

The mdwkey* package

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1 User's guide

This is a key/value-pair parser, rather like the one in David Carlisle's `keyval` package but a little more powerful. There's no problem with having both in the same program.

1.1 Terminology

A *key-value pair* is a pair $\langle key \rangle = \langle value \rangle$, where the '=' appears at the topmost bracing level. A *tag* is just a single $\langle key \rangle$. A *list* is a sequence of key-value pairs and tags separated by commas ',' at the topmost bracing level. A $\langle key \rangle$ or $\langle value \rangle$ has a leading and/or trailing space removed, if there are any, and if the whole thing is enclosed in braces, then the braces are removed. Examples:

- `foo = bar` is a key-value pair. The key is 'foo' and the value is 'bar'.
- `{foo = bar}` is a tag. The key is 'foo = bar'.
- `foo = { bar }` is a key-value pair. The key is 'foo' and the value is ' bar ' (with the leading and trailing spaces).
- `foo = { bar }x` is a key-value pair. The key is 'foo' and the value is '{ bar }x'.
- `one,two` is a list of two tags, 'one' and 'two'.

*The mdwkey package is currently at version 1.0, dated 21 August 2003.

- ‘one,{two,three}’ is a list of two tags, ‘one’ and ‘two,three’.

There is no way to get an unmatched brace into a $\langle key \rangle$ or $\langle value \rangle$ without stupid catcode tricks.

1.2 Using the system

`\mkdef` New key names, and what to do when they’re encountered, is all defined using `\mkdef`. Keys are gathered into *groups*, so that lots of people can use the system without treading on their toes. I recommend that people use $\langle package-name \rangle : \langle label \rangle$ for their group names.

There’s a lot which can be done using `\mkdef`.

- `\mkdef{\group}\{key}\{stuff}` will perform $\langle stuff \rangle$ when $\langle key \rangle$ is given a value: the value is available as #1 in $\langle stuff \rangle$.
- `\mkdef{\group}\{key}[\langle default \rangle]\{stuff}` is the same, but additionally if $\langle key \rangle$ is found as a tag, then treat it as if we found $\langle key \rangle = \{ \langle default \rangle \}$ instead.
- `\mkdef{\group}\{key}*{\stuff}` will perform $\langle stuff \rangle$ when $\langle key \rangle$ is found as a tag.
- `\mkdef*{\group}\{stuff}` will perform $\langle stuff \rangle$ when an unknown key (one for which there is no specific definition in this group) is given a value: the key is available as #1 and the value as #2 in $\langle stuff \rangle$.
- `\mkdef*{\group}[\langle default \rangle]\{stuff}` is the same, but additionally if an unknown key is found as a tag then treat it as if it had been assigned the value $\langle default \rangle$ instead.
- `\mkdef*{\group}*{\stuff}` will perform $\langle stuff \rangle$ when an unknown key is found as a tag: the key is available as #1 in $\langle stuff \rangle$.

`\mkparse` All that remains now is to learn how to use the thing. Once you have a list, you can say `\mkparse{\group}\{list}` to perform all the appropriate actions. (This will mess up `\toks0` and `\next@` and some other standard scratch macros.)

2 Implementation

```
1 \<package | macro>
```

2.1 Provide bits of L^AT_EX for plain T_EX

This lot is the infrastructure needed to make the macros work under Plain T_EX.

```
2 \<plain>
3 \edef\done{\catcode'\noexpand\@=\the\catcode'\@}
4 \catcode'\@=11
5 \def\@gobble#1{}
6 \def\@firstoftwo#1#2{#1}
7 \def\@firstofthree#1#2#3{#1}
8 \def\@secondoftwo#1#2{#2}
9 \def\@ifnextchar#1#2#3{%
10 \def\next@{%
```

```

11 \ifx\char@#1\expandafter\@firstoftwo%
12 \else\expandafter\@secondoftwo\fi{#2}{#3}%
13 }%
14 \@ifn@i%
15 }
16 \def\@ifn@i{\futurelet\char@\@ifn@ii}
17 \def\@ifn@ii{%
18 \ifx\char@\@sptoken\expandafter\@ifn@i\else%
19 \expandafter\next@fi%
20 }
21 \def\@ifstar#1#2{%
22 \def\next@{%
23 \ifx\char*\expandafter\@firstofthree%
24 \else\expandafter\@secondoftwo\fi{#1}{#2}%
25 }%
26 \futurelet\char@\next@%
27 }
28 \def\@namedef#1{\expandafter\def\csname#1\endcsname}
29 \def\PackageError#1#2#3{\errhelp{#3}\errmessage{#1 error: #2}\errhelp{}}
30 \</plain>

```

2.2 Removing spaces

`\withoutspaces` Saying `\withoutspaces{<macro>}{<stuff>}` calls `<macro>`, passing it the argument which is `<stuff>`, shorn of (a) a single leading and/or space token, and (b) a single layer of `{...}` grouping, if present. This improves over `keyval`'s attempt by being a little simpler and only stripping off one layer of braces.

```

31 \def\q@delim{\q@delim}
32 \def\next@#1{%
33 \let\@sptoken=#1
34 \def\withoutspaces##1#2{%
35 \def\next@{##1}\futurelet\char@\wsp@ii#2%
36 \q@delim#1\q@delim\q@delim\relax%
37 }
38 \def\wsp@i{%
39 \ifx\char@\@sptoken\expandafter\wsp@ii%
40 \else\expandafter\wsp@iii\fi%
41 }
42 \def\wsp@ii#1{\wsp@iii}
43 \def\wsp@iii#1#1\q@delim##2\relax{\wsp@iv##1\q@delim\relax}
44 \def\wsp@iv##1\q@delim##2\relax{\next@{##1}}
45 }\next@{ }

```

`\withoutspacesdef` As a trivial but useful application of the above, `\withoutspacesdef{<name>}{<stuff>}` defines `<name>` as a macro containing `<stuff>` with a leading and trailing space deleted and a level of bracing removed.

```

46 \def\withoutspacesdef#1#2{\withspaces\toks@{#2}\edef#1{\the\toks@}}

```

2.3 Parsing key/value lists

`\mkparse` The main parser macro. Stash some information away and then start on the main loop.

```

47 \def\mkparse#1#2{%
48   \def\mk@group{#1}%
49   \def\mk@{mk$#1$}%
50   \mk@loop!#2,\q@delim,\relax%
51 }

```

And already the subtlety begins. Note that there's a leading '!' at the front of the token list. This prevents our delimited argument from being entirely brace-enclosed, which in turn stops \TeX from removing it until we're good and ready.

This doesn't trap empty items – that happens later.

```

52 \def\mk@loop#1,{%
53   \expandafter\def\expandafter\next@\expandafter{\@gobble#1}%
54   \ifx\next@\q@delim\expandafter\mk@x%
55   \else\mk@i#1=\q@delim\expandafter\mk@loop\expandafter!\fi%
56 }
57 \def\mk@x#1\relax{\relax}

```

Now we have to split an entry into a key and a value. If we have $\langle key \rangle = \langle value \rangle$ then $\#1 = !\langle key \rangle$ and $\#2 = \langle value \rangle$; if we have only $\langle key \rangle$, then $\#1 = !\langle key \rangle$ as before, and $\#2$ is empty. The first thing to do is strip the ! and spaces from $\#1$. If $\#2$ is empty then we're done with this stage and can just call `\mk@k` with what we've got; otherwise we swap the trailing = on $\#2$ for a leading ! and strip that off, and then call `\mk@kv` with the answer.

```

58 \def\mk@i#1=#2\q@delim{%
59   \expandafter\withoutspaces\expandafter%
60   \mk@ii\expandafter{\@gobble#1}{#2}%
61 }
62 \def\mk@ii#1#2{%
63   \ifx\q@delim#2\q@delim\mk@k{#1}%
64   \else\mk@iii{#1}!#2\q@delim\fi%
65 }
66 \def\mk@iii#1#2=\q@delim{%
67   \expandafter\withoutspaces\expandafter%
68   \mk@iv\expandafter{\@gobble#2}{#1}%
69 }
70 \def\mk@iv#1#2{\mk@kv{#2}{#1}}

```

We just have $\langle key \rangle$, shorn of spaces and outer braces. If it's empty then the whole entry was empty and we should ignore it. Otherwise, if there's a defined command for handling the token then we use that; if not, then we look for a general unknown-key command. If nothing works, we raise an error.

```

71 \def\mk@k#1{%
72   \ifx\q@delim#1\q@delim\else%
73     \expandafter\let\expandafter\next@\csname\mk@!#1\endcsname%
74     \ifx\next@\relax%
75       \expandafter\let\expandafter\next@\csname\mk@*\endcsname%
76       \ifx\next@\relax\mk@err{#1}%
77       \else\next@{#1}\fi%
78     \else\next@\fi%

```

```

79 \fi%
80 }

```

We have a *key* and a *value*, both stripped of spaces and braces. If there's a command for this key, then give it the value; otherwise look for a general unknown-key-with-value command. If nothing works, raise an error.

```

81 \def\mk@kv#1#2{%
82   \expandafter\let\expandafter\next@\csname\mk@=#1\endcsname%
83   \ifx\next@\relax%
84     \expandafter\let\expandafter\next@\csname\mk@*=\endcsname%
85     \ifx\next@\relax\mk@err{#1}%
86     \else\next@{#1}{#2}\fi%
87   \else\next@{#2}\fi%
88 }

```

How to raise an error. Not so difficult.

```

89 \def\mk@err#1{%
90   \PackageError{mdwkey}{Key ‘#1’ not found in group ‘\mk@group’}{%
91     I’ve never heard of the key you tried to set. I’m going to ignore it.
92   }
93 }

```

2.4 Defining keys

`\mkdefkey` This is all quite dull, really. I tried to merge the two cases, but it failed because I can't pass around macro parameter names through `\@ifnextchar` and their friends. If anyone has any bright ideas, I'd be delighted.

```

94 \def\mkdef{\@ifstar\mkdef@star@\mkdef@}
95 \def\mkdef@#1#2{%
96   \@ifstar%
97   {\mkdef@ii{#1}{#2}}%
98   {\@ifnextchar[%
99     {\mkdef@iii{#1}{#2}}%
100    {\mkdef@i{#1}{#2}}}%
101 }
102 \def\mkdef@i#1#2{\@namedef{mk$#1$=#2}##1}
103 \def\mkdef@ii#1#2{\@namedef{mk$#1$!#2}}
104 \def\mkdef@iii#1#2[#3]{%
105   \toks@{#3}%
106   \expandafter\edef\csname mk$#1$!#2\endcsname%
107   {\expandafter\noexpand\csname mk$#1$=#2\endcsname{\the\toks@}}%
108   \@namedef{mk$#1$=#2}##1%
109 }
110 \def\mkdef@star@#1{%
111   \@ifstar%
112   {\mkdef@star@ii{#1}}%
113   {\@ifnextchar[%
114     {\mkdef@star@iii{#1}}%
115     {\mkdef@star@i{#1}}}%
116 }
117 \def\mkdef@star@i#1{\@namedef{mk$#1$*=}##1##2}
118 \def\mkdef@star@ii#1{\@namedef{mk$#1$*!}##1}
119 \def\mkdef@star@iii#1[#2]{%

```

```

120 \toks@{#2}%
121 \expandafter\edef\csname mk$#1$*!\endcsname##1%
122   {\expandafter\noexpand\csname mk$#1$*=\endcsname{##1}{\the\toks@}}%
123   \@namedef{mk$#1$*=}##1##2%
124 }

```

And with that, we're done.

```

125 <+plain>\done
126 </package | macro>

```

Mark Wooding, 21 August 2003

Appendix

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Version 2, June 1991

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