

**NAME**

Mail::Box::MH – handle MH folders

**INHERITANCE**

```
Mail::Box::MH
  is a Mail::Box::Dir
  is a Mail::Box
  is a Mail::Reporter
```

**SYNOPSIS**

```
use Mail::Box::MH;
my $folder = new Mail::Box::MH folder => $ENV{MAIL}, ...;
```

**DESCRIPTION**

This documentation describes how MH mailboxes work, and what you can do with the MH folder object Mail::Box::MH.

Extends “DESCRIPTION” in Mail::Box::Dir.

**OVERLOADED**

Extends “OVERLOADED” in Mail::Box::Dir.

overload: “”

Inherited, see “OVERLOADED” in Mail::Box

overload: @{}

Inherited, see “OVERLOADED” in Mail::Box

overload: **cmp**

Inherited, see “OVERLOADED” in Mail::Box

**METHODS**

Extends “METHODS” in Mail::Box::Dir.

**Constructors**

Extends “Constructors” in Mail::Box::Dir.

Mail::Box::MH->**new**(%options)

-Option	--Defined in	--Default
access	Mail::Box	'r'
body_delayed_type	Mail::Box	Mail::Message::Body::Delayed
body_type	Mail::Box	Mail::Message::Body::Lines
coerce_options	Mail::Box	[]
create	Mail::Box	<false>
directory	Mail::Box::Dir	<derived from folder name>
extract	Mail::Box	10240
field_type	Mail::Box	undef
fix_headers	Mail::Box	<false>
folder	Mail::Box	\$ENV{MAIL}
folderdir	Mail::Box	\$ENV{HOME}/.mh
head_delayed_type	Mail::Box	Mail::Message::Head::Delayed
head_type	Mail::Box	Mail::Message::Head::Complete
index		undef
index_filename		<foldername>/.index
index_type		Mail::Box::MH::Index
keep_dups	Mail::Box	<false>
keep_index		0
labels		undef
labels_filename		<foldername>/.mh_sequence
labels_type		Mail::Box::MH::Labels
lock_file	Mail::Box	<index_file>

lock_timeout	Mail::Box	1 hour
lock_type	Mail::Box	Mail::Box::Locker::DotLock
lock_wait	Mail::Box	10 seconds
locker	Mail::Box	undef
log	Mail::Reporter	'WARNINGS'
manager	Mail::Box	undef
message_type	Mail::Box	<folder-class>::Message
multipart_type	Mail::Box	Mail::Message::Body::Multipart
remove_when_empty	Mail::Box	<true>
save_on_exit	Mail::Box	<true>
trace	Mail::Reporter	'WARNINGS'
trusted	Mail::Box	<depends on folder location>

access => MODE

body\_delayed\_type => CLASS

body\_type => CLASS|CODE

coerce\_options => ARRAY

create => BOOLEAN

directory => DIRECTORY

extract => INTEGER | CODE | METHOD | 'LAZY' | 'ALWAYS'

field\_type => CLASS

fix\_headers => BOOLEAN

folder => FOLDERNAME

folderdir => DIRECTORY

head\_delayed\_type => CLASS

head\_type => CLASS

index => OBJECT

You may specify an OBJECT of a type which extends Mail::Box::MH::Index (at least implements a `get ( )` method), as alternative for an index file reader as created by Mail::Box::MH.

index\_filename => FILENAME

The FILENAME which is used in each directory to store the headers of all mails. The filename shall not contain a directory path. (e.g. Do not use `/usr/people/jan/.index`, nor `subdir/.index`, but say `.index`.)

index\_type => CLASS

keep\_dups => BOOLEAN

keep\_index => BOOLEAN

Keep an index file of the specified mailbox, one file per directory. Using an index file will speed up things considerably, because it avoids reading all the message files the moment that you open the folder. When you open a folder, you can use the index file to retrieve information such as the subject of each message, instead of having to read possibly thousands of messages.

labels => OBJECT

You may specify an OBJECT of a type which extends Mail::Box::MH::Labels (at least implements the `get ( )` method), as alternative for labels file reader as created by Mail::Box::MH.

labels\_filename => FILENAME

In MH-folders, messages can be labeled, for instance based on the sender or whether it is read or not. This status is kept in a file which is usually called `.mh_sequences`, but that name can be overruled with this flag.

labels\_type => CLASS

lock\_file => FILENAME

lock\_timeout => SECONDS

lock\_type => CLASS|STRING|ARRAY

```

lock_wait => SECONDS
locker => OBJECT
log => LEVEL
manager => MANAGER
message_type => CLASS
multipart_type => CLASS
remove_when_empty => BOOLEAN
save_on_exit => BOOLEAN
trace => LEVEL
trusted => BOOLEAN

```

### The folder

Extends “The folder” in Mail::Box::Dir.

\$obj->**addMessage**(\$message, %options)

Inherited, see “The folder” in Mail::Box

\$obj->**addMessages**(@messages)

Inherited, see “The folder” in Mail::Box

Mail::Box::MH->**appendMessages**(%options)

Append a message to a folder which is not open.

-Option	--Defined in	--Default
folder	Mail::Box	<required>
message	Mail::Box	undef
messages	Mail::Box	undef
share	Mail::Box	<false>

folder => FOLDERNAME

message => MESSAGE

messages => ARRAY-OF-MESSAGES

share => BOOLEAN

\$obj->**close**(%options)

Inherited, see “The folder” in Mail::Box

\$obj->**copyTo**(\$folder, %options)

Inherited, see “The folder” in Mail::Box

\$obj->**delete**(%options)

Inherited, see “The folder” in Mail::Box

\$obj->**directory**()

Inherited, see “The folder” in Mail::Box::Dir

\$obj->**folderdir**([\$directory])

Inherited, see “The folder” in Mail::Box

\$obj->**name**()

Inherited, see “The folder” in Mail::Box

\$obj->**organization**()

Inherited, see “The folder” in Mail::Box

\$obj->**size**()

Inherited, see “The folder” in Mail::Box

\$obj->**type**()

Inherited, see “The folder” in Mail::Box

\$obj->**update**(%options)

Inherited, see “The folder” in Mail::Box

`$obj->url()`

Inherited, see “The folder” in Mail::Box

### Folder flags

Extends “Folder flags” in Mail::Box::Dir.

`$obj->access()`

Inherited, see “Folder flags” in Mail::Box

`$obj->isModified()`

Inherited, see “Folder flags” in Mail::Box

`$obj->modified( [BOOLEAN] )`

Inherited, see “Folder flags” in Mail::Box

`$obj->writable()`

Inherited, see “Folder flags” in Mail::Box

### The messages

Extends “The messages” in Mail::Box::Dir.

`$obj->current( [$number|$message|$message_id] )`

Inherited, see “The messages” in Mail::Box

`$obj->find($message_id)`

Inherited, see “The messages” in Mail::Box

`$obj->findFirstLabeled( $label, [BOOLEAN, [$msgs]] )`

Inherited, see “The messages” in Mail::Box

`$obj->message( $index, [$message] )`

Inherited, see “The messages” in Mail::Box

`$obj->messageId( $message_id, [$message] )`

Inherited, see “The messages” in Mail::Box

`$obj->messageIds()`

Inherited, see “The messages” in Mail::Box

`$obj->messages( <'ALL'|$range|'ACTIVE'|'DELETED'|$label| !$label|$filter> )`

Inherited, see “The messages” in Mail::Box

`$obj->nrMessages(%options)`

Inherited, see “The messages” in Mail::Box

`$obj->scanForMessages($message, $message_ids, $timespan, $window)`

Inherited, see “The messages” in Mail::Box

### Sub-folders

Extends “Sub-folders” in Mail::Box::Dir.

`$obj->listSubFolders(%options)`

Mail::Box::MH->listSubFolders(%options)

Inherited, see “Sub-folders” in Mail::Box

`$obj->nameOfSubFolder( $subname, [$parentname] )`

Mail::Box::MH->nameOfSubFolder( \$subname, [\$parentname] )

Inherited, see “Sub-folders” in Mail::Box

`$obj->openRelatedFolder(%options)`

Inherited, see “Sub-folders” in Mail::Box

`$obj->openSubFolder($subname, %options)`

Inherited, see “Sub-folders” in Mail::Box

`$obj->topFolderWithMessages()`  
 Mail::Box::MH->topFolderWithMessages()  
 Inherited, see “Sub-folders” in Mail::Box

## Internals

Extends “Internals” in Mail::Box::Dir.

`$obj->coerce($message, %options)`  
 Inherited, see “Internals” in Mail::Box

`$obj->create($foldername, %options)`  
 Mail::Box::MH->create(\$foldername, %options)  
   Option    --Defined in--Default  
   folderdir Mail::Box    undef

folderdir => DIRECTORY

`$obj->determineBodyType($message, $head)`  
 Inherited, see “Internals” in Mail::Box

`$obj->folderToDirectory($foldername, $folderdir)`  
 Inherited, see “Internals” in Mail::Box::Dir

Mail::Box::MH->foundIn( [\$foldername], %options )  
 Inherited, see “Internals” in Mail::Box

`$obj->highestMessageNumber()`  
 Returns the highest number which is used in the folder to store a file. This method may be called when the folder is read (then this number can be derived without file-system access), but also when the folder is not read (yet).

`$obj->index()`  
 Create a index reader/writer object.

`$obj->labels()`  
 Create a label reader/writer object.

`$obj->lineSeparator( [<STRING|'CR'|'LF'|'CRLF'>] )`  
 Inherited, see “Internals” in Mail::Box

`$obj->locker()`  
 Inherited, see “Internals” in Mail::Box

`$obj->messageInFile($filename)`  
 Inherited, see “Internals” in Mail::Box::Dir

`$obj->read(%options)`  
 Inherited, see “Internals” in Mail::Box

`$obj->readMessageFileNames($directory)`  
 Inherited, see “Internals” in Mail::Box::Dir

`$obj->readMessages(%options)`  
 Inherited, see “Internals” in Mail::Box

`$obj->storeMessage($message)`  
 Inherited, see “Internals” in Mail::Box

`$obj->toBeThreaded($messages)`  
 Inherited, see “Internals” in Mail::Box

`$obj->toBeUnthreaded($messages)`  
 Inherited, see “Internals” in Mail::Box

`$obj->updateMessages(%options)`  
 Inherited, see “Internals” in Mail::Box

`$obj->write(%options)`

Inherited, see “Internals” in Mail::Box

`$obj->writeMessages(%options)`

Option	--Defined in	--Default
<code>messages</code>	Mail::Box	<required>
<code>renumber</code>		<true>

`messages => ARRAY`

`renumber => BOOLEAN`

Permit renumbering of message. By default this is true, but for some unknown reason, you may be thinking that messages should not be renumbered.

### Other methods

Extends “Other methods” in Mail::Box::Dir.

`$obj->timespan2seconds($time)`

Mail::Box::MH->`timespan2seconds($time)`

Inherited, see “Other methods” in Mail::Box

### Error handling

Extends “Error handling” in Mail::Box::Dir.

`$obj->AUTOLOAD()`

Inherited, see “Error handling” in Mail::Reporter

`$obj->addReport($object)`

Inherited, see “Error handling” in Mail::Reporter

`$obj->defaultTrace( [$level][[$loglevel, $tracelevel]][[$level, $callback] ] )`

Mail::Box::MH->`defaultTrace( [$level][[$loglevel, $tracelevel]][[$level, $callback] ] )`

Inherited, see “Error handling” in Mail::Reporter

`$obj->errors()`

Inherited, see “Error handling” in Mail::Reporter

`$obj->log( [$level, [$strings]] )`

Mail::Box::MH->`log( [$level, [$strings]] )`

Inherited, see “Error handling” in Mail::Reporter

`$obj->logPriority($level)`

Mail::Box::MH->`logPriority($level)`

Inherited, see “Error handling” in Mail::Reporter

`$obj->logSettings()`

Inherited, see “Error handling” in Mail::Reporter

`$obj->notImplemented()`

Inherited, see “Error handling” in Mail::Reporter

`$obj->report( [$level] )`

Inherited, see “Error handling” in Mail::Reporter

`$obj->reportAll( [$level] )`

Inherited, see “Error handling” in Mail::Reporter

`$obj->trace( [$level] )`

Inherited, see “Error handling” in Mail::Reporter

`$obj->warnings()`

Inherited, see “Error handling” in Mail::Reporter

### Cleanup

Extends “Cleanup” in Mail::Box::Dir.

`$obj->DESTROY()`

Inherited, see “Cleanup” in Mail::Box

## DETAILS

Extends “DETAILS” in Mail::Box::Dir.

### Different kinds of folders

Extends “Different kinds of folders” in Mail::Box::Dir.

### Available folder types

Extends “Available folder types” in Mail::Box::Dir.

### Folder class implementation

Extends “Folder class implementation” in Mail::Box::Dir.

### How MH folders work

MH-type folders use a directory to store the messages of one folder. Each message is stored in a separate file. This seems useful, because changes in a folder change only a few of these small files, in contrast with file-based folders where changes in a folder cause rewrites of huge folder files.

However, MH-based folders perform very bad if you need header information of all messages. For instance, if you want to have full knowledge about all message-threads (see Mail::Box::Thread::Manager) in the folder, it requires to read all header lines in all message files. And usually, reading your messages in threads is desired.

So, each message is written in a separate file. The filenames are numbers, which count from 1. Next to these message files, a directory may contain a file named `.mh_sequences`, storing labels which relate to the messages. Furthermore, a folder-directory may contain sub-directories, which are seen as sub-folders.

### This implementation

This implementation supports the `.mh_sequences` file and sub-folders. Next to this, considerable effort it made to avoid reading each message-file. This should boost performance of the MailBox distribution over other Perl-modules which are able to read folders.

Folder types which store their messages each in one file, together in one directory, are bad for performance. Consider that you want to know the subjects of all messages, while browser through a folder with your mail-reading client. This would cause all message-files to be read.

Mail::Box::MH has two ways to try improve performance. You can use an index-file, and use on delay-loading. The combination performs even better. Both are explained in the next sections.

### An index-file

If you specify `new(keep_index)`, then all header-lines of all messages from the folder which have been read once, will also be written into one dedicated index-file (one file per folder). The default filename is `.index`

However, index-files are not supported by any other reader which supports MH (as far as I know). If you read the folders with such I client, it will not cause unrecoverable conflicts with this index-file, but at most be bad for performance.

If you do not (want to) use an index-file, then delay-loading may save your day.

## DIAGNOSTICS

Error: Cannot append message without lock on `$folder`.

It is impossible to append one or more messages to the folder which is not opened, because locking it fails. The folder may be in use by an other application, or you may need to specify some lock related options (see `new()`).

Error: Cannot create MH folder `$name`: `!`

For some reason, it is impossible to create the folder. Check the permissions and the name of the folder. Does the path to the directory to be created exist?

Error: Cannot write folder \$name without lock.

It is impossible to get a lock on the folder, which means that the changes can not be made. You may need to tune the lock related options which are available at folder creation.

Warning: Changes not written to read-only folder \$self.

You have opened the folder read-only --which is the default set by new(access)--, made modifications, and now want to close it. Set close(force) if you want to overrule the access mode, or close the folder with close(write) set to NEVER.

Error: Copying failed for one message.

For some reason, for instance disc full, removed by external process, or read-protection, it is impossible to copy one of the messages. Copying will proceed for the other messages.

Error: Destination folder \$name is not writable.

The folder where the messages are copied to is not opened with write access (see new(access)). This has no relation with write permission to the folder which is controlled by your operating system.

Warning: Different messages with id \$msgid

The message id is discovered more than once within the same folder, but the content of the message seems to be different. This should not be possible: each message must be unique.

Error: Folder \$name is opened read-only

You can not write to this folder unless you have opened the folder to write or append with new(access), or the force option is set true.

Error: Folder \$name not deleted: not writable.

The folder must be opened with write access via new(access), otherwise removing it will be refused. So, you may have write-access according to the operating system, but that will not automatically mean that this delete method permits you to. The reverse remark is valid as well.

Error: Invalid timespan '\$timespan' specified.

The string does not follow the strict rules of the time span syntax which is permitted as parameter.

Warning: Message-id '\$msgid' does not contain a domain.

According to the RFCs, message-ids need to contain a unique random part, then an @, and then a domain name. This is made to avoid the creation of two messages with the same id. The warning emerges when the @ is missing from the string.

Error: Package \$package does not implement \$method.

Fatal error: the specific package (or one of its superclasses) does not implement this method where it should. This message means that some other related classes do implement this method however the class at hand does not. Probably you should investigate this and probably inform the author of the package.

Error: Unable to create subfolder \$name of \$folder.

The copy includes the subfolders, but for some reason it was not possible to copy one of these. Copying will proceed for all other sub-folders.

Error: Unable to write message for \$folder to \$filename: \$!

The new message could not be written to its new file, for the specific reason.

Error: Writing folder \$name failed

For some reason (you probably got more error messages about this problem) it is impossible to write the folder, although you should because there were changes made.

## SEE ALSO

This module is part of Mail-Box distribution version 3.009, built on August 18, 2020. Website: <http://perl.overmeer.net/CPAN/>

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