

keytheorems package

version 0.0.8 β

github.com/mbertucci47/keytheorems

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Abstract

An experimental `expl3`-implementation of a key-value interface to `amsthm`, implementing most of the functionality provided by `thmtools`. Likely contains many bugs; use at your own risk!

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1 Dependencies

Without using the `tcolorbox`^{P.6} or `tcolorbox-no-titlebar`^{P.7} options, the package loads the `aliascnt`, `amsthm`, `refcount`, and `translations` packages.

2 Global Options

`\keytheoremset{<options>}`

Every key in this section can be given as a package option with `\usepackage[<options>]{keytheorems}` or in `\keytheoremset{<options>}`, with the exception that `continues-code`^{P.2} can only be used in the latter.

overload (initially unset)

Redefines `\newtheorem` to internally use the `keytheorems` machinery. The syntax remains the same.

thmtools-compat (initially unset)

For compatibility with `thmtools` syntax. Currently defines the following commands:

thmtools command	keytheorems replacement
<code>\declaretheorem</code>	<code>\newkeytheorem</code>
<code>\declaretheoremstyle</code>	<code>\newkeytheoremstyle</code> ^{→ P. 7}
<code>\listoftheorems</code>	<code>\listofkeytheorems</code> ^{→ P. 9}
<code>\addtotheoremheadhook</code>	
<code>\addtotheoremheadhook</code>	
<code>\addtotheoremfoothook</code>	<code>\addtotheoremhook</code> ^{→ P. 11}
<code>\addtotheoremfoothook</code>	
<code>restatable</code> environment	<code>store</code> ^{→ P. 3} key

Also defined are the `shaded` and `thmbox` keys, implemented internally with `tcolorbox` rather than the `shadethm` and `thmbox` packages, respectively.

store-all (initially unset)

Tells `keytheorems` to grab the body of each theorem so it can later be printed with the `print-body`^{→ P. 10} option of `\listofkeytheorems`^{→ P. 9}. Note that this means a theorem body *cannot* contain verbatim material.

restate-counters= \langle *comma-list of counters* \rangle (initially `{equation}`)

Additional counters whose values are preserved when a theorem is restated. This key does not reset the list, so you don't need to include `equation` in \langle *comma-list* \rangle .

continues-code= \langle *code with #1* \rangle (initially `\GetTranslation{keythms_continues}\pageref{#1}`)

The code used to typeset the note produced by the `continues`^{→ P. 3} key. If English or an unknown language is used, defaults to `continuing from p.\, \pageref{#1}`. Currently (likely inaccurate!) translations exist for French, German, and Spanish.

qed-symbol= \langle *symbol* \rangle (initially `\openbox`)

Redefines `\qedsymbol` to be \langle *symbol* \rangle .

auto-translate=`true|false` (default `true`, initially `true`)

If `false`, `keytheorems` does not automatically translate the title text for `\listofkeytheorems`^{→ P. 9} and the note produced by the `continues`^{→ P. 3} key. These texts can be manually customized with the `title`^{→ P. 10} and `continues-code` keys, respectively.

3 Defining Theorems

\newkeytheorem $\{$ \langle *env name* \rangle $\} [$ \langle *options* \rangle $]$

Defines a theorem environment \langle *env name* \rangle which itself takes a few options (see subsection 3.1). You can also declare multiple theorems at once by replacing \langle *env name* \rangle with a comma-list of names, e.g. `\newkeytheorem{theorem, lemma, proposition} [options]`.

By default, the theorem's printed name is a title-cased \langle *env name* \rangle . This can be changed with the `name`^{→ P. 4} key. All \langle *options* \rangle are described in subsections 3.2 and 3.3.

```
% preamble
\newkeytheorem{theorem}

% document
\begin{theorem}
Some text
\end{theorem}
```

Theorem 1. *Some text*

3.1 Keys available to theorem environments

As in `amsthm`, theorems can take an optional argument that contains a note or heading.

```
\begin{theorem}[some heading]
Some text
\end{theorem}
```

Theorem 2 (some heading). *Some text*

Alternatively, the optional argument may contain any of the following keys.

`note=<text>` (initially unset)

Alias `name`. This is the key-value equivalent of the optional argument described above. This syntax, however, allows the argument to contain other keys.

```
\begin{theorem}[some heading]
Some text
\end{theorem}
\begin{theorem}[note=another heading]
Some more text
\end{theorem}
```

Theorem 3 (some heading). *Some text*

Theorem 4 (another heading). *Some more text*

`short-note=<text>` (initially unset)

Alias `short-name`. This replaces the value of `note` when displayed in `\listofkeytheorems`^{P.9}.

`label=<label name>` (initially unset)

This is the key-value equivalent of `\begin{theorem} \label{<label name>}`.

```
\begin{theorem}[label=foo]
Some text
\end{theorem}
\ref{foo}
```

Theorem 5. *Some text*

5

`continues*=<label name>` (initially unset)

Pick up a theorem where you left off. The theorem number remains the same. The printed text can be customized with the `continues-code`^{P.2} option. The starred version also copies the theorem note, if it exists.

```
\begin{theorem}[continues=foo]
\dots and some more text.
\end{theorem}
```

Theorem 5 (continuing from p. 3). *... and some more text.*

`store=<tag>` (initially unset)

Alias `restate`. Stores the the theorem to be restated at any point in the document with `\getkeytheorem`^{P.8}.

```
\begin{theorem}[store=blub]
A theorem worth restating.
\end{theorem}
More brilliant mathematics.
\getkeytheorem{blub}
```

Theorem 6. *A theorem worth restating.*

More brilliant mathematics.

Theorem 6. *A theorem worth restating.*

A theorem given this key *cannot* contain verbatim material or other unexpected catcodes, such as a `tikz-cd` diagram. The latter issue can be averted with the `ampersand-replacement` key.

```

% preamble
\usepackage{tikz}
\usetikzlibrary{cd}

% document
\begin{lemma}[store=diagram]
Some commutative diagram:
\[\begin{tikzcd}[ampersand
\rightarrow replacement=\&
X\times_S Y \ar[r] \ar[d] \& X \ar[d]
\rightarrow \& \\
Y \ar[r] \& S
\end{tikzcd}\]
\end{lemma}
\dots
\getkeytheorem{diagram}

```

Lemma 7. *Some commutative diagram:*

$$\begin{array}{ccc}
 X \times_S Y & \longrightarrow & X \\
 \downarrow & & \downarrow \\
 Y & \longrightarrow & S
 \end{array}$$

...

Lemma 7. *Some commutative diagram:*

$$\begin{array}{ccc}
 X \times_S Y & \longrightarrow & X \\
 \downarrow & & \downarrow \\
 Y & \longrightarrow & S
 \end{array}$$

`listhack=true|false`

(initially false)

Meant only to be used with the `break`^{P.8} style key for a theorem starting with a list. Compare:

```

% preamble
\newkeytheoremstyle{breaksty}{break}
\newkeytheorem{observation}[style=breaksty]

% document
\begin{observation}
\begin{enumerate}
\item First item
\end{enumerate}
\end{observation}

\begin{observation}[listhack=true]
\begin{enumerate}
\item First item
\end{enumerate}
\end{observation}

```

Observation 1. *1. First item*

Observation 2.

1. First item

Note that the value `true` must be explicitly set so that `listhack` is not interpreted as the note text.

`seq=<name>`

(initially unset)

Adds the theorem to a custom sequence `<name>` that can then be listed with `\listofkeytheorems[seq=<name>]`. See `seq`^{P.10} for more details.

3.2 Keys inherited from thmtools

These are the `[<options>]` available to `\newkeytheorem`. Except for `name` and `style`^{P.5}, each key below can also be used in `\newkeytheoremstyle`^{P.7}. For more description, see the `thmtools` package.

`name=<display name>`

(initially title-cased `<env name>`)

Aliases `title` and `heading`.

```

% preamble
\newkeytheorem{mythm}[name=Some Name]

% document
\begin{mythm}
Some text
\end{mythm}

```

Some Name 1. *Some text*

`numbered=true|false|unless-unique` (default `true`, initially `true`)

For compatibility with `thmtools`, also accepts the values `yes`, `no`, and `unless unique`.

```
% preamble
\newkeytheorem{theorem}[
  name=Theorem, numbered=false
]

% document
\begin{theorem*}
An unnumbered theorem.
\end{theorem*}
```

Theorem. *An unnumbered theorem.*

`parent=<counter>` (initially unset)

Aliases `numberwithin` and `within`.

```
% preamble
\newkeytheorem{conjecture}[parent=section]

% document
\begin{conjecture}
The first number is the section.
\end{conjecture}
```

Conjecture 3.1. *The first number is the section.*

`sibling=<counter>` (initially unset)

Aliases `numberlike` and `sharenumber`.

```
% preamble
\newkeytheorem{lemma}[sibling=theorem]

% document
\begin{lemma}
This shares its counter with
\texttt{theorem}.
\end{lemma}
```

Lemma 8. *This shares its counter with theorem.*

`style=<style name>` (initially unset)

Accepts any `<style name>` defined by `\newkeytheoremstyle`^{P.7}, as well as any of the predefined `amsthm` styles: `plain`, `definition`, and `remark`.

```
% preamble
\newkeytheorem{remark}[style=remark]

% document
\begin{remark}
Some text
\end{remark}
```

Remark 1. Some text

`preheadhook=<code>` (initially unset)

`postheadhook=<code>` (initially unset)

`prefoothook=<code>` (initially unset)

`postfoothook=<code>` (initially unset)

Details in section 7.

```

% preamble
\newkeytheorem{test}[
  preheadhook=PREHEAD,
  postheadhook=POSTHEAD,
  prefoothook=PREFOOT,
  postfoothook=POSTFOOT
]

% document
\begin{test}
Some text
\end{test}

```

PREHEAD

Test 1. *POSTHEAD*Some text *PREFOOT*

POSTFOOT

refname= \langle ref name \rangle or $\{\langle$ singular name \rangle, \langle plural name $\rangle\}$ (initially \langle display name \rangle)

If a single string, then the name used by `hyperref`'s `\autoref` and `cleveref`'s `\cref`. If two strings separated by a comma, then the second string is the plural form used by `\cref`.

Refname= \langle ref name \rangle or $\{\langle$ singular name \rangle, \langle plural name $\rangle\}$ (initially \langle display name \rangle)

Same as **refname** but for `\Autoref` and `\Cref`. Note that `\Autoref` is defined by `keytheorems`, but requires `hyperref` to work.

```

% preamble
\newkeytheorem{prop}[
  name=Proposition,
  refname={proposition,propositions},
  Refname={Proposition,Propositions}
]

% document
\begin{prop}[label=abc]
Some text
\end{prop}
\begin{prop}[label=def]
Some more text
\end{prop}
\begin{theorem}
Consider \cref{abc,def}.
\Autoref{abc} \dots
\end{theorem}

```

Proposition 1. *Some text*

Proposition 2. *Some more text*

Theorem 9. *Consider propositions 1 and 2. Proposition 1 ...*

qed= \langle symbol \rangle (default `\openbox`, initially unset)

Adds \langle symbol \rangle to the end of the theorem body. If no value is given, the symbol \square is used.

```

% preamble
\newkeytheorem{example}[qed]
\newkeytheorem{solution}[qed=$\clubsuit$]

% document
\begin{example}
Some text
\end{example}
\begin{solution}
Some more text
\end{solution}

```

Example 1. *Some text*



Solution 1. *Some more text*



3.3 Keys added by `keytheorems`

tcolorbox= $\{\langle$ tcolorbox options $\rangle\}$ (initially unset)

This key specifies that the theorem be placed inside a `tcolorbox` environment with \langle options \rangle . The theorem head is typeset as a `tcolorbox` title; to avoid this see `tcolorbox-no-titlebar`^{P.7}.

```

% preamble
\tcbset{
  defstyle/.style={
    arc=0mm,
    colback=blue!5!white,
    colframe=blue!75!black
  },
}
\newkeytheorem{corollary}[tcolorbox]
\newkeytheorem{definition}[
  style=definition,
  tcolorbox={defstyle}
]

% document
\begin{corollary}
Some text
\end{corollary}
\begin{definition}
Some more text
\end{definition}

```

Corollary 1.

Some text

Definition 1.

Some more text

`tcolorbox-no-titlebar={\langle tcolorbox options \rangle}`

(initially unset)

Same usage as `tcolorbox`^{P.6} but the theorem head is typeset as usual, not as a `tcolorbox` title.

```

% preamble
\newkeytheorem{boxcor}[
  tcolorbox-no-titlebar={
    colback=red!10
  },
  name=Corollary,sibling=corollary
]

% document
\begin{boxcor}
Some text
\end{boxcor}

```

Corollary 2. *Some text*

4 Theorem Styles

`\newkeytheoremstyle{\langle name \rangle}{\langle options \rangle}`

This is `keytheorems`' version of `thmtools`' `\declaretheoremstyle[\langle options \rangle]{\langle name \rangle}`. Since it makes little sense to define a style with no keys, we've made the `\langle options \rangle` argument mandatory. Note that unlike `amsthm`'s `\newtheoremstyle`, this command will error if a style has already been defined. To overwrite an existing style, there is the analogous `\renewkeytheoremstyle`. For completeness, there is also `\declarekeytheoremstyle` and `\providekeytheoremstyle`.



For the AMS classes `amsart`, `amsbook`, and `amsproc`, as well as the `amsart`-based `acmart`, the initial key values are slightly different than what's below in order to match those class's defaults.

4.1 Keys inherited from `thmtools`

The following keys have the same meaning and syntax as the corresponding `thmtools` keys. In addition to the list below, most of the keys available to `\newkeytheorem`^{P.2} can be used in `\newkeytheoremstyle`.

`spaceabove=\langle length \rangle` (initially `\topsep`)

`spacebelow=\langle length \rangle` (initially `\topsep`)

`bodyfont`= $\langle font\ declarations \rangle$ (initially `\itshape`)

`headindent`= $\langle length \rangle$ (initially 0pt)

`headfont`= $\langle font\ declarations \rangle$ (initially `\bfseries`)

`headpunct`= $\langle code \rangle$ (initially `\{.\}`)

`postheadspace`= $\langle length \rangle$ (initially 5pt plus 1pt minus 1pt)
Do not use this with the `break` key.

`break` (initially unset)
Do not use this with the `postheadspace` key.

`notefont`= $\langle font\ declarations \rangle$ (initially `\fontseries\mddefault\upshape`)

`notebraces`= $\{\langle left\ brace \rangle\}\{\langle right\ brace \rangle\}$ (initially `\{()\}`)

`headstyle`=`margin`|`swapnumber`| $\langle code\ using\ \backslash NAME, \backslash NUMBER, and \backslash NOTE \rangle$
Alias `headstyle`. Within $\langle code \rangle$, the commands `\NAME`, `\NUMBER`, and `\NOTE` correspond to the formatted parts of the theorem head.

4.2 Keys added by keytheorems

`inherit-style`= $\langle style\ name \rangle$ (initially unset)
Inherit the keys of any style declared with `\newkeytheoremstyle`^{P.7}. Additionally, the three styles predefined by `amsthm` are possible values: `plain`, `definition`, and `remark`.

5 Restating Theorems

When a theorem is given the `store`^{P.3} key, the contents of the theorem are saved and written to a `.thlist` file. At the start of the next run, this file is input at the beginning of the document and allows you to retrieve the stored theorems at any point, before or after the original theorem.

`\getkeytheorem`[$\langle property \rangle$]{ $\langle tag \rangle$ }

Retrieves the theorem given the key `store`= $\langle tag \rangle$. An optional $\langle property \rangle$ can be given to retrieve only the corresponding part of the theorem. Currently only the property `body` is implemented, which retrieves the (unformatted) body of the theorem.

```
\getkeytheorem{mytag}
```

```
\begin{example}[store=mytag]
```

```
Fascinating example.
```

```
\end{example}
```

```
\getkeytheorem[body]{mytag}
```

Example 2. *Fascinating example.* ☐

Example 2. *Fascinating example.* ☐

Fascinating example.

`\IfRestatingTF`{ $\langle true\ code \rangle$ }{ $\langle false\ code \rangle$ }

Executes $\langle true\ code \rangle$ if being retrieved with `\getkeytheorem` and $\langle false\ code \rangle$ if in the original theorem.

```
\begin{example}[store=hmm]
```

```
I am the
```

```
\IfRestatingTF{restated}{original}
```

```
example!
```

```
\end{example}
```

```
\getkeytheorem{hmm}
```

Example 3. *I am the original example!* ☐

Example 3. *I am the restated example!* ☐

6 Listing Theorems

`\listofkeytheorems[\langle options \rangle]`

`\keytheoremset{\langle options \rangle}`

	List of Theorems
<code>\listofkeytheorems</code>	1 Theorem 2
	2 Theorem (some heading) 2
	3 Theorem (some heading) 3
	4 Theorem (another heading) . . 3
	5 Theorem 3
	5 Theorem (continuing from p. 3) 3
	6 Theorem 3
	7 Lemma 3
	1 Observation 4
	2 Observation 4
	1 Some Name 4
	Theorem 4
	3.1 Conjecture 5
	8 Lemma 5
	1 Remark 5
	1 Test 5
	1 Proposition 6
	2 Proposition 6
	9 Theorem 6
	1 Example 6
	1 Solution 6
	1 Corollary 6
	1 Definition 6
	2 Corollary 7
	2 Example 8
	3 Example 8

6.1 Keys inherited from thmtools

`numwidth=\langle length \rangle` (initially 2.3em)

`ignore={\langle comma-list of env names \rangle}` (initially unset)

`show={\langle comma-list of env names \rangle}` (initially all theorems)

`onlynamed={\langle comma-list of env names \rangle}` (initially unset)

`ignoreall` (initially unset)

<pre> \listofkeytheorems[ignoreall,show=theorem] \listofkeytheorems[ignoreall, show=conjecture, title=List of Conjectures] </pre>	<div> <div>List of Theorems</div> <div> 1 Theorem 2 2 Theorem (some heading) . . . 2 3 Theorem (some heading) . . . 3 4 Theorem (another heading) . 3 5 Theorem 3 5 Theorem (continuing from p. 3) 3 6 Theorem 3 9 Theorem 6 </div> </div> <div> <div>List of Conjectures</div> <div> 3.1 Conjecture 5 </div> </div>
---	--

`showall` (initially set)

`title=<text>` (initially `\GetTranslation{keythms_listof_title}`)
 Defaults to “List of Theorems” if English or an unknown language is used. Currently French, German, and Spanish have (likely inaccurate!) translations. A translation can be added with a GitHub pull request or manually with `\DeclareTranslation{<lang>}{keythms_listof_title}{<text>}`.

`swapnumber=true|false` (initially false)

6.2 Keys added by keytheorems

`onlynumbered={<comma-list of env names>}` (initially unset)

Similar to `onlynamed`^{→P.9}, but lists only those theorems which are numbered. This is useful if you’d like to exclude things like unnumbered definitions and remarks from the list of theorems.

`seq=<name>` (initially unset)

Used to list only the theorems added to the custom sequence `<name>` with the `seq`^{→P.4} theorem key. This is the only way to fully customize which theorems appear in the list of theorems.

`title-code=<code with #1>` (initially `\section*{#1}`)

If `\chapter` is defined, then initially this is instead `\chapter*{#1}`.

`no-title` (initially unset)

Suppresses the title of the list of theorems. Useful for custom ordering of the list.

<pre> \keytheoremset{ignoreall} \listofkeytheorems[show=example] \listofkeytheorems[show=solution,no-title] </pre>	<div> <div>List of Theorems</div> <div> 1 Example 6 2 Example 8 3 Example 8 1 Solution 6 </div> </div>
--	---

`note-code=<code with #1>` (initially `{ #1}`)

Formats the optional note in the list of theorems.

`print-body` (initially unset)

Instead of listing the theorem headings, the theorems are restated with their body text. Not very useful without the `store-all`^{→P.2} load-time option.

`no-continues=true|false` (initially false)

Suppresses the printing of theorems given the `continues`^{→P.3} key in the list of theorems.

`no-chapter-skip=true|false` (initially `false`)

By default a small vertical space is inserted between each chapter’s chunk of theorems. Setting this key to `true` removes this space.

`chapter-skip-length=<dimension>` (initially 10pt)

Controls the amount of space inserted between chunks.

6.3 Adding code to list of theorems

There are analogous commands to `\addcontentsline` and `\addtocontents` for adding entries or arbitrary code to the list of theorems.



You *must* use these commands rather than the aforementioned because the `.thlist` file is also used to define restated theorems and cannot contain unexpected code.

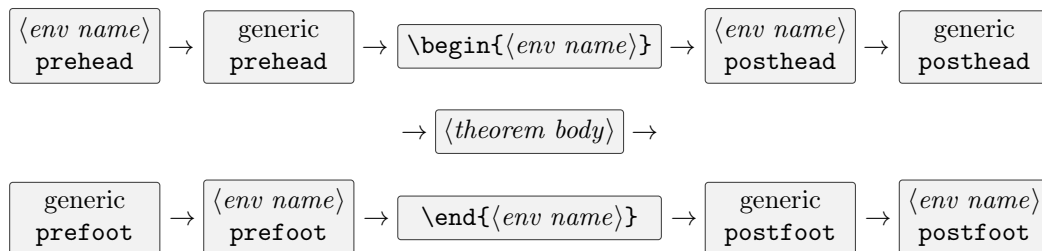
`\addtheoremcontentsline{<level>}{<text>}`

`\addtotheoremcontents{<code>}`

7 Theorem Hooks

`\addtotheoremhook[<env name>]{<hook name>}{<code>}`

`<hook name>` can be `prehead`, `posthead`, `prefoot`, `postfoot`, or `restated`. If no `<env name>` is given, the `<code>` is added to the “generic” hook, i.e. applied to all theorems. As in `thmtools`, the order of hooks is as follows:



The `restated` hook is applied at the start of theorems retrieved with `\getkeytheorem`, before the `prehead` hook. This can be useful for disabling commands such as `\footnote` in the restated theorems, e.g.

```

\addtotheoremhook{restated}{%
  \renewcommand\footnote[2][]{}%
}

```

By default, `keytheorems` disables the `\label` and `\RecordProperties` commands in restated theorems.

In `thmtools`, the `prefoot` and `postfoot` hooks always prepend code, i.e. the code

```

\addtotheoremhook{postfoot}{A}
\addtotheoremhook{postfoot}{B}

```

results in BA after the theorem. With `keytheorems`, code is added in the order declared, meaning

```

\addtotheoremhook{postfoot}{A}
\addtotheoremhook{postfoot}{B}

```

results in AB after the theorem. This is the behavior of the \LaTeX kernel hooks that `keytheorems` uses under the hood.

Right now, code added using the hook keys `preheadhook`^{P.5}, etc. is outermost, meaning executed first in `prehead` and `posthead` and last in `prefoot` and `postfoot`. This may change if I think of good reasons to do so...

8 Implementation

```

1  \ProvidesExplPackage{keytheorems}{2024-05-24}{0.0.8beta}{l3keys interface to amsthm}
2
3  %% TESTING
4  % \debug_on:n { all }
5  %% END TESTING
6
7  \RequirePackage{aliascnt} % for sibling theorems
8  \RequirePackage{amsthm}
9  % ~ams classes have way of ignoring this so don't need to check if they're loaded
10 \RequirePackage{refcount} % for \getrefnumber
11 \RequirePackage{translations} % for translating "List of Theorems"
12
13 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
14 %% Error Messages %%
15 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
16
17 \msg_new:nnn { keytheorems } { thmtools-before }
18 {
19     keytheorems~is~not~compatible~with~thmtools.~
20     Try~replacing~\protect\usepackage{thmtools}~with~
21     \protect\usepackage[thmtools-compat]{keytheorems}.
22 }
23 \msg_new:nnn { keytheorems } { thmtools-after }
24 {
25     keytheorems~is~not~compatible~with~thmtools.~
26     This~will~not~work~as~you~think!~
27     Try~replacing~\protect\usepackage{thmtools}~with~
28     \protect\usepackage[thmtools-compat]{keytheorems}.
29 }
30 \msg_new:nnn { keytheorems } { no-stored-theorem }
31 {
32     No~stored~theorem~'#1'~found!~
33     Try~compiling~again.~If~that~doesn't~work,~
34     check~the~spelling~of~'#1'.
35 }
36 \msg_new:nnn { keytheorems } { undefined-thm-hook }
37 {
38     No~theorem~hook~'#1'.~Check~the~spelling.~
39     Should~be~one~of~'prehead',~'posthead',~'prefoot',~'postfoot',~or~'restated'.
40 }
41 \msg_new:nnn { keytheorems } { no-Autorefname }
42 {
43     No~Autorefname~name~for~'#1'.
44 }
45 \msg_new:nnn { keytheorems } { thmstyle-undefined }
46 {
47     Theorem~style~'#1'~undefined.~
48     Use~\protect\newkeytheoremstyle\space instead.
49 }
50 \msg_new:nnn { keytheorems } { thmstyle-defined }
51 {
52     Theorem~style~'#1'~already~defined.~
53     Use~\protect\renewkeytheoremstyle\space instead.
54 }
55
56 % Error if thmtools loaded since compilation hangs.

```

```

57 % If thmtools loaded after, produce warning.
58 \IfPackageLoadedTF { thmtools }
59 {
60   \msg_fatal:nn { keytheorems } { thmtools-before }
61 }
62 {
63   \hook_gput_code:nnn { package/thmtools/before } { . }
64   {
65     \msg_warning:nn { keytheorems } { thmtools-after }
66   }
67 }
68
69 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
70 %%% Declare Variables %%%
71 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
72
73 \tl_new:N \l__keythms_tmpa_tl
74
75 \bool_new:N \g__keythms_listof_writefile_bool
76 \bool_gset_false:N \g__keythms_listof_writefile_bool
77 \bool_new:N \l__keythms_thm_numbered_bool
78 \bool_new:N \l__keythms_thm_unlessunique_bool
79 \bool_new:N \l__keythms_thmuse_listhack_bool
80 \bool_new:N \l__keythms_thmuse_restating_bool
81 \clist_new:N \g__keythms_restatecounters_clist
82 \clist_new:N \l__keythms_thmstyle_savedkeys_clist
83 \iow_new:N \g__keythms_listof_stream
84 \prop_new:N \g__keythms_thmnames_prop
85 \prop_new:N \g__keythms_thmuse_othercounters_prop
86 \prop_new:N \l__keythms_restate_counters_prop
87 \tl_new:N \l__keythms_thm_currentthmstyle_tl
88 \tl_new:N \l__keythms_thm_defaultkeys_tl
89 \tl_new:N \l__keythms_thm_envname_tl
90 \tl_new:N \l__keythms_thmstyle_defaultkeys_tl
91 \tl_new:N \l__keythms_thmstyle_lnotebrace_tl
92 \tl_new:N \l__keythms_thmstyle_rnotebrace_tl
93 \tl_new:N \l__keythms_thmuse_envname_tl
94 \tl_new:N \g__keythms_thmuse_temprestatedata_tl
95
96 \newcounter{keythms_restate_dummyctr}
97 \cs_gset:Npn \theHkeythms_restate_dummyctr
98   { restate.\arabic{keythms_restate_dummyctr} }
99 \cs_gset:Npn \thekeythms_restate_dummyctr { }
100 \newcounter{keythms_continues_dummyctr}
101 \cs_gset:Npn \theHkeythms_continues_dummyctr
102   { continues.\arabic{keythms_continues_dummyctr} }
103 \cs_gset:Npn \thekeythms_continues_dummyctr { }
104 \newcounter{keythms_unnumbered_dummyctr}
105 \cs_gset:Npn \theHkeythms_unnumbered_dummyctr
106   { unnumbered.\arabic{keythms_unnumbered_dummyctr} }
107 \cs_gset:Npn \thekeythms_unnumbered_dummyctr { }
108
109 \cs_generate_variant:Nn \hook_gput_code:nnn { nnV }
110 \cs_generate_variant:Nn \keys_precompile:nnN { nv, nVc }
111
112 % for detecting AMS classes
113 \prg_new_conditional:Npnn \keythms_if_amsclass: { T, TF }
114 {

```

```

115 \IfClassLoadedTF { amsart } { \prg_return_true: }
116 {
117     \IfClassLoadedTF { amsbook } { \prg_return_true: }
118     {
119         \IfClassLoadedTF { amsproc } { \prg_return_true: }
120         { \prg_return_false: }
121     }
122 }
123 }
124
125 %%%%%%%%%%%
126 %% Styles %%
127 %%%%%%%%%%%
128
129 % \_keythms_thmstyle_setbraces:nn { <left brace> } { <right brace> }
130 \cs_new_protected:Npn \_keythms_thmstyle_setbraces:nn #1#2
131 {
132     \tl_set:Nn \l__keythms_thmstyle_lnotebrace_tl { #1 }
133     \tl_set:Nn \l__keythms_thmstyle_rnotebrace_tl { #2 }
134 }
135 \cs_new:Npn \keythms_thmstyle_savethmkey_reqval:n #1
136 {
137     \clist_put_right:No \l__keythms_thmstyle_savedkeys_clist
138     { \l_keys_key_str = { #1 } }
139 }
140 \cs_new:Npn \keythms_thmstyle_savethmkey_optval:n #1
141 {
142     \tl_if_empty:NTF \l_keys_value_tl
143     {
144         \clist_put_right:No \l__keythms_thmstyle_savedkeys_clist
145         { \l_keys_key_str }
146     }
147     {
148         \clist_put_right:No \l__keythms_thmstyle_savedkeys_clist
149         { \l_keys_key_str = { #1 } }
150     }
151 }
152
153 \keys_define:nn { keytheorems/thmstyle }
154 {
155     spaceabove .tl_set:N = \l__keythms_thmstyle_spaceabove_tl,
156     spacebelow .tl_set:N = \l__keythms_thmstyle_spacebelow_tl,
157     bodyfont .tl_set:N = \l__keythms_thmstyle_bodyfont_tl,
158     headindent .tl_set:N = \l__keythms_thmstyle_headindent_tl,
159     headfont .tl_set:N = \l__keythms_thmstyle_headfont_tl,
160     headpunct .tl_set:N = \l__keythms_thmstyle_headpunct_tl,
161     postheadspace .tl_set:N = \l__keythms_thmstyle_postheadspace_tl,
162     break .meta:n = { postheadspace = \newline }, % add error if postheadspace set
163     break .value_forbidden:n = true,
164     notefont .tl_set:N = \l__keythms_thmstyle_notefont_tl,
165     notebraces .code:n = \exp_after:wN \_keythms_thmstyle_setbraces:nn #1,
166     headstyle .choice:,
167     headstyle / margin .code:n =
168     {
169         \cs_set:Nn \keythms_thmstyle_headcmd:nnn
170         { \makebox[Opt][r]{\NUMBER\ }\NAME\NOTE }
171     },
172     headstyle / swapnumber .code:n =

```

```

173     {
174         \cs_set:Nn \keythms_thmstyle_headcmd:nnn { \NUMBER\ \NAME\NOTE }
175     },
176     headstyle / unknown .cs_set:Np = \keythms_thmstyle_headcmd:nnn #1#2#3,
177     headformat .meta:n = { headstyle = #1 },
178     inherit-style .choice:,
179     inherit-style / plain .meta:n = {},
180     inherit-style / definition .meta:n = { bodyfont = \normalfont },
181     inherit-style / remark .meta:n =
182     {
183         headfont = \itshape,
184         bodyfont = \normalfont,
185         spaceabove = 0.5\topsep,
186         spacebelow = 0.5\topsep,
187     },
188     % thm keys that are saved for later
189     numbered .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
190     parent .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
191     numberwithin .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
192     within .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
193     sibling .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
194     numberlike .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
195     sharenumber .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
196     preheadhook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
197     postheadhook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
198     prefoothook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
199     postfoothook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
200     qed .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
201     tcolorbox .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
202     tcolorbox-no-titlebar .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
203 }
204
205 \cs_new_protected:Nn \keythms_thmstyle_thmname:n { \thmname{#1} }
206 \cs_new_protected:Nn \keythms_thmstyle_thmnumber:n { \thmnumber{#1} }
207 \cs_new_protected:Nn \keythms_thmstyle_thmnote:n { \thmnote{#1} }
208
209 %% NOTE: if these are used, user is in charge of spacing with \NAME and \NUMBER
210 %% QUESTION: should these be moved into def of \newkeytheoremstyle?
211 \cs_new:Npn \NAME { \keythms_thmstyle_thmname:n { ##1 } }
212 \cs_new:Npn \NUMBER
213 {
214     \keythms_thmstyle_thmnumber:n { \textup { ##2 } }
215 }
216 \cs_new:Npn \NOTE
217 {
218     \keythms_thmstyle_thmnote:n
219     { ~ \group_begin: % group so notefont doesn't affect headpunct
220       \exp_not:V \l__keythms_thmstyle_notefont_tl
221       \l__keythms_thmstyle_lnotebrace_tl ##3 \l__keythms_thmstyle_rnotebrace_tl
222       \group_end:
223     }
224 }
225
226 \cs_new:Npn \keythms_thmstyle_headcmd_default:nnn #1#2#3
227 {
228     \keythms_thmstyle_thmname:n { #1 }
229     \keythms_thmstyle_thmnumber:n
230     { \tl_if_empty:nF { #1 } { ~ } \exp_not:N \textup { #2 } }

```

```

231      % ~ this \tl_if_empty has no effect...
232      \keythms_thmstyle_thmnote:n
233      { ~ \group_begin: % group so notefont doesn't affect headpunct
234        \exp_not:V \l__keythms_thmstyle_notefont_tl
235        \l__keythms_thmstyle_lnotebrace_tl #3 \l__keythms_thmstyle_rnotebrace_tl
236        \group_end:
237      }
238    }
239
240    %%% <SURELY A BETTER WAY>
241    \cs_new_protected:Npn \__keythms_thmstyle_definekeylist:nn #1#2
242    {
243      \clist_const:cn { c__keythms_thmstyle_defaultkeys_ #1 _clist } { #2 }
244    }
245
246    \cs_new_protected:Npn \__keythms_thmstyle_setdefaultkeys:n #1
247    {
248      \keys_precompile:nvN { keytheorems/thmstyle }
249      { c__keythms_thmstyle_defaultkeys_ #1 _clist }
250      \l__keythms_thmstyle_defaultkeys_tl
251    }
252
253    \__keythms_thmstyle_definekeylist:nn { default }
254    {
255      spaceabove    = \topsep,
256      spacebelow    = \topsep,
257      bodyfont      = \itshape,
258      headindent    = 0pt,
259      headfont      = \bfseries,
260      headpunct     = {.,},
261      postheadspace = 5pt plus 1pt minus 1pt,
262      notefont      = \fontseries\mddefault\upshape,
263      notebraces    = {({}{)},
264      headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
265    }
266    \__keythms_thmstyle_definekeylist:nn { amsart }
267    {
268      spaceabove    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
269      spacebelow    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
270      bodyfont      = \itshape,
271      headindent    = 0pt,
272      headfont      = \bfseries,
273      headpunct     = {.,},
274      postheadspace = 5pt plus 1pt minus 1pt,
275      notefont      = \fontseries\mddefault\upshape,
276      notebraces    = {({}{)},
277      headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
278    }
279    \__keythms_thmstyle_definekeylist:nn { amsproc }
280    {
281      spaceabove    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
282      spacebelow    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
283      bodyfont      = \itshape,
284      headindent    = \parindent,
285      headfont      = \scshape,
286      headpunct     = {.,},
287      postheadspace = 5pt plus 1pt minus 1pt,
288      notefont      = \fontseries\mddefault\upshape,

```



```

289     notebraces      = {\}{},
290     headstyle        = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
291 }
292 \__keythms_thmstyle_definekeylist:nn { amsbook }
293 {
294     spaceabove       = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
295     spacebelow       = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
296     bodyfont         = \itshape,
297     headindent       = \parindent,
298     headfont         = \scshape,
299     headpunct        = {\.},
300     postheadspace    = 5pt plus 1pt minus 1pt,
301     notefont         = \fontseries\mddefault\upshape,
302     notebraces      = {\}{},
303     headstyle        = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
304 }
305 \__keythms_thmstyle_definekeylist:nn { acmart }
306 {
307     spaceabove       = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
308     spacebelow       = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
309     bodyfont         = \@acmplainbodyfont,
310     headindent       = \@acmplainindent,
311     headfont         = \@acmplainheadfont,
312     headpunct        = {\.},
313     postheadspace    = .5em,
314     notefont         = \@acmplainnotefont,
315     notebraces      = {\}{},
316     headstyle        = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
317 }
318
319 \IfClassLoadedTF { amsart }
320 {
321     \IfClassLoadedTF { acmart } % acmart loads amsart
322     {
323         \__keythms_thmstyle_setdefaultkeys:n { acmart }
324     }
325     {
326         \__keythms_thmstyle_setdefaultkeys:n { amsart }
327         \keys_define:nn { keytheorems/thmstyle }
328         {
329             inherit-style / remark .meta:n =
330             {
331                 headfont = \itshape,
332                 bodyfont = \normalfont,
333             }
334         }
335     }
336 }
337 {
338     \IfClassLoadedTF { amsbook }
339     {
340         \__keythms_thmstyle_setdefaultkeys:n { amsbook }
341         \keys_define:nn { keytheorems/thmstyle }
342         {
343             inherit-style / remark .meta:n =
344             {
345                 bodyfont = \normalfont,
346             },

```

```

347     }
348   }
349   {
350     \IfClassLoadedTF { amsproc }
351     {
352       \__keythms_thmstyle_setdefaultkeys:n { amsproc }
353       \keys_define:nn { keytheorems/thmstyle }
354       {
355         inherit-style / remark .meta:n =
356         {
357           bodyfont = \normalfont,
358         },
359       }
360     }
361     { \__keythms_thmstyle_setdefaultkeys:n { default } }
362   }
363 }
364 %%% </SURELY A BETTER WAY>
365
366 \NewDocumentCommand \newkeytheoremstyle { m m }
367 {
368   \cs_if_free:cTF { th@ #1 }
369   { \keythms_thmstyle_declarestyle:nn { #1 } { #2 } }
370   { \msg_error:nnn { keytheorems } { thmstyle-defined } { #1 } }
371 }
372 \NewDocumentCommand \renewkeytheoremstyle { m m }
373 {
374   \cs_if_free:cTF { th@ #1 }
375   { \msg_error:nnn { keytheorems } { thmstyle-undefined } { #1 } }
376   { \keythms_thmstyle_declarestyle:nn { #1 } { #2 } }
377 }
378 \NewDocumentCommand \providekeytheoremstyle { m m }
379 {
380   \cs_if_free:cT { th@ #1 }
381   { \keythms_thmstyle_declarestyle:nn { #1 } { #2 } }
382 }
383 \NewDocumentCommand \declarekeytheoremstyle { m m }
384 {
385   \keythms_thmstyle_declarestyle:nn { #1 } { #2 }
386 }
387
388 \@onlypreamble \newkeytheoremstyle
389 \@onlypreamble \renewkeytheoremstyle
390 \@onlypreamble \providekeytheoremstyle
391 \@onlypreamble \declarekeytheoremstyle
392
393 \cs_new_eq:NN \keythms_thmstyle_new:nnnnnnnn \newtheoremstyle
394 \cs_generate_variant:Nn \keythms_thmstyle_new:nnnnnnnn { nVVVVVVVe }
395
396 \cs_new_protected:Npn \keythms_thmstyle_declarestyle:nn #1#2
397 {
398   \clist_clear:N \l__keythms_thmstyle_savedkeys_clist
399   \tl_use:N \l__keythms_thmstyle_defaultkeys_tl
400   \keys_set:nn { keytheorems/thmstyle } { #2 }
401   \keythms_thmstyle_new:nVVVVVVVe { #1 }
402   \l__keythms_thmstyle_spaceabove_tl
403   \l__keythms_thmstyle_spacebelow_tl
404   \l__keythms_thmstyle_bodyfont_tl

```

```

405 \l__keythms_thmstyle_headindent_tl
406 \l__keythms_thmstyle_headfont_tl
407 \l__keythms_thmstyle_headpunct_tl
408 \l__keythms_thmstyle_postheadspace_tl
409 { \text_expand:n { \keythms_thmstyle_headcmd:nnn{##1}{##2}{##3} } }
410 % Define new inherit-style key
411 \keys_define:nn { keytheorems/thmstyle }
412 { inherit-style / #1 .meta:n = { #2 } }
413 \tl_if_exist:cF { l__keythms_thmstyle_ #1 _savedkeys_tl }
414 { \tl_new:c { l__keythms_thmstyle_ #1 _savedkeys_tl } }
415 \keys_precompile:nVc { keytheorems/thm }
416 \l__keythms_thmstyle_savedkeys_clist
417 { l__keythms_thmstyle_ #1 _savedkeys_tl }
418 }
419
420 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
421 %%% Defining Theorems %%%
422 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
423
424 % FIX: reimplement these without \NewDocumentCommand and \SplitArgument
425
426 % \keythms_thm_setrefnames:n { <envname> } { <refname> or <sing,plural> }
427 \NewDocumentCommand \keythms_thm_setrefnames:nn
428 { m >\SplitArgument{1}{,}} m }
429 { \__keythms_thm_setrefnames_aux:nnn{#1}#2 }
430 \cs_new_protected:Npn \__keythms_thm_setrefnames_aux:nnn #1#2#3
431 {
432 \cs_set:cpn { #1 autorefname } { #2 }
433 \IfPackageLoadedTF { cleveref }
434 {
435 \tl_if_novalue:nTF { #3 }
436 { \crefname{#1}{#2}{\textbf{??~(pl.~#2)}} }
437 { \crefname{#1}{#2}{#3} }
438 }
439 { }
440 }
441 \cs_generate_variant:Nn \keythms_thm_setrefnames:nn { nV }
442
443 % \keythms_thm_setRefnames:n { <envname> } { <refname> or <sing,plural> }
444 \NewDocumentCommand \keythms_thm_setRefnames:nn
445 { m >\SplitArgument{1}{,}} m }
446 { \__keythms_thm_setRefnames_aux:nnn{#1}#2 }
447 \cs_new_protected:Npn \__keythms_thm_setRefnames_aux:nnn #1#2#3
448 {
449 \cs_set:cpn { #1 Autorefname } { #2 }
450 \IfPackageLoadedTF { cleveref }
451 {
452 \tl_if_novalue:nTF { #3 }
453 { \Crefname{#1}{#2}{\textbf{??~(pl.~#2)}} }
454 { \Crefname{#1}{#2}{#3} }
455 }
456 { }
457 }
458 \cs_generate_variant:Nn \keythms_thm_setRefnames:nn { nV }
459
460 \keys_define:nn { keytheorems/thm }
461 {
462 name .tl_set:N = \l__keythms_thm_name_tl,

```

```

463 title .meta:n = { name = #1 },
464 heading .meta:n = { name = #1 },
465 refname .tl_set:N = \l__keythms_thm_refname_tl,
466 Refname .tl_set:N = \l__keythms_thm_Refname_tl,
467 numbered .choice:,
468 numbered / true .code:n = \bool_set_true:N \l__keythms_thm_numbered_bool,
469 numbered / false .code:n = \bool_set_false:N \l__keythms_thm_numbered_bool,
470 numbered / yes .meta:n = { numbered = true },
471 numbered / no .meta:n = { numbered = false },
472 numbered / unless-unique .code:n =
473 {
474 \bool_set_true:N \l__keythms_thm_unlessunique_bool
475 },
476 numbered / unless-unique .meta:n = { numbered = unless-unique },
477 numbered .default:n = true,
478 parent .tl_set:N = \l__keythms_thm_parent_tl,
479 numberwithin .meta:n = { parent = #1 },
480 within .meta:n = { parent = #1 },
481 sibling .tl_set:N = \l__keythms_thm_sibling_tl,
482 numberlike .meta:n = { sibling = #1 },
483 sharenumber .meta:n = { sibling = #1 },
484 style .tl_set:N = \l__keythms_thm_style_tl,
485 style .groups:n = { style-comes-first },
486 preheadhook .tl_set:N = \l__keythms_thm_preheadhook_tl,
487 postheadhook .tl_set:N = \l__keythms_thm_postheadhook_tl,
488 prefoothook .tl_set:N = \l__keythms_thm_prefoothook_tl,
489 postfoothook .tl_set:N = \l__keythms_thm_postfoothook_tl,
490 qed .tl_set:N = \l__keythms_thm_qed_tl,
491 qed .default:n = \c_novalue_tl,
492 % ~ distinguish between 'qed' and 'qed={}'
493 tcolorbox .tl_set:N = \l__keythms_thm_tcbkeys_tl,
494 tcolorbox .default:n = {},
495 tcolorbox-no-titlebar .meta:n =
496 {
497 tcolorbox={
498 notitle,
499 before~upper={
500 \group_begin:
501 \__keythms_thm_tcbxtemphead:
502 \group_end:
503 },
504 #1
505 }
506 },
507 tcolorbox-no-titlebar .default:n = {},
508 }
509
510 % what below is unnecessary? Commenting everything but \def causes spaceabove,
511 % etc. to not work
512 \cs_new:Npn \__keythms_thm_storedeferredthmhead:n #1
513 {
514 % \if@inlabel \indent \par \fi % eject a section head if one is pending
515 % \if@nobreak
516 % \adjust@parskip@nobreak
517 % \else
518 % \addpenalty\@beginparpenalty
519 \addvspace\@topsep
520 \addvspace{-\parskip}

```

```

521 % \fi
522 % \global\@inlabeltrue
523 % \everypar\dtb@everypar
524 \cs_set:Npn \__keythms_thm_tcbxtemphead: { \normalfont #1 }
525 \ignorespaces
526 }
527
528 \keys_precompile:nnN { keytheorems/thm }
529 {
530     name          = \q_no_value,
531     refname       = \q_no_value,
532     Refname       = \q_no_value,
533     numbered      = true,
534     parent        = {},
535     sibling        = {},
536     style         = {},
537     preheadhook   = {},
538     postheadhook  = {},
539     prefoothook   = {},
540     postfoothook  = {},
541     qed           = \q_no_value,
542     tcolorbox     = \q_no_value,
543 }
544 \l__keythms_thm_defaultkeys_tl
545
546 \cs_new_protected:Npn \__keythms_thm_makethmhooks:n #1
547 {
548     \hook_new:n { keytheorems/#1/prehead }
549     \hook_new:n { keytheorems/#1/posthead }
550     \hook_new_reversed:n { keytheorems/#1/prefoot }
551     \hook_new_reversed:n { keytheorems/#1/postfoot }
552     \hook_new:n { keytheorems/#1/restated }
553 }
554
555 % Make generic theorem hooks
556 \__keythms_thm_makethmhooks:n { allthms }
557
558 % \newkeytheorem{<name>}{<keys>}
559 \NewDocumentCommand \newkeytheorem { m O{} }
560 {
561     \clist_map_inline:nn { #1 } % define multiple theorems at once
562     { \keythms_thm_newkeythm:nn { ##1 } { #2 } }
563 }
564
565 \@onlypreamble \newkeytheorem
566
567 % to prevent error when plain, remark, or definition style used
568 \tl_new:N \l__keythms_thmstyle_plain_savedkeys_tl
569 \tl_new:N \l__keythms_thmstyle_remark_savedkeys_tl
570 \tl_new:N \l__keythms_thmstyle_definition_savedkeys_tl
571
572 % \keythms_thm_newkeythm:nn { <envname> } { <keys> }
573 \cs_new_protected:Npn \keythms_thm_newkeythm:nn #1#2
574 {
575     % Store envname
576     \tl_set:Nn \l__keythms_thm_envname_tl { #1 }
577     % Make unless-unique false by default (can't precompile this)
578     \bool_set_false:N \l__keythms_thm_unlessunique_bool

```

```

579 % Set default keys
580 \tl_use:N \l__keythms_thm_defaultkeys_tl
581 % First set style so we can pick up additional thm keys, then overwrite if necessary
582 \keys_set:groups:n { keytheorems/thm } { style-comes-first } { #2 }
583 \tl_if_empty:NF \l__keythms_thm_style_tl
584 {
585   % Store theorem style
586   \tl_set:Ne \l__keythms_thm_currentthmstyle_tl { \the\thm@style }
587   % Temporarily set theorem style
588   \__keythms_theoremstyle:n { \l__keythms_thm_style_tl }
589   % If thm keys given in style, call now (possibly overwritten in next step)
590   % but don't error if user uses a style defined with just \newtheoremstyle
591   \tl_if_exist:cT { l__keythms_thmstyle_ \l__keythms_thm_style_tl _savedkeys_tl }
592     { \tl_use:c { l__keythms_thmstyle_ \l__keythms_thm_style_tl _savedkeys_tl } }
593 }
594 % Set env-specific keys
595 \keys_set:nn { keytheorems/thm } { #2 }
596 % Set up env-specific hooks
597 \__keythms_thm_makethmhooks:n { #1 }
598 % Add to env-specific hooks (use label so code given in keys is outermost)
599 % NOTE: faster to check if empty than add empty code to hook
600 \tl_if_empty:NF \l__keythms_thm_preheadhook_tl
601 {
602   \hook_gput_code:nnV { keytheorems/#1/prehead }
603     { keythms_hook_keys } \l__keythms_thm_preheadhook_tl
604 }
605 \tl_if_empty:NF \l__keythms_thm_postheadhook_tl
606 {
607   \hook_gput_code:nnV { keytheorems/#1/posthead }
608     { keythms_hook_keys } \l__keythms_thm_postheadhook_tl
609 }
610 \tl_if_empty:NF \l__keythms_thm_prefoothook_tl
611 {
612   \hook_gput_code:nnV { keytheorems/#1/prefoot }
613     { keythms_hook_keys } \l__keythms_thm_prefoothook_tl
614 }
615 \tl_if_empty:NF \l__keythms_thm_postfoothook_tl
616 {
617   \hook_gput_code:nnV { keytheorems/#1/postfoot }
618     { keythms_hook_keys } \l__keythms_thm_postfoothook_tl
619 }
620 % Set name if none given
621 \quark_if_no_value:NT \l__keythms_thm_name_tl % use quark so name={} is valid
622 {
623   % use e so \text_titlecase called only once per theorem definition,
624   % not each time the theorem is used
625   \tl_set:Ne \l__keythms_thm_name_tl
626     { \text_titlecase_first:n { #1 } }
627 }
628 % associate formatted name with envname in prop list
629 \prop_gput:NnV \g__keythms_thmnames_prop { #1 } \l__keythms_thm_name_tl
630 % Call correct \newtheorem variant
631 \bool_if:NTF \l__keythms_thm_unlessunique_bool
632 {
633   % [unq] is required since aux is read at begindocument
634   % (technically right before) which is after theorem is defined
635   \RequirePackage[unq]{unique}
636   \tl_if_empty:NTF \l__keythms_thm_parent_tl

```

```

637 {
638   \hook_gput_code:nnn { keytheorems/#1/prehead }
639   { keythms_hook_keys } { \setuniqmark { #1 } }
640   \ifuniq{ #1 }
641     { \bool_set_false:N \l__keythms_thm_numbered_bool }
642     { \bool_set_true:N \l__keythms_thm_numbered_bool }
643   \bool_if:NTF \l__keythms_thm_numbered_bool
644     {
645       \tl_if_empty:NTF \l__keythms_thm_sibling_tl
646       {
647         \__keythms_thm_new:nV { #1 } \l__keythms_thm_name_tl
648       }
649       {
650         \exp_args:NnV \newaliascnt { #1 } \l__keythms_thm_sibling_tl
651         \__keythms_thm_new_sibling:nVn { #1 }
652         \l__keythms_thm_name_tl { #1 }
653         \aliascntresetthe { #1 }
654       }
655     }
656     {
657       \__keythms_thm_new_nonnumber:nV { #1 } \l__keythms_thm_name_tl
658       \hook_gput_code:nnn { keytheorems/#1/prehead } { keythms_hook_keys }
659       {
660         \keythms_if_restating:F
661         { \refstepcounter{ keythms_unnumbered_dummyctr } }
662       }
663     }
664   }
665   {
666     \__keythms_thm_new_uuwithparent:nVV { #1 }
667     \l__keythms_thm_name_tl \l__keythms_thm_parent_tl
668   }
669 }
670 {
671   \bool_if:NTF \l__keythms_thm_numbered_bool
672   {
673     \tl_if_empty:NTF \l__keythms_thm_parent_tl
674     {
675       \tl_if_empty:NTF \l__keythms_thm_sibling_tl
676       {
677         \__keythms_thm_new:nV { #1 } \l__keythms_thm_name_tl
678       }
679       {
680         \exp_args:NnV \newaliascnt { #1 } \l__keythms_thm_sibling_tl
681         \__keythms_thm_new_sibling:nVn { #1 }
682         \l__keythms_thm_name_tl { #1 }
683         \aliascntresetthe { #1 }
684       }
685     }
686     {
687       \__keythms_thm_new_parent:nVV { #1 }
688       \l__keythms_thm_name_tl \l__keythms_thm_parent_tl
689     }
690   }
691   {
692     \__keythms_thm_new_nonnumber:nV { #1 } \l__keythms_thm_name_tl
693     \hook_gput_code:nnn { keytheorems/#1/prehead } { keythms_hook_keys }
694     {

```

```

695         \keythms_if_restating:F
696         { \refstepcounter{ keythms_unnumbered_dummyctr } }
697     }
698 }
699 }
700 % Store theorem def and redefine it with keys
701 \keythms_keyify_theorem:n { #1 }
702 % define \<env>autorefname and \<env>Autorefname, might be redefined next
703 \exp_args:NnV \cs_set:cpn { #1 autorefname } \l__keythms_thm_name_tl
704 \exp_args:NnV \cs_set:cpn { #1 Autorefname } \l__keythms_thm_name_tl
705 % Set ref names
706 \quark_if_no_value:NF \l__keythms_thm_refname_tl
707 { \keythms_thm_setrefnames:nV { #1 } \l__keythms_thm_refname_tl }
708 \quark_if_no_value:NF \l__keythms_thm_Refname_tl
709 { \keythms_thm_setRefnames:nV { #1 } \l__keythms_thm_Refname_tl }
710 % Set up qed if needed
711 \quark_if_no_value:NF \l__keythms_thm_qed_tl
712 {
713     \exp_args:Nno \__keythms_thm_qedcode:nn { #1 } { \l__keythms_thm_qed_tl }
714 }
715 % Set up tcolorbox if needed
716 \quark_if_no_value:NF \l__keythms_thm_tcbkeys_tl
717 {
718     \exp_args:Nno \__keythms_thm_tcbboxcode:nn { #1 }
719     { \l__keythms_thm_tcbkeys_tl }
720 }
721 % Set default list-of display command
722 \__keythms_listof_show_aux:n { #1 }
723 % Set theorem style back to original state if needed
724 \tl_if_empty:NF \l__keythms_thm_style_tl
725 {
726     \__keythms_theoremstyle:V \l__keythms_thm_currentthmstyle_tl
727 }
728 }
729
730 \cs_new_protected:Npn \__keythms_thm_tcbboxcode:nn #1#2
731 {
732     \RequirePackage{tcolorbox}
733     \hook_gput_code:nnn { keytheorems/#1/prehead }
734     { keythms_tcbbox }
735     {
736         \cs_set_eq:NN \deferred@thm@head \__keythms_thm_storedeferredthmhead:n
737         \cs_set_eq:NN \Hy@theorem@makelinktarget \use_none:n
738         % ^ don't like playing with hyperref internals... but don't see around
739         % it because hyperref tries to add to para hook which doesn't work
740         % when title set up the way we do it
741         \cs_set:Npn \thm@space@setup { \thm@preskip=Opt \thm@postskip=Opt }
742         % ^ to match tcolorbox defaults; shouldn't interfere with user styles
743     }
744     \hook_gset_rule:nnnn { keytheorems/#1/posthead }
745     { keythms_tcbbox } { before } { keythms_hook_keys }
746     \hook_gset_rule:nnnn { keytheorems/#1/prefoot }
747     { keythms_tcbbox } { after } { keythms_hook_keys }
748     \hook_gset_rule:nnnn { keytheorems/#1/prefoot }
749     { keythms_tcbbox } { after } { keythms_qed }
750     \bool_if:NTF \l__keythms_thm_numbered_bool
751     {
752         \hook_gput_code:nnn { begindocument } { . }

```



```

753 {
754   \IfPackageLoadedTF{cleveref}
755   { % hyperref doesn't patch \@thm if cleveref loaded
756     \hook_gput_code:nnn { keytheorems/#1/posthead }
757       { keythms_tcbox }
758       {
759         \begin{tcolorbox}[
760           savedelimiter=#1,
761           title={ \_keythms_thm_tcboxtemphead: },
762           #2]
763       }
764     }
765   {
766     \hook_gput_code:nnn { keytheorems/#1/posthead }
767       { keythms_tcbox }
768       {
769         \begin{tcolorbox}[
770           savedelimiter=#1,
771           title={ \_keythms_thm_tcboxtemphead: },
772           phantom={ \MakeLinkTarget*{\@currentHref} }, % fix hyperlinking
773           #2]
774       }
775     }
776   }
777 }
778 {
779   \hook_gput_code:nnn { keytheorems/#1/posthead }
780     { keythms_tcbox }
781     {
782       \begin{tcolorbox}[
783         savedelimiter=#1,
784         title={ \_keythms_thm_tcboxtemphead: },
785         #2]
786       }
787     }
788   \hook_gput_code:nnn { keytheorems/#1/prefoot }
789     { keythms_tcbox } { \end{tcolorbox} }
790 }
791 \cs_new_protected:Npn \_keythms_thm_qedcode:nn #1#2
792 {
793   \hook_gput_code:nnn { keytheorems/#1/posthead }
794     { keythms_qed }
795     {
796       \exp_args:No \tl_if_novalue:nF { #2 } { \protected@edef\qedsymbol{#2} }
797       \pushQED{\qed}
798     }
799   \hook_gput_code:nnn { keytheorems/#1/prefoot }
800     { keythms_qed }
801     {
802       \exp_args:No \tl_if_novalue:nF { #2 } { \protected@edef\qedsymbol{#2} }
803       \popQED
804     }
805 }
806
807 \cs_new_eq:NN \_keythms_theoremstyle:n \theoremstyle
808 \cs_generate_variant:Nn \_keythms_theoremstyle:n { V }
809
810 % newtheorem variants

```

```

811 \cs_new_eq:NN \__keythms_thm_new:nn \newtheorem
812 \cs_generate_variant:Nn \__keythms_thm_new:nn { nV }
813
814 \cs_new_protected:Npn \__keythms_thm_new_nonnumber:nn #1#2
815 { \__keythms_thm_new:nn*{#1}{#2} }
816 \cs_generate_variant:Nn \__keythms_thm_new_nonnumber:nn { nV }
817
818 \cs_new_protected:Npn \__keythms_thm_new_parent:nnn #1#2#3
819 { \__keythms_thm_new:nn{#1}{#2}[#3] }
820 \cs_generate_variant:Nn \__keythms_thm_new_parent:nnn { nVV }
821
822 \cs_new_protected:Npn \__keythms_thm_new_sibling:nnn #1#2#3
823 { \__keythms_thm_new:nn{#1}[#3]{#2} }
824 \cs_generate_variant:Nn \__keythms_thm_new_sibling:nnn { nV }
825
826 \cs_new_protected:Npn \__keythms_thm_new_uuwithparent:nnn #1#2#3
827 {
828   \cs_undefine:c { keythms_orig_nonnumber_#1 } % for renew, declare
829   \__keythms_thm_new_nonnumber:nn { keythms_orig_nonnumber_#1 } { #2 }
830   \__keythms_thm_new_parent:nnn { #1 } { #2 } { #3 }
831   \DeclareEnvironmentCopy { keythms_orig_withparent_#1 } { #1 }
832   \renewenvironment { #1 } % opt arg is implicit
833   {
834     \setuniqmark{ #1. \use:c {the #3} }
835     \ifuniq{ #1. \use:c {the #3} }
836     {
837       \keythms_if_restating:F
838       { \refstepcounter{ keythms_unnumbered_dummyctr } }
839       \begin{keythms_orig_nonnumber_#1}
840     }
841     {
842       \begin{keythms_orig_withparent_#1}
843     }
844   }
845   {
846     \ifuniq{ #1. \use:c {the #3} }
847     { \end{keythms_orig_nonnumber_#1} }
848     { \end{keythms_orig_withparent_#1} }
849   }
850 }
851 \cs_generate_variant:Nn \__keythms_thm_new_uuwithparent:nnn { nVV }
852
853 % for getting notes with continues*, use nameref if available, otherwise ltproperties
854 \hook_gput_code:nnn { begindocument } { . }
855 {
856   \IfPackageLoadedTF { nameref }
857   {
858     \cs_new:Npn \__keythms_thmuse_recordnote: { } % nameref takes care of this
859     \cs_new:Npn \__keythms_getrecordednote:n #1
860     {
861       \getrefbykeydefault{ #1 }{ name }{ }
862     }
863   }
864   { % needs https://github.com/latex3/latex2e/issues/1200 fixed
865     \property_new:nnnn { keytheorems/recordednote } { now } { }
866     { \l__keythms_thmuse_note_tl }
867     \cs_new:Npn \__keythms_getrecordednote:n #1
868     {

```

```

869         \property_ref:nn { keythms_recordednote_#1 }
870         { keytheorems/recordednote }
871     }
872     \cs_new:Npn \__keythms_thmuse_recordnote:
873     {
874         \tl_if_empty:NF \l__keythms_thmuse_note_tl
875         {
876             \RecordProperties
877             { keythms_recordednote_\l__keythms_thmuse_label_tl }
878             { keytheorems/recordednote }
879         }
880     }
881 }
882 }
883
884 \keys_define:nn { keytheorems/thmuse }
885 {
886     label      .tl_set:N = \l__keythms_thmuse_label_tl,
887     note       .tl_set:N = \l__keythms_thmuse_note_tl,
888     name       .meta:n   = { note = #1 },
889     % ^ for compatibility. "name" is ambiguous and doesn't match amsthm language
890     short-note .code:n   = {}, % these do nothing at point of use
891     short-name .code:n   = {}, % ^ worthwhile compatibility?
892     continues  .tl_set:N = \l__keythms_thmuse_contlabel_tl,
893     continues* .code:n   =
894     {
895         \keys_set:nn { keytheorems/thmuse } { continues = #1 }
896         \protected@edef \l__keythms_tmpa_tl { \__keythms_getrecordednote:n{#1} }
897         \tl_if_empty:NF \l__keythms_tmpa_tl
898         {
899             \keys_set:nn { keytheorems/thmuse }
900             { note = \l__keythms_tmpa_tl }
901         }
902     },
903     store      .tl_set:N = \l__keythms_thmuse_store_tl,
904     %store      .default:n = \q_no_value, % ={name} causes issues
905     restate    .meta:n   = { store = #1 },
906     % ^ thmtools compatibility
907     listhack   .choice:, % need equals sign
908     listhack / true .code:n = \bool_set_true:N \l__keythms_thmuse_listhack_bool,
909     listhack / false .code:n = \bool_set_false:N \l__keythms_thmuse_listhack_bool,
910     listhack   .initial:n = false,
911     seq        .code:n   = {},
912 }
913
914 \cs_new_protected:Npn \keythms_keyify_theorem:n #1
915 { % #1 = theorem name
916     \DeclareEnvironmentCopy { keythms_orig_#1 } { #1 }
917     \DeclareDocumentEnvironment { keythms_grab_#1 } { m O{} +b }
918     { % ##1 = keys, ##2 = note, ##3 = theorem body
919         \__keythms_thm_prehead_code:n { #1 }
920         \begin{keythms_orig_#1}[{##2}]
921         \clist_map_inline:Nn \g__keythms_restatecounters_clist
922         {
923             \prop_gput:Nne \g__keythms_thmuse_othercounters_prop { ####1 }
924             { \the\value{####1} }
925         }
926         \__keythms_thm_posthead_code:n { #1 }

```

```

927 % below needs to come after posthead so that correct \@currentHref
928 % is stored for tcolorbox theorems
929 \__keythms_thm_addcontentsdata:nnnn { #1 }
930 { \prop_to_keyval:N \g__keythms_thmuse_othercounters_prop }
931 { ##1 } { ##3 }
932 \__keythms_thm_tempstorerebasedata:nnn { #1 } { ##1 } { ##3 }
933 ##3
934 \__keythms_thm_prefoot_code:n { #1 }
935 \end{keythms_orig_#1}
936 \__keythms_thm_postfoot_code:n { #1 }
937 }
938 {}
939 % NOTE: have to do a lot of shenanigans to make sure the begin/end of grabbed
940 % theorem env captures only the body and no package code.
941 % This is the price of on-the-fly redefining the env to grab body
942 \RenewDocumentEnvironment { #1 } { = {note} 0 {} }
943 {
944 \keys_set:nn { keytheorems/thmuse } { ##1 }
945 \tl_if_empty:NF \l__keythms_thmuse_store_tl
946 {
947 \bool_gset_true:N \g__keythms_listof_writefile_bool
948 \cs_set_eq:NN \__keythms_withhooks_begin:nn \__keythms_grab_begin:nn
949 \cs_set_eq:NN \__keythms_withhooks_begin:nnn \__keythms_grab_begin:nnn
950 \cs_set_eq:NN \__keythms_withhooks_begin:nnV \__keythms_grab_begin:nnV
951 \cs_set_eq:NN \__keythms_withhooks_end:n \__keythms_grab_end:n
952 }
953 \__keythms_thm_prehead_continues_code:n { #1 }
954 \tl_if_empty:NTF \l__keythms_thmuse_note_tl
955 { \__keythms_withhooks_begin:nn { #1 } { ##1 } }
956 {
957 \__keythms_withhooks_begin:nnV { #1 } { ##1 }
958 \l__keythms_thmuse_note_tl
959 }
960 }
961 {
962 \__keythms_withhooks_end:n { #1 }
963 \tl_if_empty:NF \l__keythms_thmuse_store_tl
964 {
965 \cs_if_exist:cF
966 { __keythms_getthm_ \l__keythms_thmuse_store_tl _theorem }
967 {
968 \cs_new:cpe
969 { __keythms_getthm_ \l__keythms_thmuse_store_tl _theorem }
970 {
971 \exp_not:N \__keythms_getthm_theorem:nnnnn
972 \exp_not:o { \g__keythms_thmuse_temprestatedata_tl }
973 }
974 \cs_new:cpe
975 { __keythms_getthm_ \l__keythms_thmuse_store_tl _body }
976 {
977 \exp_not:N \__keythms_getthm_body:nn
978 \exp_args:No \exp_not:o
979 {
980 \exp_after:wN \__keythms_use_iii_v_braced:nnnnn
981 \g__keythms_thmuse_temprestatedata_tl
982 }
983 }
984 }

```

```

985     }
986   }
987 }
988 \cs_new:Npn \__keythms_use_iii_v_braced:nnnnn #1#2#3#4#5 { {#3}-{#5} }
989
990 \cs_new_protected:Npn \__keythms_withhooks_begin:nn #1#2
991 { % #1 = theorem name, #2 = keys
992   \__keythms_thm_prehead_code:n { #1 }
993   \begin{keythms_orig_#1}
994   \__keythms_thm_posthead_code:n { #1 }
995   \__keythms_thm_addcontentsdata:nnnn { #1 } { } { #2 } { }
996   \ignorespaces % I hope this is alright
997 }
998 \cs_new_protected:Npn \__keythms_withhooks_begin:nnn #1#2#3
999 { % #1 = theorem name, #2 = keys, #3 = note
1000   \__keythms_thm_prehead_code:n { #1 }
1001   \begin{keythms_orig_#1}[{#3}]
1002   \__keythms_thm_posthead_code:n { #1 }
1003   \__keythms_thm_addcontentsdata:nnnn { #1 } { } { #2 } { }
1004   \ignorespaces % I hope this is alright
1005 }
1006 \cs_generate_variant:Nn \__keythms_withhooks_begin:nnn { nnV }
1007 \cs_new_protected:Npn \__keythms_withhooks_end:n #1
1008 {
1009   \__keythms_thm_prefoot_code:n { #1 }
1010   \end{keythms_orig_#1}
1011   \__keythms_thm_postfoot_code:n { #1 }
1012 }
1013 \cs_new_protected:Npn \__keythms_grab_begin:nn #1#2
1014 { % #1 = theorem name, #2 = keys
1015   \begin{keythms_grab_#1}{#2}
1016 }
1017 \cs_new_protected:Npn \__keythms_grab_begin:nnn #1#2#3
1018 { % #1 = theorem name, #2 = keys, #3 = note
1019   \begin{keythms_grab_#1}{#2}[{#3}]
1020 }
1021 \cs_generate_variant:Nn \__keythms_grab_begin:nnn { nnV }
1022 \cs_new_protected:Npn \__keythms_grab_end:n #1 { \end{keythms_grab_#1} }
1023
1024 \cs_new_protected:Npn \__keythms_orig_begin:n #1 { \begin{keythms_orig_#1} }
1025 \cs_new_protected:Npn \__keythms_orig_begin:nn #1#2
1026 { \begin{keythms_orig_#1}[{#2}] }
1027 \cs_generate_variant:Nn \__keythms_orig_begin:nn { nV }
1028 \cs_new_protected:Npn \__keythms_orig_end:n #1 { \end{keythms_orig_#1} }
1029
1030 \cs_new:Npn \__keythms_thm_prehead_code:n #1
1031 { % #1 = theorem name
1032   \tl_set:Nn \l__keythms_thmuse_envname_tl { #1 }
1033   \hook_use:n { keytheorems/#1/prehead }
1034   \hook_use:n { keytheorems/allthms/prehead }
1035 }
1036 %% this below has to be separate from prehead_code above since we need to add
1037 %% continues-code to note before retrieving it in \__keythms_withhooks_begin:nnV
1038 \cs_new:Npn \__keythms_thm_prehead_continues_code:n #1
1039 { % #1 = theorem name
1040   \tl_if_empty:NF \l__keythms_thmuse_contlabel_tl
1041   {
1042     \tl_if_empty:NF \l__keythms_thmuse_note_tl

```

```

1043     { \tl_put_right:Nn \l__keythms_thmuse_note_tl { , ~ } }
1044 \tl_put_right:Ne \l__keythms_thmuse_note_tl
1045     { \__keythms_thmuse_continues:V \l__keythms_thmuse_contlabel_tl }
1046 \cs_set:cpn { the #1 }
1047     {
1048         \getrefnumber { \l__keythms_thmuse_contlabel_tl }
1049     }
1050 \cs_set_eq:cN { c@ #1 } \c@keythms_continues_dummyctr
1051 \cs_set_eq:cN { theH #1 } \theHkeythms_continues_dummyctr
1052 %\cs_set_eq:NN \setunigmark \use_none:n % not the right fix
1053 }
1054 }
1055 \cs_new:Npn \__keythms_thm_posthead_code:n #1
1056 { % #1 = theorem name
1057     \hook_use:n { keytheorems/#1/posthead }
1058     \hook_use:n { keytheorems/allthms/posthead }
1059     \tl_if_empty:NF \l__keythms_thmuse_label_tl
1060     {
1061         \label{ \l__keythms_thmuse_label_tl }
1062         \__keythms_thmuse_recordnote:
1063     }
1064     \bool_if:NT \l__keythms_thmuse_listhack_bool
1065     { % straight from thm-amsthm.sty
1066         \leavevmode
1067         \vspace{-\baselineskip}%
1068         \par
1069         \everypar{\setbox\z@\lastbox\everypar{}}%
1070     }
1071 }
1072 \cs_new:Npn \__keythms_thm_prefoot_code:n #1
1073 { % #1 = theorem name
1074     \hook_use:n { keytheorems/allthms/prefoot }
1075     \hook_use:n { keytheorems/#1/prefoot }
1076 }
1077 \cs_new:Npn \__keythms_thm_postfoot_code:n #1
1078 { % #1 = theorem name
1079     \hook_use:n { keytheorems/allthms/postfoot }
1080     \hook_use:n { keytheorems/#1/postfoot }
1081 }
1082 \cs_new:Npn \__keythms_thm_addcontentsdata:nnnn #1#2#3#4
1083 { % #1 = theorem name, #2 = stored counters, #3 = keys, #4 = body
1084     \keythms_listof_chaptervspacethack:
1085     \iow_shipout:Ne \@auxout
1086     {
1087         \exp_not:N \@writefile { thlist }
1088         {
1089             \KeyThmsSavedTheorem{ #1 }
1090             { \@currentlabel }
1091             { \@currentHref }
1092             { \thepage }
1093             { #2 }
1094             { \exp_not:n { #3 } } % do we want any expansion here, perhaps
1095             { \exp_not:n { #4 } } % with \text_expand:n ?
1096         }
1097     }
1098 }
1099 \cs_new:Npn \__keythms_thm_tempstorerebasedata:nnn #1#2#3
1100 { % #1 = theorem name, #2 = keys, #3 = body

```

```

1101 \tl_gset:Nx \g__keythms_thmuse_temprestatedata_tl % needs to be global to get out of env
1102 {
1103   { #1 }
1104   { \@currentlabel }
1105   { \prop_to_keyval:N \g__keythms_thmuse_othercounters_prop }
1106   { \exp_not:n { #2 } } % do we want any expansion here, perhaps
1107   { \exp_not:n { #3 } } % with \text_expand:n ?
1108 }
1109 }
1110
1111 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1112 %% Retrieving Theorem Data %%
1113 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1114
1115 \cs_new_protected:Npn \KeyThmsSavedTheorem #1#2#3#4#5#6#7 % 7th arg is body
1116 { \use:c { __keythms_thmitem_#1:nnnnnn } {#2}{#3}{#4}{#5}{#6}{#7} }
1117
1118 \keys_define:nn { keytheorems/storeatbegin }
1119 {
1120   store .tl_set:N = \l__keythms_storeatbegin_store_tl,
1121   restate .meta:n = { store=#1 },
1122   unknown .code:n = { } % do nothing with unknown keys
1123 }
1124
1125 \cs_new_protected:Npn \KeyThmsContentsLine #1 { #1 }
1126 \NewDocumentCommand \addtheoremcontentsline { m m }
1127 {
1128   \addtocontents { thlist }
1129   {
1130     \KeyThmsContentsLine
1131     { % copied from def of \addcontentsline
1132       \protect\contentsline{#1}{#2}{\thepage}{ }
1133       \protected@file@percent
1134     }
1135   }
1136 }
1137 \NewDocumentCommand \addtotheoremcontents { m }
1138 {
1139   \addtocontents { thlist }
1140   {
1141     \KeyThmsContentsLine { #1 }
1142   }
1143 }
1144
1145 \hook_gput_code:nnn { begindocument } { . }
1146 {
1147   \group_begin:
1148   \cs_set_eq:NN \KeyThmsContentsLine \use_none:n
1149   \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1150   \cs_set_protected:Npn \KeyThmsSavedTheorem #1#2#3#4#5#6#7
1151   {
1152     \group_begin:
1153     \keys_set:nn { keytheorems/storeatbegin } { #6 }
1154     \tl_if_empty:NF \l__keythms_storeatbegin_store_tl
1155     {
1156       \cs_new:cpn
1157       { __keythms_getthm_ \l__keythms_storeatbegin_store_tl _theorem }
1158       {

```

```

1159         \_keythms_getthm_theorem:nnnnn
1160         {#1}{#2}{#5}{#6}{#7}
1161     }
1162     \cs_new:cpn
1163     { \_keythms_getthm_ \l\_keythms_storeatbegin_store_tl _body }
1164     {
1165         \_keythms_getthm_body:nn {#5}{#7}
1166     }
1167 }
1168 \group_end:
1169 }
1170 \file_if_exist_input:n { \c_sys_jobname_str.thlist }
1171 \group_end:
1172 }
1173
1174 \prg_new_conditional:Npnn \keythms_if_restating: { T, F, TF }
1175 {
1176     \bool_if:NTF \l\_keythms_thmuse_restating_bool
1177     { \prg_return_true: }
1178     { \prg_return_false: }
1179 }
1180 \NewDocumentCommand \IfRestatingTF { } { \keythms_if_restating:TF }
1181
1182 \cs_new_protected:Npn \_keythms_getthm_theorem:nnnnn #1#2#3#4#5
1183 { % #1 = name, #2 = number, #3 = restate counters, #4 = keys, #5 = theorem body
1184     \group_begin:
1185     \bool_set_true:N \l\_keythms_thmuse_restating_bool
1186     \prop_set_from_keyval:Nn \l\_keythms_restate_counters_prop { #3 }
1187     \prop_map_inline:Nn \l\_keythms_restate_counters_prop
1188     {
1189         \tl_set:ce { l\_keythms_restate_current_##1_tl } { \the\value{##1} }
1190         \setcounter { ##1 } { ##2 }
1191         % ^ FIX: what if eq's numbered by section, theorem, etc.? The
1192         %       thmtools code is opaque.... Or maybe should be up to the
1193         %       user to say "restate-counters={section,chapter,...}".
1194         \cs_set:cpn { theH ##1 } { \use:c { the ##1 } . \theHkeythms_restate_dummyctr }
1195     }
1196     \tl_if_empty:nTF { #2 }
1197     { \refstepcounter{keythms_restate_dummyctr} } % for unnumbered theorems
1198     {
1199         \cs_set:cpn { the #1 } { #2 }
1200         \cs_set_eq:cN { c@ #1 } \c@keythms_restate_dummyctr
1201         \cs_set_eq:cN { theH #1 } \theHkeythms_restate_dummyctr
1202         % ^ why are the last two line here? We shouldn't be referencing
1203         %   restated theorems. Think it's a remnant of thmtools
1204         % WRONG: needed to make numbering correct after restated theorem.
1205         % not sure about theH. <- this is needed to prevent duplicate anchors
1206     }
1207     \renewcommand\label[2][]{ } % disable \label (opt arg in case cleveref loaded)
1208     \cs_set_eq:NN \ltx@label \use_none:n % disable \ltx@label
1209     \cs_set_eq:NN \property_record:nn \use_none:nn % disable \RecordProperties
1210     \cs_set_eq:NN \setuniqmark \use_none:n % work with numbered=unless-unique
1211     % QUESTION: also disable \hyper@@anchor? \MakeLinkTarget?
1212     \keys_set:nn { keytheorems/thmuse } { #4 }
1213     \hook_use:n { keytheorems/#1/restated }
1214     \hook_use:n { keytheorems/allthms/restated }
1215     \_keythms_thm_prehead_continues_code:n { #1 }
1216     \_keythms_thm_prehead_code:n { #1 }

```



```

1217 \tl_if_empty:NTF \l__keythms_thmuse_note_tl
1218 { \__keythms_orig_begin:n { #1 } }
1219 { \__keythms_orig_begin:nV { #1 } \l__keythms_thmuse_note_tl }
1220 \__keythms_thm_posthead_code:n { #1 }
1221 #5
1222 \__keythms_thm_prefoot_code:n { #1 }
1223 \__keythms_orig_end:n { #1 }
1224 \__keythms_thm_postfoot_code:n { #1 }
1225 \prop_map_inline:Nn \l__keythms_restate_counters_prop
1226 {
1227   \exp_args:Nnc \setcounter { ##1 }
1228   { l_keythms_restate_current_##1_tl }
1229 }
1230 \group_end:
1231 }
1232
1233 \cs_new_protected:Npn \__keythms_getthm_body:nn #1#2
1234 { % #1 = restate counters, #2 = theorem body
1235   \group_begin:
1236   \bool_set_true:N \l__keythms_thmuse_restating_bool
1237   \prop_set_from_keyval:Nn \l__keythms_restate_counters_prop { #1 }
1238   \prop_map_inline:Nn \l__keythms_restate_counters_prop
1239   {
1240     \tl_set:ce { l_keythms_restate_current_##1_tl } { \the\value{##1} }
1241     \setcounter { ##1 } { ##2 }
1242     % ^ FIX: what if eq's numbered by section, theorem, etc.? The
1243     %       thmtools code is opaque.... Or maybe should be up to the
1244     %       user to say "restate-counters={section,chapter,...}".
1245     \cs_set:cpn { theH ##1 } { \use:c { the ##1 } . \theHkeythms_restate_dummyctr }
1246   }
1247   \refstepcounter{keythms_restate_dummyctr}
1248   \renewcommand\label[2] [] {} % disable \label (opt arg in case cleveref loaded)
1249   \cs_set_eq:NN \ltx@label \use_none:n % disable \ltx@label
1250   \cs_set_eq:NN \property_record:nn \use_none:nn % disable \RecordProperties
1251   \hook_use:n { keytheorems/#1/restated }
1252   \hook_use:n { keytheorems/allthms/restated }
1253   #2
1254   \prop_map_inline:Nn \l__keythms_restate_counters_prop
1255   {
1256     \exp_args:Nnc \setcounter { ##1 }
1257     { l_keythms_restate_current_##1_tl }
1258   }
1259   \group_end:
1260 }
1261
1262 % \getkeytheorem[<property>]{<tag>}
1263 \NewDocumentCommand \getkeytheorem { o m }
1264 {
1265   \cs_if_exist:cTF { __keythms_getthm_#2_theorem }
1266   {
1267     \IfNoValueTF { #1 }
1268     { \use:c { __keythms_getthm_#2_theorem } }
1269     { \use:c { __keythms_getthm_#2_#1 } }
1270   }
1271   {
1272     \textbf{??}
1273     \msg_warning:nnn { keytheorems } { no-stored-theorem } { #2 }
1274   }

```

```

1275 }
1276
1277 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1278 %% Theorem Hooks %%
1279 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1280
1281 %%% \addtotheoremhook[<envname>]{<hook>}{<code>}
1282 \NewDocumentCommand \addtotheoremhook { o m +m }
1283 {
1284   \__hook_if_declared:nTF { keytheorems/allthms/#2 }
1285   {
1286     \IfNoValueTF { #1 }
1287     { \hook_gput_code:nnn { keytheorems/allthms/#2 } { . } { #3 } }
1288     { \hook_gput_code:nnn { keytheorems/#1/#2 } { . } { #3 } }
1289   }
1290   {
1291     \msg_error:nnn { keytheorems } { undefined-thm-hook } { #2 }
1292   }
1293 }
1294
1295 % NOTE: I think it's OK we use the internal \__hook_if_declared:nTF above
1296 %       since we don't need to worry about the user creating new theorem hooks
1297 %       so, as we're only checking the existence of hooks created by us, it's OK.
1298
1299 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1300 %% List of Theorems %%
1301 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1302
1303 \keys_define:nn { keytheorems/listof }
1304 {
1305   numwidth .dim_set:N = \l_keythms_listof_numwidth_dim,
1306   numwidth .initial:n = 2.3em,
1307   ignore .code:n =
1308   {
1309     \hook_gput_code:nnn { begindocument/before } { keytheorems }
1310     { \keythms_listof_ignore:n { #1 } }
1311   },
1312   show .code:n =
1313   {
1314     \hook_gput_code:nnn { begindocument/before } { keytheorems }
1315     { \keythms_listof_show:n { #1 } }
1316   },
1317   onlynamed .code:n =
1318   {
1319     \hook_gput_code:nnn { begindocument/before } { keytheorems }
1320     { \keythms_listof_onlynamed:n { #1 } }
1321   },
1322   onlynamed .default:n = \q_no_value,
1323   onlynumbered .code:n =
1324   {
1325     \hook_gput_code:nnn { begindocument/before } { keytheorems }
1326     { \keythms_listof_onlynumbered:n { #1 } }
1327   },
1328   onlynumbered .default:n = \q_no_value,
1329   ignoreall .code:n =
1330   {
1331     \hook_gput_code:nnn { begindocument/before } { keytheorems } % in case called before theorem
1332     {

```

```

1333     \prop_map_inline:Nn \g__keythms_thmnames_prop
1334     { \__keythms_listof_ignore_aux:n { ##1 } }
1335   }
1336 },
1337 showall .code:n =
1338 {
1339   \hook_gput_code:nnn { begindocument/before } { keytheorems } % in case called before theorem
1340   {
1341     \prop_map_inline:Nn \g__keythms_thmnames_prop
1342     { \__keythms_listof_show_aux:n { ##1 } }
1343   }
1344 },
1345 title .tl_set:N = \l__keythms_listof_title_tl,
1346 title .initial:n = \GetTranslation{keythms_listof_title},
1347 swapnumber .bool_set:N = \l__keythms_listof_swapnumber_bool,
1348 swapnumber .initial:n = false,
1349 title-code .cs_set:Np = \__keythms_listof_titlecmd:n #1,
1350 no-title .bool_set:N = \l__keythms_listof_notitle_bool,
1351 no-title .initial:n = false,
1352 print-body .code:n =
1353 {
1354   \cs_set:Nn \keythms_listof_listcmd:nnnnnnn
1355   {
1356     \tl_if_empty:nF { ##7 }
1357     {
1358       \__keythms_getthm_theorem:nnnnn
1359       {##1}{##2}{##5}{##6}{##7}
1360     }
1361   }
1362   \cs_set_eq:NN \KeyThmsContentsLine \use_none:n
1363   % ^ I assume we want this?
1364   \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1365 },
1366 note-code .cs_set:Np = \__keythms_listof_notecmd:n #1,
1367 note-code .initial:n = { ~ (#1) },
1368 no-continues .bool_set:N = \l__keythms_listof_nocont_bool,
1369 no-continues .initial:n = false,
1370 no-chapter-skip .bool_set:N = \l__keythms_listof_nochapskip_bool,
1371 no-chapter-skip .initial:n = false,
1372 chapter-skip-length .dim_set:N = \keythms@listof@chaptervspace@dim,
1373 chapter-skip-length .initial:n = 10pt,
1374 }
1375
1376 \hook_gput_code:nnn { begindocument } { . } % redefine these keys at begindocument
1377 {
1378   \keys_define:nn { keytheorems/listof }
1379   {
1380     ignore .code:n = \keythms_listof_ignore:n { #1 },
1381     show .code:n = \keythms_listof_show:n { #1 },
1382     onlynamed .code:n = \keythms_listof_onlynamed:n { #1 },
1383     onlynamed .default:n = \q_no_value,
1384     onlynumbered .code:n = \keythms_listof_onlynumbered:n { #1 },
1385     onlynumbered .default:n = \q_no_value,
1386     ignoreall .code:n =
1387     {
1388       \prop_map_inline:Nn \g__keythms_thmnames_prop
1389       { \__keythms_listof_ignore_aux:n { ##1 } }
1390     },

```

```

1391     showall .code:n =
1392     {
1393         \prop_map_inline:Nn \g__keythms_thmnames_prop
1394         { \__keythms_listof_show_aux:n { ##1 } }
1395     },
1396     seq .code:n = \keythms_listof_showseq:n { #1 },
1397 }
1398 }
1399
1400 \NewDocumentCommand \keytheoremset { m }
1401 {
1402     \keys_set:nn { keytheorems/listof } { #1 }
1403 }
1404
1405 \cs_new_protected:Npn \keythms_listof_ignore:n #1
1406 {
1407     \clist_map_inline:nn { #1 } { \__keythms_listof_ignore_aux:n { ##1 } }
1408 }
1409 \cs_new_protected:Npn \__keythms_listof_ignore_aux:n #1
1410 {
1411     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1412     { }
1413 }
1414
1415 \cs_new_protected:Npn \keythms_listof_show:n #1
1416 {
1417     \clist_map_inline:nn { #1 } { \__keythms_listof_show_aux:n { ##1 } }
1418 }
1419 \cs_new_protected:Npn \__keythms_listof_show_aux:n #1
1420 {
1421     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1422     {
1423         \__keythms_listof_listcmd_setup:nn { ##5 }
1424         {
1425             \keythms_listof_listcmd:nnnnnnn
1426             {#1}{##1}{##2}{##3}{##4}{##5}{##6}
1427         }
1428     }
1429 }
1430
1431 \cs_new_protected:Npn \keythms_listof_onlynamed:n #1
1432 {
1433     \quark_if_no_value:nTF { #1 }
1434     {
1435         \prop_map_inline:Nn \g__keythms_thmnames_prop
1436         { \__keythms_listof_onlynamed_aux:n { ##1 } }
1437     }
1438     {
1439         \clist_map_inline:nn { #1 }
1440         { \__keythms_listof_onlynamed_aux:n { ##1 } }
1441     }
1442 }
1443 \cs_new_protected:Npn \__keythms_listof_onlynamed_aux:n #1
1444 {
1445     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1446     {
1447         \__keythms_listof_listcmd_setup:nn { ##5 }
1448         {

```

```

1449         \tl_if_empty:NF \l__keythms_listofheading_note_tl
1450         {
1451             \keythms_listof_listcmd:nnnnnnn
1452             {#1}{##1}{##2}{##3}{##4}{##5}{##6}
1453         }
1454     }
1455 }
1456 }
1457
1458 \cs_new_protected:Npn \keythms_listof_onlynumbered:n #1
1459 {
1460     \quark_if_no_value:nTF { #1 }
1461     {
1462         \prop_map_inline:Nn \g__keythms_thmnames_prop
1463         { \__keythms_listof_onlynumbered_aux:n { ##1 } }
1464     }
1465     {
1466         \clist_map_inline:nn { #1 }
1467         { \__keythms_listof_onlynumbered_aux:n { ##1 } }
1468     }
1469 }
1470 \cs_new_protected:Npn \__keythms_listof_onlynumbered_aux:n #1
1471 {
1472     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1473     {
1474         \__keythms_listof_listcmd_setup:nn { ##5 }
1475         {
1476             \tl_if_empty:NF { ##1 }
1477             {
1478                 \keythms_listof_listcmd:nnnnnnn
1479                 {#1}{##1}{##2}{##3}{##4}{##5}{##6}
1480             }
1481         }
1482     }
1483 }
1484
1485 \cs_new_protected:Npn \keythms_listof_showseq:n #1
1486 {
1487     \prop_map_inline:Nn \g__keythms_thmnames_prop
1488     { \__keythms_listof_showseq_aux:nn { #1 } { ##1 } }
1489 }
1490 \cs_new_protected:Npn \__keythms_listof_showseq_aux:nn #1#2
1491 { % #1 = seq name, #2 = theorem name
1492     \cs_set_protected:cpn { __keythms_thmitem_#2:nnnnnn } ##1##2##3##4##5##6
1493     {
1494         \__keythms_listof_listcmd_setup:nn { ##5 }
1495         {
1496             \tl_if_eq:NnT \l__keythms_listofheading_seq_tl { #1 }
1497             {
1498                 \keythms_listof_listcmd:nnnnnnn
1499                 {#2}{##1}{##2}{##3}{##4}{##5}{##6}
1500             }
1501         }
1502     }
1503 }
1504
1505 % Seems unnecessary to repeat all this for reading the keyvals from seq.
1506 % In thmtools they just hook the "thmitem" definition into the theorem declaration.

```

```

1507 %% NOTE ON ABOVE: this gives more flexibility to define different kinds of lists.
1508 %% See acro.sty for template idea.
1509 \keys_define:nn { keytheorems/listofheading }
1510 {
1511     note .tl_set:N = \l__keythms_listofheading_note_tl,
1512     name .meta:n = { note = #1 },
1513     short-note .tl_set:N = \l__keythms_listofheading_shortnote_tl,
1514     short-name .meta:n = { short-note = #1 },
1515     continues .tl_set:N = \l__keythms_listofheading_contlabel_tl,
1516     continues* .code:n =
1517     {
1518         \keys_set:nn { keytheorems/listofheading } { continues = #1 }
1519         \protected@edef \l__keythms_tmpa_tl { \__keythms_getrecordednote:n{#1} }
1520         \tl_if_empty:NF \l__keythms_tmpa_tl
1521         {
1522             \keys_set:nn { keytheorems/listofheading }
1523             { note = \l__keythms_tmpa_tl }
1524         }
1525     },
1526     seq .tl_set:N = \l__keythms_listofheading_seq_tl,
1527     unknown .code:n = { } % do nothing with unknown keys
1528     % ~ this is OK because we have total control over possible keys; if invalid
1529     % key is given to theorem then an error will be raised there
1530 }
1531
1532 \cs_new:Npn \__keythms_listof_printheadng:
1533 {
1534     \tl_if_empty:NTF \l__keythms_listofheading_shortnote_tl
1535     {
1536         \tl_if_empty:NF \l__keythms_listofheading_note_tl
1537         { \__keythms_listof_notecmd:n { \l__keythms_listofheading_note_tl } }
1538     }
1539     {
1540         \__keythms_listof_notecmd:n { \l__keythms_listofheading_shortnote_tl }
1541     }
1542 }
1543
1544 \cs_new:Npn \__keythms_listof_default_listcmd:nnnnnnn #1#2#3#4#5#6#7
1545 {
1546     \contentsline{ #1 }
1547     {
1548         \bool_if:NTF \l__keythms_listof_swapnumber_bool
1549         {
1550             \prop_item:Nn \g__keythms_thmnames_prop { #1 } ~ #2
1551         }
1552         {
1553             \numberline{ #2 }
1554             \prop_item:Nn \g__keythms_thmnames_prop { #1 }
1555         }
1556         \__keythms_listof_printheadng:
1557     }
1558     { #4 }{ #3 }
1559 }
1560
1561 % NOTE: We still need to do this setup for [print-body] so that onlynamed works
1562 \cs_new:Npn \__keythms_listof_listcmd_setup:nn #1#2
1563 { % #1 = keys, #2 = list command
1564     \group_begin:

```

```

1565 \keys_set:nn { keytheorems/listofheading } { #1 }
1566 \tl_if_empty:NTF \l__keythms_listofheading_contlabel_tl
1567 { #2 }
1568 {
1569     \bool_if:NF \l__keythms_listof_nocont_bool
1570     {
1571         \tl_if_empty:NF \l__keythms_listofheading_note_tl
1572         {
1573             \tl_put_right:Nn \l__keythms_listofheading_note_tl { , ~ }
1574         }
1575         \tl_put_right:Nn \l__keythms_listofheading_note_tl
1576         {
1577             \__keythms_thmuse_continues:V \l__keythms_listofheading_contlabel_tl
1578         }
1579         #2
1580     }
1581 }
1582 \group_end:
1583 }
1584
1585 % set default listcmd
1586 \cs_new_eq:NN \keythms_listof_listcmd:nnnnnnn
1587 \__keythms_listof_default_listcmd:nnnnnnn
1588
1589 \cs_if_exist:NTF \chapter
1590 { \cs_set:Npn \__keythms_listof_titlecmd:n #1 { \chapter*{#1} } }
1591 { \cs_set:Npn \__keythms_listof_titlecmd:n #1 { \section*{#1} } }
1592
1593 \hook_gput_code:nnn { begindocument } { . }
1594 { % try to detect ams classes
1595     \keythms_if_amsclass:TF
1596     {
1597         \prop_map_inline:Nn \g__keythms_thmnames_prop
1598         {
1599             \cs_set:cpn { l@ #1 }
1600             {
1601                 \@tocline{ 0 }{ 3pt plus 2pt }{ 0pt }
1602                 { \l__keythms_listof_numwidth_dim }{ }
1603             }
1604         }
1605     }
1606     {
1607         \prop_map_inline:Nn \g__keythms_thmnames_prop
1608         {
1609             \cs_set:cpn { l@ #1 }
1610             {
1611                 \@dottedtocline{ 1 }{ 1.5em }
1612                 { \l__keythms_listof_numwidth_dim }
1613             }
1614         }
1615     }
1616 }
1617
1618 \keythms_if_amsclass:TF
1619 {
1620     \keys_define:nn { keytheorems/listof } % adjust to class
1621     {
1622         numwidth .initial:n = 1.5pc,

```

```

1623     }
1624     \NewDocumentCommand \listofkeytheorems { 0{} }
1625     { % title command not customizable here
1626       \bool_gset_true:N \g__keythms_listof_writefile_bool
1627       \group_begin:
1628       \keys_set:nn { keytheorems/listof } { #1 }
1629       \bool_if:NT \l__keythms_listof_nochapskip_bool
1630       {
1631         \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1632       }
1633       \legacy_if_set_false:n { @files }
1634       \bool_if:NTF \l__keythms_listof_notitle_bool
1635       {
1636         \@starttoc{ thlist }{ }
1637       }
1638       { % ams classes don't expand title enough
1639         \protected@edef \l__keythms_tmpa_tl { \l__keythms_listof_title_tl }
1640         \@starttoc{ thlist }{ \l__keythms_tmpa_tl }
1641       }
1642       \group_end:
1643     }
1644   }
1645   {
1646     \NewDocumentCommand \listofkeytheorems { 0{} }
1647     {
1648       \bool_gset_true:N \g__keythms_listof_writefile_bool
1649       \group_begin:
1650       \keys_set:nn { keytheorems/listof } { #1 }
1651       \bool_if:NT \l__keythms_listof_nochapskip_bool
1652       {
1653         \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1654       }
1655       \bool_if:NF \l__keythms_listof_notitle_bool
1656       {
1657         \__keythms_listof_titlecmd:n { \l__keythms_listof_title_tl }
1658         \@mkboth % QUESTION: should this go in titlecmd ?
1659         { \MakeUppercase \l__keythms_listof_title_tl }
1660         { \MakeUppercase \l__keythms_listof_title_tl }
1661       }
1662       \legacy_if_set_false:n { @files }
1663       \@starttoc{ thlist }
1664       \group_end:
1665     }
1666   }
1667   % ^ unlike thmtools we don't use the class's style of \listoffigures because
1668   % we want control over title-code, no-title, etc. But this means we have to guess
1669   % things like marks, sectioning command, etc.
1670
1671   \hook_gput_code:nnn { enddocument } { . }
1672   {
1673     \bool_if:NTF \g__keythms_listof_writefile_bool
1674     {
1675       \legacy_if:nT { @files }
1676       {
1677         \iow_new:N \tf@thlist
1678         \iow_open:Nn \tf@thlist { \c_sys_jobname_str.thlist }
1679       }
1680     }

```



```

1681      { % if .thlist file left over from previous run but not needed, clear it
1682        \file_if_exist:nT { \c_sys_jobname_str.thlist }
1683        {
1684          \iow_open:Nn \g_tmpa_iow { \c_sys_jobname_str.thlist }
1685          \iow_close:N \g_tmpa_iow
1686        }
1687      }
1688    }
1689
1690    % chapterspacehack (code translated from thmtools)
1691    \cs_new_eq:NN \KeyThmsAddvspace \addvspace
1692    \int_new:N \g_keythms_listof_prevchapter_int
1693    \int_gset:Nn \g_keythms_listof_prevchapter_int { 1 }
1694    % ^ if this is zero, bad things happen if title-code is changed; anyways don't
1695    % need addvspace at top
1696    \cs_new:Npn \keythms_listof_chaptervspacehack: { }
1697    \cs_if_exist:cT { c@chapter }
1698    {
1699      \cs_if_eq:NNF \c@chapter \relax
1700      {
1701        \cs_set:Npn \keythms_listof_chaptervspacehack:
1702        {
1703          \int_compare:nNnF { \value{chapter} } = { \g_keythms_listof_prevchapter_int }
1704          {
1705            \addtocontents{ thlist }
1706            {
1707              \protect\KeyThmsAddvspace
1708              { \keythms@listof@chaptervspace@dim }
1709            }
1710            \int_gset:Nn \g_keythms_listof_prevchapter_int { \value{chapter} }
1711          }
1712        }
1713      }
1714    }
1715
1716    %%%%%%%%%%%%%%%
1717    %%% \Autoref %%
1718    %%%%%%%%%%%%%%%
1719
1720    \ProvideDocumentCommand { \Autoref } { s m }
1721    {
1722      \group_begin:
1723      \cs_set_eq:NN \HyRef@testreftype \__keythms_Autoref_testreftype:w
1724      \IfBooleanTF { #1 } { \autoref*{#2} } { \autoref{#2} }
1725      \group_end:
1726    }
1727
1728    \cs_new:Npn \__keythms_Autoref_testreftype:w #1.#2\
1729    {
1730      \cs_if_exist:cTF { #1 Autorefname }
1731      {
1732        \cs_set:Npe \HyRef@currentHtag
1733        {
1734          \exp_not:N \use:c { #1 Autorefname }
1735          \exp_not:N \c_space_token
1736        }
1737      }
1738      { \msg_warning:nnn { keytheorems } { no-Autorefname } { #1 } }

```

```

1739 }
1740
1741 %%%%%%%%%%%%%%%
1742 %%% Global Keys %%%
1743 %%%%%%%%%%%%%%%
1744
1745 \keys_define:nn { keytheorems }
1746 {
1747   restate-counters .code:n =
1748   {
1749     \clist_map_inline:nn { #1 }
1750     { \tl_new:c { l_keythms_restate_current_##1_tl } }
1751     \clist_gput_right:Nn \g__keythms_restatecounters_clist { #1 }
1752   },
1753   restate-counters .initial:n = equation,
1754   continues-code .cs_set:Np = \__keythms_thmuse_continues:n #1,
1755   continues-code .initial:n =
1756   { % not sure how best to handle this translation
1757     \GetTranslation{keythms_continues}\pageref{#1}
1758   },
1759   qed-symbol .cs_set_protected:Np = \qedsymbol,
1760   overload .code:n = \__keythms_overload_code:,
1761   overload .value_forbidden:n = true,
1762   overload .usage:n = preamble,
1763   thmtools-compat .code:n = \__keythms_thmtoolscompat_code:,
1764   thmtools-compat .value_forbidden:n = true,
1765   thmtools-compat .usage:n = preamble,
1766   store-all .code:n = \__keythms_storeall_code:,
1767   store-all .value_forbidden:n = true,
1768   store-all .usage:n = preamble,
1769   auto-translate .bool_gset:N = \g__keythms_autotranslate_bool,
1770   auto-translate .initial:n = true,
1771 }
1772
1773 \cs_generate_variant:Nn \__keythms_thmuse_continues:n { V }
1774
1775 % \keytheoremset{<options>}
1776 \NewDocumentCommand \keytheoremset { m }
1777 {
1778   \keys_set:nn { keytheorems } { #1 }
1779 }
1780
1781 \cs_new_protected:Npn \__keythms_overload_code:
1782 {
1783   \RenewDocumentCommand { \newtheorem } { smomo }
1784   {
1785     \IfBooleanTF { ##1 }
1786     { \keythms_thm_newkeythm:nn { ##2 } { name=##4, numbered=no } }
1787     {
1788       \IfNoValueTF { ##3 }
1789       {
1790         \IfNoValueTF { ##5 }
1791         { \keythms_thm_newkeythm:nn { ##2 } { name=##4 } }
1792         { \keythms_thm_newkeythm:nn { ##2 } { name=##4, parent=##5 } }
1793       }
1794       { \keythms_thm_newkeythm:nn { ##2 } { name=##4, sibling=##3 } }
1795     }
1796   }

```

```

1797 }
1798
1799 \cs_new_protected:Npn \__keythms_thmtoolscompat_code:
1800 {
1801   \ProvideDocumentCommand { \declaretheoremstyle } { 0{} m }
1802   {
1803     \declarekeytheoremstyle { ##2 } { ##1 }
1804   }
1805   \ProvideDocumentCommand { \declaretheorem } { 0{} m }
1806   {
1807     \newkeytheorem { ##2 } [ ##1 ]
1808   }
1809   \ProvideDocumentEnvironment { restatable } { 0{} m m }
1810   {
1811     \begin{##2}[##1,store=##3]
1812   }
1813   {
1814     \end{##2}
1815     \cs_new:cpn { ##3 }
1816       { % make \foo and \foo* identical
1817         \peek_meaning_remove:NTF *
1818         { \use:c { __keythms_getthm_ ##3 _theorem } }
1819         { \use:c { __keythms_getthm_ ##3 _theorem } }
1820       }
1821   }
1822   \ProvideDocumentCommand { \listoftheorems } { } { \listofkeytheorems }
1823   \ProvideDocumentCommand { \addtotheorempreheadhook } { o m }
1824   {
1825     \IfNoValueTF { ##1 }
1826       { \addtotheoremhooke { prehead } { ##2 } }
1827       { \addtotheoremhooke [ ##1 ] { prehead } { ##2 } }
1828   }
1829   \ProvideDocumentCommand { \addtotheorempostheadhook } { o m }
1830   {
1831     \IfNoValueTF { ##1 }
1832       { \addtotheoremhooke { posthead } { ##2 } }
1833       { \addtotheoremhooke [ ##1 ] { posthead } { ##2 } }
1834   }
1835   \ProvideDocumentCommand { \addtotheoremprefoothook } { o m }
1836   {
1837     \IfNoValueTF { ##1 }
1838       { \addtotheoremhooke { prefoot } { ##2 } }
1839       { \addtotheoremhooke [ ##1 ] { prefoot } { ##2 } }
1840   }
1841   \ProvideDocumentCommand { \addtotheorempostfoothook } { o m }
1842   {
1843     \IfNoValueTF { ##1 }
1844       { \addtotheoremhooke { postfoot } { ##2 } }
1845       { \addtotheoremhooke [ ##1 ] { postfoot } { ##2 } }
1846   }
1847   \clist_new:N \l__keythms_tcbshaded_keys_clist
1848   \clist_new:N \l__keythms_tcbthmbox_keys_clist
1849   \keys_define:nn { keytheorems/thm/shaded }
1850   {
1851     textwidth .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { width=##1 },
1852     bgcolor .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { colback=##1 },
1853     rulewidth .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { boxrule=##1 },
1854     rulecolor .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { colframe=##1 },

```

```

1855     margin      .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { boxsep=##1 },
1856     padding      .meta:n = { margin=##1 },
1857     leftmargin    .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { left~skip=##1 }
1858     rightmargin   .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { right~skip=##1 }
1859   }
1860 \keys_define:nn { keytheorems/thm/thmbox }
1861 {
1862   L .code:n =
1863   {
1864     \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1865     { keythms_tcbthmbox_L }
1866   },
1867   M .code:n =
1868   {
1869     \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1870     { keythms_tcbthmbox_M }
1871   },
1872   S .code:n =
1873   {
1874     \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1875     { keythms_tcbthmbox_S }
1876   },
1877   underline .choice:,
1878   underline / true .code:n = {},
1879   underline / false .code:n =
1880   {
1881     \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1882     { boxed~title~style={bottomrule=0pt} }
1883   },
1884   underline .default:n = true,
1885   nounderline .meta:n = { underline=false },
1886   cut .choice:,
1887   cut / true .code:n = {},
1888   cut / false .code:n =
1889   {
1890     \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist { unbreakable }
1891   },
1892   cut .default:n = true,
1893   nocut .meta:n = { cut=false },
1894   thickness .code:n = % could also add keys to clist with changed dims; which is better?
1895   {
1896     \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1897     { keythms_tcbbox }
1898     { \dim_set:Nn \l__keythms_tcbthmbox_thickness_dim { ##1 } }
1899   },
1900   leftmargin .code:n =
1901   {
1902     \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1903     { keythms_tcbbox }
1904     { \dim_set:Nn \l__keythms_tcbthmbox_leftmargin_dim { ##1 } }
1905   },
1906   rightmargin .code:n =
1907   {
1908     \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1909     { keythms_tcbbox }
1910     { \dim_set:Nn \l__keythms_tcbthmbox_rightmargin_dim { ##1 } }
1911   },
1912   hskip .code:n =

```

```

1913     {
1914       \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1915       { keythms_tcbox }
1916       { \dim_set:Nn \l_keythms_tcbthmbox_hskip_dim { ##1 } }
1917     },
1918     vskip .code:n =
1919     {
1920       \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1921       { keythms_tcbox }
1922       { \dim_set:Nn \l_keythms_tcbthmbox_vskip_dim { ##1 } }
1923     },
1924   }
1925   \dim_new:N \l_keythms_tcbthmbox_thickness_dim
1926   \dim_set:Nn \l_keythms_tcbthmbox_thickness_dim { 0.6pt }
1927   \dim_new:N \l_keythms_tcbthmbox_leftmargin_dim
1928   \dim_set:Nn \l_keythms_tcbthmbox_leftmargin_dim { 0.7\parindent } % use \parindent? thmbox does
1929   \dim_new:N \l_keythms_tcbthmbox_rightmargin_dim
1930   \dim_set:Nn \l_keythms_tcbthmbox_rightmargin_dim { 0pt }
1931   \dim_new:N \l_keythms_tcbthmbox_hskip_dim
1932   \dim_set:Nn \l_keythms_tcbthmbox_hskip_dim { 0.2em }
1933   \dim_new:N \l_keythms_tcbthmbox_vskip_dim
1934   \dim_set:Nn \l_keythms_tcbthmbox_vskip_dim { 0.2em }
1935   \msg_new:nnn { keytheorems } { mdframed-undefined }
1936   {
1937     keytheorems~does~not~define~the~'mdframed'~key.~
1938     Consider~using~the~'tcolorbox'~key~instead.
1939   }
1940   \keys_define:nn { keytheorems/thm }
1941   {
1942     shaded .code:n =
1943     {
1944       \clist_clear:N \l__keythms_tcbshaded_keys_clist
1945       \keys_set:nn { keytheorems/thm/shaded } { ##1 }
1946       % FIX: surely a better way to do this
1947       \RequirePackage{tcolorbox}
1948       \pgfkeysifdefined{/tcb/keythms_tcbshaded_default/.@cmd} % even worth it?
1949       {}
1950       {
1951         \tcbset % wish I could do this outside of key but can't assume tcb loaded
1952         {
1953           keythms_tcbshaded_default/.style=
1954           {
1955             sharp~corners = all,
1956             boxrule = 0pt,
1957             left = 0pt, right = 0pt,
1958             top = 0pt, bottom = 0pt,
1959             parbox = false,
1960           }
1961         }
1962       }
1963       \keys_set:ne { keytheorems/thm }
1964       {
1965         tcolorbox-no-titlebar =
1966         {
1967           keythms_tcbshaded_default,
1968           \l__keythms_tcbshaded_keys_clist
1969         }
1970       }

```

```

1971 },
1972 thmbox .code:n = % adapted from https://tex.stackexchange.com/a/236230/208544
1973 {
1974   \clist_clear:N \l__keythms_tcbthmbox_keys_clist
1975   \keys_set:nn { keytheorems/thm/thmbox } { ##1 }
1976   % FIX: surely a better way to do this
1977   \RequirePackage{tcolorbox}
1978   \tcbuselibrary{skins,breakable}
1979   \pgfkeysifdefined{/tcb/keythms_tcbthmbox_default/.@cmd} % even worth it?
1980   {}
1981   {
1982     \tcbset{
1983       keythms_tcbthmbox_default/.style={
1984         enhanced,
1985         breakable,
1986         sharp~corners=all,
1987         right=\l_keythms_tcbthmbox_hskip_dim,
1988         left=\l_keythms_tcbthmbox_hskip_dim,
1989         top=\l_keythms_tcbthmbox_vskip_dim,
1990         bottom=\l_keythms_tcbthmbox_vskip_dim,
1991         coltitle=black,
1992         frame~engine=empty,
1993         interior~titled~engine=empty,
1994         interior~engine=empty,
1995         extras~broken={
1996           frame~engine=empty,
1997           interior~titled~engine=empty,
1998           interior~engine=empty
1999         },
2000         parbox=false,
2001         % even though frame isn't drawn, makes spacing correct
2002         boxrule=0.5\l_keythms_tcbthmbox_thickness_dim,
2003         attach~boxed~title~to~top~left={
2004           xshift=-\l_keythms_tcbthmbox_leftmargin_dim,
2005         },
2006         boxed~title~style={
2007           empty,
2008           size=minimal,
2009           bottom=0.7ex,
2010           top=0ex,
2011           % ditto
2012           bottomrule=0.5\l_keythms_tcbthmbox_thickness_dim,
2013         },
2014         left~skip=\l_keythms_tcbthmbox_leftmargin_dim,
2015         right~skip=\l_keythms_tcbthmbox_rightmargin_dim,
2016         overlay~unbroken={
2017           \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2018             (title.south~west)
2019             --
2020             (title.south~east);
2021           \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2022             (frame.north~west)
2023             |-
2024             ([xshift=10mm]frame.south~west);
2025         },
2026         overlay~first={
2027           \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2028             (title.south~west)

```

```

2029         --
2030         (title.south~east);
2031     \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2032         (frame.north~west)
2033         --
2034         (frame.south~west);
2035     },
2036     overlay~middle={
2037         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2038             (frame.north~west)
2039             --
2040             (frame.south~west);
2041     },
2042     overlay~last={
2043         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2044             (frame.north~west)
2045             |-
2046             ([xshift=10mm]frame.south~west);
2047     }
2048 },
2049 keythms_tcbthmbox_L/.style={
2050     overlay~unbroken={
2051         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2052             (title.south~west)
2053             --
2054             (title.south~east);
2055         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2056             (frame.north~west)
2057             |-
2058             (frame.south~east)
2059             -|
2060             (frame.north~east);
2061     },
2062     overlay~first={
2063         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2064             (title.south~west)
2065             --
2066             (title.south~east);
2067         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2068             (frame.north~west)
2069             --
2070             (frame.south~west);
2071         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2072             (frame.north~east)
2073             --
2074             (frame.south~east);
2075     },
2076     overlay~middle={
2077         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2078             (frame.north~west)
2079             --
2080             (frame.south~west);
2081         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2082             (frame.north~east)
2083             --
2084             (frame.south~east);
2085     },
2086     overlay~last={

```

```

2087         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2088             (frame.north~west)
2089             |-
2090             (frame.south~east)
2091             -|
2092             (frame.north~east);
2093     }
2094 },
2095 keythms_tcbthmbox_M/.style={},
2096 keythms_tcbthmbox_S/.style={ % first and middle same as M
2097     overlay~unbroken={
2098         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2099             (title.south~west)
2100             --
2101             (title.south~east);
2102         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2103             (frame.north~west)
2104             --
2105             (frame.south~west);
2106     },
2107     overlay~last={
2108         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2109             (frame.north~west)
2110             --
2111             (frame.south~west);
2112     }
2113 },
2114 }
2115 }
2116 \keys_set:ne { keytheorems/thm }
2117 {
2118     tcolorbox =
2119     {
2120         keythms_tcbthmbox_default,
2121         \l__keythms_tcbthmbox_keys_clist
2122     }
2123 }
2124 },
2125 thmbox .default:n = M,
2126 mdframed .code:n = \msg_error:nn { keytheorems } { mdframed-undefined },
2127 }
2128 }
2129
2130 \cs_new_protected:Npn \__keythms_storeall_code:
2131 {
2132     \cs_set_eq:NN \__keythms_withhooks_begin:nn \__keythms_grab_begin:nn
2133     \cs_set_eq:NN \__keythms_withhooks_begin:nnn \__keythms_grab_begin:nnn
2134     \cs_set_eq:NN \__keythms_withhooks_begin:nnV \__keythms_grab_begin:nnV
2135     \cs_set_eq:NN \__keythms_withhooks_end:n \__keythms_grab_end:n
2136 }
2137
2138 \hook_gput_code:nnn { begindocument/before } { . }
2139 { % use 'provide' in case user defines their own translation in preamble
2140     \ProvideTranslationFallback { keythms_listof_title } { List~of~Theorems }
2141     \ProvideTranslationFallback { keythms_continues } { continuing~from~p.\, }
2142     \bool_if:NT \g__keythms_autotranslate_bool
2143     {
2144         \ProvideTranslation { English } { keythms_listof_title } { List~of~Theorems }

```



```

2145     \ProvideTranslation { English } { keythms_continues } { continuing~from~p.\, }
2146     % from DeepL; I don't know these languages!
2147     \ProvideTranslation { French } { keythms_listof_title } { Liste~des~théorèmes }
2148     \ProvideTranslation { French } { keythms_continues } { suite~de~la~p.\, }
2149     \ProvideTranslation { German } { keythms_listof_title } { Liste~der~Theoreme }
2150     \ProvideTranslation { German } { keythms_continues } { weiter~von~Seite~ }
2151     \ProvideTranslation { Spanish } { keythms_listof_title } { Lista~de~teoremas }
2152     \ProvideTranslation { Spanish } { keythms_continues } { continúa~de~la~p.\, }
2153   }
2154 }
2155
2156 \ProcessKeyOptions[keytheorems]
2157
2158 \file_input_stop:

```

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