opmerkingen}%
      \crefname{note}{aantekening}{aantekeningen}%
      \crefname{algorithm}{algoritme}{algoritmen}%
      \crefname{listing}{listing}{listings}%
      \crefname{line}{lijn}{lijnen}%
    \fi%
  }}}
```

### 14.12.4 French

`french` French translations attempted by the package author (please report any corrections that might be needed!).

```
\DeclareOption{french}{%
  \PackageInfo{cleveref}{loaded ‘french’ language definitions}
```

First, we set up the definitions used at the beginning of the document to define the formats created by the document preamble.

```
  \AtBeginDocument{%
    \def\crefrangeconjunction@preamble{ \‘a\nobreakspace}%
    \def\crefrangepreconjunction@preamble{}%
    \def\crefrangepostconjunction@preamble{}%
    \def\crefpairconjunction@preamble{ et\nobreakspace}%
    \def\crefmiddleconjunction@preamble{, }%
    \def\creflastconjunction@preamble{ et\nobreakspace}%
```

Erring on the side of caution, I've left off the extra comma before "et" between groups, pending more knowledgeable input on punctuation rules from a native French speaker.

```
    \def\crefpairgroupconjunction@preamble{ et\nobreakspace}%
    \def\crefmiddlegroupconjunction@preamble{, }%
    \def\creflastgroupconjunction@preamble{, et\nobreakspace}%
  %
    \Crefname@preamble{equation}{{\’E}quation}{{\’E}quations}%
    \Crefname@preamble{figure}{Figure}{Figures}%
    \Crefname@preamble{table}{Tableau}{Tableaux}%
    \Crefname@preamble{page}{Page}{Pages}%
    \Crefname@preamble{part}{Partie}{Parties}%
    \Crefname@preamble{chapter}{Chapitre}{Chapitres}%
    \Crefname@preamble{section}{Section}{Sections}%
    \Crefname@preamble{appendix}{Annexe}{Annexes}%
    \Crefname@preamble{enumi}{Point}{Points}%
    \Crefname@preamble{footnote}{Note}{Notes}%
    \Crefname@preamble{theorem}{Th\’eor\‘eme}{Th\’eor\‘emes}%
    \Crefname@preamble{lemma}{Lemme}{Lemmes}%
    \Crefname@preamble{corollary}{Corollaire}{Corollaires}%
    \Crefname@preamble{proposition}{Proposition}{Propositions}%
```

```
    \Crefname@preamble{definition}{D\'efinition}{D\'efinitions}%
    \Crefname@preamble{result}{R\'esultat}{R\'esultats}%
    \Crefname@preamble{example}{Exemple}{Exemples}%
    \Crefname@preamble{remark}{Remarque}{Remarques}%
    \Crefname@preamble{algorithm}{Algorithme}{Algorithmes}%
    \Crefname@preamble{listing}{Liste}{Listes}%
    \Crefname@preamble{line}{Ligne}{Lignes}%
%
    \if@cref@capitalise%  capitalise set
      \crefname@preamble{equation}{{\'E}quation}{{\'E}quations}%
      \crefname@preamble{figure}{Figure}{Figures}%
      \crefname@preamble{table}{Tableau}{Tableaux}%
      \crefname@preamble{page}{Page}{Pages}%
      \crefname@preamble{part}{Partie}{Parties}%
      \crefname@preamble{chapter}{Chapitre}{Chapitres}%
      \crefname@preamble{section}{Section}{Sections}%
      \crefname@preamble{appendix}{Annexe}{Annexes}%
      \crefname@preamble{enumi}{Point}{Points}%
      \crefname@preamble{footnote}{Note}{Notes}%
      \crefname@preamble{theorem}{Th\'eor\`eme}{Th\'eor\`emes}%
      \crefname@preamble{lemma}{Lemme}{Lemmes}%
      \crefname@preamble{corollary}{Corollaire}{Corollaires}%
      \crefname@preamble{proposition}{Proposition}{Propositions}%
      \crefname@preamble{definition}{D\'efinition}{D\'efinitions}%
      \crefname@preamble{result}{R\'esultat}{R\'esultats}%
      \crefname@preamble{example}{Exemple}{Exemples}%
      \crefname@preamble{remark}{Remarque}{Remarques}%
      \crefname@preamble{note}{Commentaire}{Commentaires}%
      \crefname@preamble{algorithm}{Algorithme}{Algorithmes}%
      \crefname@preamble{listing}{Liste}{Listes}%
      \crefname@preamble{line}{Ligne}{Lignes}%
%
    \else%  capitalise unset
      \crefname@preamble{equation}{{\'e}quation}{{\'e}quations}%
      \crefname@preamble{figure}{figure}{figures}%
      \crefname@preamble{table}{tableau}{tableaux}%
      \crefname@preamble{page}{page}{pages}%
      \crefname@preamble{part}{partie}{parties}%
      \crefname@preamble{chapter}{chapitre}{chapitres}%
      \crefname@preamble{section}{section}{sections}%
      \crefname@preamble{appendix}{annexe}{annexes}%
      \crefname@preamble{enumi}{point}{points}%
      \crefname@preamble{footnote}{note}{notes}%
      \crefname@preamble{theorem}{th\'eor\`eme}{th\'eor\`emes}%
      \crefname@preamble{lemma}{lemme}{lemmes}%
      \crefname@preamble{corollary}{corollaire}{corollaires}%
      \crefname@preamble{proposition}{proposition}{propositions}%
      \crefname@preamble{definition}{d\'efinition}{d\'efinitions}%
      \crefname@preamble{result}{r\'esultat}{r\'esultats}%
      \crefname@preamble{example}{exemple}{exemples}%
```

```
      \crefname@preamble{remark}{remarque}{remarques}%
      \crefname@preamble{note}{commentaire}{commentaires}%
      \crefname@preamble{algorithm}{algorithme}{algorithmes}%
      \crefname@preamble{listing}{liste}{listes}%
      \crefname@preamble{line}{ligne}{lignes}%
    \fi%
    \def\cref@language{french}%
```

Next, we add the definitions to `\extras...` so that `babel`'s `\selectlanguage` command will change the format appropriately.

```
    \cref@addto\extrasfrench{%
      \renewcommand{\crefrangeconjunction}{ \‘a\nobreakspace}%
      \renewcommand\crefrangepreconjunction{}%
      \renewcommand\crefrangepostconjunction{}%
      \renewcommand{\crefpairconjunction}{ et\nobreakspace}%
      \renewcommand{\crefmiddleconjunction}{, }%
      \renewcommand{\creflastconjunction}{ et\nobreakspace}%
      \renewcommand{\crefpairgroupconjunction}{ et\nobreakspace}%
      \renewcommand{\crefmiddlegroupconjunction}{, }%
      \renewcommand{\creflastgroupconjunction}{ et\nobreakspace}%
%
      \Crefname{equation}{{\’E}quation}{{\’E}quations}%
      \Crefname{figure}{Figure}{Figures}%
      \Crefname{subfigure}{Figure}{Figures}%
      \Crefname{table}{Tableau}{Tableaux}%
      \Crefname{subtable}{Tableau}{Tableaux}%
      \Crefname{page}{Page}{Pages}%
      \Crefname{part}{Partie}{Parties}%
      \Crefname{chapter}{Chapitre}{Chapitres}%
      \Crefname{section}{Section}{Sections}%
      \Crefname{subsection}{Section}{Sections}%
      \Crefname{subsubsection}{Section}{Sections}%
      \Crefname{appendix}{Annexe}{Annexes}%
      \Crefname{subappendix}{Annexe}{Annexes}%
      \Crefname{subsubappendix}{Annexe}{Annexes}%
      \Crefname{subsubsubappendix}{Annexe}{Annexes}%
      \Crefname{enumi}{Point}{Points}%
      \Crefname{enumii}{Point}{Points}%
      \Crefname{enumiii}{Point}{Points}%
      \Crefname{enumiv}{Point}{Points}%
      \Crefname{enumv}{Point}{Points}%
      \Crefname{footnote}{Note}{Notes}%
      \Crefname{theorem}{Th\’eor\‘eme}{Th\’eor\‘emes}%
      \Crefname{lemma}{Lemme}{Lemmes}%
      \Crefname{corollary}{Corollaire}{Corollaires}%
      \Crefname{proposition}{Proposition}{Propositions}%
      \Crefname{definition}{D\’efinition}{D\’efinitions}%
      \Crefname{result}{R\’esultat}{R\’esultats}%
      \Crefname{example}{Exemple}{Exemples}%
      \Crefname{remark}{Remarque}{Remarques}%
```

```
      \Crefname{note}{Commentaire}{Commentaires}%
      \Crefname{algorithm}{Algorithme}{Algorithmes}%
      \Crefname{listing}{Liste}{Listes}%
      \Crefname{line}{Ligne}{Lignes}%
%
      \if@cref@capitalise%  capitalise set
        \crefname{equation}{{\'E}quation}{{\'E}quations}%
        \crefname{figure}{Figure}{Figures}%
        \crefname{subfigure}{Figure}{Figures}%
        \crefname{table}{Tableau}{Tableaux}%
        \crefname{subtable}{Tableau}{Tableaux}%
        \crefname{page}{Page}{Pages}%
        \crefname{part}{Partie}{Parties}%
        \crefname{chapter}{Chapitre}{Chapitres}%
        \crefname{section}{Section}{Sections}%
        \crefname{subsection}{Section}{Sections}%
        \crefname{subsubsection}{Section}{Sections}%
        \crefname{appendix}{Annexe}{Annexes}%
        \crefname{subappendix}{Annexe}{Annexes}%
        \crefname{subsubappendix}{Annexe}{Annexes}%
        \crefname{subsubsubappendix}{Annexe}{Annexes}%
        \crefname{enumi}{Point}{Points}%
        \crefname{enumii}{Point}{Points}%
        \crefname{enumiii}{Point}{Points}%
        \crefname{enumiv}{Point}{Points}%
        \crefname{enumv}{Point}{Points}%
        \crefname{footnote}{Note}{Notes}%
        \crefname{theorem}{Th\'eor\`eme}{Th\'eor\`emes}%
        \crefname{lemma}{Lemme}{Lemmes}%
        \crefname{corollary}{Corollaire}{Corollaires}%
        \crefname{proposition}{Proposition}{Propositions}%
        \crefname{definition}{D\'efinition}{D\'efinitions}%
        \crefname{result}{R\'esultat}{R\'esultats}%
        \crefname{example}{Exemple}{Exemples}%
        \crefname{remark}{Remarque}{Remarques}%
        \crefname{note}{Commentaire}{Commentaires}%
        \crefname{algorithm}{Algorithme}{Algorithmes}%
        \crefname{listing}{Liste}{Listes}%
        \crefname{line}{Ligne}{Lignes}%
%
      \else%  capitalise unset
        \crefname{equation}{{\'e}quation}{{\'e}quations}%
        \crefname{figure}{figure}{figures}%
        \crefname{subfigure}{figure}{figures}%
        \crefname{table}{tableau}{tableaux}%
        \crefname{subtable}{tableau}{tableaux}%
        \crefname{page}{page}{pages}%
        \crefname{part}{partie}{parties}%
        \crefname{chapter}{chapitre}{chapitres}%
        \crefname{section}{section}{sections}%
```

```
      \crefname{subsection}{section}{sections}%
      \crefname{subsubsection}{section}{sections}%
      \crefname{appendix}{annexe}{annexes}%
      \crefname{subappendix}{annexe}{annexes}%
      \crefname{subsubappendix}{annexe}{annexes}%
      \crefname{subsubsubappendix}{annexe}{annexes}%
      \crefname{enumi}{point}{points}%
      \crefname{enumii}{point}{points}%
      \crefname{enumiii}{point}{points}%
      \crefname{enumiv}{point}{points}%
      \crefname{enumv}{point}{points}%
      \crefname{footnote}{note}{notes}%
      \crefname{theorem}{th\'eor\`eme}{th\'eor\`emes}%
      \crefname{lemma}{lemme}{lemmes}%
      \crefname{corollary}{corollaire}{corollaires}%
      \crefname{proposition}{proposition}{propositions}%
      \crefname{definition}{d\'efinition}{d\'efinitions}%
      \crefname{result}{r\'esultat}{r\'esultats}%
      \crefname{example}{exemple}{exemples}%
      \crefname{remark}{remarque}{remarques}%
      \crefname{note}{commentaire}{commentaires}%
      \crefname{algorithm}{algorithme}{algorithmes}%
      \crefname{listing}{liste}{listes}%
      \crefname{line}{ligne}{lignes}%
    \fi%
  }}}
```

### 14.12.5 Spanish

`spanish` Spanish translations generously contributed by Gonzalo Medina.

```
\DeclareOption{spanish}{%
  \PackageInfo{cleveref}{loaded `spanish' language definitions}
```

First, we set up the definitions used at the beginning of the document to define the formats created by the document preamble.

```
  \AtBeginDocument{%
    \def\crefrangeconjunction@preamble{ a\nobreakspace}%
    \def\crefrangepreconjunction@preamble{}%
    \def\crefrangepostconjunction@preamble{}%
    \def\crefpairconjunction@preamble{ y\nobreakspace}%
    \def\crefmiddleconjunction@preamble{, }%
    \def\creflastconjunction@preamble{ y\nobreakspace}%
    \def\crefpairgroupconjunction@preamble{ y\nobreakspace}%
    \def\crefmiddlegroupconjunction@preamble{, }%
    \def\creflastgroupconjunction@preamble{ y\nobreakspace}%
%
    \Crefname@preamble{equation}{Ecuaci\'on}{Ecuaciones}%
    \Crefname@preamble{figure}{Figura}{Figuras}%
    \Crefname@preamble{table}{Cuadro}{Cuadros}%
```

```
    \Crefname@preamble{page}{P\'agina}{P\'aginas}%
    \Crefname@preamble{part}{Parte}{Partes}%
    \Crefname@preamble{chapter}{Cap\'itulo}{Cap\'itulos}%
    \Crefname@preamble{section}{Apartado}{Apartados}%
    \Crefname@preamble{appendix}{Ap\'endice}{Ap\'endices}%
    \Crefname@preamble{enumi}{Punto}{Puntos}%
    \Crefname@preamble{footnote}{Nota}{Notas}%
    \Crefname@preamble{theorem}{Teorema}{Teoremas}%
    \Crefname@preamble{lemma}{Lema}{Lemas}%
    \Crefname@preamble{corollary}{Corolario}{Corolarios}%
    \Crefname@preamble{proposition}{Proposici\'on}{Proposiciones}%
    \Crefname@preamble{definition}{Definici\'on}{Definiciones}%
    \Crefname@preamble{result}{Resultado}{Resultados}%
    \Crefname@preamble{example}{Ejemplo}{Ejemplos}%
    \Crefname@preamble{remark}{Observaci\'on}{Observaciones}%
    \Crefname@preamble{note}{Nota}{Notas}%
    \Crefname@preamble{algorithm}{Algoritmo}{Algoritmos}%
    \Crefname@preamble{listing}{Listado}{Listados}%
    \Crefname@preamble{line}{L\'inea}{L\'ineas}%
%
    \if@cref@capitalise%  capitalise set
      \crefname@preamble{equation}{Ecuaci\'on}{Ecuaciones}%
      \crefname@preamble{figure}{Figura}{Figuras}%
      \crefname@preamble{table}{Cuadro}{Cuadros}%
      \crefname@preamble{page}{P\'agina}{P\'aginas}%
      \crefname@preamble{part}{Parte}{Partes}%
      \crefname@preamble{chapter}{Cap\'itulo}{Cap\'itulos}%
      \crefname@preamble{section}{Apartado}{Apartados}%
      \crefname@preamble{appendix}{Ap\'endice}{Ap\'endices}%
      \crefname@preamble{enumi}{Punto}{Puntos}%
      \crefname@preamble{footnote}{Nota}{Notas}%
      \crefname@preamble{theorem}{Teorema}{Teoremas}%
      \crefname@preamble{lemma}{Lema}{Lemas}%
      \crefname@preamble{corollary}{Corolario}{Corolarios}%
      \crefname@preamble{proposition}{Proposici\'on}{Proposiciones}%
      \crefname@preamble{definition}{Definici\'on}{Definiciones}%
      \crefname@preamble{result}{Resultado}{Resultados}%
      \crefname@preamble{example}{Ejemplo}{Ejemplos}%
      \crefname@preamble{remark}{Observaci\'on}{Observaciones}%
      \crefname@preamble{note}{Nota}{Notas}%
      \crefname@preamble{algorithm}{Algoritmo}{Algoritmos}%
      \crefname@preamble{listing}{Listado}{Listados}%
      \crefname@preamble{line}{L\'inea}{L\'ineas}%
%
    \else%  capitalise unset
      \crefname@preamble{equation}{ecuaci\'on}{ecuaciones}%
      \crefname@preamble{figure}{figura}{figuras}%
      \crefname@preamble{table}{cuadro}{cuadros}%
      \crefname@preamble{page}{p\'agina}{p\'aginas}%
      \crefname@preamble{part}{parte}{partes}%
```

```
      \crefname@preamble{chapter}{cap\'itulo}{cap\'itulos}%
      \crefname@preamble{section}{apartado}{apartados}%
      \crefname@preamble{appendix}{ap\'endice}{ap\'endices}%
      \crefname@preamble{enumi}{punto}{puntos}%
      \crefname@preamble{footnote}{nota}{notas}%
      \crefname@preamble{theorem}{teorema}{teoremas}%
      \crefname@preamble{lemma}{lema}{lemas}%
      \crefname@preamble{corollary}{corolario}{corolarios}%
      \crefname@preamble{proposition}{proposici\'on}{proposiciones}%
      \crefname@preamble{definition}{definici\'on}{definiciones}%
      \crefname@preamble{result}{resultado}{resultados}%
      \crefname@preamble{example}{ejemplo}{ejemplos}%
      \crefname@preamble{remark}{observaci\'on}{observaciones}%
      \crefname@preamble{note}{nota}{notas}%
      \crefname@preamble{algorithm}{algoritmo}{algoritmos}%
      \crefname@preamble{listing}{listado}{listados}%
      \crefname@preamble{line}{l\'inea}{l\'ineas}%
    \fi%
    \def\cref@language{spanish}%
```

Next, we add the definitions to `\extras...` so that `babel`'s `\selectlanguage` command will change the format appropriately.

```
    \cref@addto\extrasspanish{%
      \renewcommand{\crefrangeconjunction}{ a\nobreakspace}%
      \renewcommand{\crefrangepreconjunction}{}%
      \renewcommand{\crefrangepostconjunction}{}%
      \renewcommand{\crefpairconjunction}{ y\nobreakspace}%
      \renewcommand{\crefmiddleconjunction}{, }%
      \renewcommand{\creflastconjunction}{ y\nobreakspace}%
      \renewcommand{\crefpairgroupconjunction}{ y\nobreakspace}%
      \renewcommand{\crefmiddlegroupconjunction}{, }%
      \renewcommand{\creflastgroupconjunction}{ y\nobreakspace}%
%
      \Crefname{equation}{Ecuaci\'on}{Ecuaciones}%
      \Crefname{figure}{Figura}{Figuras}%
      \Crefname{subfigure}{Figura}{Figuras}%
      \Crefname{table}{Cuadro}{Cuadros}%
      \Crefname{subtable}{Cuadro}{Cuadros}%
      \Crefname{page}{P\'agina}{P\'aginas}%
      \Crefname{part}{Parte}{Partes}%
      \Crefname{chapter}{Cap\'itulo}{Cap\'itulos}%
      \Crefname{section}{Apartado}{Apartados}%
      \Crefname{subsection}{Apartado}{Apartados}%
      \Crefname{subsubsection}{Apartado}{Apartados}%
      \Crefname{appendix}{Ap\'endice}{Ap\'endices}%
      \Crefname{subappendix}{Ap\'endice}{Ap\'endices}%
      \Crefname{subsubappendix}{Ap\'endice}{Ap\'endices}%
      \Crefname{subsubsubappendix}{Ap\'endice}{Ap\'endices}%
      \Crefname{enumi}{Punto}{Puntos}%
      \Crefname{enumii}{Punto}{Puntos}%
```

```
      \Crefname{enumiii}{Punto}{Puntos}%
      \Crefname{enumiv}{Punto}{Puntos}%
      \Crefname{enumv}{Punto}{Puntos}%
      \Crefname{footnote}{Nota}{Notas}%
      \Crefname{theorem}{Teorema}{Teoremas}%
      \Crefname{lemma}{Lema}{Lemas}%
      \Crefname{corollary}{Corolario}{Corolarios}%
      \Crefname{proposition}{Proposici\'on}{Proposiciones}%
      \Crefname{definition}{Definici\'on}{Definiciones}%
      \Crefname{result}{Resultado}{Resultados}%
      \Crefname{example}{Ejemplo}{Ejemplos}%
      \Crefname{remark}{Observaci\'on}{Observaci\'on}%
      \Crefname{note}{Nota}{Notas}%
      \Crefname{algorithm}{Algoritmo}{Algoritmos}%
      \Crefname{listing}{Listado}{Listados}%
      \Crefname{line}{L\'inea}{L\'ineas}%
%
      \if@cref@capitalise%  capitalise set
        \crefname{equation}{Ecuaci\'on}{Ecuaciones}%
        \crefname{figure}{Figura}{Figuras}%
        \crefname{subfigure}{Figura}{Figuras}%
        \crefname{table}{Cuadro}{Cuadros}%
        \crefname{subtable}{Cuadro}{Cuadros}%
        \crefname{page}{P\'agina}{P\'aginas}%
        \crefname{part}{Parte}{Partes}%
        \crefname{chapter}{Cap\'itulo}{Cap\'itulos}%
        \crefname{section}{Apartado}{Apartados}%
        \crefname{subsection}{Apartado}{Apartados}%
        \crefname{subsubsection}{Apartado}{Apartados}%
        \crefname{appendix}{Ap\'endice}{Ap\'endices}%
        \crefname{subappendix}{Ap\'endice}{Ap\'endices}%
        \crefname{subsubappendix}{Ap\'endice}{Ap\'endices}%
        \crefname{subsubsubappendix}{Ap\'endice}{Ap\'endices}%
        \crefname{enumi}{Punto}{Puntos}%
        \crefname{enumii}{Punto}{Puntos}%
        \crefname{enumiii}{Punto}{Puntos}%
        \crefname{enumiv}{Punto}{Puntos}%
        \crefname{enumv}{Punto}{Puntos}%
        \crefname{footnote}{Nota}{Notas}%
        \crefname{theorem}{Teorema}{Teoremas}%
        \crefname{lemma}{Lema}{Lemas}%
        \crefname{corollary}{Corolario}{Corolarios}%
        \crefname{proposition}{Proposici\'on}{Proposiciones}%
        \crefname{definition}{Definici\'on}{Definiciones}%
        \crefname{result}{Resultado}{Resultados}%
        \crefname{example}{Ejemplo}{Ejemplos}%
        \crefname{remark}{Observaci\'on}{Observaci\'ones}%
        \crefname{note}{Nota}{Notas}%
        \crefname{algorithm}{Algoritmo}{Algoritmos}%
        \crefname{listing}{Listado}{Listados}%
```

```
        \crefname{line}{L\'inea}{L\'ineas}%
%
      \else%  capitalise unset
        \crefname{equation}{ecuaci\'on}{ecuaciones}%
        \crefname{figure}{figura}{figuras}%
        \crefname{subfigure}{figura}{figuras}%
        \crefname{table}{cuadro}{cuadros}%
        \crefname{subtable}{cuadro}{cuadros}%
        \crefname{page}{p\'agina}{p\'aginas}%
        \crefname{part}{parte}{partes}%
        \crefname{chapter}{cap\'itulo}{cap\'itulos}%
        \crefname{section}{apartado}{apartados}%
        \crefname{subsection}{apartado}{apartados}%
        \crefname{subsubsection}{apartado}{apartados}%
        \crefname{appendix}{ap\'endice}{ap\'endices}%
        \crefname{subappendix}{ap\'endice}{ap\'endices}%
        \crefname{subsubappendix}{ap\'endice}{ap\'endices}%
        \crefname{subsubsubappendix}{ap\'endice}{ap\'endices}%
        \crefname{enumi}{punto}{puntos}%
        \crefname{enumii}{punto}{puntos}%
        \crefname{enumiii}{punto}{puntos}%
        \crefname{enumiv}{punto}{puntos}%
        \crefname{enumv}{punto}{puntos}%
        \crefname{footnote}{nota}{notas}%
        \crefname{theorem}{teorema}{teoremas}%
        \crefname{lemma}{lema}{lemas}%
        \crefname{corollary}{corolario}{corolarios}%
        \crefname{proposition}{proposici\'on}{proposiciones}%
        \crefname{definition}{definici\'on}{definiciones}%
        \crefname{result}{resultado}{resultados}%
        \crefname{example}{ejemplo}{ejemplos}%
        \crefname{remark}{observaci\'on}{observaci\'ones}%
        \crefname{note}{nota}{notas}%
        \crefname{algorithm}{algoritmo}{algoritmos}%
        \crefname{listing}{listado}{listados}%
        \crefname{line}{l\'inea}{l\'ineas}%
      \fi%
    }}}
```

### 14.12.6 Italian

`italian` Italian translations kindly contributed by Massimo Redaelli.

```
\DeclareOption{italian}{%
  \PackageInfo{cleveref}{loaded `italian' language definitions}
```

First, we set up the definitions used at the beginning of the document to define the formats created by the document preamble. (Note that Italian makes use of `\crefrangepreconjunction`.)

```
  \AtBeginDocument{%
```

```
    \def\crefrangeconjunction@preamble{ a\nobreakspace}%
    \def\crefrangepreconjunction@preamble{da\nobreakspace}%
    \def\crefrangepostconjunction@preamble{}%
    \def\crefpairconjunction@preamble{ e\nobreakspace}%
    \def\crefmiddleconjunction@preamble{, }%
    \def\creflastconjunction@preamble{ e\nobreakspace}%
```

We have to define the group conjunctions explicitly here, rather than relying on fall-back definitions in terms of the above conjunctions (see Section 14.13), in case any other language option defines them explicitly and we need to override those.

```
    \def\crefpairgroupconjunction@preamble{ e\nobreakspace}%
    \def\crefmiddlegroupconjunction@preamble{, }%
    \def\creflastgroupconjunction@preamble{ e\nobreakspace}%
%
    \Crefname@preamble{equation}{Equazione}{Equazioni}%
    \Crefname@preamble{figure}{Figura}{Figure}%
    \Crefname@preamble{table}{Tabella}{Tabelle}%
    \Crefname@preamble{page}{Pagina}{Pagine}%
    \Crefname@preamble{part}{Parte}{Parti}%
    \Crefname@preamble{chapter}{Capitolo}{Capitoli}%
    \Crefname@preamble{section}{Sezione}{Sezioni}%
    \Crefname@preamble{appendix}{Appendice}{Appendici}%
    \Crefname@preamble{enumi}{Voce}{Voci}%
    \Crefname@preamble{footnote}{Nota}{Note}%
    \Crefname@preamble{theorem}{Teorema}{Teoremi}%
    \Crefname@preamble{lemma}{Lemma}{Lemmi}%
    \Crefname@preamble{corollary}{Corollario}{Corollari}%
    \Crefname@preamble{proposition}{Proposizione}{Proposizioni}%
    \Crefname@preamble{definition}{Definizioni}{Definizioni}%
    \Crefname@preamble{result}{Risultato}{Risultati}%
    \Crefname@preamble{example}{esempio}{esempi}%
    \Crefname@preamble{remark}{Osservazione}{Osservazioni}%
    \Crefname@preamble{note}{Nota}{Note}%
    \Crefname@preamble{algorithm}{Algoritmo}{Algoritmi}%
    \Crefname@preamble{listing}{Elenco}{Elenchi}%
    \Crefname@preamble{line}{Linea}{Linee}%
%
    \if@cref@capitalise%  capitalise set
      \if@cref@abbrev%
        \crefname@preamble{equation}{Eq.}{Eq.}%
        \crefname@preamble{figure}{Fig.}{Fig.}%
      \else%
        \crefname@preamble{equation}{Equazione}{Equazioni}%
        \crefname@preamble{figure}{Figura}{Figure}%
      \fi%
      \crefname@preamble{table}{Tabella}{Tabelle}%
      \crefname@preamble{page}{Pagina}{Pagine}%
      \crefname@preamble{part}{Parte}{Parti}%
      \crefname@preamble{chapter}{Capitolo}{Capitoli}%
      \crefname@preamble{section}{Sezione}{Sezioni}%
```

```
      \crefname@preamble{appendix}{Appendice}{Appendici}%
      \crefname@preamble{enumi}{Voce}{Voci}%
      \crefname@preamble{footnote}{Nota}{Note}%
      \crefname@preamble{theorem}{Teorema}{Teoremi}%
      \crefname@preamble{lemma}{Lemma}{Lemmi}%
      \crefname@preamble{corollary}{Corollario}{Corollari}%
      \crefname@preamble{proposition}{Proposizione}{Proposizioni}%
      \crefname@preamble{definition}{Definizione}{Definizioni}%
      \crefname@preamble{result}{Risultato}{Risultati}%
      \crefname@preamble{example}{Esempio}{Esempi}%
      \crefname@preamble{remark}{Osservazione}{Osservazioni}%
      \crefname@preamble{note}{Nota}{Note}%
      \crefname@preamble{algorithm}{Algoritmo}{Algoritmi}%
      \crefname@preamble{listing}{Elenco}{Elenchi}%
      \crefname@preamble{line}{Linea}{Linee}%
%
    \else%  capitalise unset
      \if@cref@abbrev%
        \crefname@preamble{equation}{eq.}{eq.}%
        \crefname@preamble{figure}{fig.}{fig.}%
      \else%
        \crefname@preamble{equation}{equazione}{equazioni}%
        \crefname@preamble{figure}{figura}{figure}%
      \fi%
      \crefname@preamble{table}{tabella}{tabelle}%
      \crefname@preamble{page}{pagina}{pagine}%
      \crefname@preamble{part}{parte}{parti}%
      \crefname@preamble{chapter}{capitolo}{capitoli}%
      \crefname@preamble{section}{sezione}{sezioni}%
      \crefname@preamble{appendix}{appendice}{appendici}%
      \crefname@preamble{enumi}{voce}{voci}%
      \crefname@preamble{footnote}{nota}{note}%
      \crefname@preamble{theorem}{teorema}{teoremi}%
      \crefname@preamble{lemma}{lemma}{lemmi}%
      \crefname@preamble{corollary}{corollario}{corollari}%
      \crefname@preamble{proposition}{proposizione}{proposizioni}%
      \crefname@preamble{definition}{definizione}{definizioni}%
      \crefname@preamble{result}{risultato}{risultati}%
      \crefname@preamble{example}{esempio}{esempi}%
      \crefname@preamble{remark}{osservazione}{osservazioni}%
      \crefname@preamble{note}{nota}{note}%
      \crefname@preamble{algorithm}{algoritmo}{algoritmi}%
      \crefname@preamble{listing}{elenco}{elenchi}%
      \crefname@preamble{line}{linea}{linee}%
    \fi%
    \def\cref@language{italian}%
```

Next, we add the definitions to `\extras...` so that `babel`'s `\selectlanguage` command will change the format appropriately.

```
    \cref@addto\extrasitalian{%
```

```
      \renewcommand{\crefrangeconjunction}{ a\nobreakspace}%
      \renewcommand\crefrangepreconjunction{da\nobreakspace}%
      \renewcommand\crefrangepostconjunction{}%
      \renewcommand{\crefpairconjunction}{ e\nobreakspace}%
      \renewcommand{\crefmiddleconjunction}{, }%
      \renewcommand{\creflastconjunction}{ e\nobreakspace}%
      \renewcommand{\crefpairgroupconjunction}{ e\nobreakspace}%
      \renewcommand{\crefmiddlegroupconjunction}{, }%
      \renewcommand{\creflastgroupconjunction}{ e\nobreakspace}%
%
      \Crefname{equation}{Equazione}{Equazioni}%
      \Crefname{figure}{Figura}{Figure}%
      \Crefname{subfigure}{Figura}{Figure}%
      \Crefname{table}{Tabella}{Tabelle}%
      \Crefname{subtable}{Tabella}{Tabelle}%
      \Crefname{page}{Pagina}{Pagine}%
      \Crefname{part}{Parte}{Parti}%
      \Crefname{chapter}{Capitolo}{Capitoli}%
      \Crefname{section}{Sezione}{Sezioni}%
      \Crefname{subsection}{Sezione}{Sezioni}%
      \Crefname{subsubsection}{Sezione}{Sezioni}%
      \Crefname{appendix}{Appendice}{Appendici}%
      \Crefname{subappendix}{Appendice}{Appendici}%
      \Crefname{subsubappendix}{Appendice}{Appendici}%
      \Crefname{subsubsubappendix}{Appendice}{Appendici}%
      \Crefname{enumi}{Voce}{Voci}%
      \Crefname{enumii}{Voce}{Voci}%
      \Crefname{enumiii}{Voce}{Voci}%
      \Crefname{enumiv}{Voce}{Voci}%
      \Crefname{enumv}{Voce}{Voci}%
      \Crefname{footnote}{Nota}{Note}%
      \Crefname{theorem}{Teorema}{Teoremi}%
      \Crefname{lemma}{Lemma}{Lemmi}%
      \Crefname{corollary}{Corollario}{Corollari}%
      \Crefname{proposition}{Proposizione}{Proposizioni}%
      \Crefname{definition}{Definizione}{Definizione}%
      \Crefname{result}{Risultato}{Risultati}%
      \Crefname{example}{esempio}{esempi}%
      \Crefname{remark}{Osservazione}{Osservazioni}%
      \Crefname{note}{Nota}{Note}%
      \Crefname{algorithm}{Algoritmo}{Algoritmi}%
      \Crefname{listing}{Elenco}{Elenchi}%
      \Crefname{line}{Linea}{Linee}%
%
      \if@cref@capitalise%  capitalise set
        \if@cref@abbrev%
          \crefname{equation}{Eq.}{Eq.}%
          \crefname{figure}{Fig.}{Fig.}%
          \crefname{subfigure}{Fig.}{Fig.}%
        \else%
```

```
4718          \crefname{equation}{Equazione}{Equazioni}%
4719          \crefname{figure}{Figura}{Figure}%
4720          \crefname{figure}{Figura}{Figure}%
4721        \fi%
4722        \crefname{table}{Tabella}{Tabelle}%
4723        \crefname{page}{Pagina}{Pagine}%
4724        \crefname{subtable}{Tabella}{Tabelle}%
4725        \crefname{part}{Parte}{Parti}%
4726        \crefname{chapter}{Capitolo}{Capitoli}%
4727        \crefname{section}{Sezione}{Sezioni}%
4728        \crefname{subsection}{Sezione}{Sezioni}%
4729        \crefname{subsubsection}{Sezione}{Sezioni}%
4730        \crefname{appendix}{Appendice}{Appendici}%
4731        \crefname{subappendix}{Appendice}{Appendici}%
4732        \crefname{subsubappendix}{Appendice}{Appendici}%
4733        \crefname{subsubsubappendix}{Appendice}{Appendici}%
4734        \crefname{enumi}{Voce}{Voci}%
4735        \crefname{enumii}{Voce}{Voci}%
4736        \crefname{enumiii}{Voce}{Voci}%
4737        \crefname{enumiv}{Voce}{Voci}%
4738        \crefname{enumv}{Voce}{Voci}%
4739        \crefname{footnote}{Nota}{Note}%
4740        \crefname{theorem}{Teorema}{Teoremi}%
4741        \crefname{lemma}{Lemma}{Lemmi}%
4742        \crefname{corollary}{Corollario}{Corollari}%
4743        \crefname{proposition}{Proposizione}{Proposizioni}%
4744        \crefname{definition}{Definizione}{Definizione}%
4745        \crefname{result}{Risultato}{Risultati}%
4746        \crefname{example}{Esempio}{Esempi}%
4747        \crefname{remark}{Osservazione}{Osservazioni}%
4748        \crefname{note}{Nota}{Note}%
4749        \crefname{algorithm}{Algoritmo}{Algoritmi}%
4750        \crefname{listing}{Elenco}{Elenchi}%
4751        \crefname{line}{Linea}{Linee}%
4752  %
4753      \else%  capitalise unset
4754        \if@cref@abbrev%
4755          \crefname{equation}{eq.}{eq.}%
4756          \crefname{figure}{fig.}{fig.}%
4757          \crefname{subfigure}{fig.}{fig.}%
4758        \else%
4759          \crefname{equation}{equazione}{equazioni}%
4760          \crefname{figure}{figura}{figure}%
4761          \crefname{figure}{figura}{figure}%
4762        \fi%
4763        \crefname{table}{tabella}{tabelle}%
4764        \crefname{page}{pagina}{pagine}%
4765        \crefname{subtable}{tabella}{tabelle}%
4766        \crefname{part}{parte}{parti}%
4767        \crefname{chapter}{capitolo}{capitoli}%
```

```
      \crefname{section}{sezione}{sezioni}%
      \crefname{subsection}{sezione}{sezioni}%
      \crefname{subsubsection}{sezione}{sezioni}%
      \crefname{appendix}{appendice}{appendici}%
      \crefname{subappendix}{appendice}{appendici}%
      \crefname{subsubappendix}{appendice}{appendici}%
      \crefname{subsubsubappendix}{appendice}{appendici}%
      \crefname{enumi}{voce}{voci}%
      \crefname{enumii}{voce}{voci}%
      \crefname{enumiii}{voce}{voci}%
      \crefname{enumiv}{voce}{voci}%
      \crefname{enumv}{voce}{voci}%
      \crefname{footnote}{nota}{note}%
      \crefname{theorem}{teorema}{teoremi}%
      \crefname{lemma}{lemma}{lemmi}%
      \crefname{corollary}{corollario}{corollari}%
      \crefname{proposition}{proposizione}{proposizioni}%
      \crefname{definition}{definizione}{definizione}%
      \crefname{result}{risultato}{risultati}%
      \crefname{example}{esempio}{esempi}%
      \crefname{remark}{osservazione}{osservazioni}%
      \crefname{note}{nota}{note}%
      \crefname{algorithm}{algoritmo}{algoritmi}%
      \crefname{listing}{elenco}{elenchi}%
      \crefname{line}{linea}{linee}%
    \fi%
  }}}
```

### 14.12.7 Russian

`russian` Russian translations generously contributed by Aleksander Gorohovski.

```
\DeclareOption{russian}{%
  \PackageInfo{cleveref}{loaded 'russian' language definitions}
```

First, we set up the definitions used at the beginning of the document to define the formats created by the document preamble.

```
  \AtBeginDocument{%
    \def\crefrangeconjunction@preamble{--}%
    \def\crefrangepreconjunction@preamble{}%
    \def\crefrangepostconjunction@preamble{}%
    \def\crefpairconjunction@preamble{ \cyri\nobreakspace}%
    \def\crefmiddleconjunction@preamble{, }%
    \def\creflastconjunction@preamble{ \cyri\nobreakspace}%
```

We have to define the group conjunctions explicitly here, rather than relying on fall-back definitions in terms of the above conjunctions (see Section 14.13), in case any other language option defines them explicitly and we need to override those.

```
    \def\crefpairgroupconjunction@preamble{ \cyri\nobreakspace}%
    \def\crefmiddlegroupconjunction@preamble{, }%
```

```
    \def\creflastgroupconjunction@preamble%
      {, \cyra\ \cyrt\cyra\cyrk\cyrzh\cyre\nobreakspace}%
%
      \Crefname@preamble{equation}%
      {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyra}%
      {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyrery}%
    \Crefname@preamble{figure}%
      {\CYRR\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
      {\CYRR\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
    \Crefname@preamble{table}%
      {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyra}%
      {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrery}%
    \Crefname@preamble{enumi}%
      {\CYRP\cyru\cyrn\cyrk\cyrt}%
      {\CYRP\cyru\cyrn\cyrk\cyrt\cyrery}%
    \Crefname@preamble{chapter}%
      {\CYRG\cyrl\cyra\cyrv\cyra}%
      {\CYRG\cyrl\cyra\cyrv\cyrery}%
    \Crefname@preamble{section}%
      {\CYRR\cyra\cyrz\cyrd\cyre\cyrl}%
      {\CYRR\cyra\cyrz\cyrd\cyre\cyrl\cyrery}%
    \Crefname@preamble{appendix}%
      {\CYRP\cyrr\cyri\cyrl\cyro\cyrzh\cyre\cyrn\cyri\cyre}%
      {\CYRP\cyrr\cyri\cyrl\cyro\cyrzh\cyre\cyrn\cyri\cyrya}%
    \Crefname@preamble{footnote}%
      {\CYRS\cyrn\cyro\cyrs\cyrk\cyra}%
      {\CYRS\cyrn\cyro\cyrs\cyrk\cyri}%
    \Crefname@preamble{theorem}%
      {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyra}%
      {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyrery}%
    \Crefname@preamble{lemma}%
      {\CYRL\cyre\cyrm\cyrm\cyra}%
      {\CYRL\cyre\cyrm\cyrm\cyrery}%
    \Crefname@preamble{corollary}%
      {\CYRV\cyrery\cyrv\cyro\cyrd}%
      {\CYRV\cyrery\cyrv\cyro\cyrd\cyrery}%
    \Crefname@preamble{proposition}%
      {\CYRU\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd\cyre\cyrn\cyri\cyre}%
      {\CYRU\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd\cyre\cyrn\cyri\cyrya}%
    \Crefname@preamble{definition}%
      {\CYRO\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn\cyri\cyre}%
      {\CYRO\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn\cyri\cyrya}%
    \Crefname@preamble{result}%
      {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt}%
      {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt\cyrery}%
    \Crefname@preamble{example}%
      {\CYRP\cyrr\cyri\cyrm\cyre\cyrr}%
      {\CYRP\cyrr\cyri\cyrm\cyre\cyrr\cyrery}%
    \Crefname@preamble{remark}%
      {\CYRP\cyrr\cyri\cyrm\cyre\cyrch\cyra\cyrn\cyri\cyre}%
```

```
      {\CYRP\cyrr\cyri\cyrm\cyre\cyrch\cyra\cyrn\cyri\cyrya}%
    \Crefname@preamble{note}%
      {\CYRZ\cyra\cyrm\cyre\cyrt\cyrk\cyra}%
      {\CYRZ\cyra\cyrm\cyre\cyrt\cyrk\cyri}%
    \Crefname@preamble{algorithm}%
      {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm}%
      {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm\cyrery}%
    \Crefname@preamble{listing}%
      {\CYRL\cyri\cyrs\cyrt\cyri\cyrn\cyrg}%
      {\CYRL\cyri\cyrs\cyrt\cyri\cyrn\cyrg\cyri}%
    \Crefname@preamble{line}%
      {\CYRS\cyrt\cyrr\cyro\cyrk\cyra}%
      {\CYRS\cyrt\cyrr\cyro\cyrk\cyri}%
    \Crefname@preamble{page}%
      {\CYRS\cyrt\cyrr\cyra\cyrn\cyri\cyrc\cyra}%
      {\CYRS\cyrt\cyrr\cyra\cyrn\cyri\cyrc\cyrery}%
    \Crefname@preamble{part}%
      {\CYRCH\cyra\cyrs\cyrt\cyrsftsn}%
      {\CYRCH\cyra\cyrs\cyrt\cyri}%
%
    \if@cref@capitalise%  capitalise set
      \if@cref@abbrev%  abbrev set
        \crefname@preamble{equation}%
          {\CYRF-\cyrl.}%
          {\CYRF-\cyrl.}%
        \crefname@preamble{figure}%
          {\CYRR\cyri\cyrs.}%
          {\CYRR\cyri\cyrs.}%
        \crefname@preamble{table}%
          {\CYRT\cyra\cyrb\cyrl.}%
          {\CYRT\cyra\cyrb\cyrl.}%
        \crefname@preamble{enumi}%
          {\CYRP.}%
          {\CYRP.\cyrp.}%
      \else%
        \crefname@preamble{equation}%
          {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyra}%
          {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyrery}%
        \crefname@preamble{figure}%
          {\CYRR\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
          {\CYRR\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
        \crefname@preamble{table}%
          {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyra}%
          {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrery}%
        \crefname@preamble{enumi}%
          {\CYRP\cyru\cyrn\cyrk\cyrt}%
          {\CYRP\cyru\cyrn\cyrk\cyrt\cyrery}%
      \fi%
      \crefname@preamble{chapter}%
        {\CYRG\cyrl\cyra\cyrv\cyra}%
```

```
      {\CYRG\cyrl\cyra\cyrv\cyrery}%
    \crefname@preamble{section}%
      {\CYRR\cyra\cyrz\cyrd\cyre\cyrl}%
      {\CYRR\cyra\cyrz\cyrd\cyre\cyrl\cyrery}%
    \crefname@preamble{appendix}%
      {\CYRP\cyrr\cyri\cyrl\cyro\cyrzh\cyre\cyrn\cyri\cyre}%
      {\CYRP\cyrr\cyri\cyrl\cyro\cyrzh\cyre\cyrn\cyri\cyrya}%
    \crefname@preamble{footnote}%
      {\CYRS\cyrn\cyro\cyrs\cyrk\cyra}%
      {\CYRS\cyrn\cyro\cyrs\cyrk\cyri}%
    \crefname@preamble{theorem}%
      {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyra}%
      {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyrery}%
    \crefname@preamble{lemma}%
      {\CYRL\cyre\cyrm\cyrm\cyra}%
      {\CYRL\cyre\cyrm\cyrm\cyrery}%
    \crefname@preamble{corollary}%
      {\CYRV\cyrery\cyrv\cyro\cyrd}%
      {\CYRV\cyrery\cyrv\cyro\cyrd\cyrery}%
    \crefname@preamble{proposition}%
      {\CYRU\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd\cyre\cyrn\cyri\cyre}%
      {\CYRU\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd\cyre\cyrn\cyri\cyrya}%
    \crefname@preamble{definition}%
      {\CYRO\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn\cyri\cyre}%
      {\CYRO\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn\cyri\cyrya}%
    \crefname@preamble{result}%
      {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt}%
      {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt\cyrery}%
    \crefname@preamble{example}%
      {\CYRP\cyrr\cyri\cyrm\cyre\cyrr}%
      {\CYRP\cyrr\cyri\cyrm\cyre\cyrr\cyrery}%
    \crefname@preamble{remark}%
      {\CYRP\cyrr\cyri\cyrm\cyre\cyrch\cyra\cyrn\cyri\cyre}%
      {\CYRP\cyrr\cyri\cyrm\cyre\cyrch\cyra\cyrn\cyri\cyrya}%
    \crefname@preamble{note}%
      {\CYRZ\cyra\cyrm\cyre\cyrt\cyrk\cyra}%
      {\CYRZ\cyra\cyrm\cyre\cyrt\cyrk\cyri}%
    \crefname@preamble{algorithm}%
      {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm}%
      {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm\cyrery}%
    \crefname@preamble{listing}%
      {\CYRL\cyri\cyrs\cyrt\cyri\cyrn\cyrg}%
      {\CYRL\cyri\cyrs\cyrt\cyri\cyrn\cyrg\cyri}%
    \crefname@preamble{line}%
      {\CYRS\cyrt\cyrr\cyro\cyrk\cyra}%
      {\CYRS\cyrt\cyrr\cyro\cyrk\cyri}%
    \crefname@preamble{page}%
      {\CYRS\cyrt\cyrr\cyra\cyrn\cyri\cyrc\cyra}%
      {\CYRS\cyrt\cyrr\cyra\cyrn\cyri\cyrc\cyrery}%
    \crefname@preamble{part}%
```

```
        {\CYRCH\cyra\cyrs\cyrt\cyrsftsn}%
        {\CYRCH\cyra\cyrs\cyrt\cyri}%
%
    \else%  capitalise unset
      \if@cref@abbrev%  abbrev set
        \crefname@preamble{equation}%
          {\cyrf-\cyrl.}%
          {\cyrf-\cyrl.}%
        \crefname@preamble{figure}%
          {\cyrr\cyri\cyrs.}%
          {\cyrr\cyri\cyrs.}%
        \crefname@preamble{table}%
          {\cyrt\cyra\cyrb\cyrl.}%
          {\cyrt\cyra\cyrb\cyrl.}%
        \crefname@preamble{enumi}%
          {\cyrp.}%
          {\cyrp.\cyrp.}%
        \crefname@preamble{chapter}%
          {\cyrg\cyrl\cyra\cyrv.}%
          {\cyrg\cyrl\cyra\cyrv.}%
        \crefname@preamble{section}%
          {\cyrr\cyra\cyrz\cyrd.}%
          {\cyrr\cyra\cyrz\cyrd\cyre\cyrl.}%
        \crefname@preamble{appendix}%
          {\cyrp\cyrr\cyri\cyrl\cyro\cyrzh.}%
          {\cyrp\cyrr\cyri\cyrl\cyro\cyrzh.}%
        \crefname@preamble{footnote}%
          {\cyrs\cyrn\cyro\cyrs\cyrk.}%
          {\cyrs\cyrn\cyro\cyrs\cyrk.}%
        \crefname@preamble{theorem}%
          {\cyrt\cyre\cyro\cyrr\cyre\cyrm.}%
          {\cyrt\cyre\cyro\cyrr\cyre\cyrm.}%
        \crefname@preamble{lemma}%
          {\cyrl\cyre\cyrm\cyrm.}%
          {\cyrl\cyre\cyrm\cyrm.}%
        \crefname@preamble{corollary}%
          {\cyrv\cyrery\cyrv\cyro\cyrd}%
          {\cyrv\cyrery\cyrv\cyro\cyrd.}%
        \crefname@preamble{proposition}%
          {\cyru\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd.}%
          {\cyru\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd.}%
        \crefname@preamble{definition}%
          {\cyro\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn.}%
          {\cyro\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn.}%
        \crefname@preamble{result}%
          {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt.}%
          {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt.}%
        \crefname@preamble{example}%
          {\cyrp\cyrr\cyri\cyrm.}%
          {\cyrp\cyrr\cyri\cyrm\cyre\cyrr.}%
```

```
    \crefname@preamble{remark}%
      {\cyrp\cyrr\cyri\cyrm\cyre\cyrch.}%
      {\cyrp\cyrr\cyri\cyrm\cyre\cyrch.}%
    \crefname@preamble{note}%
      {\cyrz\cyra\cyrm\cyre\cyrt\cyrk.}%
      {\cyrz\cyra\cyrm\cyre\cyrt\cyrk.}%
    \crefname@preamble{algorithm}%
      {\cyra\cyrl\cyrg.}%
      {\cyra\cyrl\cyrg.}%
    \crefname@preamble{listing}%
      {\cyrl\cyri\cyrs\cyrt\cyri\cyrn.}%
      {\cyrl\cyri\cyrs\cyrt\cyri\cyrn\cyrg.}%
    \crefname@preamble{line}%
      {\cyrs\cyrt\cyrr\cyrk.}%
      {\cyrs\cyrt\cyrr\cyrk.}%
  \else%  abbrev unset
    \crefname@preamble{equation}%
      {\cyrf\cyro\cyrr\cyrm\cyru\cyrl\cyra}%
      {\cyrf\cyro\cyrr\cyrm\cyru\cyrl\cyrery}%
    \crefname@preamble{figure}%
      {\cyrr\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
      {\cyrr\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
    \crefname@preamble{table}%
      {\cyrt\cyra\cyrb\cyrl\cyri\cyrc\cyra}%
      {\cyrt\cyra\cyrb\cyrl\cyri\cyrc\cyrery}%
    \crefname@preamble{enumi}%
      {\cyrp\cyru\cyrn\cyrk\cyrt}%
      {\cyrp\cyru\cyrn\cyrk\cyrt\cyrery}%
    \crefname@preamble{chapter}%
      {\cyrg\cyrl\cyra\cyrv\cyra}%
      {\cyrg\cyrl\cyra\cyrv\cyrery}%
    \crefname@preamble{section}%
      {\cyrr\cyra\cyrz\cyrd\cyre\cyrl}%
      {\cyrr\cyra\cyrz\cyrd\cyre\cyrl\cyrery}%
    \crefname@preamble{appendix}%
      {\cyrp\cyrr\cyri\cyrl\cyro\cyrzh\cyre\cyrn\cyri\cyre}%
      {\cyrp\cyrr\cyri\cyrl\cyro\cyrzh\cyre\cyrn\cyri\cyrya}%
    \crefname@preamble{footnote}%
      {\cyrs\cyrn\cyro\cyrs\cyrk\cyra}%
      {\cyrs\cyrn\cyro\cyrs\cyrk\cyri}%
    \crefname@preamble{theorem}%
      {\cyrt\cyre\cyro\cyrr\cyre\cyrm\cyra}%
      {\cyrt\cyre\cyro\cyrr\cyre\cyrm\cyrery}%
    \crefname@preamble{lemma}%
      {\cyrl\cyre\cyrm\cyrm\cyra}%
      {\cyrl\cyre\cyrm\cyrm\cyrery}%
    \crefname@preamble{corollary}%
      {\cyrv\cyrery\cyrv\cyro\cyrd}%
      {\cyrv\cyrery\cyrv\cyro\cyrd\cyrery}%
    \crefname@preamble{proposition}%
```

```
      {\cyru\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd\cyre\cyrn\cyri\cyre}%
      {\cyru\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd\cyre\cyrn\cyri\cyrya}%
    \crefname@preamble{definition}%
      {\cyro\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn\cyri\cyre}%
      {\cyro\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn\cyri\cyrya}%
    \crefname@preamble{result}%
      {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt}%
      {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt\cyrery}%
    \crefname@preamble{example}%
      {\cyrp\cyrr\cyri\cyrm\cyre\cyrr}%
      {\cyrp\cyrr\cyri\cyrm\cyre\cyrr\cyrery}%
    \crefname@preamble{remark}%
      {\cyrp\cyrr\cyri\cyrm\cyre\cyrch\cyra\cyrn\cyri\cyre}%
      {\cyrp\cyrr\cyri\cyrm\cyre\cyrch\cyra\cyrn\cyri\cyrya}%
    \crefname@preamble{note}%
      {\cyrz\cyra\cyrm\cyre\cyrt\cyrk\cyra}%
      {\cyrz\cyra\cyrm\cyre\cyrt\cyrk\cyri}%
    \crefname@preamble{algorithm}%
      {\cyra\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm}%
      {\cyra\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm\cyrery}%
    \crefname@preamble{listing}%
      {\cyrl\cyri\cyrs\cyrt\cyri\cyrn\cyrg}%
      {\cyrl\cyri\cyrs\cyrt\cyri\cyrn\cyrg\cyri}%
    \crefname@preamble{line}%
      {\cyrs\cyrt\cyrr\cyro\cyrk\cyra}%
      {\cyrs\cyrt\cyrr\cyro\cyrk\cyri}%
  \fi%
  \crefname@preamble{page}%
    {\cyrs\cyrt\cyrr\cyra\cyrn\cyri\cyrc\cyre}%
    {\cyrs\cyrt\cyrr\cyra\cyrn\cyri\cyrc\cyra\cyrh}%
  \crefname@preamble{part}%
    {\cyrch\cyra\cyrs\cyrt\cyrsftsn}%
    {\cyrch\cyra\cyrs\cyrt\cyri}%
\fi%
\def\cref@language{russian}%
```

Next, we add the definitions to `\extras...` so that `babel`'s `\selectlanguage` command will change the format appropriately.

```
\cref@addto\extrasrussian{%
  \renewcommand{\crefrangeconjunction}{--}%
  \renewcommand\crefrangepreconjunction{}%
  \renewcommand\crefrangepostconjunction{}%
  \renewcommand{\crefpairconjunction}{ \cyri\nobreakspace}%
  \renewcommand{\crefmiddleconjunction}{, }%
  \renewcommand{\creflastconjunction}{ \cyri\nobreakspace}%
  \renewcommand{\crefpairgroupconjunction}{ \cyri\nobreakspace}%
  \renewcommand{\crefmiddlegroupconjunction}{, }%
  \renewcommand{\creflastgroupconjunction}%
    {, \cyra\ \cyrt\cyra\cyrk\cyrzh\cyre\nobreakspace}%
%
```

```
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    {\CYRS\cyrt\cyrr\cyra\cyrn\cyri\cyrc\cyrery}%
  \Crefname{equation}%
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    {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyrery}%
  \Crefname{figure}%
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    {\CYRR\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
  \Crefname{subfigure}%
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    {\CYRR\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
  \Crefname{table}%
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  \Crefname{part}%
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    {\CYRCH\cyra\cyrs\cyrt\cyri}%
  \Crefname{chapter}%
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    {\CYRG\cyrl\cyra\cyrv\cyrery}%
  \Crefname{section}%
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  \Crefname{subsubsection}%
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  \Crefname{subappendix}%
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  \Crefname{subsubappendix}%
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  \Crefname{subsubsubappendix}%
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  \Crefname{enumi}%
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    {\CYRP\cyru\cyrn\cyrk\cyrt\cyrery}%
  \Crefname{enumii}%
    {\CYRP\cyru\cyrn\cyrk\cyrt}%
```

```
      {\CYRP\cyru\cyrn\cyrk\cyrt\cyrery}%
    \Crefname{enumiii}%
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      {\CYRP\cyru\cyrn\cyrk\cyrt\cyrery}%
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      {\CYRP\cyru\cyrn\cyrk\cyrt\cyrery}%
    \Crefname{enumv}%
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      {\CYRP\cyru\cyrn\cyrk\cyrt\cyrery}%
    \Crefname{footnote}%
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      {\CYRV\cyrery\cyrv\cyro\cyrd\cyrery}%
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%
```

```
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      \if@cref@abbrev%  abbrev set
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          {\CYRR\cyri\cyrs.}%
        \crefname{subfigure}%
          {\CYRR\cyri\cyrs.}%
          {\CYRR\cyri\cyrs.}%
        \crefname{table}%
          {\CYRT\cyra\cyrb\cyrl.}%
          {\CYRT\cyra\cyrb\cyrl.}%
        \crefname{subtable}%
          {\CYRT\cyra\cyrb\cyrl.}%
          {\CYRT\cyra\cyrb\cyrl.}%
        \crefname{enumi}%
          {\CYRP.}%
          {\CYRP.\cyrp.}%
        \crefname{enumii}%
          {\CYRP.}%
          {\CYRP.\cyrp.}%
        \crefname{enumiii}%
          {\CYRP.}%
          {\CYRP.\cyrp.}%
        \crefname{enumiv}%
          {\CYRP.}%
          {\CYRP.\cyrp.}%
        \crefname{enumv}%
          {\CYRP.}%
          {\CYRP.\cyrp.}%
      \else%  abbrev unset
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          {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyrery}%
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          {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrery}%
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```

```
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    \crefname{enumv}%
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    {\CYRS\cyrn\cyro\cyrs\cyrk\cyri}%
  \crefname{theorem}%
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```

```
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          {\CYRL\cyre\cyrm\cyrm\cyrery}%
        \crefname{corollary}%
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          {\CYRV\cyrery\cyrv\cyro\cyrd\cyrery}%
        \crefname{proposition}%
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          {\CYRU\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd\cyre\cyrn\cyri\cyrya}%
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          {\CYRO\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn\cyri\cyrya}%
        \crefname{result}%
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          {\CYRP\cyrr\cyri\cyrm\cyre\cyrr\cyrery}%
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        \crefname{line}%
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          {\CYRS\cyrt\cyrr\cyro\cyrk\cyri}%
%
      \else%  capitalise unset
        \if@cref@abbrev%  abbrev set
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            {\cyrf-\cyrl.}%
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            {\cyrg\cyrl\cyra\cyrv.}%
          \crefname{section}%
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            {\cyrr\cyra\cyrz\cyrd\cyre\cyrl.}%
          \crefname{subsection}%
            {\cyrr\cyra\cyrz\cyrd.}%
            {\cyrr\cyra\cyrz\cyrd\cyre\cyrl.}%
          \crefname{subsubsection}%
            {\cyrr\cyra\cyrz\cyrd.}%
```

```
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    {\cyrp\cyrr\cyri\cyrl\cyro\cyrzh.}%
  \crefname{subappendix}%
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    {\cyrp\cyrr\cyri\cyrl\cyro\cyrzh.}%
  \crefname{subsubappendix}%
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    {\cyrp\cyrr\cyri\cyrl\cyro\cyrzh.}%
  \crefname{subsubsubappendix}%
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    {\cyrp\cyrr\cyri\cyrl\cyro\cyrzh.}%
  \crefname{enumi}%
    {\cyrp.}%
    {\cyrp.\cyrp.}%
  \crefname{enumii}%
    {\cyrp.}%
    {\cyrp.\cyrp.}%
  \crefname{enumiii}%
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    {\cyrp.\cyrp.}%
  \crefname{enumiv}%
    {\cyrp.}%
    {\cyrp.\cyrp.}%
  \crefname{enumv}%
    {\cyrp.}%
    {\cyrp.\cyrp.}%
  \crefname{footnote}%
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    {\cyrs\cyrn\cyro\cyrs\cyrk.}%
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    {\cyrr\cyri\cyrs.}%
  \crefname{subfigure}%
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    {\cyrr\cyri\cyrs.}%
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    {\cyrt\cyra\cyrb\cyrl.}%
  \crefname{subtable}%
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    {\cyrt\cyra\cyrb\cyrl.}%
  \crefname{theorem}%
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    {\cyrt\cyre\cyro\cyrr\cyre\cyrm.}%
  \crefname{lemma}%
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    {\cyrl\cyre\cyrm\cyrm.}%
  \crefname{corollary}%
```

```
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      {\cyrv\cyrery\cyrv\cyro\cyrd.}%
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      {\cyru\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd.}%
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      {\cyro\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn.}%
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      {\cyrp\cyrr\cyri\cyrm\cyre\cyrr.}%
    \crefname{remark}%
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      {\cyrp\cyrr\cyri\cyrm\cyre\cyrch.}%
    \crefname{note}%
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      {\cyrz\cyra\cyrm\cyre\cyrt\cyrk.}%
    \crefname{algorithm}%
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      {\cyra\cyrl\cyrg.}%
    \crefname{listing}%
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      {\cyrl\cyri\cyrs\cyrt\cyri\cyrn\cyrg.}%
    \crefname{line}%
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      {\cyrs\cyrt\cyrr\cyrk.}%
  \else%  abbrev unset
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      {\cyrt\cyra\cyrb\cyrl\cyri\cyrc\cyrery}%
    \crefname{enumi}%
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      {\cyrp\cyru\cyrn\cyrk\cyrt\cyrery}%
    \crefname{enumii}%
      {\cyrp\cyru\cyrn\cyrk\cyrt}%
```

```
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  \crefname{enumiii}%
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  \crefname{enumv}%
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    {\cyrp\cyru\cyrn\cyrk\cyrt\cyrery}%
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  \crefname{subsection}%
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  \crefname{appendix}%
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  \crefname{subappendix}%
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  \crefname{subsubappendix}%
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  \crefname{subsubsubappendix}%
    {\cyrp\cyrr\cyri\cyrl\cyro\cyrzh\cyre\cyrn\cyri\cyre}%
    {\cyrp\cyrr\cyri\cyrl\cyro\cyrzh\cyre\cyrn\cyri\cyrya}%
  \crefname{footnote}%
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    {\cyrs\cyrn\cyro\cyrs\cyrk\cyri}%
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    {\cyrl\cyre\cyrm\cyrm\cyrery}%
  \crefname{corollary}%
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    {\cyrv\cyrery\cyrv\cyro\cyrd\cyrery}%
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    {\cyru\cyrt\cyrv\cyre\cyrr\cyrzh\cyrd\cyre\cyrn\cyri\cyrya}%
  \crefname{definition}%
```

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      {\cyro\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn\cyri\cyre}%
      {\cyro\cyrp\cyrr\cyre\cyrd\cyre\cyrl\cyre\cyrn\cyri\cyrya}%
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      {\cyrp\cyrr\cyri\cyrm\cyre\cyrr\cyrery}%
    \crefname{remark}%
      {\cyrp\cyrr\cyri\cyrm\cyre\cyrch\cyra\cyrn\cyri\cyre}%
      {\cyrp\cyrr\cyri\cyrm\cyre\cyrch\cyra\cyrn\cyri\cyrya}%
    \crefname{note}%
      {\cyrz\cyra\cyrm\cyre\cyrt\cyrk\cyra}%
      {\cyrz\cyra\cyrm\cyre\cyrt\cyrk\cyri}%
    \crefname{algorithm}%
      {\cyra\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm}%
      {\cyra\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm\cyrery}%
    \crefname{listing}%
      {\cyrl\cyri\cyrs\cyrt\cyri\cyrn\cyrg}%
      {\cyrl\cyri\cyrs\cyrt\cyri\cyrn\cyrg\cyri}%
    \crefname{line}%
      {\cyrs\cyrt\cyrr\cyro\cyrk\cyra}%
      {\cyrs\cyrt\cyrr\cyro\cyrk\cyri}%
  \fi%
  \crefname{page}%
    {\cyrs\cyrt\cyrr\cyra\cyrn\cyri\cyrc\cyre}%
    {\cyrs\cyrt\cyrr\cyra\cyrn\cyri\cyrc\cyra\cyrh}%
  \crefname{part}%
    {\cyrch\cyra\cyrs\cyrt\cyrsftsn}%
    {\cyrch\cyra\cyrs\cyrt\cyri}%
 \fi%
}}}
```

### 14.12.8 Ukrainian

`ukrainian` Ukrainian translations courtesy of Aleksander Gorohovski.

```
\DeclareOption{ukrainian}{%
  \PackageInfo{cleveref}{loaded ‘ukrainian’ language definitions}
```

First, we set up the definitions used at the beginning of the document to define the formats created by the document preamble.

```
  \AtBeginDocument{%
    \def\crefrangeconjunction@preamble{--}%
    \def\crefrangepreconjunction@preamble{}%
    \def\crefrangepostconjunction@preamble{}%
    \def\crefpairconjunction@preamble{ \cyrii\nobreakspace}%
    \def\crefmiddleconjunction@preamble{, }%
    \def\creflastconjunction@preamble{ \cyrii\nobreakspace}%
```

We have to define the group conjunctions explicitly here, rather than relying on fall-back definitions in terms of the above conjunctions (see Section 14.13), in case any other language option defines them explicitly and we need to override those.

```
    \def\crefpairgroupconjunction@preamble{ \cyrt\cyra\nobreakspace}%
    \def\crefmiddlegroupconjunction@preamble{, }%
    \def\creflastgroupconjunction@preamble%
      {, \cyra\ \cyrt\cyra\cyrk\cyro\cyrzh\nobreakspace}%
%
    \Crefname@preamble{equation}%
      {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyra}%
      {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyri}%
    \Crefname@preamble{figure}%
      {\CYRR\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
      {\CYRR\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
    \Crefname@preamble{table}%
      {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrya}%
      {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrii}%
    \Crefname@preamble{enumi}%
      {\CYRP\cyru\cyrn\cyrk\cyrt}%
      {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
    \Crefname@preamble{chapter}%
      {\CYRG\cyrl\cyra\cyrv\cyra}%
      {\CYRG\cyrl\cyra\cyrv\cyri}%
    \Crefname@preamble{section}%
      {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl}%
      {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
    \Crefname@preamble{appendix}%
      {\CYRD\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
      {\CYRD\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
    \Crefname@preamble{footnote}%
      {\CYRV\cyri\cyrn\cyro\cyrs\cyrk\cyra}%
      {\CYRV\cyri\cyrn\cyro\cyrs\cyrk\cyri}%
    \Crefname@preamble{theorem}%
      {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyra}%
      {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyri}%
    \Crefname@preamble{lemma}%
      {\CYRL\cyre\cyrm\cyrm\cyra}%
      {\CYRL\cyre\cyrm\cyrm\cyri}%
    \Crefname@preamble{corollary}%
      {\CYRV\cyri\cyrs\cyrn\cyro\cyrv\cyro\cyrk}%
      {\CYRV\cyri\cyrs\cyrn\cyro\cyrv\cyrk\cyri}%
    \Crefname@preamble{proposition}%
      {\CYRT\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
      {\CYRT\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
    \Crefname@preamble{definition}%
      {\CYRV\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
      {\CYRV\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
    \Crefname@preamble{result}%
      {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt}%
```

```
      {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt\cyri}%
    \Crefname@preamble{example}%
      {\CYRP\cyrr\cyri\cyrk\cyrl\cyra\cyrd}%
      {\CYRP\cyrr\cyri\cyrk\cyrl\cyra\cyrd\cyri}%
    \Crefname@preamble{remark}%
      {\CYRP\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyra}%
      {\CYRP\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyri}%
    \Crefname@preamble{note}%
      {\CYRZ\cyra\cyrm\cyrii\cyrt\cyrk\cyra}%
      {\CYRZ\cyra\cyrm\cyrii\cyrt\cyrk\cyri}%
    \Crefname@preamble{algorithm}%
      {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm}%
      {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm\cyri}%
    \Crefname@preamble{listing}%
      {\CYRL\cyrii\cyrs\cyrt\cyri\cyrn\cyrg}%
      {\CYRL\cyrii\cyrs\cyrt\cyri\cyrn\cyrg\cyri}%
    \Crefname@preamble{line}%
      {\CYRS\cyrt\cyrr\cyro\cyrk\cyra}%
      {\CYRS\cyrt\cyrr\cyro\cyrk\cyri}%
    \Crefname@preamble{page}%
      {\CYRS\cyrt\cyro\cyrr\cyri\cyrn\cyrk\cyra}%
      {\CYRS\cyrt\cyro\cyrr\cyrii\cyrn\cyrk\cyri}%
    \Crefname@preamble{part}%
      {\CYRCH\cyra\cyrs\cyrt\cyri\cyrn\cyra}%
      {\CYRCH\cyra\cyrs\cyrt\cyri\cyrn\cyri}%
%
    \if@cref@capitalise%  capitalise set
      \if@cref@abbrev%  abbrev set
        \crefname@preamble{equation}%
          {\CYRF-\cyrl.}%
          {\CYRF-\cyrl.}%
        \crefname@preamble{figure}%
          {\CYRR\cyri\cyrs.}%
          {\CYRR\cyri\cyrs.}%
        \crefname@preamble{table}%
          {\CYRT\cyra\cyrb\cyrl.}%
          {\CYRT\cyra\cyrb\cyrl.}%
        \crefname@preamble{enumi}%
          {\CYRP.}%
          {\CYRP.\cyrp.}%
      \else%
        \crefname@preamble{equation}%
          {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyra}%
          {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyri}%
        \crefname@preamble{figure}%
          {\CYRR\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
          {\CYRR\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
        \crefname@preamble{table}%
          {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrya}%
          {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrii}%
```

```
    \crefname@preamble{enumi}%
      {\CYRP\cyru\cyrn\cyrk\cyrt}%
      {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
  \fi%
  \crefname@preamble{chapter}%
    {\CYRG\cyrl\cyra\cyrv\cyra}%
    {\CYRG\cyrl\cyra\cyrv\cyri}%
  \crefname@preamble{section}%
    {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl}%
    {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
  \crefname@preamble{appendix}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \crefname@preamble{footnote}%
    {\CYRV\cyri\cyrn\cyro\cyrs\cyrk\cyra}%
    {\CYRV\cyri\cyrn\cyro\cyrs\cyrk\cyri}%
  \crefname@preamble{theorem}%
    {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyra}%
    {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyri}%
  \crefname@preamble{lemma}%
    {\CYRL\cyre\cyrm\cyrm\cyra}%
    {\CYRL\cyre\cyrm\cyrm\cyri}%
  \crefname@preamble{corollary}%
    {\CYRV\cyri\cyrs\cyrn\cyro\cyrv\cyro\cyrk}%
    {\CYRV\cyri\cyrs\cyrn\cyro\cyrv\cyrk\cyri}%
  \crefname@preamble{proposition}%
    {\CYRT\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
    {\CYRT\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
  \crefname@preamble{definition}%
    {\CYRV\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
    {\CYRV\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
  \crefname@preamble{result}%
    {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt}%
    {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt\cyri}%
  \crefname@preamble{example}%
    {\CYRP\cyrr\cyri\cyrk\cyrl\cyra\cyrd}%
    {\CYRP\cyrr\cyri\cyrk\cyrl\cyra\cyrd\cyri}%
  \crefname@preamble{remark}%
    {\CYRP\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyra}%
    {\CYRP\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyri}%
  \crefname@preamble{note}%
    {\CYRZ\cyra\cyrm\cyrii\cyrt\cyrk\cyra}%
    {\CYRZ\cyra\cyrm\cyrii\cyrt\cyrk\cyri}%
  \crefname@preamble{algorithm}%
    {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm}%
    {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm\cyri}%
  \crefname@preamble{listing}%
    {\CYRL\cyrii\cyrs\cyrt\cyri\cyrn\cyrg}%
    {\CYRL\cyrii\cyrs\cyrt\cyri\cyrn\cyrg\cyri}%
  \crefname@preamble{line}%
```

```
      {\CYRS\cyrt\cyrr\cyro\cyrk\cyra}%
      {\CYRS\cyrt\cyrr\cyro\cyrk\cyri}%
    \crefname@preamble{page}%
      {\CYRS\cyrt\cyro\cyrr\cyri\cyrn\cyrk\cyra}%
      {\CYRS\cyrt\cyro\cyrr\cyrii\cyrn\cyrk\cyri}%
    \crefname@preamble{part}%
      {\CYRCH\cyra\cyrs\cyrt\cyri\cyrn\cyra}%
      {\CYRCH\cyra\cyrs\cyrt\cyri\cyrn\cyri}%
%
  \else%  capitalise unset
    \if@cref@abbrev%  abbrev set
      \crefname@preamble{equation}%
        {\cyrf-\cyrl.}%
        {\cyrf-\cyrl.}%
      \crefname@preamble{figure}%
        {\cyrr\cyri\cyrs.}%
        {\cyrr\cyri\cyrs.}%
      \crefname@preamble{table}%
        {\cyrt\cyra\cyrb\cyrl.}%
        {\cyrt\cyra\cyrb\cyrl.}%
      \crefname@preamble{enumi}%
        {\cyrp.}%
        {\cyrp.\cyrp.}%
      \crefname@preamble{chapter}%
        {\cyrg\cyrl\cyra\cyrv.}%
        {\cyrg\cyrl\cyra\cyrv.}%
      \crefname@preamble{section}%
        {\cyrr\cyro\cyrz\cyrd.}%
        {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl.}%
      \crefname@preamble{appendix}%
        {\cyrd\cyro\cyrd\cyra\cyrt.}%
        {\cyrd\cyro\cyrd\cyra\cyrt\cyrk.}%
      \crefname@preamble{footnote}%
        {\cyrv\cyri\cyrn\cyro\cyrs\cyrk.}%
        {\cyrv\cyri\cyrn\cyro\cyrs\cyrk.}%
      \crefname@preamble{theorem}%
        {\cyrt\cyre\cyro\cyrr\cyre\cyrm.}%
        {\cyrt\cyre\cyro\cyrr\cyre\cyrm.}%
      \crefname@preamble{lemma}%
        {\cyrl\cyre\cyrm\cyrm.}%
        {\cyrl\cyre\cyrm\cyrm.}%
      \crefname@preamble{corollary}%
        {\cyrv\cyri\cyrs\cyrn\cyro\cyrv.}%
        {\cyrv\cyri\cyrs\cyrn\cyro\cyrv\cyrk.}%
      \crefname@preamble{proposition}%
        {\cyrt\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn.}%
        {\cyrt\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn.}%
      \crefname@preamble{definition}%
        {\cyrv\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn.}%
        {\cyrv\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn.}%
```

```
    \crefname@preamble{result}%
      {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt.}%
      {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt.}%
    \crefname@preamble{example}%
      {\cyrp\cyrr\cyri\cyrk\cyrl.}%
      {\cyrp\cyrr\cyri\cyrk\cyrl\cyra\cyrd.}%
    \crefname@preamble{remark}%
      {\cyrp\cyrr\cyri\cyrm\cyrii\cyrt.}%
      {\cyrp\cyrr\cyri\cyrm\cyrii\cyrt.}%
    \crefname@preamble{note}%
      {\cyrz\cyra\cyrm\cyrii\cyrt.}%
      {\cyrz\cyra\cyrm\cyrii\cyrt.}%
    \crefname@preamble{algorithm}%
      {\cyra\cyrl\cyrg.}%
      {\cyra\cyrl\cyrg.}%
    \crefname@preamble{listing}%
      {\cyrl\cyrii\cyrs\cyrt\cyri\cyrn.}%
      {\cyrl\cyrii\cyrs\cyrt\cyri\cyrn\cyrg.}%
    \crefname@preamble{line}%
      {\cyrs\cyrt\cyrr\cyrk.}%
      {\cyrs\cyrt\cyrr\cyrk.}%
  \else%  abbrev unset
    \crefname@preamble{equation}%
      {\cyrf\cyro\cyrr\cyrm\cyru\cyrl\cyra}%
      {\cyrf\cyro\cyrr\cyrm\cyru\cyrl\cyri}%
    \crefname@preamble{figure}%
      {\cyrr\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
      {\cyrr\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
    \crefname@preamble{table}%
      {\cyrt\cyra\cyrb\cyrl\cyri\cyrc\cyrya}%
      {\cyrt\cyra\cyrb\cyrl\cyri\cyrc\cyrii}%
    \crefname@preamble{enumi}%
      {\cyrp\cyru\cyrn\cyrk\cyrt}%
      {\cyrp\cyru\cyrn\cyrk\cyrt\cyri}%
    \crefname@preamble{chapter}%
      {\cyrg\cyrl\cyra\cyrv\cyra}%
      {\cyrg\cyrl\cyra\cyrv\cyri}%
    \crefname@preamble{section}%
      {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl}%
      {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
    \crefname@preamble{appendix}%
      {\cyrd\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
      {\cyrd\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
    \crefname@preamble{footnote}%
      {\cyrv\cyri\cyrn\cyro\cyrs\cyrk\cyra}%
      {\cyrv\cyri\cyrn\cyro\cyrs\cyrk\cyri}%
    \crefname@preamble{theorem}%
      {\cyrt\cyre\cyro\cyrr\cyre\cyrm\cyra}%
      {\cyrt\cyre\cyro\cyrr\cyre\cyrm\cyri}%
    \crefname@preamble{lemma}%
```

```
      {\cyrl\cyre\cyrm\cyrm\cyra}%
      {\cyrl\cyre\cyrm\cyrm\cyri}%
    \crefname@preamble{corollary}%
      {\cyrv\cyri\cyrs\cyrn\cyro\cyrv\cyro\cyrk}%
      {\cyrv\cyri\cyrs\cyrn\cyro\cyrv\cyrk\cyri}%
    \crefname@preamble{proposition}%
      {\cyrt\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
      {\cyrt\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
    \crefname@preamble{definition}%
      {\cyrv\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
      {\cyrv\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
    \crefname@preamble{result}%
      {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt}%
      {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt\cyri}%
    \crefname@preamble{example}%
      {\cyrp\cyrr\cyri\cyrk\cyrl\cyra\cyrd}%
      {\cyrp\cyrr\cyri\cyrk\cyrl\cyra\cyrd\cyri}%
    \crefname@preamble{remark}%
      {\cyrp\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyra}%
      {\cyrp\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyri}%
    \crefname@preamble{note}%
      {\cyrz\cyra\cyrm\cyrii\cyrt\cyrk\cyra}%
      {\cyrz\cyra\cyrm\cyrii\cyrt\cyrk\cyri}%
    \crefname@preamble{algorithm}%
      {\cyra\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm}%
      {\cyra\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm\cyri}%
    \crefname@preamble{listing}%
      {\cyrl\cyrii\cyrs\cyrt\cyri\cyrn\cyrg}%
      {\cyrl\cyrii\cyrs\cyrt\cyri\cyrn\cyrg\cyri}%
    \crefname@preamble{line}%
      {\cyrs\cyrt\cyrr\cyro\cyrk\cyra}%
      {\cyrs\cyrt\cyrr\cyro\cyrk\cyri}%
  \fi%
  \crefname@preamble{page}%
    {\cyrs\cyrt\cyro\cyrr\cyri\cyrn\cyrc\cyrii}%
    {\cyrs\cyrt\cyro\cyrr\cyrii\cyrn\cyrk\cyra\cyrh}%
  \crefname@preamble{part}%
    {\cyrch\cyra\cyrs\cyrt\cyri\cyrn\cyra}%
    {\cyrch\cyra\cyrs\cyrt\cyri\cyrn\cyri}%
\fi%
\def\cref@language{ukrainian}%
```

Next, we add the definitions to `\extras`... so that `babel`'s `\selectlanguage` command will change the format appropriately.

```
\cref@addto\extrasukrainian{%
  \renewcommand{\crefrangeconjunction}{--}%
  \renewcommand\crefrangepreconjunction{}%
  \renewcommand\crefrangepostconjunction{}%
  \renewcommand{\crefpairconjunction}{ \cyrii\nobreakspace}%
  \renewcommand{\crefmiddleconjunction}{, }%
```

```
      \renewcommand{\creflastconjunction}{ \cyrii\nobreakspace}%
      \renewcommand{\crefpairgroupconjunction}%
        { \cyrt\cyra\nobreakspace}%
      \renewcommand{\crefmiddlegroupconjunction}{, }%
      \renewcommand{\creflastgroupconjunction}%
        {, \cyra\ \cyrt\cyra\cyrk\cyro\cyrzh\nobreakspace}%
%
        \Crefname{equation}%
        {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyra}%
        {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyri}%
      \Crefname{figure}%
        {\CYRR\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
        {\CYRR\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
      \Crefname{subfigure}%
        {\CYRR\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
        {\CYRR\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
      \Crefname{table}%
        {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrya}%
        {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrii}%
      \Crefname{subtable}%
        {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrya}%
        {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrii}%
      \Crefname{enumi}%
        {\CYRP\cyru\cyrn\cyrk\cyrt}%
        {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
      \Crefname{enumii}%
        {\CYRP\cyru\cyrn\cyrk\cyrt}%
        {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
      \Crefname{enumiii}%
        {\CYRP\cyru\cyrn\cyrk\cyrt}%
        {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
      \Crefname{enumiv}%
        {\CYRP\cyru\cyrn\cyrk\cyrt}%
        {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
      \Crefname{enumv}%
        {\CYRP\cyru\cyrn\cyrk\cyrt}%
        {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
      \Crefname{chapter}%
        {\CYRG\cyrl\cyra\cyrv\cyra}%
        {\CYRG\cyrl\cyra\cyrv\cyri}%
      \Crefname{section}%
        {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl}%
        {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
      \Crefname{subsection}%
        {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl}%
        {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
      \Crefname{subsubsection}%
        {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl}%
        {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
      \Crefname{appendix}%
```

```
    {\CYRD\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \Crefname{subappendix}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \Crefname{subsubappendix}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \Crefname{subsubsubappendix}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \Crefname{footnote}%
    {\CYRV\cyri\cyrn\cyro\cyrs\cyrk\cyra}%
    {\CYRV\cyri\cyrn\cyro\cyrs\cyrk\cyri}%
  \Crefname{theorem}%
    {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyra}%
    {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyri}%
  \Crefname{lemma}%
    {\CYRL\cyre\cyrm\cyrm\cyra}%
    {\CYRL\cyre\cyrm\cyrm\cyri}%
  \Crefname{corollary}%
    {\CYRV\cyri\cyrs\cyrn\cyro\cyrv\cyro\cyrk}%
    {\CYRV\cyri\cyrs\cyrn\cyro\cyrv\cyrk\cyri}%
  \Crefname{proposition}%
    {\CYRT\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
    {\CYRT\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
  \Crefname{definition}%
    {\CYRV\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
    {\CYRV\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
  \Crefname{result}%
    {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt}%
    {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt\cyri}%
  \Crefname{example}%
    {\CYRP\cyrr\cyri\cyrk\cyrl\cyra\cyrd}%
    {\CYRP\cyrr\cyri\cyrk\cyrl\cyra\cyrd\cyri}%
  \Crefname{remark}%
    {\CYRP\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyra}%
    {\CYRP\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyri}%
  \Crefname{note}%
    {\CYRZ\cyra\cyrm\cyrii\cyrt\cyrk\cyra}%
    {\CYRZ\cyra\cyrm\cyrii\cyrt\cyrk\cyri}%
  \Crefname{algorithm}%
    {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm}%
    {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm\cyri}%
  \Crefname{listing}%
    {\CYRL\cyrii\cyrs\cyrt\cyri\cyrn\cyrg}%
    {\CYRL\cyrii\cyrs\cyrt\cyri\cyrn\cyrg\cyri}%
  \Crefname{line}%
    {\CYRS\cyrt\cyrr\cyro\cyrk\cyra}%
    {\CYRS\cyrt\cyrr\cyro\cyrk\cyri}%
```

```
      \Crefname{page}%
        {\CYRS\cyrt\cyro\cyrr\cyri\cyrn\cyrk\cyra}%
        {\CYRS\cyrt\cyro\cyrr\cyrii\cyrn\cyrk\cyri}%
      \Crefname{part}%
        {\CYRCH\cyra\cyrs\cyrt\cyri\cyrn\cyra}%
        {\CYRCH\cyra\cyrs\cyrt\cyri\cyrn\cyri}%
%
      \if@cref@capitalise%  capitalise set
        \if@cref@abbrev%  abbrev set
          \crefname{equation}%
            {\CYRF-\cyrl.}%
            {\CYRF-\cyrl.}%
          \crefname{figure}%
            {\CYRR\cyri\cyrs.}%
            {\CYRR\cyri\cyrs.}%
          \crefname{subfigure}%
            {\CYRR\cyri\cyrs.}%
            {\CYRR\cyri\cyrs.}%
          \crefname{table}%
            {\CYRT\cyra\cyrb\cyrl.}%
            {\CYRT\cyra\cyrb\cyrl.}%
          \crefname{subtable}%
            {\CYRT\cyra\cyrb\cyrl.}%
            {\CYRT\cyra\cyrb\cyrl.}%
          \crefname{enumi}%
            {\CYRP.}%
            {\CYRP.\cyrp.}%
          \crefname{enumii}%
            {\CYRP.}%
            {\CYRP.\cyrp.}%
          \crefname{enumiii}%
            {\CYRP.}%
            {\CYRP.\cyrp.}%
          \crefname{enumiv}%
            {\CYRP.}%
            {\CYRP.\cyrp.}%
          \crefname{enumv}%
            {\CYRP.}%
            {\CYRP.\cyrp.}%
        \else%  abbrev unset
          \crefname{equation}%
            {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyra}%
            {\CYRF\cyro\cyrr\cyrm\cyru\cyrl\cyri}%
          \crefname{figure}%
            {\CYRR\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
            {\CYRR\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
          \crefname{subfigure}%
            {\CYRR\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
            {\CYRR\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
          \crefname{table}%
```

```
      {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrya}%
      {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrii}%
    \crefname{subtable}%
      {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrya}%
      {\CYRT\cyra\cyrb\cyrl\cyri\cyrc\cyrii}%
    \crefname{enumi}%
      {\CYRP\cyru\cyrn\cyrk\cyrt}%
      {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
    \crefname{enumii}%
      {\CYRP\cyru\cyrn\cyrk\cyrt}%
      {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
    \crefname{enumiii}%
      {\CYRP\cyru\cyrn\cyrk\cyrt}%
      {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
    \crefname{enumiv}%
      {\CYRP\cyru\cyrn\cyrk\cyrt}%
      {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
    \crefname{enumv}%
      {\CYRP\cyru\cyrn\cyrk\cyrt}%
      {\CYRP\cyru\cyrn\cyrk\cyrt\cyri}%
  \fi%
  \crefname{chapter}%
    {\CYRG\cyrl\cyra\cyrv\cyra}%
    {\CYRG\cyrl\cyra\cyrv\cyri}%
  \crefname{section}%
    {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl}%
    {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
  \crefname{subsection}%
    {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl}%
    {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
  \crefname{subsubsection}%
    {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl}%
    {\CYRR\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
  \crefname{appendix}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \crefname{subappendix}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \crefname{subsubappendix}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \crefname{subsubsubappendix}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\CYRD\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \crefname{footnote}%
    {\CYRV\cyri\cyrn\cyro\cyrs\cyrk\cyra}%
    {\CYRV\cyri\cyrn\cyro\cyrs\cyrk\cyri}%
  \crefname{theorem}%
    {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyra}%
```

```
      {\CYRT\cyre\cyro\cyrr\cyre\cyrm\cyri}%
    \crefname{lemma}%
      {\CYRL\cyre\cyrm\cyrm\cyra}%
      {\CYRL\cyre\cyrm\cyrm\cyri}%
    \crefname{corollary}%
      {\CYRV\cyri\cyrs\cyrn\cyro\cyrv\cyro\cyrk}%
      {\CYRV\cyri\cyrs\cyrn\cyro\cyrv\cyrk\cyri}%
    \crefname{proposition}%
      {\CYRT\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
      {\CYRT\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
    \crefname{definition}%
      {\CYRV\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
      {\CYRV\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
    \crefname{result}%
      {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt}%
      {\CYRR\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt\cyri}%
    \crefname{example}%
      {\CYRP\cyrr\cyri\cyrk\cyrl\cyra\cyrd}%
      {\CYRP\cyrr\cyri\cyrk\cyrl\cyra\cyrd\cyri}%
    \crefname{remark}%
      {\CYRP\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyra}%
      {\CYRP\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyri}%
    \crefname{note}%
      {\CYRZ\cyra\cyrm\cyrii\cyrt\cyrk\cyra}%
      {\CYRZ\cyra\cyrm\cyrii\cyrt\cyrk\cyri}%
    \crefname{algorithm}%
      {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm}%
      {\CYRA\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm\cyri}%
    \crefname{listing}%
      {\CYRL\cyrii\cyrs\cyrt\cyri\cyrn\cyrg}%
      {\CYRL\cyrii\cyrs\cyrt\cyri\cyrn\cyrg\cyri}%
    \crefname{line}%
      {\CYRS\cyrt\cyrr\cyro\cyrk\cyra}%
      {\CYRS\cyrt\cyrr\cyro\cyrk\cyri}%
    \crefname{page}%
      {\CYRS\cyrt\cyro\cyrr\cyri\cyrn\cyrk\cyra}%
      {\CYRS\cyrt\cyro\cyrr\cyrii\cyrn\cyrk\cyri}%
    \crefname{part}%
      {\CYRCH\cyra\cyrs\cyrt\cyri\cyrn\cyra}%
      {\CYRCH\cyra\cyrs\cyrt\cyri\cyrn\cyri}%
%
  \else%  capitalise unset
    \if@cref@abbrev%  abbrev set
      \crefname{equation}%
        {\cyrf-\cyrl.}%
        {\cyrf-\cyrl.}%
      \crefname{chapter}%
        {\cyrg\cyrl\cyra\cyrv.}%
        {\cyrg\cyrl\cyra\cyrv.}%
      \crefname{section}%
```

```
    {\cyrr\cyro\cyrz\cyrd.}%
    {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl.}%
  \crefname{subsection}%
    {\cyrr\cyro\cyrz\cyrd.}%
    {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl.}%
  \crefname{subsubsection}%
    {\cyrr\cyro\cyrz\cyrd.}%
    {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl.}%
  \crefname{appendix}%
    {\cyrd\cyro\cyrd\cyra\cyrt.}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyrk.}%
  \crefname{subappendix}%
    {\cyrd\cyro\cyrd\cyra\cyrt.}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyrk.}%
  \crefname{subsubappendix}%
    {\cyrd\cyro\cyrd\cyra\cyrt.}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyrk.}%
  \crefname{subsubsubappendix}%
    {\cyrd\cyro\cyrd\cyra\cyrt.}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyrk.}%
  \crefname{enumi}%
    {\cyrp.}%
    {\cyrp.\cyrp.}%
  \crefname{enumii}%
    {\cyrp.}%
    {\cyrp.\cyrp.}%
  \crefname{enumiii}%
    {\cyrp.}%
    {\cyrp.\cyrp.}%
  \crefname{enumiv}%
    {\cyrp.}%
    {\cyrp.\cyrp.}%
  \crefname{enumv}%
    {\cyrp.}%
    {\cyrp.\cyrp.}%
  \crefname{footnote}%
    {\cyrv\cyri\cyrn\cyro\cyrs\cyrk.}%
    {\cyrv\cyri\cyrn\cyro\cyrs\cyrk.}%
  \crefname{figure}%
    {\cyrr\cyri\cyrs.}%
    {\cyrr\cyri\cyrs.}%
  \crefname{subfigure}%
    {\cyrr\cyri\cyrs.}%
    {\cyrr\cyri\cyrs.}%
  \crefname{table}%
    {\cyrt\cyra\cyrb\cyrl.}%
    {\cyrt\cyra\cyrb\cyrl.}%
  \crefname{subtable}%
    {\cyrt\cyra\cyrb\cyrl.}%
    {\cyrt\cyra\cyrb\cyrl.}%
```

```
      \crefname{theorem}%
        {\cyrt\cyre\cyro\cyrr\cyre\cyrm.}%
        {\cyrt\cyre\cyro\cyrr\cyre\cyrm.}%
      \crefname{lemma}%
        {\cyrl\cyre\cyrm\cyrm.}%
        {\cyrl\cyre\cyrm\cyrm.}%
      \crefname{corollary}%
        {\cyrv\cyri\cyrs\cyrn\cyro\cyrv.}%
        {\cyrv\cyri\cyrs\cyrn\cyro\cyrv\cyrk.}%
      \crefname{proposition}%
        {\cyrt\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn.}%
        {\cyrt\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn.}%
      \crefname{definition}%
        {\cyrv\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn.}%
        {\cyrv\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn.}%
      \crefname{result}%
        {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt.}%
        {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt.}%
      \crefname{example}%
        {\cyrp\cyrr\cyri\cyrk\cyrl.}%
        {\cyrp\cyrr\cyri\cyrk\cyrl\cyra\cyrd.}%
      \crefname{remark}%
        {\cyrp\cyrr\cyri\cyrm\cyrii\cyrt.}%
        {\cyrp\cyrr\cyri\cyrm\cyrii\cyrt.}%
      \crefname{note}%
        {\cyrz\cyra\cyrm\cyrii\cyrt.}%
        {\cyrz\cyra\cyrm\cyrii\cyrt.}%
      \crefname{algorithm}%
        {\cyra\cyrl\cyrg.}%
        {\cyra\cyrl\cyrg.}%
      \crefname{listing}%
        {\cyrl\cyrii\cyrs\cyrt\cyri\cyrn.}%
        {\cyrl\cyrii\cyrs\cyrt\cyri\cyrn\cyrg.}%
      \crefname{line}%
        {\cyrs\cyrt\cyrr\cyrk.}%
        {\cyrs\cyrt\cyrr\cyrk.}%
    \else%  abbrev unset
      \crefname{equation}%
        {\cyrf\cyro\cyrr\cyrm\cyru\cyrl\cyra}%
        {\cyrf\cyro\cyrr\cyrm\cyru\cyrl\cyri}%
      \crefname{figure}%
        {\cyrr\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
        {\cyrr\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
      \crefname{subfigure}%
        {\cyrr\cyri\cyrs\cyru\cyrn\cyro\cyrk}%
        {\cyrr\cyri\cyrs\cyru\cyrn\cyrk\cyri}%
      \crefname{table}%
        {\cyrt\cyra\cyrb\cyrl\cyri\cyrc\cyrya}%
        {\cyrt\cyra\cyrb\cyrl\cyri\cyrc\cyrii}%
      \crefname{subtable}%
```

```
    {\cyrt\cyra\cyrb\cyrl\cyri\cyrc\cyrya}%
    {\cyrt\cyra\cyrb\cyrl\cyri\cyrc\cyrii}%
  \crefname{enumi}%
    {\cyrp\cyru\cyrn\cyrk\cyrt}%
    {\cyrp\cyru\cyrn\cyrk\cyrt\cyri}%
  \crefname{enumii}%
    {\cyrp\cyru\cyrn\cyrk\cyrt}%
    {\cyrp\cyru\cyrn\cyrk\cyrt\cyri}%
  \crefname{enumiii}%
    {\cyrp\cyru\cyrn\cyrk\cyrt}%
    {\cyrp\cyru\cyrn\cyrk\cyrt\cyri}%
  \crefname{enumiv}%
    {\cyrp\cyru\cyrn\cyrk\cyrt}%
    {\cyrp\cyru\cyrn\cyrk\cyrt\cyri}%
  \crefname{enumv}%
    {\cyrp\cyru\cyrn\cyrk\cyrt}%
    {\cyrp\cyru\cyrn\cyrk\cyrt\cyri}%
  \crefname{chapter}%
    {\cyrg\cyrl\cyra\cyrv\cyra}%
    {\cyrg\cyrl\cyra\cyrv\cyri}%
  \crefname{section}%
    {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl}%
    {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
  \crefname{subsection}%
    {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl}%
    {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
  \crefname{subsubsection}%
    {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl}%
    {\cyrr\cyro\cyrz\cyrd\cyrii\cyrl\cyri}%
  \crefname{appendix}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \crefname{subappendix}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \crefname{subsubappendix}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \crefname{subsubsubappendix}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyro\cyrk}%
    {\cyrd\cyro\cyrd\cyra\cyrt\cyrk\cyri}%
  \crefname{footnote}%
    {\cyrv\cyri\cyrn\cyro\cyrs\cyrk\cyra}%
    {\cyrv\cyri\cyrn\cyro\cyrs\cyrk\cyri}%
  \crefname{theorem}%
    {\cyrt\cyre\cyro\cyrr\cyre\cyrm\cyra}%
    {\cyrt\cyre\cyro\cyrr\cyre\cyrm\cyri}%
  \crefname{lemma}%
    {\cyrl\cyre\cyrm\cyrm\cyra}%
    {\cyrl\cyre\cyrm\cyrm\cyri}%
```

```
      \crefname{corollary}%
        {\cyrv\cyri\cyrs\cyrn\cyro\cyrv\cyro\cyrk}%
        {\cyrv\cyri\cyrs\cyrn\cyro\cyrv\cyrk\cyri}%
      \crefname{proposition}%
        {\cyrt\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
        {\cyrt\cyrv\cyre\cyrr\cyrd\cyrzh\cyre\cyrn\cyrn\cyrya}%
      \crefname{definition}%
        {\cyrv\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
        {\cyrv\cyri\cyrz\cyrn\cyra\cyrch\cyre\cyrn\cyrn\cyrya}%
      \crefname{result}%
        {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt}%
        {\cyrr\cyre\cyrz\cyru\cyrl\cyrsftsn\cyrt\cyra\cyrt\cyri}%
      \crefname{example}%
        {\cyrp\cyrr\cyri\cyrk\cyrl\cyra\cyrd}%
        {\cyrp\cyrr\cyri\cyrk\cyrl\cyra\cyrd\cyri}%
      \crefname{remark}%
        {\cyrp\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyra}%
        {\cyrp\cyrr\cyri\cyrm\cyrii\cyrt\cyrk\cyri}%
      \crefname{note}%
        {\cyrz\cyra\cyrm\cyrii\cyrt\cyrk\cyra}%
        {\cyrz\cyra\cyrm\cyrii\cyrt\cyrk\cyri}%
      \crefname{algorithm}%
        {\cyra\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm}%
        {\cyra\cyrl\cyrg\cyro\cyrr\cyri\cyrt\cyrm\cyri}%
      \crefname{listing}%
        {\cyrl\cyrii\cyrs\cyrt\cyri\cyrn\cyrg}%
        {\cyrl\cyrii\cyrs\cyrt\cyri\cyrn\cyrg\cyri}%
      \crefname{line}%
        {\cyrs\cyrt\cyrr\cyro\cyrk\cyra}%
        {\cyrs\cyrt\cyrr\cyro\cyrk\cyri}%
    \fi%
    \crefname{page}%
      {\cyrs\cyrt\cyro\cyrr\cyri\cyrn\cyrc\cyrii}%
      {\cyrs\cyrt\cyro\cyrr\cyrii\cyrn\cyrk\cyra\cyrh}%
    \crefname{part}%
      {\cyrch\cyra\cyrs\cyrt\cyri\cyrn\cyra}%
      {\cyrch\cyra\cyrs\cyrt\cyri\cyrn\cyri}%
  \fi%
}}}
```

### 14.12.9 Norsk

`norsk` Norwegian translations kindly donated by Sveinung Heggen.

```
\DeclareOption{norsk}{%
  \PackageInfo{cleveref}{loaded norsk language definitions}
```

First, we set up the definitions used at the beginning of the document to define the formats created by the document preamble.

```
  \AtBeginDocument{%
```

```
    \def\crefrangeconjunction@preamble{ til\nobreakspace}%
    \def\crefrangepreconjunction@preamble{}%
    \def\crefrangepostconjunction@preamble{}%
    \def\crefpairconjunction@preamble{ og\nobreakspace}%
    \def\crefmiddleconjunction@preamble{, }%
    \def\creflastconjunction@preamble{ og\nobreakspace}%
```

We have to define the group conjunctions explicitly here, rather than relying on fall-back definitions in terms of the above conjunctions (see Section 14.13), in case any other language option defines them explicitly and we need to override those.

```
    \def\crefpairgroupconjunction@preamble{ og\nobreakspace}%
    \def\crefmiddlegroupconjunction@preamble{, }%
    \def\creflastgroupconjunction@preamble{ og\nobreakspace}%
%
    \Crefname@preamble{equation}{Likning}{Likningene}%
    \Crefname@preamble{figure}{Figur}{Figurene}%
    \Crefname@preamble{table}{Tabell}{Tabellene}%
    \Crefname@preamble{page}{Side}{Siden}%
    \Crefname@preamble{part}{Del}{Delene}%
    \Crefname@preamble{chapter}{Kapittel}{Kapitlene}%
    \Crefname@preamble{section}{Avsnitt}{Avsnittene}%
    \Crefname@preamble{appendix}{Tillegg}{Tilleggene}%
    \Crefname@preamble{enumi}{Punkt}{Punktene}%
    \Crefname@preamble{footnote}{Fotnote}{Fotnotene}%
    \Crefname@preamble{theorem}{Teorem}{Teoremene}%
    \Crefname@preamble{lemma}{Lemma}{Lemma}%
    \Crefname@preamble{corollary}{Korollar}{Korollarene}%
    \Crefname@preamble{proposition}{P\aa stand}{P\aa standene}%
    \Crefname@preamble{definition}{Definisjon}{Definisjonene}%
    \Crefname@preamble{result}{Resultat}{Resultatene}%
    \Crefname@preamble{example}{Eksempel}{Eksemplene}%
    \Crefname@preamble{remark}{Bemerkning}{Bemerkningene}%
    \Crefname@preamble{note}{Note}{Notene}%
    \Crefname@preamble{algorithm}{Algoritme}{Algoritmene}%
    \Crefname@preamble{listing}{Opplisting}{Opplistingene}%
    \Crefname@preamble{line}{Linje}{Linjene}%
%
    \if@cref@capitalise%
      \crefname@preamble{page}{Side}{Siden}%
      \crefname@preamble{equation}{Likning}{Likningene}%
      \crefname@preamble{figure}{Figur}{Figurene}%
      \crefname@preamble{table}{Tabell}{Tabellene}%
      \crefname@preamble{part}{Del}{Delene}%
      \crefname@preamble{chapter}{Kapittel}{Kapitlene}%
      \crefname@preamble{section}{Avsnitt}{Avsnittene}%
      \crefname@preamble{appendix}{Tillegg}{Tilleggene}%
      \crefname@preamble{enumi}{Punkt}{Punktene}%
      \crefname@preamble{footnote}{Fotnote}{Fotnotene}%
      \crefname@preamble{theorem}{Teorem}{Teoremene}%
      \crefname@preamble{lemma}{Lemma}{Lemma}%
```

```
      \crefname@preamble{corollary}{Korollar}{Korollarene}%
      \crefname@preamble{proposition}{P\aa stand}{P\aa standene}%
      \crefname@preamble{definition}{Definisjon}{Definisjonene}%
      \crefname@preamble{result}{Resultat}{Resultatene}%
      \crefname@preamble{example}{Eksempel}{Eksemplene}%
      \crefname@preamble{remark}{Bemerkning}{Bemerkningene}%
      \crefname@preamble{note}{Note}{Notene}%
      \crefname@preamble{algorithm}{Algoritme}{Algoritmene}%
      \crefname@preamble{listing}{Opplisting}{Opplistingene}%
      \crefname@preamble{line}{Linje}{Linjene}%
%
    \else%
      \crefname@preamble{equation}{likning}{likningene}%
      \crefname@preamble{figure}{figur}{figurene}%
      \crefname@preamble{table}{tabell}{tabeller}%
      \crefname@preamble{page}{side}{siden}%
      \crefname@preamble{part}{del}{delene}%
      \crefname@preamble{chapter}{kapittel}{kapitlene}%
      \crefname@preamble{section}{avsnitt}{avsnittene}%
      \crefname@preamble{appendix}{tillegg}{tilleggene}%
      \crefname@preamble{enumi}{punkt}{punktene}%
      \crefname@preamble{footnote}{fotnote}{fotnotene}%
      \crefname@preamble{theorem}{teorem}{teoremene}%
      \crefname@preamble{lemma}{lemma}{lemma}%
      \crefname@preamble{corollary}{korollar}{korollarene}%
      \crefname@preamble{proposition}{p\aa stand}{p\aa standene}%
      \crefname@preamble{definition}{definisjon}{definisjonene}%
      \crefname@preamble{result}{resultat}{resultatene}%
      \crefname@preamble{example}{eksempel}{eksemplene}%
      \crefname@preamble{remark}{bemerkning}{bemerkningene}%
      \crefname@preamble{note}{note}{notene}%
      \crefname@preamble{algorithm}{algoritme}{algoritmene}%
      \crefname@preamble{listing}{opplisting}{opplistingene}%
      \crefname@preamble{line}{linje}{linjene}%
    \fi%
    \def\cref@language{norsk}%
```

Next, we add the definitions to `\extras...` so that `babel`'s `\selectlanguage` command will change the format appropriately.

```
    \cref@addto\extrasnorsk{%
      \renewcommand{\crefrangeconjunction}{ til\nobreakspace}%
      \renewcommand\crefrangepreconjunction{}%
      \renewcommand\crefrangepostconjunction{}%
      \renewcommand{\crefpairconjunction}{ og\nobreakspace}%
      \renewcommand{\crefmiddleconjunction}{, }%
      \renewcommand{\creflastconjunction}{ og\nobreakspace}%
      \renewcommand{\crefpairgroupconjunction}{ og\nobreakspace}%
      \renewcommand{\crefmiddlegroupconjunction}{, }%
      \renewcommand{\creflastgroupconjunction}{ og\nobreakspace}%
%
```

```
      \Crefname{equation}{Likning}{Likningene}%
      \Crefname{figure}{Figur}{Figurene}%
      \Crefname{subfigure}{Figur}{Figurene}%
      \Crefname{table}{Tabell}{Tabellene}%
      \Crefname{subtable}{Tabell}{Tabellene}%
      \Crefname{page}{Side}{Siden}%
      \Crefname{part}{Del}{Delene}%
      \Crefname{chapter}{Kapittel}{Kapitlene}%
      \Crefname{section}{Avsnitt}{Avsnittene}%
      \Crefname{subsection}{Avsnitt}{Avsnittene}%
      \Crefname{subsubsection}{Avsnitt}{Avsnittene}%
      \Crefname{appendix}{Tillegg}{Tilleggene}%
      \Crefname{subappendix}{Tillegg}{Tilleggene}%
      \Crefname{subsubappendix}{Tillegg}{Tilleggene}%
      \Crefname{subsubsubappendix}{Tillegg}{Tilleggene}%
      \Crefname{enumi}{Punkt}{Punktene}%
      \Crefname{enumii}{Punkt}{Punktene}%
      \Crefname{enumiii}{Punkt}{Punktene}%
      \Crefname{enumiv}{Punkt}{Punktene}%
      \Crefname{enumv}{Punkt}{Punktene}%
      \Crefname{footnote}{Fotnote}{Fotnotene}%
      \Crefname{theorem}{Teorem}{Teoremene}%
      \Crefname{lemma}{Lemma}{Lemma}%
      \Crefname{corollary}{Korollar}{Korollarene}%
      \Crefname{proposition}{P\aa stand}{P\aa standene}%
      \Crefname{definition}{Definisjon}{Definisjonene}%
      \Crefname{result}{Resultat}{Resultatene}%
      \Crefname{example}{Eksempel}{Eksemplene}%
      \Crefname{remark}{Bemerkning}{Bemerkningene}%
      \Crefname{note}{Note}{Notene}%
      \Crefname{algorithm}{Algoritme}{Algoritmene}%
      \Crefname{listing}{Opplisting}{Opplistingene}%
      \Crefname{line}{Linje}{Linjene}%
%
      \if@cref@capitalise%
        \crefname{equation}{Likning}{Likningene}%
        \crefname{figure}{Figur}{Figurene}%
        \crefname{subfigure}{Figur}{Figurene}%
        \crefname{table}{Tabell}{Tabellene}%
        \crefname{subtable}{Tabell}{Tabellene}%
        \crefname{page}{Side}{Siden}%
        \crefname{part}{Del}{Delene}%
        \crefname{chapter}{Kapittel}{Kapitlene}%
        \crefname{section}{Avsnitt}{Avsnittene}%
        \crefname{subsection}{Avsnitt}{Avsnittene}%
        \crefname{subsubsection}{Avsnitt}{Avsnittene}%
        \crefname{appendix}{Tillegg}{Tilleggene}%
        \crefname{subappendix}{Tillegg}{Tilleggene}%
        \crefname{subsubappendix}{Tillegg}{Tilleggene}%
        \crefname{subsubsubappendix}{Tillegg}{Tilleggene}%
```

```
6422          \crefname{enumi}{Punkt}{Punktene}%
6423          \crefname{enumii}{Punkt}{Punktene}%
6424          \crefname{enumiii}{Punkt}{Punktene}%
6425          \crefname{enumiv}{Punkt}{Punktene}%
6426          \crefname{enumv}{Punkt}{Punktene}%
6427          \crefname{footnote}{Fotnote}{Fotnotene}%
6428          \crefname{theorem}{Teorem}{Teoremene}%
6429          \crefname{lemma}{Lemma}{Lemma}%
6430          \crefname{corollary}{Korollar}{Korollarene}%
6431          \crefname{proposition}{P\aa stand}{P\aa standene}%
6432          \crefname{definition}{Definisjon}{Definisjonene}%
6433          \crefname{result}{Resultat}{Resultatene}%
6434          \crefname{example}{Eksempel}{Eksemplene}%
6435          \crefname{remark}{Bemerkning}{Bemerkningene}%
6436          \crefname{note}{Note}{Notene}%
6437          \crefname{algorithm}{Algoritme}{Algoritmene}%
6438          \crefname{listing}{Opplisting}{Opplistingene}%
6439          \crefname{line}{Linje}{Linjene}%
6440  %
6441        \else%
6442          \crefname{equation}{likning}{likningene}%
6443          \crefname{figure}{figur}{figurene}%
6444          \crefname{subfigure}{figur}{figurene}%
6445          \crefname{table}{tabell}{tabellene}%
6446          \crefname{subtable}{tabell}{tabellene}%
6447          \crefname{page}{side}{siden}%
6448          \crefname{part}{del}{delene}%
6449          \crefname{chapter}{kapittel}{kapitlene}%
6450          \crefname{section}{avsnitt}{avsnittene}%
6451          \crefname{subsection}{avsnitt}{avsnittene}%
6452          \crefname{subsubsection}{avsnitt}{avsnittene}%
6453          \crefname{appendix}{tillegg}{tilleggene}%
6454          \crefname{subappendix}{tillegg}{tilleggene}%
6455          \crefname{subsubappendix}{tillegg}{tilleggene}%
6456          \crefname{subsubsubappendix}{tillegg}{tilleggene}%
6457          \crefname{enumi}{punkt}{punktene}%
6458          \crefname{enumii}{punkt}{punktene}%
6459          \crefname{enumiii}{punkt}{punktene}%
6460          \crefname{enumiv}{punkt}{punktene}%
6461          \crefname{enumv}{punkt}{punktene}%
6462          \crefname{footnote}{fotnote}{fotnotene}%
6463          \crefname{theorem}{teorem}{teoremene}%
6464          \crefname{lemma}{lemma}{lemma}%
6465          \crefname{corollary}{korollar}{korollarene}%
6466          \crefname{proposition}{p\aa stand}{p\aa standene}%
6467          \crefname{definition}{definisjon}{definisjonene}%
6468          \crefname{result}{resultat}{resultatene}%
6469          \crefname{example}{eksempel}{eksemplene}%
6470          \crefname{remark}{bemerkning}{bemerkningene}%
6471          \crefname{note}{note}{notene}%
```

```
      \crefname{algorithm}{algoritme}{algoritmene}%
      \crefname{listing}{opplisting}{opplistingene}%
      \crefname{line}{linje}{linjene}%
    \fi%
  }}}
```

### 14.12.10 Danish

`danish` Danish translations courtesy of Benjamin Høyer.

```
\DeclareOption{danish}{%
  \PackageInfo{cleveref}{loaded danish language definitions}
```

First, we set up the definitions used at the beginning of the document to define the formats created by the document preamble.

```
  \AtBeginDocument{%
    \def\crefrangeconjunction@preamble{ til\nobreakspace}%
    \def\crefrangepreconjunction@preamble{}%
    \def\crefrangepostconjunction@preamble{}%
    \def\crefpairconjunction@preamble{ og\nobreakspace}%
    \def\crefmiddleconjunction@preamble{, }%
    \def\creflastconjunction@preamble{ og\nobreakspace}%
```

We have to define the group conjunctions explicitly here, rather than relying on fall-back definitions in terms of the above conjunctions (see Section 14.13), in case any other language option defines them explicitly and we need to override those.

```
    \def\crefpairgroupconjunction@preamble{ og\nobreakspace}%
    \def\crefmiddlegroupconjunction@preamble{, }%
    \def\creflastgroupconjunction@preamble{ og\nobreakspace}%
  %
    \Crefname@preamble{equation}{Ligning}{Ligninger}%
    \Crefname@preamble{figure}{Figur}{Figurer}%
    \Crefname@preamble{table}{Tabel}{Tabeller}%
    \Crefname@preamble{page}{Side}{Sider}%
    \Crefname@preamble{part}{Del}{Dele}%
    \Crefname@preamble{chapter}{Kapitel}{Kapitler}%
    \Crefname@preamble{section}{Afsnit}{Afsnit}%
    \Crefname@preamble{appendix}{Appendiks}{Appendiks}%
    \Crefname@preamble{enumi}{Punkt}{Punkter}%
    \Crefname@preamble{footnote}{Fodnote}{Fodnoter}%
    \Crefname@preamble{theorem}{Teorem}{Teoremer}%
    \Crefname@preamble{lemma}{Lemma}{Lemma}%
    \Crefname@preamble{corollary}{F\o lgeslutning}{F\o lgeslutninger}%
    \Crefname@preamble{proposition}{Udsagn}{Udsagn}%
    \Crefname@preamble{definition}{Definition}{Definitioner}%
    \Crefname@preamble{result}{Resultat}{Resultater}%
    \Crefname@preamble{example}{Eksempel}{Eksempler}%
    \Crefname@preamble{remark}{Bem\ae rkning}{Bem\ae rkninger}%
    \Crefname@preamble{note}{Note}{Noter}%
    \Crefname@preamble{algorithm}{Algoritme}{Algoritmer}%
```

```
    \Crefname@preamble{line}{Linje}{Linjer}%
%
    \if@cref@capitalise%
      \crefname@preamble{equation}{Ligning}{Ligninger}%
      \crefname@preamble{figure}{Figur}{Figurer}%
      \crefname@preamble{table}{Tabel}{Tabeller}%
      \crefname@preamble{page}{Side}{Sider}%
      \crefname@preamble{part}{Del}{Dele}%
      \crefname@preamble{chapter}{Kapitel}{Kapitler}%
      \crefname@preamble{section}{Afsnit}{Afsnit}%
      \crefname@preamble{appendix}{Appendiks}{Appendiks}%
      \crefname@preamble{enumi}{Punkt}{Punkter}%
      \crefname@preamble{footnote}{Fodnote}{Fodnoter}%
      \crefname@preamble{theorem}{Teorem}{Teoremer}%
      \crefname@preamble{lemma}{Lemma}{Lemma}%
      \crefname@preamble{corollary}{F\o lgeslutning}{F\o lgeslutninger}%
      \crefname@preamble{proposition}{Udsagn}{Udsagn}%
      \crefname@preamble{definition}{Definition}{Definitioner}%
      \crefname@preamble{result}{Resultat}{Resultater}%
      \crefname@preamble{example}{Eksempel}{Eksempler}%
      \crefname@preamble{remark}{Bem\ae rkning}{Bem\ae rkninger}%
      \crefname@preamble{note}{Note}{Noter}%
      \crefname@preamble{algorithm}{Algoritme}{Algoritmer}%
      \crefname@preamble{line}{Linje}{Linjer}%
%
    \else%
      \crefname@preamble{equation}{ligning}{ligninger}%
      \crefname@preamble{figure}{figur}{figurer}%
      \crefname@preamble{table}{tabel}{tabeller}%
      \crefname@preamble{page}{side}{sider}%
      \crefname@preamble{part}{del}{dele}%
      \crefname@preamble{chapter}{kapitel}{kapitler}%
      \crefname@preamble{section}{afsnit}{afsnit}%
      \crefname@preamble{appendix}{appendiks}{appendiks}%
      \crefname@preamble{enumi}{punkt}{punkter}%
      \crefname@preamble{footnote}{fodnote}{fodnoter}%
      \crefname@preamble{theorem}{teorem}{teoremer}%
      \crefname@preamble{lemma}{lemma}{lemma}%
      \crefname@preamble{corollary}{f\o lgeslutning}{f\o lgeslutninger}%
      \crefname@preamble{proposition}{udsagn}{udsagn}%
      \crefname@preamble{definition}{definition}{definitioner}%
      \crefname@preamble{result}{resultat}{resultater}%
      \crefname@preamble{example}{eksempel}{eksempler}%
      \crefname@preamble{remark}{bem\ae rkning}{bem\ae rkninger}%
      \crefname@preamble{note}{note}{noter}%
      \crefname@preamble{algorithm}{algoritme}{algoritmer}%
      \crefname@preamble{line}{linje}{linjer}%
    \fi%
    \def\cref@language{danish}%
```

Next, we add the definitions to `\extras...` so that `babel`'s `\selectlanguage` command will change the format appropriately.

```
    \cref@addto\extrasdanish{%
    \renewcommand{\crefrangeconjunction@preamble}{ til\nobreakspace}%
    \renewcommand\crefrangepreconjunction@preamble{}%
    \renewcommand\crefrangepostconjunction@preamble{}%
    \renewcommand{\crefpairconjunction@preamble}{ og\nobreakspace}%
    \renewcommand{\crefmiddleconjunction@preamble}{, }%
    \renewcommand{\creflastconjunction@preamble}{ og\nobreakspace}%
    \renewcommand{\crefpairgroupconjunction@preamble}{ og\nobreakspace}%
    \renewcommand{\crefmiddlegroupconjunction@preamble}{, }%
    \renewcommand{\creflastgroupconjunction@preamble}{ og\nobreakspace}%
%
    \Crefname{equation}{Ligning}{Ligninger}%
    \Crefname{figure}{Figur}{Figurer}%
    \Crefname{subfigure}{Figur}{Figurer}%
    \Crefname{table}{Tabel}{Tabeller}%
    \Crefname{subtable}{Tabel}{Tabeller}%
    \Crefname{page}{Side}{Sider}%
    \Crefname{part}{Del}{Dele}%
    \Crefname{chapter}{Kapitel}{Kapitler}%
    \Crefname{section}{Afsnit}{Afsnit}%
    \Crefname{subsection}{Afsnit}{Afsnit}%
    \Crefname{subsubsection}{Afsnit}{Afsnit}%
    \Crefname{appendix}{Appendiks}{Appendiks}%
    \Crefname{subappendix}{Appendiks}{Appendiks}%
    \Crefname{subsubappendix}{Appendiks}{Appendiks}%
    \Crefname{subsubsubappendix}{Appendiks}{Appendiks}%
    \Crefname{enumi}{Punkt}{Punkter}%
    \Crefname{enumii}{Punkt}{Punkter}%
    \Crefname{enumiii}{Punkt}{Punkter}%
    \Crefname{enumiv}{Punkt}{Punkter}%
    \Crefname{enumv}{Punkt}{Punkter}%
    \Crefname{footnote}{Fodnote}{Fodnoter}%
    \Crefname{theorem}{Teorem}{Teoremer}%
    \Crefname{lemma}{Lemma}{Lemma}%
    \Crefname{corollary}{F\o lgeslutning}{F\o lgeslutninger}%
    \Crefname{proposition}{Udsagn}{Udsagn}%
    \Crefname{definition}{Definition}{Definitioner}%
    \Crefname{result}{Resultat}{Resultater}%
    \Crefname{example}{Eksempel}{Eksempler}%
    \Crefname{remark}{Bem\ae rkning}{Bem\ae rkninger}%
    \Crefname{note}{Note}{Noter}%
    \Crefname{algorithm}{Algoritme}{Algoritmer}%
    \Crefname{line}{Linje}{Linjer}%
%
    \if@cref@capitalise%
      \crefname{equation}{Ligning}{Ligninger}%
      \crefname{figure}{Figur}{Figurer}%
```

```
      \crefname{subfigure}{Figur}{Figurer}%
      \crefname{table}{Tabel}{Tabeller}%
      \crefname{subtable}{Tabel}{Tabeller}%
      \crefname{page}{Side}{Sider}%
      \crefname{part}{Del}{Dele}%
      \crefname{chapter}{Kapitel}{Kapitler}%
      \crefname{section}{Afsnit}{Afsnit}%
      \crefname{subsection}{Afsnit}{Afsnit}%
      \crefname{subsubsection}{Afsnit}{Afsnit}%
      \crefname{appendix}{Appendiks}{Appendiks}%
      \crefname{subappendix}{Appendiks}{Appendiks}%
      \crefname{subsubappendix}{Appendiks}{Appendiks}%
      \crefname{subsubsubappendix}{Appendiks}{Appendiks}%
      \crefname{enumi}{Punkt}{Punkter}%
      \crefname{enumii}{Punkt}{Punkter}%
      \crefname{enumiii}{Punkt}{Punkter}%
      \crefname{enumiv}{Punkt}{Punkter}%
      \crefname{enumv}{Punkt}{Punkter}%
      \crefname{footnote}{Fodnote}{Fodnoter}%
      \crefname{theorem}{Teorem}{Teoremer}%
      \crefname{lemma}{Lemma}{Lemma}%
      \crefname{corollary}{F\o lgeslutning}{F\o lgeslutninger}%
      \crefname{proposition}{Udsagn}{Udsagn}%
      \crefname{definition}{Definition}{Definitioner}%
      \crefname{result}{Resultat}{Resultater}%
      \crefname{example}{Eksempel}{Eksempler}%
      \crefname{remark}{Bem\ae rkning}{Bem\ae rkninger}%
      \crefname{note}{Note}{Noter}%
      \crefname{algorithm}{Algoritme}{Algoritmer}%
      \crefname{line}{Linje}{Linjer}%
%
    \else%
      \crefname{equation}{ligning}{ligninger}%
      \crefname{figure}{figur}{figurer}%
      \crefname{subfigure}{figur}{figurer}%
      \crefname{table}{tabel}{tabeller}%
      \crefname{subtable}{tabel}{tabeller}%
      \crefname{page}{side}{sider}%
      \crefname{part}{del}{dele}%
      \crefname{chapter}{kapitel}{kapitler}%
      \crefname{section}{afsnit}{afsnit}%
      \crefname{subsection}{afsnit}{afsnit}%
      \crefname{subsubsection}{afsnit}{afsnit}%
      \crefname{appendix}{appendiks}{appendiks}%
      \crefname{subappendix}{appendiks}{appendiks}%
      \crefname{subsubappendix}{appendiks}{appendiks}%
      \crefname{subsubsubappendix}{appendiks}{appendiks}%
      \crefname{enumi}{punkt}{punkter}%
      \crefname{enumii}{punkt}{punkter}%
      \crefname{enumiii}{punkt}{punkter}%
```

```
      \crefname{enumiv}{punkt}{punkter}%
      \crefname{enumv}{punkt}{punkter}%
      \crefname{footnote}{fodnote}{fodnoter}%
      \crefname{theorem}{teorem}{teoremer}%
      \crefname{lemma}{lemma}{lemma}%
      \crefname{corollary}{f\o lgeslutning}{f\o lgeslutninger}%
      \crefname{proposition}{udsagn}{udsagn}%
      \crefname{definition}{definition}{definitioner}%
      \crefname{result}{resultat}{resultater}%
      \crefname{example}{eksempel}{eksempler}%
      \crefname{remark}{bem\ae rkning}{bem\ae rkninger}%
      \crefname{note}{note}{noter}%
      \crefname{algorithm}{algoritme}{algoritmer}%
      \crefname{line}{linje}{linjer}%
      \fi%
    }}}
```

## 14.13 Default Cross-Reference Formats

The `capitalise` and `nameinlink` options must be processed before we process any language options and define the default formats, so that they take effect in the default format definitions. Therefore, we have to manually check whether they're present, and force processing of those before the other options.

```
\edef\@curroptions{\@ptionlist{\@currname.\@currext}}%
\@expandtwoargs\in@{,capitalise,}{%
  ,\@classoptionslist,\@curroptions,}%
\ifin@%
  \ExecuteOptions{capitalise}%
\else%
  \@expandtwoargs\in@{,capitalize,}{%
    ,\@classoptionslist,\@curroptions,}%
  \ifin@%
    \ExecuteOptions{capitalise}%
  \fi%
\fi%
\@expandtwoargs\in@{,nameinlink,}{%
  ,\@classoptionslist,\@curroptions,}%
\ifin@%
  \ExecuteOptions{nameinlink}%
\fi%
```

`\crefdefaultlabelformat` `\creflabelformat` Define the default label formats, which don't depend on language. We override the default format for equations, to follow the near universal convention of enclosing equation labels in brackets. However, if the `nameinlink` option is enabled, the end of the hyperlink must come outside the group or it will cause LaTeX grouping errors, so we must define it differently in that case.

```
\crefdefaultlabelformat{#2#1#3}
\if@cref@nameinlink%
  \creflabelformat{equation}{#2\textup{(#1)}#3}%
```

```
\else%
  \creflabelformat{equation}{\textup{(#2#1#3)}}%
\fi
\@labelcrefdefinedefaultformats
```

Setup the default English format definitions, then process options in the order they were supplied.

```
\ExecuteOptions{english}
\ProcessOptions*\relax
```

Define the component-derived formats.

```
\AtBeginDocument{%
```

Use whatever's in the ... `@preamble` definitions at the beginning of the document to set up the default cross-reference names, unless overridden by explicit definitions.

```
  \edef\@tempa{%
    \expandafter\noexpand\csname extras\cref@language\endcsname}%
  \@ifundefined{crefrangeconjunction}{%
    \let\crefrangeconjunction\crefrangeconjunction@preamble%
  }{%
    \expandafter\def\expandafter\@tempb\expandafter{%
      \expandafter\renewcommand\expandafter%
      {\expandafter\crefrangeconjunction\expandafter}%
      \expandafter{\crefrangeconjunction}}%
    \expandafter\expandafter\expandafter\cref@addto%
      \expandafter\@tempa\expandafter{\@tempb}%
  }%
  \@ifundefined{crefrangepreconjunction}{%
    \let\crefrangepreconjunction\crefrangepreconjunction@preamble%
  }{%
    \expandafter\def\expandafter\@tempb\expandafter{%
      \expandafter\renewcommand\expandafter%
      {\expandafter\crefrangepreconjunction\expandafter}%
      \expandafter{\crefrangepreconjunction}}%
    \expandafter\expandafter\expandafter\cref@addto%
      \expandafter\@tempa\expandafter{\@tempb}%
  }%
  \@ifundefined{crefrangepostconjunction}{%
    \let\crefrangepostconjunction\crefrangepostconjunction@preamble%
  }{%
    \expandafter\def\expandafter\@tempb\expandafter{%
      \expandafter\renewcommand\expandafter%
      {\expandafter\crefrangepostconjunction\expandafter}%
      \expandafter{\crefrangepostconjunction}}%
    \expandafter\expandafter\expandafter\cref@addto%
      \expandafter\@tempa\expandafter{\@tempb}%
  }%
```

If the group conjunctions haven't been defined, but explicit definitions *have* been given for the reference list conjunctions, define the group conjunctions to be iden-

tical to the reference conjunctions.

```
\@ifundefined{crefpairconjunction}{%
  \let\crefpairconjunction\crefpairconjunction@preamble%
}{%
  \expandafter\def\expandafter\@tempb\expandafter{%
    \expandafter\renewcommand\expandafter%
    {\expandafter\crefpairconjunction\expandafter}%
    \expandafter{\crefpairconjunction}}%
  \expandafter\expandafter\expandafter\cref@addto%
    \expandafter\@tempa\expandafter{\@tempb}%
  \@ifundefined{crefpairgroupconjunction}{%
    \let\crefpairgroupconjunction\crefpairconjunction}{}%
}%
\@ifundefined{crefmiddleconjunction}{%
  \let\crefmiddleconjunction\crefmiddleconjunction@preamble%
}{%
  \expandafter\def\expandafter\@tempb\expandafter{%
    \expandafter\renewcommand\expandafter%
    {\expandafter\crefmiddleconjunction\expandafter}%
    \expandafter{\crefmiddleconjunction}}%
  \expandafter\expandafter\expandafter\cref@addto%
    \expandafter\@tempa\expandafter{\@tempb}%
  \@ifundefined{crefmiddlegroupconjunction}{%
    \let\crefmiddlegroupconjunction\crefmiddleconjunction}{}%
}%
\@ifundefined{creflastconjunction}{%
  \let\creflastconjunction\creflastconjunction@preamble%
}{%
  \expandafter\def\expandafter\@tempb\expandafter{%
    \expandafter\renewcommand\expandafter%
    {\expandafter\creflastconjunction\expandafter}%
    \expandafter{\creflastconjunction}}%
  \expandafter\expandafter\expandafter\cref@addto%
    \expandafter\@tempa\expandafter{\@tempb}%
```

Define the last group conjunction to include an extra comma.

```
  \@ifundefined{creflastgroupconjunction}{%
    \edef\creflastgroupconjunction{, \creflastconjunction}}{}%
}%
\@ifundefined{crefpairgroupconjunction}{%
  \let\crefpairgroupconjunction%
  \crefpairgroupconjunction@preamble%
}{%
  \expandafter\def\expandafter\@tempb\expandafter{%
    \expandafter\renewcommand\expandafter%
    {\expandafter\crefpairgroupconjunction\expandafter}%
    \expandafter{\crefpairgroupconjunction}}%
  \expandafter\expandafter\expandafter\cref@addto%
    \expandafter\@tempa\expandafter{\@tempb}%
}%
```

```
\@ifundefined{crefmiddlegroupconjunction}{%
  \let\crefmiddlegroupconjunction%
    \crefmiddlegroupconjunction@preamble%
}{%
  \expandafter\def\expandafter\@tempb\expandafter{%
    \expandafter\renewcommand\expandafter%
    {\expandafter\crefmiddlegroupconjunction\expandafter}%
    \expandafter{\crefmiddlegroupconjunction}}%
  \expandafter\expandafter\expandafter\cref@addto%
    \expandafter\@tempa\expandafter{\@tempb}%
}%
\@ifundefined{creflastgroupconjunction}{%
  \let\creflastgroupconjunction%
    \creflastgroupconjunction@preamble%
}{%
  \expandafter\def\expandafter\@tempb\expandafter{%
    \expandafter\renewcommand\expandafter%
    {\expandafter\creflastgroupconjunction\expandafter}%
    \expandafter{\creflastgroupconjunction}}%
  \expandafter\expandafter\expandafter\cref@addto%
    \expandafter\@tempa\expandafter{\@tempb}%
}%
```

Define any undefined formats listed in `\cref@label@types` using the components.

```
\let\@tempstack\cref@label@types%
\cref@isstackfull{\@tempstack}%
\@whilesw\if@cref@stackfull\fi{%
  \edef\@tempa{\cref@stack@top{\@tempstack}}%
  \@ifundefined{cref@\@tempa @name}{%
    \expandafter\def\expandafter\@tempb\expandafter{%
      \csname cref@\@tempa @name\endcsname}%
    \expandafter\def\expandafter\@tempc\expandafter{%
      \csname cref@\@tempa @name@preamble\endcsname}%
    \expandafter\expandafter\expandafter%
      \let\expandafter\@tempb\@tempc%
    \expandafter\def\expandafter\@tempb\expandafter{%
      \csname cref@\@tempa @name@plural\endcsname}%
    \expandafter\def\expandafter\@tempc\expandafter{%
      \csname cref@\@tempa @name@plural@preamble\endcsname}%
    \expandafter\expandafter\expandafter%
      \let\expandafter\@tempb\@tempc%
  }{%
    \edef\@tempb{%
      \expandafter\noexpand\csname extras\cref@language\endcsname}%
    \expandafter\def\expandafter\@tempc\expandafter{%
      \expandafter\crefname\expandafter{\@tempa}}%
    \expandafter\expandafter\expandafter\cref@addto%
    \expandafter\expandafter\expandafter\@tempc%
    \expandafter\expandafter\expandafter{%
```

```
      \expandafter\expandafter\expandafter{%
        \csname cref@\@tempa @name\endcsname}}%
    \expandafter\expandafter\expandafter\cref@addto%
    \expandafter\expandafter\expandafter\@tempc%
    \expandafter\expandafter\expandafter{%
      \expandafter\expandafter\expandafter{%
        \csname cref@\@tempa @name@plural\endcsname}}%
    \expandafter\expandafter\expandafter\cref@addto%
      \expandafter\@tempb\expandafter{\@tempc}%
  }%
  \@ifundefined{Cref@\@tempa @name}{%
    \expandafter\def\expandafter\@tempb\expandafter{%
      \csname Cref@\@tempa @name\endcsname}%
    \expandafter\def\expandafter\@tempc\expandafter{%
      \csname Cref@\@tempa @name@preamble\endcsname}%
    \expandafter\expandafter\expandafter%
      \let\expandafter\@tempb\@tempc%
    \expandafter\def\expandafter\@tempb\expandafter{%
      \csname Cref@\@tempa @name@plural\endcsname}%
    \expandafter\def\expandafter\@tempc\expandafter{%
      \csname Cref@\@tempa @name@plural@preamble\endcsname}%
    \expandafter\expandafter\expandafter%
      \let\expandafter\@tempb\@tempc%
  }{%
    \edef\@tempb{%
      \expandafter\noexpand\csname extras\cref@language\endcsname}%
    \expandafter\def\expandafter\@tempc\expandafter{%
      \expandafter\Crefname\expandafter{\@tempa}}%
    \expandafter\expandafter\expandafter\cref@addto%
    \expandafter\expandafter\expandafter\@tempc%
    \expandafter\expandafter\expandafter{%
      \expandafter\expandafter\expandafter{%
        \csname Cref@\@tempa @name\endcsname}}%
    \expandafter\expandafter\expandafter\cref@addto%
    \expandafter\expandafter\expandafter\@tempc%
    \expandafter\expandafter\expandafter{%
      \expandafter\expandafter\expandafter{%
        \csname Cref@\@tempa @name@plural\endcsname}}%
    \expandafter\expandafter\expandafter\cref@addto%
      \expandafter\@tempb\expandafter{\@tempc}%
  }%
```

We only define the reference-range and multi-reference formats if the plural form of the name is defined in the corresponding `\cref`⟨*type*⟩`@name@plural`. Though `\crefname` and `\Crefname` always define both the singular and plural forms together, cross-reference names can also be defined automatically by `\newtheorem`, which can only define the singular form. In this case, the singular form might be defined whilst the plural form is undefined. For symmetry, we apply the same logic to the normal cross-reference format definition (only defining it if `\cref`⟨*type*⟩`@name`

is defined), though currently this should always be the case.

```
\@ifundefined{cref@\@tempa @format}{%
  \@ifundefined{cref@\@tempa @name}{}{%
    \expandafter\@crefdefineformat\expandafter{\@tempa}}}{}%
\@ifundefined{crefrange@\@tempa @format}{%
  \@ifundefined{cref@\@tempa @name@plural}{}{%
    \expandafter\@crefrangedefineformat\expandafter{\@tempa}}}{}%
\@ifundefined{cref@\@tempa @format@first}{%
  \@ifundefined{cref@\@tempa @name@plural}{}{%
    \expandafter\@crefdefinemultiformat\expandafter{\@tempa}}}{}%
\@ifundefined{crefrange@\@tempa @format@first}{%
  \@ifundefined{cref@\@tempa @name@plural}{}{%
    \expandafter\@crefrangedefinemultiformat%
    \expandafter{\@tempa}}}{}%
\cref@stack@pop{\@tempstack}%
\cref@isstackfull{\@tempstack}}%
```

If formats for subsections are undefined, define them to be identical to the formats for sections.

```
\@ifundefined{cref@subsection@name}{%
  \let\cref@subsection@name\cref@section@name%
  \let\cref@subsection@name@plural\cref@section@name@plural}{}%
\@ifundefined{Cref@subsection@name}{%
  \let\Cref@subsection@name\Cref@section@name%
  \let\Cref@subsection@name@plural\Cref@section@name@plural}{}%
\@ifundefined{cref@subsection@format}{%
  \let\cref@subsection@format\cref@section@format}{}%
\@ifundefined{Cref@subsection@format}{%
  \let\Cref@subsection@format\Cref@section@format}{}%
\@ifundefined{crefrange@subsection@format}{%
  \let\crefrange@subsection@format%
  \crefrange@section@format}{}%
\@ifundefined{Crefrange@subsection@format}{%
  \let\Crefrange@subsection@format%
  \Crefrange@section@format}{}%
\@ifundefined{cref@subsection@format@first}{%
  \let\cref@subsection@format@first%
  \cref@section@format@first}{}%
\@ifundefined{Cref@subsection@format@first}{%
  \let\Cref@subsection@format@first%
  \Cref@section@format@first}{}%
\@ifundefined{cref@subsection@format@second}{%
  \let\cref@subsection@format@second%
  \cref@section@format@second}{}%
\@ifundefined{Cref@subsection@format@second}{%
  \let\Cref@subsection@format@second%
  \Cref@section@format@second}{}%
\@ifundefined{cref@subsection@format@middle}{%
  \let\cref@subsection@format@middle%
  \cref@section@format@middle}{}%
```

```
    \@ifundefined{Cref@subsection@format@middle}{%
      \let\Cref@subsection@format@middle%
      \Cref@section@format@middle}{}%
    \@ifundefined{cref@subsection@format@last}{%
      \let\cref@subsection@format@last%
      \cref@section@format@last}{}%
    \@ifundefined{Cref@subsection@format@last}{%
      \let\Cref@subsection@format@last%
      \Cref@section@format@last}{}%
    \@ifundefined{crefrange@subsection@format@first}{%
      \let\crefrange@subsection@format@first%
      \crefrange@section@format@first}{}%
    \@ifundefined{Crefrange@subsection@format@first}{%
      \let\Crefrange@subsection@format@first%
      \Crefrange@section@format@first}{}%
    \@ifundefined{crefrange@subsection@format@second}{%
      \let\crefrange@subsection@format@second%
      \crefrange@section@format@second}{}%
    \@ifundefined{Crefrange@subsection@format@second}{%
      \let\Crefrange@subsection@format@second%
      \Crefrange@section@format@second}{}%
    \@ifundefined{crefrange@subsection@format@middle}{%
      \let\crefrange@subsection@format@middle%
      \crefrange@section@format@middle}{}%
    \@ifundefined{Crefrange@subsection@format@middle}{%
      \let\Crefrange@subsection@format@middle%
      \Crefrange@section@format@middle}{}%
    \@ifundefined{crefrange@subsection@format@last}{%
      \let\crefrange@subsection@format@last%
      \crefrange@section@format@last}{}%
    \@ifundefined{Crefrange@subsection@format@last}{%
      \let\Crefrange@subsection@format@last%
      \Crefrange@section@format@last}{}%
%
    \@ifundefined{cref@subsubsection@name}{%
      \let\cref@subsubsection@name\cref@section@name%
      \let\cref@subsubsection@name@plural\cref@section@name@plural}{}%
    \@ifundefined{Cref@subsection@name}{%
      \let\Cref@subsection@name\Cref@section@name%
      \let\Cref@subsection@name@plural\Cref@section@name@plural}{}%
    \@ifundefined{cref@subsubsection@format}{%
      \let\cref@subsubsection@format%
      \cref@subsection@format}{}%
    \@ifundefined{Cref@subsubsection@format}{%
      \let\Cref@subsubsection@format%
      \Cref@subsection@format}{}%
    \@ifundefined{crefrange@subsubsection@format}{%
      \let\crefrange@subsubsection@format%
      \crefrange@subsection@format}{}%
    \@ifundefined{Crefrange@subsubsection@format}{%
```

```
    \let\Crefrange@subsubsection@format%
    \Crefrange@subsection@format}{}%
  \@ifundefined{cref@subsubsection@format@first}{%
    \let\cref@subsubsection@format@first%
    \cref@subsection@format@first}{}%
  \@ifundefined{Cref@subsubsection@format@first}{%
    \let\Cref@subsubsection@format@first%
    \Cref@subsection@format@first}{}%
  \@ifundefined{cref@subsubsection@format@second}{%
    \let\cref@subsubsection@format@second%
    \cref@subsection@format@second}{}%
  \@ifundefined{Cref@subsubsection@format@second}{%
    \let\Cref@subsubsection@format@second%
    \Cref@subsection@format@second}{}%
  \@ifundefined{cref@subsubsection@format@middle}{%
    \let\cref@subsubsection@format@middle%
    \cref@subsection@format@middle}{}%
  \@ifundefined{Cref@subsubsection@format@middle}{%
    \let\Cref@subsubsection@format@middle%
    \Cref@subsection@format@middle}{}%
  \@ifundefined{cref@subsubsection@format@last}{%
    \let\cref@subsubsection@format@last%
    \cref@subsection@format@last}{}%
  \@ifundefined{Cref@subsubsection@format@last}{%
    \let\Cref@subsubsection@format@last%
    \Cref@subsection@format@last}{}%
  \@ifundefined{crefrange@subsubsection@format@first}{%
    \let\crefrange@subsubsection@format@first%
    \crefrange@subsection@format@first}{}%
  \@ifundefined{Crefrange@subsubsection@format@first}{%
    \let\Crefrange@subsubsection@format@first%
    \Crefrange@subsection@format@first}{}%
  \@ifundefined{crefrange@subsubsection@format@second}{%
    \let\crefrange@subsubsection@format@second%
    \crefrange@subsection@format@second}{}%
  \@ifundefined{Crefrange@subsubsection@format@second}{%
    \let\Crefrange@subsubsection@format@second%
    \Crefrange@subsection@format@second}{}%
  \@ifundefined{crefrange@subsubsection@format@middle}{%
    \let\crefrange@subsubsection@format@middle%
    \crefrange@subsection@format@middle}{}%
  \@ifundefined{Crefrange@subsubsection@format@middle}{%
    \let\Crefrange@subsubsection@format@middle%
    \Crefrange@subsection@format@middle}{}%
  \@ifundefined{crefrange@subsubsection@format@last}{%
    \let\crefrange@subsubsection@format@last%
    \crefrange@subsection@format@last}{}%
  \@ifundefined{Crefrange@subsubsection@format@last}{%
    \let\Crefrange@subsubsection@format@last%
    \Crefrange@subsection@format@last}{}%
```

Similarly for subsections within appendices.

```
\@ifundefined{cref@subappendix@name}{%
  \let\cref@subappendix@name\cref@appendix@name%
  \let\cref@subappendix@name@plural%
    \cref@appendix@name@plural}{}%
\@ifundefined{Cref@subappendix@name}{%
  \let\Cref@subappendix@name\Cref@section@name%
  \let\Cref@subappendixsection@name@plural%
    \Cref@appendix@name@plural}{}%
\@ifundefined{cref@subappendix@format}{%
  \let\cref@subappendix@format\cref@appendix@format}{}%
\@ifundefined{Cref@subappendix@format}{%
  \let\Cref@subappendix@format\Cref@appendix@format}{}%
\@ifundefined{crefrange@subappendix@format}{%
  \let\crefrange@subappendix@format%
  \crefrange@appendix@format}{}%
\@ifundefined{Crefrange@subappendix@format}{%
  \let\Crefrange@subappendix@format%
  \Crefrange@appendix@format}{}%
\@ifundefined{cref@subappendix@format@first}{%
  \let\cref@subappendix@format@first%
  \cref@appendix@format@first}{}%
\@ifundefined{Cref@subappendix@format@first}{%
  \let\Cref@subappendix@format@first%
  \Cref@appendix@format@first}{}%
\@ifundefined{cref@subappendix@format@second}{%
  \let\cref@subappendix@format@second%
  \cref@appendix@format@second}{}%
\@ifundefined{Cref@subappendix@format@second}{%
  \let\Cref@subappendix@format@second%
  \Cref@appendix@format@second}{}%
\@ifundefined{cref@subappendix@format@middle}{%
  \let\cref@subappendix@format@middle%
  \cref@appendix@format@middle}{}%
\@ifundefined{Cref@subappendix@format@middle}{%
  \let\Cref@subappendix@format@middle%
  \Cref@appendix@format@middle}{}%
\@ifundefined{cref@subappendix@format@last}{%
  \let\cref@subappendix@format@last%
  \cref@appendix@format@last}{}%
\@ifundefined{Cref@subappendix@format@last}{%
  \let\Cref@subappendix@format@last%
  \Cref@appendix@format@last}{}%
\@ifundefined{crefrange@subappendix@format@first}{%
  \let\crefrange@subappendix@format@first%
  \crefrange@appendix@format@first}{}%
\@ifundefined{Crefrange@subappendix@format@first}{%
  \let\Crefrange@subappendix@format@first%
  \Crefrange@appendix@format@first}{}%
```

```
    \@ifundefined{crefrange@subappendix@format@second}{%
      \let\crefrange@subappendix@format@second%
      \crefrange@appendix@format@second}{}%
    \@ifundefined{Crefrange@subappendix@format@second}{%
      \let\Crefrange@subappendix@format@second%
      \Crefrange@appendix@format@second}{}%
    \@ifundefined{crefrange@subappendix@format@middle}{%
      \let\crefrange@subappendix@format@middle%
      \crefrange@appendix@format@middle}{}%
    \@ifundefined{Crefrange@subappendix@format@middle}{%
      \let\Crefrange@subappendix@format@middle%
      \Crefrange@appendix@format@middle}{}%
    \@ifundefined{crefrange@subappendix@format@last}{%
      \let\crefrange@subappendix@format@last%
      \crefrange@appendix@format@last}{}%
    \@ifundefined{Crefrange@subappendix@format@last}{%
      \let\Crefrange@subappendix@format@last%
      \Crefrange@appendix@format@last}{}%
%
    \@ifundefined{cref@subsubappendix@name}{%
      \let\cref@subsubappendix@name\cref@appendix@name%
      \let\cref@subsubappendix@name@plural%
        \cref@appendix@name@plural}{}%
    \@ifundefined{Cref@subsubappendix@name}{%
      \let\Cref@subsubappendix@name\Cref@section@name%
      \let\Cref@subsubappendixsection@name@plural%
        \Cref@appendix@name@plural}{}%
    \@ifundefined{cref@subsubappendix@format}{%
      \let\cref@subsubappendix@format%
      \cref@subappendix@format}{}%
    \@ifundefined{Cref@subsubappendix@format}{%
      \let\Cref@subsubappendix@format%
      \Cref@subappendix@format}{}%
    \@ifundefined{crefrange@subsubappendix@format}{%
      \let\crefrange@subsubappendix@format%
      \crefrange@subappendix@format}{}%
    \@ifundefined{Crefrange@subsubappendix@format}{%
      \let\Crefrange@subsubappendix@format%
      \Crefrange@subappendix@format}{}%
    \@ifundefined{cref@subsubappendix@format@first}{%
      \let\cref@subsubappendix@format@first%
      \cref@subappendix@format@first}{}%
    \@ifundefined{Cref@subsubappendix@format@first}{%
      \let\Cref@subsubappendix@format@first%
      \Cref@subappendix@format@first}{}%
    \@ifundefined{cref@subsubappendix@format@second}{%
      \let\cref@subsubappendix@format@second%
      \cref@subappendix@format@second}{}%
    \@ifundefined{Cref@subsubappendix@format@second}{%
      \let\Cref@subsubappendix@format@second%
```

```
    \Cref@subappendix@format@second}{}%
  \@ifundefined{cref@subsubappendix@format@middle}{%
    \let\cref@subsubappendix@format@middle%
    \cref@subappendix@format@middle}{}%
  \@ifundefined{Cref@subsubappendix@format@middle}{%
    \let\Cref@subsubappendix@format@middle%
    \Cref@subappendix@format@middle}{}%
  \@ifundefined{cref@subsubappendix@format@last}{%
    \let\cref@subsubappendix@format@last%
    \cref@subappendix@format@last}{}%
  \@ifundefined{Cref@subsubappendix@format@last}{%
    \let\Cref@subsubappendix@format@last%
    \Cref@subappendix@format@last}{}%
  \@ifundefined{crefrange@subsubappendix@format@first}{%
    \let\crefrange@subsubappendix@format@first%
    \crefrange@subappendix@format@first}{}%
  \@ifundefined{Crefrange@subsubappendix@format@first}{%
    \let\Crefrange@subsubappendix@format@first%
    \Crefrange@subappendix@format@first}{}%
  \@ifundefined{crefrange@subsubappendix@format@second}{%
    \let\crefrange@subsubappendix@format@second%
    \crefrange@subappendix@format@second}{}%
  \@ifundefined{Crefrange@subsubappendix@format@second}{%
    \let\Crefrange@subsubappendix@format@second%
    \Crefrange@subappendix@format@second}{}%
  \@ifundefined{crefrange@subsubappendix@format@middle}{%
    \let\crefrange@subsubappendix@format@middle%
    \crefrange@subappendix@format@middle}{}%
  \@ifundefined{Crefrange@subsubappendix@format@middle}{%
    \let\Crefrange@subsubappendix@format@middle%
    \Crefrange@subappendix@format@middle}{}%
  \@ifundefined{crefrange@subsubappendix@format@last}{%
    \let\crefrange@subsubappendix@format@last%
    \crefrange@subappendix@format@last}{}%
  \@ifundefined{Crefrange@subsubappendix@format@last}{%
    \let\Crefrange@subsubappendix@format@last%
    \Crefrange@subappendix@format@last}{}%
%
  \@ifundefined{cref@subsubsubappendix@format}{%
    \let\cref@subsubsubappendix@format%
    \cref@subsubappendix@format}{}%
  \@ifundefined{Cref@subsubsubappendix@format}{%
    \let\Cref@subsubsubappendix@format%
    \Cref@subsubappendix@format}{}%
  \@ifundefined{crefrange@subsubsubappendix@format}{%
    \let\crefrange@subsubsubappendix@format%
    \crefrange@subsubappendix@format}{}%
  \@ifundefined{Crefrange@subsubsubappendix@format}{%
    \let\Crefrange@subsubsubappendix@format%
    \Crefrange@subsubappendix@format}{}%
```

```
  \@ifundefined{cref@subsubsubappendix@format@first}{%
    \let\cref@subsubsubappendix@format@first%
    \cref@subsubappendix@format@first}{}%
  \@ifundefined{Cref@subsubsubappendix@format@first}{%
    \let\Cref@subsubsubappendix@format@first%
    \Cref@subsubappendix@format@first}{}%
  \@ifundefined{cref@subsubsubappendix@format@second}{%
    \let\cref@subsubsubappendix@format@second%
    \cref@subsubappendix@format@second}{}%
  \@ifundefined{Cref@subsubsubappendix@format@second}{%
    \let\Cref@subsubsubappendix@format@second%
    \Cref@subsubappendix@format@second}{}%
  \@ifundefined{cref@subsubsubappendix@format@middle}{%
    \let\cref@subsubsubappendix@format@middle%
    \cref@subsubappendix@format@middle}{}%
  \@ifundefined{Cref@subsubsubappendix@format@middle}{%
    \let\Cref@subsubsubappendix@format@middle%
    \Cref@subsubappendix@format@middle}{}%
  \@ifundefined{cref@subsubsubappendix@format@last}{%
    \let\cref@subsubsubappendix@format@last%
    \cref@subsubappendix@format@last}{}%
  \@ifundefined{Cref@subsubsubappendix@format@last}{%
    \let\Cref@subsubsubappendix@format@last%
    \Cref@subsubappendix@format@last}{}%
  \@ifundefined{crefrange@subsubsubappendix@format@first}{%
    \let\crefrange@subsubsubappendix@format@first%
    \crefrange@subsubappendix@format@first}{}%
  \@ifundefined{Crefrange@subsubsubappendix@format@first}{%
    \let\Crefrange@subsubsubappendix@format@first%
    \Crefrange@subsubappendix@format@first}{}%
  \@ifundefined{crefrange@subsubsubappendix@format@second}{%
    \let\crefrange@subsubsubappendix@format@second%
    \crefrange@subsubappendix@format@second}{}%
  \@ifundefined{Crefrange@subsubsubappendix@format@second}{%
    \let\Crefrange@subsubsubappendix@format@second%
    \Crefrange@subsubappendix@format@second}{}%
  \@ifundefined{crefrange@subsubsubappendix@format@middle}{%
    \let\crefrange@subsubsubappendix@format@middle%
    \crefrange@subsubappendix@format@middle}{}%
  \@ifundefined{Crefrange@subsubsubappendix@format@middle}{%
    \let\Crefrange@subsubsubappendix@format@middle%
    \Crefrange@subsubappendix@format@middle}{}%
  \@ifundefined{crefrange@subsubsubappendix@format@last}{%
    \let\crefrange@subsubsubappendix@format@last%
    \crefrange@subsubappendix@format@last}{}%
  \@ifundefined{Crefrange@subsubsubappendix@format@last}{%
    \let\Crefrange@subsubsubappendix@format@last%
    \Crefrange@subsubappendix@format@last}{}%
```

Ditto for subfigures and subtables.

```
\@ifundefined{cref@subfigure@format}{%
  \let\cref@subfigure@format%
  \cref@figure@format}{}%
\@ifundefined{Cref@subfigure@format}{%
  \let\Cref@subfigure@format%
  \Cref@figure@format}{}%
\@ifundefined{crefrange@subfigure@format}{%
  \let\crefrange@subfigure@format%
  \crefrange@figure@format}{}%
\@ifundefined{Crefrange@subfigure@format}{%
  \let\Crefrange@subfigure@format%
  \Crefrange@figure@format}{}%
\@ifundefined{cref@subfigure@format@first}{%
  \let\cref@subfigure@format@first%
  \cref@figure@format@first}{}%
\@ifundefined{Cref@subfigure@format@first}{%
  \let\Cref@subfigure@format@first%
  \Cref@figure@format@first}{}%
\@ifundefined{cref@subfigure@format@second}{%
  \let\cref@subfigure@format@second%
  \cref@figure@format@second}{}%
\@ifundefined{Cref@subfigure@format@second}{%
  \let\Cref@subfigure@format@second%
  \Cref@figure@format@second}{}%
\@ifundefined{cref@subfigure@format@middle}{%
  \let\cref@subfigure@format@middle%
  \cref@figure@format@middle}{}%
\@ifundefined{Cref@subfigure@format@middle}{%
  \let\Cref@subfigure@format@middle%
  \Cref@figure@format@middle}{}%
\@ifundefined{cref@subfigure@format@last}{%
  \let\cref@subfigure@format@last%
  \cref@figure@format@last}{}%
\@ifundefined{Cref@subfigure@format@last}{%
  \let\Cref@subfigure@format@last%
  \Cref@figure@format@last}{}%
\@ifundefined{crefrange@subfigure@format@first}{%
  \let\crefrange@subfigure@format@first%
  \crefrange@figure@format@first}{}%
\@ifundefined{Crefrange@subfigure@format@first}{%
  \let\Crefrange@subfigure@format@first%
  \Crefrange@figure@format@first}{}%
\@ifundefined{crefrange@subfigure@format@second}{%
  \let\crefrange@subfigure@format@second%
  \crefrange@figure@format@second}{}%
\@ifundefined{Crefrange@subfigure@format@second}{%
  \let\Crefrange@subfigure@format@second%
  \Crefrange@figure@format@second}{}%
\@ifundefined{crefrange@subfigure@format@middle}{%
  \let\crefrange@subfigure@format@middle%
```

```
      \crefrange@figure@format@middle}{}%
    \@ifundefined{Crefrange@subfigure@format@middle}{%
      \let\Crefrange@subfigure@format@middle%
      \Crefrange@figure@format@middle}{}%
    \@ifundefined{crefrange@subfigure@format@last}{%
      \let\crefrange@subfigure@format@last%
      \crefrange@figure@format@last}{}%
    \@ifundefined{Crefrange@subfigure@format@last}{%
      \let\Crefrange@subfigure@format@last%
      \Crefrange@figure@format@last}{}%
%
    \@ifundefined{cref@subtable@format}{%
      \let\cref@subtable@format%
      \cref@table@format}{}%
    \@ifundefined{Cref@subtable@format}{%
      \let\Cref@subtable@format%
      \Cref@table@format}{}%
    \@ifundefined{crefrange@subtable@format}{%
      \let\crefrange@subtable@format%
      \crefrange@table@format}{}%
    \@ifundefined{Crefrange@subtable@format}{%
      \let\Crefrange@subtable@format%
      \Crefrange@table@format}{}%
    \@ifundefined{cref@subtable@format@first}{%
      \let\cref@subtable@format@first%
      \cref@table@format@first}{}%
    \@ifundefined{Cref@subtable@format@first}{%
      \let\Cref@subtable@format@first%
      \Cref@table@format@first}{}%
    \@ifundefined{cref@subtable@format@second}{%
      \let\cref@subtable@format@second%
      \cref@table@format@second}{}%
    \@ifundefined{Cref@subtable@format@second}{%
      \let\Cref@subtable@format@second%
      \Cref@table@format@second}{}%
    \@ifundefined{cref@subtable@format@middle}{%
      \let\cref@subtable@format@middle%
      \cref@table@format@middle}{}%
    \@ifundefined{Cref@subtable@format@middle}{%
      \let\Cref@subtable@format@middle%
      \Cref@table@format@middle}{}%
    \@ifundefined{cref@subtable@format@last}{%
      \let\cref@subtable@format@last%
      \cref@table@format@last}{}%
    \@ifundefined{Cref@subtable@format@last}{%
      \let\Cref@subtable@format@last%
      \Cref@table@format@last}{}%
    \@ifundefined{crefrange@subtable@format@first}{%
      \let\crefrange@subtable@format@first%
      \crefrange@table@format@first}{}%
```

```
\@ifundefined{Crefrange@subtable@format@first}{%
  \let\Crefrange@subtable@format@first%
  \Crefrange@table@format@first}{}%
\@ifundefined{crefrange@subtable@format@second}{%
  \let\crefrange@subtable@format@second%
  \crefrange@table@format@second}{}%
\@ifundefined{Crefrange@subtable@format@second}{%
  \let\Crefrange@subtable@format@second%
  \Crefrange@table@format@second}{}%
\@ifundefined{crefrange@subtable@format@middle}{%
  \let\crefrange@subtable@format@middle%
  \crefrange@table@format@middle}{}%
\@ifundefined{Crefrange@subtable@format@middle}{%
  \let\Crefrange@subtable@format@middle%
  \Crefrange@table@format@middle}{}%
\@ifundefined{crefrange@subtable@format@last}{%
  \let\crefrange@subtable@format@last%
  \crefrange@table@format@last}{}%
\@ifundefined{Crefrange@subtable@format@last}{%
  \let\Crefrange@subtable@format@last%
  \Crefrange@table@format@last}{}%
```

Ditto for enums.

```
\@ifundefined{cref@enumii@format}{%
  \let\cref@enumii@format%
  \cref@enumi@format}{}%
\@ifundefined{Cref@enumii@format}{%
  \let\Cref@enumii@format%
  \Cref@enumi@format}{}%
\@ifundefined{crefrange@enumii@format}{%
  \let\crefrange@enumii@format%
  \crefrange@enumi@format}{}%
\@ifundefined{Crefrange@enumii@format}{%
  \let\Crefrange@enumii@format%
  \Crefrange@enumi@format}{}%
\@ifundefined{cref@enumii@format@first}{%
  \let\cref@enumii@format@first%
  \cref@enumi@format@first}{}%
\@ifundefined{Cref@enumii@format@first}{%
  \let\Cref@enumii@format@first%
  \Cref@enumi@format@first}{}%
\@ifundefined{cref@enumii@format@second}{%
  \let\cref@enumii@format@second%
  \cref@enumi@format@second}{}%
\@ifundefined{Cref@enumii@format@second}{%
  \let\Cref@enumii@format@second%
  \Cref@enumi@format@second}{}%
\@ifundefined{cref@enumii@format@middle}{%
  \let\cref@enumii@format@middle%
  \cref@enumi@format@middle}{}%
```

```
    \@ifundefined{Cref@enumii@format@middle}{%
      \let\Cref@enumii@format@middle%
      \Cref@enumi@format@middle}{}%
    \@ifundefined{cref@enumii@format@last}{%
      \let\cref@enumii@format@last%
      \cref@enumi@format@last}{}%
    \@ifundefined{Cref@enumii@format@last}{%
      \let\Cref@enumii@format@last%
      \Cref@enumi@format@last}{}%
    \@ifundefined{crefrange@enumii@format@first}{%
      \let\crefrange@enumii@format@first%
      \crefrange@enumi@format@first}{}%
    \@ifundefined{Crefrange@enumii@format@first}{%
      \let\Crefrange@enumii@format@first%
      \Crefrange@enumi@format@first}{}%
    \@ifundefined{crefrange@enumii@format@second}{%
      \let\crefrange@enumii@format@second%
      \crefrange@enumi@format@second}{}%
    \@ifundefined{Crefrange@enumii@format@second}{%
      \let\Crefrange@enumii@format@second%
      \Crefrange@enumi@format@second}{}%
    \@ifundefined{crefrange@enumii@format@middle}{%
      \let\crefrange@enumii@format@middle%
      \crefrange@enumi@format@middle}{}%
    \@ifundefined{Crefrange@enumii@format@middle}{%
      \let\Crefrange@enumii@format@middle%
      \Crefrange@enumi@format@middle}{}%
    \@ifundefined{crefrange@enumii@format@last}{%
      \let\crefrange@enumii@format@last%
      \crefrange@enumi@format@last}{}%
    \@ifundefined{Crefrange@enumii@format@last}{%
      \let\Crefrange@enumii@format@last%
      \Crefrange@enumi@format@last}{}%
%
    \@ifundefined{cref@enumiii@format}{%
      \let\cref@enumiii@format%
      \cref@enumii@format}{}%
    \@ifundefined{Cref@enumiii@format}{%
      \let\Cref@enumiii@format%
      \Cref@enumii@format}{}%
    \@ifundefined{crefrange@enumiii@format}{%
      \let\crefrange@enumiii@format%
      \crefrange@enumii@format}{}%
    \@ifundefined{Crefrange@enumiii@format}{%
      \let\Crefrange@enumiii@format%
      \Crefrange@enumii@format}{}%
    \@ifundefined{cref@enumiii@format@first}{%
      \let\cref@enumiii@format@first%
      \cref@enumii@format@first}{}%
    \@ifundefined{Cref@enumiii@format@first}{%
```

```
      \let\Cref@enumiii@format@first%
      \Cref@enumii@format@first}{}%
    \@ifundefined{cref@enumiii@format@second}{%
      \let\cref@enumiii@format@second%
      \cref@enumii@format@second}{}%
    \@ifundefined{Cref@enumiii@format@second}{%
      \let\Cref@enumiii@format@second%
      \Cref@enumii@format@second}{}%
    \@ifundefined{cref@enumiii@format@middle}{%
      \let\cref@enumiii@format@middle%
      \cref@enumii@format@middle}{}%
    \@ifundefined{Cref@enumiii@format@middle}{%
      \let\Cref@enumiii@format@middle%
      \Cref@enumii@format@middle}{}%
    \@ifundefined{cref@enumiii@format@last}{%
      \let\cref@enumiii@format@last%
      \cref@enumii@format@last}{}%
    \@ifundefined{Cref@enumiii@format@last}{%
      \let\Cref@enumiii@format@last%
      \Cref@enumii@format@last}{}%
    \@ifundefined{crefrange@enumiii@format@first}{%
      \let\crefrange@enumiii@format@first%
      \crefrange@enumii@format@first}{}%
    \@ifundefined{Crefrange@enumiii@format@first}{%
      \let\Crefrange@enumiii@format@first%
      \Crefrange@enumii@format@first}{}%
    \@ifundefined{crefrange@enumiii@format@second}{%
      \let\crefrange@enumiii@format@second%
      \crefrange@enumii@format@second}{}%
    \@ifundefined{Crefrange@enumiii@format@second}{%
      \let\Crefrange@enumiii@format@second%
      \Crefrange@enumii@format@second}{}%
    \@ifundefined{crefrange@enumiii@format@middle}{%
      \let\crefrange@enumiii@format@middle%
      \crefrange@enumii@format@middle}{}%
    \@ifundefined{Crefrange@enumiii@format@middle}{%
      \let\Crefrange@enumiii@format@middle%
      \Crefrange@enumii@format@middle}{}%
    \@ifundefined{crefrange@enumiii@format@last}{%
      \let\crefrange@enumiii@format@last%
      \crefrange@enumii@format@last}{}%
    \@ifundefined{Crefrange@enumiii@format@last}{%
      \let\Crefrange@enumiii@format@last%
      \Crefrange@enumii@format@last}{}%
%
    \@ifundefined{cref@enumiv@format}{%
      \let\cref@enumiv@format%
      \cref@enumiii@format}{}%
    \@ifundefined{Cref@enumiv@format}{%
      \let\Cref@enumiv@format%
```

```
    \Cref@enumiii@format}{}%
  \@ifundefined{crefrange@enumiv@format}{%
    \let\crefrange@enumiv@format%
    \crefrange@enumiii@format}{}%
  \@ifundefined{Crefrange@enumiv@format}{%
    \let\Crefrange@enumiv@format%
    \Crefrange@enumiii@format}{}%
  \@ifundefined{cref@enumiv@format@first}{%
    \let\cref@enumiv@format@first%
    \cref@enumiii@format@first}{}%
  \@ifundefined{Cref@enumiv@format@first}{%
    \let\Cref@enumiv@format@first%
    \Cref@enumiii@format@first}{}%
  \@ifundefined{cref@enumiv@format@second}{%
    \let\cref@enumiv@format@second%
    \cref@enumiii@format@second}{}%
  \@ifundefined{Cref@enumiv@format@second}{%
    \let\Cref@enumiv@format@second%
    \Cref@enumiii@format@second}{}%
  \@ifundefined{cref@enumiv@format@middle}{%
    \let\cref@enumiv@format@middle%
    \cref@enumiii@format@middle}{}%
  \@ifundefined{Cref@enumiv@format@middle}{%
    \let\Cref@enumiv@format@middle%
    \Cref@enumiii@format@middle}{}%
  \@ifundefined{cref@enumiv@format@last}{%
    \let\cref@enumiv@format@last%
    \cref@enumiii@format@last}{}%
  \@ifundefined{Cref@enumiv@format@last}{%
    \let\Cref@enumiv@format@last%
    \Cref@enumiii@format@last}{}%
  \@ifundefined{crefrange@enumiv@format@first}{%
    \let\crefrange@enumiv@format@first%
    \crefrange@enumiii@format@first}{}%
  \@ifundefined{Crefrange@enumiv@format@first}{%
    \let\Crefrange@enumiv@format@first%
    \Crefrange@enumiii@format@first}{}%
  \@ifundefined{crefrange@enumiv@format@second}{%
    \let\crefrange@enumiv@format@second%
    \crefrange@enumiii@format@second}{}%
  \@ifundefined{Crefrange@enumiv@format@second}{%
    \let\Crefrange@enumiv@format@second%
    \Crefrange@enumiii@format@second}{}%
  \@ifundefined{crefrange@enumiv@format@middle}{%
    \let\crefrange@enumiv@format@middle%
    \crefrange@enumiii@format@middle}{}%
  \@ifundefined{Crefrange@enumiv@format@middle}{%
    \let\Crefrange@enumiv@format@middle%
    \Crefrange@enumiii@format@middle}{}%
  \@ifundefined{crefrange@enumiv@format@last}{%
```

```
      \let\crefrange@enumiv@format@last%
      \crefrange@enumiii@format@last}{}%
    \@ifundefined{Crefrange@enumiv@format@last}{%
      \let\Crefrange@enumiv@format@last%
      \Crefrange@enumiii@format@last}{}%
%
    \@ifundefined{cref@enumv@format}{%
      \let\cref@enumv@format%
      \cref@enumiv@format}{}%
    \@ifundefined{Cref@enumv@format}{%
      \let\Cref@enumv@format%
      \Cref@enumiv@format}{}%
    \@ifundefined{crefrange@enumv@format}{%
      \let\crefrange@enumv@format%
      \crefrange@enumiv@format}{}%
    \@ifundefined{Crefrange@enumv@format}{%
      \let\Crefrange@enumv@format%
      \Crefrange@enumiv@format}{}%
    \@ifundefined{cref@enumv@format@first}{%
      \let\cref@enumv@format@first%
      \cref@enumiv@format@first}{}%
    \@ifundefined{Cref@enumv@format@first}{%
      \let\Cref@enumv@format@first%
      \Cref@enumiv@format@first}{}%
    \@ifundefined{cref@enumv@format@second}{%
      \let\cref@enumv@format@second%
      \cref@enumiv@format@second}{}%
    \@ifundefined{Cref@enumv@format@second}{%
      \let\Cref@enumv@format@second%
      \Cref@enumiv@format@second}{}%
    \@ifundefined{cref@enumv@format@middle}{%
      \let\cref@enumv@format@middle%
      \cref@enumiv@format@middle}{}%
    \@ifundefined{Cref@enumv@format@middle}{%
      \let\Cref@enumv@format@middle%
      \Cref@enumiv@format@middle}{}%
    \@ifundefined{cref@enumv@format@last}{%
      \let\cref@enumv@format@last%
      \cref@enumiv@format@last}{}%
    \@ifundefined{Cref@enumv@format@last}{%
      \let\Cref@enumv@format@last%
      \Cref@enumiv@format@last}{}%
    \@ifundefined{crefrange@enumv@format@first}{%
      \let\crefrange@enumv@format@first%
      \crefrange@enumiv@format@first}{}%
    \@ifundefined{Crefrange@enumv@format@first}{%
      \let\Crefrange@enumv@format@first%
      \Crefrange@enumiv@format@first}{}%
    \@ifundefined{crefrange@enumv@format@second}{%
      \let\crefrange@enumv@format@second%
```

```
      \crefrange@enumiv@format@second}{}%
    \@ifundefined{Crefrange@enumv@format@second}{%
      \let\Crefrange@enumv@format@second%
      \Crefrange@enumiv@format@second}{}%
    \@ifundefined{crefrange@enumv@format@middle}{%
      \let\crefrange@enumv@format@middle%
      \crefrange@enumiv@format@middle}{}%
    \@ifundefined{Crefrange@enumv@format@middle}{%
      \let\Crefrange@enumv@format@middle%
      \Crefrange@enumiv@format@middle}{}%
    \@ifundefined{crefrange@enumv@format@last}{%
      \let\crefrange@enumv@format@last%
      \crefrange@enumiv@format@last}{}%
    \@ifundefined{Crefrange@enumv@format@last}{%
      \let\Crefrange@enumv@format@last%
      \Crefrange@enumiv@format@last}{}%
%
  \let\cref@language\relax%
}%  end of \AtBeginDocument
```

## 14.14 `cleveref.cfg` Config File

`cleveref.cfg` If LaTeX can find a `cleveref.cfg` file in its search path, then we read in whatever's in it. The intended use of `cleveref.cfg` is to make it easy for authors to customise the cross-reference formats for all their documents, without having to manually include the definitions in every document preamble. In order for these customisations to override the default formats, we input `cleveref.cfg` right at the end, after the rest of `cleveref` has loaded.

```
\InputIfFileExists{cleveref.cfg}%
  {\PackageInfo{cleveref}{reading definitions from cleveref.cfg}}{}
```