

The make4ht build system

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Contents

1	Introduction	2
2	Usage	3
2.1	Command line options	3
2.2	Option handling	3
2.3	Input from the standard input	4
2.4	Change amount of information printed on the command line	4
3	Difference of make4ht from htlatex	4
3.1	Passing of command line arguments to low-level commands used in the conversion	5
3.2	Compilation sequence	5
3.3	Handling of the generated files	6
3.4	Image conversion and postprocessing of the generated files	6
4	Output file formats and extensions	7
4.1	Extensions	7
5	Build files	8
5.1	User commands	9
5.1.1	The command function	9
5.1.2	The settings table table	9
5.1.3	Repetition	9
5.1.4	Expected exit code	10
5.2	Provided commands	10
5.3	File matches	11
5.3.1	Filters	11
5.3.2	DOM filters	12
5.4	Image conversion	13
5.5	The mode variable	14
5.6	The settings table	14
5.6.1	Default settings	15

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6	make4ht configuration file	16
6.1	Location	16
6.2	Additional commands	16
6.3	Example	16
7	List of available settings for filters and extensions.	17
7.1	Compilation commands	17
7.2	The autohtlatex command	17
7.3	Indexing commands	17
7.3.1	The xindy command	17
7.3.2	The makeindex command	17
7.3.3	The xindex command	17
7.4	The tidy extension	17
7.5	The collapsetoc dom filter	18
7.6	The copy_images extension	18
7.7	The fixinlines dom filter	18
7.8	The joincharacters dom filter	19
7.9	The mjcli filter and extension	19
7.9.1	Available settings	19
7.10	The staticsite filter and extension	20
7.11	The dvisvgm_hashes extension	20
7.12	The odttemplate filter and extension	21
7.13	The aeneas filter	21
7.14	The make4ht-aeneas-config package	21
7.14.1	Available parameters	21
7.14.2	Additional parameters for the job configuration file	22
7.14.3	Available map options	22
7.14.4	Full example	23
8	Troubleshooting	23
8.1	Incorrect handling of command line arguments for tex4ht, t4ht or latex	23
8.2	Table of Contents points to a wrong destination	24
8.3	Filenames containing spaces	24
8.4	Filenames containing non-ASCII characters	24
9	License	24
10	Changelog	24

1 Introduction

make4ht is a build system for [T_EX4ht](#), T_EX to XML converter. It provides a command line tool that drives the conversion process. It also provides a library that can be used to create customized conversion tools. An example of such a tool is [tex4ebook](#), a tool for conversion from T_EX to ePub and other e-book formats.

See section 3 for some reasons why you should consider to use make4ht instead of htlatex, section 4 talks about supported output formats and extensions and section 5 describes build files, which can be used to execute additional commands or post-process the generated files.

2 Usage

The basic conversion from L^AT_EX to HTML using make4ht can be executed using the following command:

```
$ make4ht filename.tex
```

It will produce a file named filename.html if the compilation goes without fatal errors.

2.1 Command line options

```
make4ht - build system for TeX4ht
Usage:
make4ht [options] filename ["tex4ht.sty op." "tex4ht op."
    "t4ht op" "latex op"]
-a,--loglevel (default status) Set log level.
    possible values: debug, info, status, warning, error, fatal
-b,--backend (default tex4ht) Backend used for xml generation.
    possible values: tex4ht or lua4ht
-c,--config (default xhtml) Custom config file
-d,--output-dir (default "") Output directory
-B,--build-dir (default nil) Build directory
-e,--build-file (default nil) If the build filename is different
    than `filename`.mk4
-f,--format (default nil) Output file format
-j,--jobname (default nil) Set the jobname
-l,--lua Use luatex for document compilation
-m,--mode (default default) Switch which can be used in the makefile
-n,--no-tex4ht Disable DVI file processing with tex4ht command
-s,--shell-escape Enables running external programs from LaTeX
-u,--utf8 For output documents in utf8 encoding
-x,--xetex Use xelatex for document compilation
-v,--version Print version number
<filename> (string) Input filename
```

2.2 Option handling

It is possible to invoke make4ht in the same way as htlatex:

```
$ make4ht filename "customcfg, charset=utf-8" "-cunihtf -utf8" "-dfoo"
```

Note that this will not use make4ht routines for the output directory handling. See section 3.3 for more information about this issue. To use these routines, change the previous listing to:

```
$ make4ht -d foo filename "customcfg, charset=utf-8" "-cunihtf -utf8"
```

This call has the same effect as the following:

```
$ make4ht -u -c customcfg -d foo filename
```

Output directory does not have to exist, it make4ht creates it automatically. Specified path can be relative to the current directory, or absolute:

```
$ make4ht -d use/current/dir/ filename
$ make4ht -d ../gotoparentdir filename
$ make4ht -d ~/gotohomedir filename
$ make4ht -d c:\documents\windowspathsareshworkingtoo filename
```

The short options that do not take parameters can be collapsed:

```
$ make4ht -ulc customcfg -d foo filename
```

2.3 Input from the standard input

To pass the output from other commands to make4ht, use the - character as a filename. It is best to use this feature together with the --jobname or -j option.

```
$ cat hello.tex | make4ht -j world -
```

2.4 Change amount of information printed on the command line

By default, make4ht tries to be quiet, so it hides most of the command line messages and output from the executed commands. It displays status messages, warnings, and errors. The logging level can be selected using the --loglevel or -a options. If the compilation fails, it may be useful to display more information using the info or debug levels.

```
$ make4ht -a debug faulty.tex
```

3 Difference of make4ht from htlatex

\TeX 4ht system supports several output formats, most notably XHTML, HTML 5 and ODT, but it also supports TEI or Docbook.

The conversion can be invoked using several scripts, which are distributed with \TeX 4ht. They differ in parameters passed to the underlying commands.

These scripts invoke \LaTeX or Plain \TeX with special instructions to load the tex4ht.sty package. The \TeX run produces a special DVI file that contains the code for the desired output format. The produced DVI file is then processed using the tex4ht command, which in conjunction with the t4ht command produces the desired output files.

3.1 Passing of command line arguments to low-level commands used in the conversion

The basic conversion script provided by \TeX 4ht system is named `htlatex`. It compiles \LaTeX files to HTML with this command sequence:

```
$ latex $latex_options 'code for loading tex4ht.sty \input{filename}'
$ latex $latex_options 'code for loading tex4ht.sty \input{filename}'
$ latex $latex_options 'code for loading tex4ht.sty \input{filename}'
$ tex4ht $tex4ht_options filename
$ t4ht $t4ht_options filename
```

The options for various parts of the system can be passed on the command line:

```
$ htlatex filename "tex4ht.sty options" "tex4ht_options" "t4ht_options" "latex_options"
```

For basic HTML conversion it is possible to use the most basic invocation:

```
$ htlatex filename.tex
```

It can be much more involved for the HTML 5 output in UTF-8 encoding:

```
$ htlatex filename.tex "xhtml,html5,charset=utf-8" " -cmozhtf -utf8"
```

`make4ht` can simplify it:

```
$ make4ht -u filename.tex
```

The `-u` option requires the UTF-8 encoding. HTML 5 is used as the default output format by `make4ht`.

More information about the command line arguments can be found in section [2.1](#).

3.2 Compilation sequence

`htlatex` has a fixed compilation order and a hard-coded number of \LaTeX invocations.

It is not possible to execute additional commands during the compilation. When we want to run a program that interacts with \LaTeX , such as `Makeindex` or `Bibtex`, we have two options. The first option is to create a new script based on `htlatex` and add the wanted commands to the modified script. The second option is to execute `htlatex`, then the additional and then `htlatex` again. The second option means that \LaTeX will be invoked six times, as each call to `htlatex` executes three calls to \LaTeX . This can lead to significantly long compilation times.

`make4ht` provides a solution for this issue using a build file, or extensions. These can be used for interaction with external tools.

`make4ht` also provides compilation modes, which enables to select commands that should be executed using a command line option.

There is a built-in draft mode, which invokes \LaTeX only once, instead of the default three invocations. It is useful for the compilations of the document before its final stage, when it is not important that all cross-references work. It can save quite a lot of the compilation time:

```
$ make4ht -um draft filename.tex
```

Another built-in mode is `clean`. It executes the `Make:clean()` command to remove all generated and temporary files from the current directory. No \LaTeX compilation happens in this mode.

It should be used in this way:

```
# copy generated files to a directory
$ make4ht -d outdir filename.tex
# remove all generated files in the current dir
# the -a info option will print files that are removed
$ make4ht -m clean -a info filename.tex
```

More information about the build files can be found in section 5.

3.3 Handling of the generated files

There are also issues with the behavior of the `t4ht` application. It reads the `.lg` file generated by the `tex4ht` command. This file contains information about the generated files, CSS instructions, calls to the external applications, instructions for image conversions, etc.

`t4ht` can be instructed to copy the generated files to an output directory, but it doesn't preserve the directory structure. When the images are placed in a subdirectory, they will be copied to the output directory, losing the directory structure. Links will be pointing to a non-existing subdirectory. The following command should copy all output files to the correct destinations.

```
$ make4ht -d outputdir filename.tex
```

`make4ht` can also output temporary files to a build directory, thanks to the `--build-dir` (or `-B`) option. The following command will put `.aux`, `.4tc` and other auxiliary files to the build dir, and the generated `.html` and `.css` files to the `outputdir` directory.

```
$ make4ht -B build -d outputdir filename.tex
```

3.4 Image conversion and postprocessing of the generated files

\TeX 4ht can convert parts of the document to images. This is useful for diagrams or complicated math, for example.

By default, the image conversion is configured in a `.env` file. It has a bit of strange syntax, with operating system dependent rules. `make4ht` provides simpler means for the image conversion in the build files. It is possible to change the image conversion parameters without a need to modify the `.env` file. The process is described in section 5.4.

It is also possible to post-process the generated output files. The post-processing can be done either using external programs such as XSLT processors and HTML Tidy or using Lua functions. More information can be found in section 5.3.

4 Output file formats and extensions

The default output format used by `make4ht` is `html5`. A different format can be requested using the `--format` option. Supported formats are:

- `xhtml`
- `html5`
- `odt`
- `tei`
- `docbook`

The `--format` option can be also used for extension loading.

4.1 Extensions

Extensions can be used to modify the build process without the need to use a build file. They may post-process the output files or request additional commands for the compilation.

The extensions can be enabled or disabled by appending `+EXTENSION` or `-EXTENSION` after the output format name:

```
$ make4ht -f html5+tidy filename.tex
```

In `xhtml` and `html5` output formats, the `common_domfilters` extension is triggered automatically, but it can still be disabled using:

```
$ make4ht -f html5-common_domfilters filename.tex
```

Available extensions:

common_filters clean the output HTML files using filters.

common_domfilters clean the HTML file using DOM filters. It is more powerful than `common_filters`. It used following DOM filters: `fixinlines`, `idcolons`, `joincharacters`, `mathmlfixes`, `tablerows`, `booktabs`, `sectionid` and `itemparagraphs`

copy_images Copies the images to the output directory. This is useful if the original images are stored in directories above the document directory.

detect_engine detect engine and format necessary for the document compilation from the magic comments supported by \LaTeX editors such as `TeXShop` or `TeXWorks`. Add something like the following line at the beginning of the main \TeX file:

```
%!TEX TS-program = xelatex
```

It supports also Plain \TeX , use for example `tex` or `luatex` as the program name.

dvisvgm_hashes efficient generation of SVG pictures using `Dvisvgm`. It can utilize multiple processor cores and generates only changed images.

inliness load the inliness DOM filter.

join_colors load the joincolors DOM filter for all HTML files.

latexmk_build use [Latexmk](#) for the \LaTeX compilation.

mathjaxnode (**deprecated**, use `mjcli` extension instead) Old information: use [mathjax-node-page](#) to convert from MathML code to HTML + CSS or SVG. See [the available settings](#).

mjcli use [mjcli](#) to convert math in MathML or \LaTeX format to plain HTML + CSS. MathML is used by default. If you want to use \LaTeX math, add “mathjax” option on the command line (like `make4ht -f html5+mjcli filename.tex "mathjax"`). See [the available settings](#).

nodynamicodt change dynamic content in ODT files (such as tables of contents or bibliographies) to text.

odttemplate it automatically loads the odttemplate filter (page 12).

preprocess_input compilation of the formats supported by [Knitr](#) (`.Rnw`, `.Rtex`, `.Rmd`, `.Rrst`) and also Markdown and reStructuredText formats. It requires [R](#) + [Knitr](#) installation, it requires also [Pandoc](#) for formats based on Markdown or reStructuredText.

staticsite build the document in a form suitable for static site generators like [Jekyll](#).

tidy clean the HTML files using the tidy command.

5 Build files

`make4ht` supports build files. These are Lua scripts that can adjust the build process. They can request external applications like BibTeX or Makeindex, pass options to the commands, modify the image conversion process, or post-process the generated files.

`make4ht` tries to load default build file named as `filename + .mk4` extension. It is possible to select a different build file with `-e` or `--build-file` command line option.

Sample build file:

```
Make:htlatex()  
Make:match("html$", "tidy -m -xml -utf8 -q -i ${filename}")
```

`Make:htlatex()` is preconfigured command for calling \LaTeX with the `tex4ht.sty` package loaded. In this example, it will be executed only once. After the compilation, the `tidy` command is executed on the output HTML files.

Note that it is not necessary to call `tex4ht` and `t4ht` commands explicitly in the build file, they are called automatically.

5.1 User commands

It is possible to add more commands like `Make:htlatex` using the `Make:add` command:

```
Make:add("name", "command", {settings table}, repetition)
```

This defines the `name` command, which can be then executed using `Make:name()` command in the build file.

The name and command parameters are required, the rest of the parameters are optional.

The defined command receives a table with settings as a parameter at the call time. The default settings are provided by `make4ht`. Additional settings can be declared in the `Make:add` commands, user can also override the default settings when the command is executed in the build file:

```
Make:name({hello="world"})
```

More information about settings, including the default settings provided by `make4ht`, can be found in section [5.6](#) on page [14](#).

5.1.1 The command function

The command parameter can be either a string template or function:

```
Make:add("text", "echo hello, input file: ${input}")
```

The template can get a variable value from the parameters table using a `${var_name}` placeholder. Templates are executed using the operating system, so they should invoke existing OS commands.

5.1.2 The settings table **table**

The `settings table` parameter is optional. If it is present, it should be a table with new settings available in the command. It can also override the default `make4ht` settings for the defined command.

```
Make:add("sample_function", function(params)
  for k, v in pairs(params) do
    print(k..": "..v)
  end, {custom="Hello world"}
)
```

5.1.3 Repetition

The repetition parameter specifies the maximum number of executions of the particular command. This is used for instance for `tex4ht` and `t4ht` commands, as they should be executed only once in the compilation. They would be executed multiple times when they are included in the build file, as they are called by `make4ht` by default. Because these commands allow only one repetition, the second execution is blocked.

5.1.4 Expected exit code

You can set the expected exit code from a command with a `correct_exit` key in the settings table. The compilation will be terminated when the command returns a different exit code.

```
Make:add("biber", "biber ${input}", {correct_exit=0})
```

Commands that execute lua functions can return the numerical values using the return statement.

This mechanism isn't used for \TeX , because it doesn't differentiate between fatal and non-fatal errors. It returns the same exit code in all cases. Because of this, log parsing is used for a fatal error detection instead. Error code value 1 is returned in the case of a fatal error, 0 is used otherwise. The `Make.testlogfile` function can be used in the build file to detect compilation errors in the \TeX log file.

5.2 Provided commands

`Make:htlatex` One call to the \TeX engine with special configuration for loading of the `tex4ht.sty` package.

`Make:autohtlatex` Variant of `Make:htlatex` that automates the compilation of \LaTeX documents, ensuring that the process is repeated until the output stabilizes or an error occurs.

`Make:clean` This command removes all generated files, including images, HTML files and various auxiliary files, from the current directory. It keeps files whose file names don't match the input file name. It is preferable to use `make4ht -m clean filename.tex` to clean output files.

`Make:httex` Variant of `Make:htlatex` suitable for Plain \TeX .

`Make:latexmk` Use `Latexmk` for the document compilation. `tex4ht.sty` will be loaded automatically.

`Make:tex4ht` Process the DVI file and create output files.

`Make:t4ht` Create the CSS file and generate images.

`Make:biber` Process bibliography using the `biber` command.

`Make:pythontex` Process the input file using `pythontex`.

`Make:bibtex` Process bibliography using the `bibtex` command.

`Make:xindy` Generate index using `Xindy` index processor.

`Make:makeindex` Generate index using the `Makeindex` command.

`Make:xindex` Generate index using the `Xindex` command.

5.3 File matches

Another type of action that can be specified in the build file is `Make:match`. It can be used to post-process the generated files:

```
Make:match("html$", "tidy -m -xml -utf8 -q -i ${filename}")
```

The above example will clean all output HTML files using the `tidy` command.

The `Make:match` action tests output filenames using a Lua pattern matching function.

It executes a command or a function, specified in the second argument, on files whose filenames match the pattern.

The commands to be executed can be specified as strings. They can contain `${var_name}` placeholders, which are replaced with corresponding variables from the settings table. The templating system was described in subsection 5.1.1. There is an additional variable available in this table, called `filename`. It contains the name of the current output file.

If a function is used instead, it will get two parameters. The first one is the current filename, the second one is the settings table.

```
Make:match("html$", function(filename, settings)
  print("Post-processing file: ".. filename)
  print("Available settings")
  for k,v in pairs(settings)
    print(k,v)
  end
  return true
end)
```

Multiple post-processing actions can be executed on each filename. The Lua action functions can return an exit code. If the exit code is false, the execution of the post-processing chain for the current file will be terminated.

5.3.1 Filters

To make it easier to post-process the generated files using the match actions, `make4ht` provides a filtering mechanism thanks to the `make4ht-filter` module.

The `make4ht-filter` module returns a function that can be used for the filter chain building. Multiple filters can be chained into a pipeline. Each filter can modify the string that is passed to it from the previous filters. The changes are then saved to the processed file.

Several built-in filters are available, it is also possible to create new ones.

Example that use only the built-in filters:

```
local filter = require "make4ht-filter"
local process = filter{"cleanspan", "fixligatures", "hruletohr"}
Make:htlatex()
Make:match("html$", process)
```

Function `filter` accepts also function arguments, in this case this function takes file contents as a parameter and modified contents are returned.

Example with custom filter:

```
local filter = require "make4ht-filter"
```

```

local changea = function(s) return s:gsub("a","z") end
local process = filter{"cleanspan", "fixligatures", changea}
Make:htlatex()
Make:match("html$",process)

```

In this example, spurious span elements are joined, ligatures are decomposed, and then all letters “a” are replaced with “z” letters.

Built-in filters are the following:

cleanspan clean spurious span elements when accented characters are used

cleanspan-nat alternative clean span filter, provided by Nat Kuhn

fixligatures decompose ligatures to base characters

hruletohr \hrule commands are translated to series of underscore characters by \TeX 4ht, this filter translates these underscores to <hr> elements

entites convert prohibited named entities to numeric entities (only currently).

fix-links replace colons in local links and id attributes with underscores. Some cross-reference commands may produce colons in internal links, which results in a validation error.

mathjaxnode (**deprecated**, use mjcli extension instead) Old information: use [mathjax-node-page](#) to convert from MathML code to HTML + CSS or SVG. See [the available settings](#).

mjcli use [mjcli](#) to convert math in MathML or \LaTeX format to plain HTML + CSS. See [the available settings](#).

odttemplate use styles from another ODT file serving as a template in the current document. It works for the styles.xml file in the ODT file. During the compilation, this file is named as \jobname.4oy.

staticsite create HTML files in a format suitable for static site generators such as [Jekyll](#)

svg-height some SVG images produced by dvisvgm seem to have wrong dimensions. This filter tries to set the correct image size.

5.3.2 DOM filters

DOM filters are variants of filters that use the [LuaXML](#) library to modify directly the XML object. This enables more powerful operations than the regex-based filters from the previous section.

Example:

```

local domfilter = require "make4ht-domfilter"
local process = domfilter {"joincharacters"}
Make:match("html$", process)

```

Available DOM filters:

aeneas [Aeneas](#) is a tool for automagical synchronization of text and audio. This filter modifies the HTML code to support synchronization.

booktabs fix lines produced by the `\cmidrule` command provided by the `Booktabs` package.

collapsetoc collapse table of contents to contain only top-level sectioning level and sections on the current page.

fixinlines put all inline elements which are direct children of the `<body>` elements to a paragraph.

idcolons replace the colon (`:`) character in internal links and id attributes. They cause validation issues.

inlinecss remove CSS rules that target elements with unique attributes, such as color boxes, table rules, or inline math pictures, and insert their properties as a inline style attribute in the HTML document.

joincharacters join consecutive `` or `<mn>` elements. This DOM filter supersedes the `cleanspan` filter.

joincolors many `` elements with unique id attributes are created when \LaTeX colors are being used in the document. A CSS rule is added for each of these elements, which may result in substantial growth of the CSS file. This filter replaces these rules with a common one for elements with the same color value. See also the `inlinecss` DOM filter and extension, which provides an alternative using inline styles.

odtfonts fix styles for fonts that were wrongly converted by `Xtpipes` in the ODT format.

odtimagesize set correct dimensions for images in the ODT format. It is no longer used, as the dimensions are set by `TeX4ht` itself.

odtpartable resolve tables nested inside paragraphs, which is invalid in the ODT format.

tablerows remove spurious rows from HTML tables.

mathmlfixes fix common issues for MathML.

sectionid create id attribute for HTML sectioning elements derived from the section title. It also updates links to these sections. Use the `notoc` command line option to prevent that.

t4htlinks fix hyperlinks in the ODT format.

5.4 Image conversion

It is possible to convert parts of the \LaTeX input as pictures. It can be used for preserving the appearance of math or diagrams, for example.

These pictures are stored in a special DVI file, which can be processed by a DVI to image commands, such as `dvipng` or `dvisvgm`.

This conversion is normally configured in the `tex4ht.env` file. This file is system dependent and it has quite an unintuitive syntax. The configuration is processed by the `t4ht` application and the conversion command is called for all pictures.

It is possible to disable `t4ht` image processing and configure image conversion in the build file using the `image` action:

```
Make:image("png$",  
"dvipng -bg Transparent -T tight -o ${output} -pp ${page} ${source}")
```

`Make:image` takes two parameters, a Lua pattern to match the image name, and the action.

Action can be either a string template with the conversion command or a function that takes a table with parameters as an argument.

There are three parameters:

- `output` - output image filename
- `source` - DVI file with the pictures
- `page` - page number of the converted image

5.5 The mode variable

The mode variable available in the build process contains contents of the `--mode` command line option. It can be used to run some commands conditionally. For example:

```
if mode == "draft" then  
  Make:htlatex{}  
else  
  Make:htlatex{}  
  Make:htlatex{}  
  Make:htlatex{}  
end
```

In this example (which is the default configuration used by `make4ht`), \LaTeX is called only once when `make4ht` is called with the `draft` mode:

```
make4ht -m draft filename
```

5.6 The settings table

It is possible to access the parameters outside commands, file matches and image conversion functions. For example, to convert the document to the OpenDocument Format (ODT), the following settings can be used. They are based on the `oolatex` command:

```
settings.tex4ht_sty_par = settings.tex4ht_sty_par .. "ooffice"  
settings.tex4ht_par = settings.tex4ht_par .. " ooffice/! -cmozhtf"  
settings.t4ht_par = settings.t4ht_par .. " -cooxtpipes -coo "
```

(Note that it is possible to use the `--format odt` option which is superior to the previous code. This example is intended just as an illustration)

There are some functions to simplify access to the settings:

`set_settings{parameters}` overwrite settings with values from a passed table

`settings_add{parameters}` add values to the current settings

`filter_settings "filter name" {parameters}` set settings for a filter

`get_filter_settings(name)` get settings for a filter

For example, it is possible to simplify the sample from the previous code listings:

```
settings_add {
  tex4ht_sty_par =",ooffice",
  tex4ht_par = " ooffice/! -cmozhtf",
  t4ht_par = " -cooxtpipes -coo "
}
```

Settings for filters and extensions can be set using `filter_settings`:

```
filter_settings "test" {
  hello = "world"
}
```

These settings can be retrieved in the extensions and filters using the `get_filter_settings` function:

```
function test(input)
  local options = get_filter_settings("test")
  print(options.hello)
  return input
end
```

5.6.1 Default settings

The default parameters are the following:

`htlatex` used \TeX engine

`input` content of `\jobname`, see also the `tex_file` parameter.

`interaction` interaction mode for the \TeX engine. The default value is `batchmode` to suppress user input on compilation errors. It also suppresses most of the \TeX compilation log output. Use the `errorstopmode` for the default behavior.

`tex_file` input \TeX filename

`latex_par` command line parameters to the \TeX engine

`packages` additional \LaTeX code inserted before `\documentclass`. Useful for passing options to packages used in the document or to load additional packages.

`tex4ht_sty_par` options for `tex4ht.sty`
`tex4ht_par` command line options for the `tex4ht` command
`t4ht_par` command line options for the `t4ht` command
`outdir` the output directory
`correct_exit` expected exit code from the command. The compilation will be terminated if the exit code of the executed command has a different value.
`auto_extensions` table with extensions of auxiliary files that should be watched by the `Make:autohtlatex` command.
`max_compilations` maximum number of \LaTeX runs by the `Make:autohtlatex` command.

6 make4ht configuration file

It is possible to globally modify the build settings using the configuration file. It is a special version of a build file where the global settings can be set.

Common tasks for the configuration file can be a declaration of the new commands, loading of the default filters or specification of a default build sequence.

One additional functionality not available in the build files are commands for enabling and disabling of extensions.

6.1 Location

The configuration file can be saved either in the `$HOME/.config/make4ht/config.lua` file, or in the `.make4ht` file placed in the current directory or its parent directories (up to the `$HOME` directory).

6.2 Additional commands

There are two additional commands:

```
Make:enable_extension(name) require extension
```

```
Make:disable_extension(name) disable extension
```

6.3 Example

The following example of the configuration file adds support for the `biber` command, requires `common_domfilters` extension and requires `MathML` output for `math`.

```

Make:add("biber", "biber ${input}")
Make:enable_extension "common_domfilters"
settings_add {
  tex4ht_sty_par = "mathml"
}

```


7 List of available settings for filters and extensions.

These settings may be set using `filter_settings` function in a build file or in the `make4ht` configuration file.

7.1 Compilation commands

7.2 The `autohtlatex` command

auto_extensions table with extensions of auxiliary files that should be watched by the `Make:autohtlatex` command.

max_compilations maximum number of \LaTeX runs by the `Make:autohtlatex` command.

7.3 Indexing commands

The indexing commands (like `xindy` or `makeindex`) use some common settings.

idxfile name of the `.idx` file. Default value is `\jobname.idx`.

indfile name of the `.ind` file. Default value is the same as `idxfile` with the file extension changed to `.ind`.

Each indexing command can have some additional settings.

7.3.1 The `xindy` command

encoding text encoding of the `.idx` file. Default value is `utf8`.

language index language. Default language is English.

modules table with names of additional Xindy modules to be used.

7.3.2 The `makeindex` command

options additional command line options for the `Makeindex` command.

7.3.3 The `xindex` command

options additional command line options for the `Xindex` command.

language document language

7.4 The `tidy` extension

options command line options for the `tidy` command. Default value is `-m -utf8 -w 512 -q`.

7.5 The `collapsetoc` dom filter

`toc_query` CSS selector for selection of element that contains the table of contents.

`title_query` CSS selector for selecting all elements that contain the section ID attribute.

`toc_levels` table containing a hierarchy of classes used in TOC

`max_depth` set depth of displayed children TOC levels

Default values:

```
filter_settings "collapsetoc" {
  toc_query = ".tableofcontents",
  title_query = "h1 a, h2 a, h3 a, h4 a, h5 a, h6 a",
  max_depth = 1,
  toc_levels = {
    tocpart = 1,
    toclikepart = 1,
    tocappendix = 1,
    toclikechapter = 2,
    tocchapter = 2,
    tocsection = 3,
    toclikesection = 3,
    tocsubsection = 4,
    toclikesubsection = 4,
    tocsubsubsection = 5,
    toclikesubsubsection = 5,
    tocparagraph = 6,
    toclikeparagraph = 6,
    tocsubparagraph = 7,
    toclikesubparagraph = 7,
  }
}
```

7.6 The `copy_images` extension

`extensions` table with list of image extensions that should be processed.

`img_dir` name of the output directory where images should be stored

Default values:

```
filter_settings "copy_images" {
  extensions = {"png", "jpg", "jpeg", "svg"},
  img_dir = ""
}
```

7.7 The `fixinlines` dom filter

`inline_elements` table of inline elements that shouldn't be direct descendants of the body element. The element names should be table keys, the values should be true.

Example

```
filter_settings "fixinlines" {inline_elements = {a = true, b = true}}
```

7.8 The joincharacters dom filter

charclasses table of elements that should be concatenated when two or more of such elements with the same value of the class attribute are placed one after another.

Example

```
filter_settings "joincharacters" { charclasses = { span=true, mn = true}}
```

7.9 The mjcli filter and extension

`mjcli` detects whether to use MathML or \LaTeX input by use of the `mathjax` option for `make4ht`. By default, it uses MathML. \LaTeX input can be required using:

```
make4ht -f html5+mjcli filename.tex "mathjax"
```

7.9.1 Available settings

options command line options for the `mjcli` command.

Example

```
filter_settings "mjcli" {  
  options="--svg"  
}
```

cssfilename the `mjcli` command puts some CSS code into the HTML pages. The `mjcli` filter extracts this information and saves it to a standalone CSS file. Default name of this CSS file is `${input}-mathjax.css`

fontdir directory with MathJax font files. This option enables the use of local fonts, which is useful in the conversion to ePub, for example. The font directory should be sub-directory of the current directory. Only \TeX font is supported at the moment.

Example

```
filter_settings "mjcli" {  
  fontdir="fonts/TeX/woff/"  
}
```

7.10 The staticsite filter and extension

site_root directory where generated files should be copied.

map a hash table where keys contain patterns that match filenames and values contain destination directory for the matched files. The destination directories are relative to the site_root (it is possible to use .. to switch to a parent directory).

file_pattern a pattern used for filename generation. It is possible to use string templates and format strings for os.date function. The default pattern %Y-%m-%d-`{input}` creates names in the form of YYYY-MM-DD-file_name.

header table with variables to be set in the YAML header in HTML files. If the table value is a function, it is executed with current parameters and HTML page DOM object as arguments.

remove_maketitle the staticsite extension removes text produced by the \maketitle command by default. Set this option to false to disable the removal.

Example:

```
-- set the environmental variable 'blog_root' with path to
-- the directory that should hold the generated HTML files
local outdir = os.getenv "blog_root"

filter_settings "staticsite" {
  site_root = outdir,
  map = {
    [".css$"] = "/css/"
  },
  header = {
    layout="post",
    date = function(parameters, dom)
      return os.date("!%Y-%m-%d %T", parameters.time)
    end
  }
}
```

7.11 The dvisvgm_hashes extension

options command line options for Dvisvgm. The default value is -n --exact -c `{scale}`,`{scale}`.

cpu_cnt the number of processor cores used for the conversion. The extension tries to detect the available cores automatically by default.

make_command variant of the make command used for the parallel conversion of large number of pages. It receives two variables, process_count and make_file. Default value is "make -j `{process_count}` -f `{make_file}`".

test_make_command command that tests if the selected variant of the make command exists. Default value is make -v.

parallel_size the number of pages used in each Dvisvgm call. The extension detects changed pages in the DVI file and constructs multiple calls to Dvisvgm with only changed pages.

scale amount of SVG scaling. The default value is 1.4.

7.12 The odttemplate filter and extension

template filename of the template ODT file

odttemplate can also get the template filename from the odttemplate option from tex4ht sty_par parameter. It can be set using the following command line call:

```
make4ht -f odt+odttemplate filename.tex "odttemplate=template.odt"
```

7.13 The aeneas filter

skip_elements List of CSS selectors that match elements that shouldn't be processed. Default value: { "math", "svg"}.

id_prefix prefix used in the ID attribute forming.

sentence_match Lua pattern used to match a sentence. Default value: "`([^%.^%?^!]*) ([%.%?!]?)`".

7.14 The make4ht-aeneas-config package

Companion for the aeneas DOM filter is the make4ht-aeneas-config plugin. It can be used to write the Aeneas configuration file or execute Aeneas on the generated HTML files.

Available functions:

write_job(parameters) write Aeneas job configuration to config.xml file. See the [Aeneas documentation](#) for more information about jobs.

execute(parameters) execute Aeneas.

process_files(parameters) process the audio and generated subtitle files.

By default, a SMIL file is created. It is assumed that there is an audio file in the mp3 format, named as the \TeX file. It is possible to use different formats and filenames using mapping.

The configuration options can be passed directly to the functions or set using filter_settings "aeneas-config" {parameters} function.

7.14.1 Available parameters

lang document language. It is interfered from the HTML file, so it is not necessary to set it.

map mapping between HTML, audio and subtitle files. More info below.

text_type type of input. The aeneas DOM filter produces an unparsed text type.

id_sort sorting of id attributes. The default value is numeric.

id_regex regular expression to parse the id attributes.

sub_format generated subtitle format. The default value is smil.

7.14.2 Additional parameters for the job configuration file

- description
- prefix
- config_name
- keep_config

It is possible to generate multiple HTML files from the \LaTeX source. For example, tex4ebook generates a separate file for each chapter or section. It is possible to set options for each HTML file, in particular names of the corresponding audio files. This mapping is done using the map parameter.

Example:

```
filter_settings "aeneas-config" {
  map = {
    ["sampleli1.html"] = {audio_file="sample.mp3"},
    ["sample.html"] = false
  }
}
```

Table keys are the configured filenames. It is necessary to insert them as ["filename.html"], because of Lua syntax rules.

This example maps audio file sample.mp3 to a section subpage. The main HTML file, which may contain title and table of contents doesn't have a corresponding audio file.

Filenames of the subfiles correspond to the chapter numbers, so they are not stable when a new chapter is added. It is possible to request filenames derived from the chapter titles using the sec-filename option for tex4ht.sty.

7.14.3 Available map options

audio_file the corresponding audio file

sub_file name of the generated subtitle file

The following options are the same as their counterparts from the main parameters table and generally, don't need to be set:

- prefix
- file_desc
- file_id

- text_type
- id_sort
- id_prefix
- sub_format

7.14.4 Full example

```

local domfilter = require "make4ht-domfilter"
local aeneas_config = require "make4ht-aeneas-config"

filter_settings "aeneas-config" {
  map = {
    ["krecekli1.xhtml"] = {audio_file="krecek.mp3"},
    ["krecek.xhtml"] = false
  }
}

local process = domfilter {"aeneas"}
Make:match("html$", process)

if mode == "draft" then
  aeneas_config.process_files {}
else
  aeneas_config.execute {}
end

```

8 Troubleshooting

8.1 Incorrect handling of command line arguments for tex4ht, t4ht or latex

Sometimes, you may get a similar error:

```
make4ht:unrecognized parameter: i
```

It may be caused by a following make4ht invocation:

```
$ make4ht hello.tex "customcfg,charset=utf-8" "-cunihtf -utf8" -d foo
```

The command line option parser is confused by mixing options for make4ht and \TeX 4ht in this case. It tries to interpret the `-cunihtf -utf8`, which are options for the tex4ht command, as make4ht options. To fix that, try to move the `-d foo` directly after the make4ht command:

```
$ make4ht -d foo hello.tex "customcfg,charset=utf-8" "-cunihtf -utf8"
```

Another option is to add a space before the tex4ht options:

```
$ make4ht hello.tex "customcfg,charset=utf-8" " -cunihtf -utf8" -d foo
```

The former way is preferable, though.

8.2 Table of Contents points to a wrong destination

The sectionid DOM filter creates better link destinations for sectioning commands. In some cases, for example if you use Pandoc, the document may already contain the link destination with the same name. In such cases the original destination is preserved in the file. In this case links to the section will point to that place, instead of correct destination in the section. This may happen for example if you use Pandoc for the Markdown to L^AT_EX conversion. It creates `\hypertarget` commands that are placed just before section. The links points to that place, instead of the actual section.

In this case you don't want to update links. Use the `notoc` option to prevent that.

8.3 Filenames containing spaces

`tex4ht` command cannot handle filenames containing spaces. to fix this issue, `make4ht` replaces spaces in the input filenames with underscores. The generated XML filenames use underscores instead of spaces as well.

8.4 Filenames containing non-ASCII characters

The `odt` output doesn't support accented filenames, it is best to stick to ASCII characters in filenames.

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10 Changelog

- 2025/04/14
 - version 0.4d released.
- 2025/04/11
 - support `--build-dir` in `autohtlatex`
- 2025/03/12
 - added `Make:autohtlatex` function to automate L^AT_EX compilation, ensuring repeated runs until temporary file checksums stabilize or a max limit is reached. This function is used by default instead of `Make:htlatex`.
- 2025/03/02
 - fixed bug in the `make4ht-indexing` library. If subentries generated by `Xindex` keywords were only numbers, they were mistaken for the page numbers. <https://tug.org/pipermail/tex4ht/2025q1/003699.html>

- 2025/02/19
 - version 0.4c released.
- 2025/02/03
 - added the nodynamicodt extension. It removes dynamic content from ODT files. <https://puszcza.gnu.org.ua/bugs/?505#discussion>
- 2025/01/15
 - fixed handling of commands with number as optional arguments in the make4ht-indexing library. https://fosstodon.org/@juergen_hubert@thefolklore.cafe/113809011903088411
- 2025/01/09
 - convert horizontal rules in MathML arrays to the rowlines attribute. <https://tex.stackexchange.com/a/734616/2891>
- 2025/01/06
 - use Unicode characters for MathML font styles. <https://tex.stackexchange.com/a/734331/2891>
- 2024/12/23
 - fixed bug in the make4ht-indexing library. It didn't handle index entries with the duplicate locator number that were broken over several lines correctly. <https://tex.stackexchange.com/a/733106/2891>
- 2024/12/20
 - remove duplicate index locators in the make4ht-indexing library. <https://tex.stackexchange.com/a/733106/2891>
- 2024/12/19
 - fixed fatal error caused by handling comments in the fixinlines DOM filter.
- 2024/12/17
 - keep track of braces around index entries page numbers. <https://tex.stackexchange.com/a/733106/2891>
- 2024/12/08
 - support other index locators than index command counters. <https://tex.stackexchange.com/a/732446/2891>
- 2024/12/05

- recognize inline math and comments as inline content in the `fixinlines` DOM filter.
- 2024/11/09
 - fixed `tablerows` for longtables longer than 200 rows. <https://tex.stackexchange.com/a/730466/2891>
- 2024/10/22
 - version 0.4b released.
 - test for the existence of the class attribute of tables before performing string matches in the `tablerows` DOM filter.
- 2024/10/21
 - version 0.4a released.
- 2024/09/30
 - remove last empty row in longtable environments.
- 2024/09/25
 - added `make4ht-char-def` library to remove dependency on `char-def` from ConTeXt. It is used by the `sectionid` DOM filter. The library is automatically created from `UnicodeData.txt` by `tools/make_chardata.lua`. <https://tex.stackexchange.com/q/727202/2891>
- 2024/09/18
 - print error messages from the log file.
- 2024/08/22
 - print debug message with XML parsing error context
- 2024/08/21
 - try the HTML parser for DOM filters if XML parser fails.
- 2024/06/18
 - changed default scaling in `dvismgm_hashes` to 1.4.
- 2024/06/17
 - fixed support for index entries that are broken over several lines.
- 2024/05/29
 - create temporary `Lg` file for `Xtpipes`. <https://github.com/michalh21/make4ht/issues/148#issuecomment-2136160818>

- fixed handling of the generated ODT file, don't copy it unnecessarily and handle build and output directories. <https://github.com/michal-h21/make4ht/issues/148#issuecomment-2136160818>
- 2024/04/23
 - test if referenced files are contained in the build-dir directory, use the current dir otherwise. <https://github.com/michal-h21/tex4ebook/issues/126>
- 2024/04/16
 - fixed bug in dvisvgm_hashes log parsing. On Windows, it didn't expect \r characters at the line ends, they then ended in new SVG filenames.
- 2024/04/15
 - made the make command used in the dvisvgm_hashes extension configurable. <https://tex.stackexchange.com/q/715633/2891>
- 2024/03/29
 - ignore numbers in braces in make4ht-indexing library. <https://tex.stackexchange.com/q/714247/2891>
- 2024/02/22
 - version 0.4 released
 - fixed name of the <title-group> element in JATS output.
- 2024/02/21
 - add standalone minus sign to the <mn> element in MathML.
- 2024/01/26
 - fixed passing of the params table in the staticsite extension.
- 2024/01/22
 - don't enable parsing of void elements in DOM filter with XML output formats.
- 2023/12/15
 - call fix_rel_mo MathML fix only in the ODT output.
- 2023/12/11
 - fixed handling of the --build-dir argument in dvisvgm_hashes extension.
- 2023/11/03

- remove leading dashes in ids created by the sectionid DOM filter.
- 2023/10/26
 - check that removed elements in the sectionid DOM filter are <a> elements.
- 2023/10/25
 - fixed addition of named IDs to figures.
- 2023/10/19
 - print info about packages with no corresponding .4ht file.
- 2023/10/05
 - added fix for LibreOffice's bug regarding relation type math operators.
- 2023/10/03
 - fixed most features that didn't work with the --build-dir argument.
- 2023/10/02
 - working on new command line argument --build-dir. It should allow moving of temporary files to a temporary directory. The idea and most of the code comes from Robin Seth Ekman.
- 2023/09/07
 - fix spacing for the dcases* environment in the mathml_fixes DOM filter.
- 2023/08/24
 - support non-numerical values in index entry destinations (for example roman numerals).
- 2023/08/22
 - updated list of DOM filters used by the common_domfilters extension, and documented that it is used automatically in the HTML output.
- 2023/08/12
 - remove unnecessary <a> elements with id attributes and set the id on the parent.
- 2023/07/06
 - add prefix to section IDs if the section name is empty.

- 2023/06/20
 - added the `copy_images` extension.
- 2023/06/14
 - fixed bug in the `mathmlfixes` DOM filter – non-empty last rows were removed if they contained only one element.
- 2023/05/26
 - load `tex4ht.sty` before input file processing starts.
- 2023/04/19
 - handle additional characters in the `idcolons` DOM filter.
- 2023/04/06
 - fixed handling of ID attributes in the `idcolons` DOM filter.
- 2023/03/07
 - remove empty rows in `longtable`.
- 2023/02/24
 - version 0.3k released.
- 2023/01/09
 - fixed detection of image file names in `mkutils.parse_lg()`
- 2022/11/25
 - reverted change of index page numbers, it was buggy
 - test if the `.idx` file exists.
- 2022/11/24
 - `make4ht-indexing`: fixed handling of numbers in index entries text.
- 2022/11/01
 - remove empty last rows in MathML tables.
- 2022/10/21
 - added the `inlinecss` DOM filter and extension with the same name.
- 2022/09/29
 - the `join_characters` DOM filter now shouldn't produce extra `` elements after white space.

- 2022/09/16
 - use the `no^` option to compile the `make4ht` HTML docs, to prevent clash with the `Doc` package.
- 2022/07/22
 - `mathmlfixes` DOM filter:
 - * don't change `<mo>` to `<mtext>` if the element contain the `stretchy` attribute.
 - * add `<mtext>` to `<mstyle>` if it contains only plain text
- 2022/07/08
 - configure elements used in `join_characters` DOM filter.
 - added support for the `mml: prefix` in `mathml_fixes` DOM filter.
- 2022/06/28
 - handle `\maketitle` in JATS.
- 2022/06/24
 - handle internal and external links in the JATS output.
 - better detection of empty paragraphs.
- 2022/06/16
 - use DOM filters to fix JATS output.
- 2022/04/22
 - use more explicit options for `latexmk`.
- 2022/04/19
 - remove all `htlatex` calls from the build sequence when the `latexmk_build` extension is used.
 - fixed other issues that caused spurious executions of `latexmk`.
- 2022/04/01
 - don't copy files to the output dir if it wasn't requested
 - fixed copying of the ODT file to the output dir.
- 2022/03/29
 - check if `tidy` return non-empty string in the `tidy` extension.
- 2022/03/24

- don't use totally random names in the preprocess_input extension, in order to support images correctly.
- 2022/03/22
 - version 0.31 released.
 - fixed issues with filenames on Windows.
- 2022/03/01
 - use rmarkdown package to process .rmd files in the preprocess_input extension (thanks to James Clawson).
- 2022/02/18
 - version 0.3k released.
- 2022/02/07
 - fixed support for some fonts in the ODT format.
 - added odtfonts DOM filter.
- 2022/01/30
 - fix mathvariant attribute of <mi> elements if they are children of <mstyle>.
- 2021/12/17
 - quote jobname in order to support filenames like (xxx).tex.
- 2021/12/13
 - fixed setting of properties in the staticsite filter.
- 2021/12/06
 - in the end, use <mtext> even for one <mo> in the fix_operators function. LO had issues with <mi>.
- 2021/12/03
 - don't add additional <mrow> elements in the mathmlfixes DOM filter. It caused various issues.
- 2021/12/01
 - transform <mn>x</mn><mo>.</mo><mn>x</mn> to <mn>x.x</mn> in MathML.
 - transform <mo> elements that are single childs to <mi> in MathML, and list of consecutive <mo> elements to <mtext>. This should fix rendering issues of superscripts in LibreOffice.

- added filter names in extensions to prevent multiple execution of filters.
- 2021/11/29
 - make current logging level available outside of the Logging module.
 - print Xtpipes and Tidy output if these command fail in the Xtpipes module.
- 2021/11/18
 - don't put `<mrow>` as children of `<mrow>` in the `mathmlfixes` DOM filter.
- 2021/11/04
 - more intelligent handling of text and inline elements outside of paragraphs in the `fixinlines` DOM filter.
- 2021/10/11
 - version 0.3j released.
- 2021/10/09
 - fixed wrong DOM object name in the ODT format.
 - add additional `<mrow>` elements when necessary.
- 2021/09/30
 - version 0.3i released.
- 2021/09/21
 - run DOM parse in sandbox in the ODT format picture size function.
- 2021/09/20
 - remove LaTeX commands from TOC entries in `sectionid` DOM filter.
- 2021/09/09
 - corrected SVG dimension setting in the ODT output. Dimensions are set also for PNG and JPG pictures.
- 2021/09/05
 - corrected detection of closing brace in CSS style in `mjcli` filter.
- 2021/08/13
 - use LaTeX new hook mechanism to load `tex4ht.sty` before document class. It fixes some issues with packages required in classes.
- 2021/08/12

- correctly set dimensions for SVG images in the ODT format.
- 2021/07/29
 - sort YAML header in the staticsite filter.
- 2021/07/25
 - version 0.3h released.
- 2021/07/25
 - use current directory as default output dir in staticsite extension.
- 2021/07/23
 - fixed detection of single paragraphs inside in the itemparagraphs DOM filter.
- 2021/07/18
 - remove elements produced by \maketitle in the staticsite extension.
- 2021/07/05
 - sort colors alphabetically in the joincolors DOM filter to enable reproducible builds.
- 2021/06/26
 - rewrote the collapsetoc DOM filter.
- 2021/06/20
 - test for the svg picture mode in the tex4ht command. Use the -g.svg option if it is detected. This is necessary for correct support of pictorial characters.
- 2021/06/16
 - better handling of duplicate ID attributes in sectionid DOM filter.
 - support notoc option in sectionid.
- 2021/06/13
 - added itemparagraphs DOM filter. It removes unnecessary paragraphs from elements.
- 2021/05/06
 - remove <hr> elements in .hline rows in tablerows DOM filter.
- 2021/05/01

- added function `mkutils.isModuleAvailable`. It checks if Lua library is available.
 - check for `char-def` library in `sectionid` DOM filter.
- 2021/04/08
 - removed `build_changed`. New script, `siterebuild`, should be used instead.
 - new DOM filter, `sectionid`. It uses sanitized titles instead of automatically generated numbers as section IDs.
 - added `sectionid` to `common_domfilters`.
 - use context in the Docker file, because it contains the `char-def.lua` file.
- 2021/03/20
 - use `kpse` library when files are copied to the output directory.
 - added clean mode. It removes all generated, temporary and auxiliary files.
- 2021/03/19
 - version 0.3g released.
- 2021/02/08
 - remove `<?xtpipes ?>` processing instructions from the generated ODT file.
- 2021/02/01
 - better error messages when extension cannot be loaded.
 - added `mjcli` extension.
 - `mjcli` filter supports \LaTeX syntax.
 - updated documentation.
- 2021/01/31
 - added new MathJax Node filter, `mjcli`.
- 2020/12/19
 - build web documentation only when documentation sources change.
- 2020/11/22
 - set exit status for the `make4ht` command.
- 2020/11/22
 - new extension, `build_changed`.

- 2020/11/01
 - fix deprecated `<mfenced>` element in MathML
 - convert `<mo fence>` elements to `<mfenced>` in ODT format.
- 2020/10/28
 - fixed handling of nested `` elements in joincharacters DOM filter.
- 2020/10/25
 - fixed command name for `Make:httex`, it was `Make:htttex`.
- 2020/10/17
 - generate YAML header for all generated files with the staticsite extension.
- 2020/09/17
 - require `mathml` option when `mathjaxnode` extension is used.
- 2020/09/07
 - version 0.3f released.
- 2020/08/26
 - `fixinlines` DOM filter: added `<a>` element into list of inline elements.
- 2020/08/24
 - initialize attributes in new element in `mathmlfixes` DOM extension.
- 2020/07/18
 - changed CSS for the HTML documentation.
- 2020/07/17
 - fixed bug in index parsing.
- 2020/07/10
 - use the `joincharacters` DOM filter for TEI output.
- 2020/07/08
 - don't fail when filename cannot be detected in `make4ht-errorlogparser.lua`.
- 2020/05/27

- test if copied file exists in `mkutils.cp`.
- 2020/05/19
 - fixed image filename replace in `dvisvgm_hashes` extension.
- 2020/05/16
 - fixed HTML filename matching in extensions.
- 2020/05/08
 - use global environment in the build files.
- 2020/03/03
 - added `jats` format.
- 2020/02/28
 - version `0.3e` released.
- 2020/02/24
 - `t4htlinks` DOM filter: cleanup file names from internal links.
 - `make4ht-indexing`: added support for `splitindex`.
- 2020/02/19
 - use UTF-8 output by default. 8-bit output is broken and non fixable.
- 2020/02/07
 - use `lualatex-dev` instead of `harflatex`
- 2020/02/06
 - added support for `harflatex` and `harftex` in the `detect_engine` extension.
- 2020/01/22
 - version `0.3d` released.
 - added `Make:httex` command for Plain TeX support.
 - added `detect_engine` extension. It supports detection of the used engine and format from TeX Shop or TeXWorks magic comments. These comments can look like: `%!TEX TS-program = xelatex`.
- 2020/01/22
 - fixed support for multiple indices in `make4ht-indexing.lua`.
- 2019/12/29

- use the `mathvariant="italic"` attribute for joined `<mi>` elements.
 - fixed comparison of element attributes in `joincharacters` DOM filter.
- 2019/12/28
 - print warning if the input file doesn't exist.
- 2019/12/17
 - added `booktabs` DOM filter.
 - load the `booktabs` in `common_domfilters` by default.
- 2019/12/14
 - fixed bug in the `tablerows` DOM filter – it could remove table rows if they contained only one column with elements that contained no text content.
- 2019/11/28
 - version 0.3c released.
 - updated `mathmlfixes` DOM filter. It handles `<mstyle>` element inside token elements now.
 - use `mathmlfixes` and `joincharacters` DOM filters for math XML files in the ODT output.
- 2019/11/25
 - added `pythontex` command.
 - added `mathmlfixes` DOM filter.
 - use the `mathmlfixes` DOM filter in `common_domfilters` extension.
- 2019/11/22
 - `make4ht-joincharacters dom filter`: added support for the `<mi>` element. Test all attributes for match when joining characters.
 - `html5 format`: use the `common_domfilters` by default.
- 2019/11/03
 - version 0.3b
 - use `make4ht-ext-` prefix for extensions to prevent filename clashes with corresponding filters.
- 2019/11/01
 - version 0.3a released.
 - added `make4ht-` prefix to all extensions and formats
 - removed the unused `mathjaxnode.lua` file.

- 2019/11/01
 - version 0.3 released.
 - added `Make:makeindex`, `Make:xindex` and `Make:bibtex` commands.
- 2019/10/25
 - modified the `Make:xindy` command to use the indexing mechanism.
- 2019/10/24
 - added functions for preparing and cleaning of the index files in `make4ht-indexing.lua`.
- 2019/10/23
 - replaced `os.execute` function with `mkutils.execute`. It uses the logging mechanism for the output.
 - finished transforming of filters, extensions and formats to the logging system.
- 2019/10/22
 - added `tablerows domfilter`.
 - added the `tablerows domfilter` to the `common_domfilters` extension.
 - converted most of the filters to use the logging mechanism.
- 2019/10/20
 - added status log level.
- 2019/10/18
 - converted most print commands to use the logging mechanism.
 - added output log level used for printing of the commands output.
- 2019/10/17
 - added `--loglevel` CLI parameter.
 - added logging mechanism.
 - moved `htlatex` related code to `make4ht-htlatex.lua` from `mkutils.lua`
- 2019/10/11
 - added `xindy` settings.
 - added simple regular expression to detect errors in the log file, because log parsing can be slow.
- 2019/10/09

- added the `interaction` parameter for the `htlatex` command. The default value is `batchmode` to suppress the user input on errors, and to suppress full log output to the terminal.
 - added the `make4ht-errorlogparser` module. It is used to parse errors in the `htlatex` run unless `interaction` is set to `errorstopmode`.
- 2019/10/08
 - set up Github Actions pipeline to compile the documentation to HTML and publish it at <https://www.kodymirus.cz/make4ht/make4ht-doc.html>.
- 2019/10/07
 - don't move the `common_domfilters` extension to the first place in the file matches pipeline. We may want to run `tidy` or `regex` filters first, to fix XML validation errors.
- 2019/10/04
 - added HTML documentation.
- 2019/09/27
 - don't convert Latin 1 entities to Unicode in the `entities_to_unicode` extension.
- 2019/09/20
 - fixed bugs in the temporary directory handling for the ODT output.
- 2019/09/13
 - added `preprocess_input` extension. It enables compilation of formats supported by **Knitr** (`.Rnw`, `.Rtex`, `.Rmd`, `.Rrst`) and also `Markdown` and `reStructuredText` formats.
- 2019/09/12
 - added support for the ODT files in `common_domfilters` extension.
 - renamed `charclasses` option for the `joincharacters` DOM filter to `charclasses`.
 - don't execute the `fixentities` filter before `Xtpipes`, it makes no sense.
- 2019/09/11
 - added support for Biber in the build files.
- 2019/08/28
 - added support for input from `stdin`.

- 2019/08/27
 - fixed -jobname detection regex.
 - added function handle_jobname.
 - added the --jobname command line option.
- 2019/08/26
 - quote file names and paths in xtpipes and tidy invocation.
- 2019/08/25
 - the issue tracker link in the help message is now configurable.
 - fixed bug in the XeTeX handling: the .xdv argument for tex4ht wasn't used if command line arguments for tex4ht were present.
- 2019/07/03
 - new DOM filter: odtpartable. It fixes tables nested in paragraphs in the ODT format.
- 2019/06/13
 - new DOM extension: collapsetoc.
- 2019/05/29
 - new module: make4ht-indexing for working with index files.
- 2019/05/24
 - version 0.2g released
 - fixed failing dvisvgm_hashes extension on Windows.
- 2019/05/02
 - fixed infinite loop bug in the dvisvgm_hashes extension.
- 2019/04/09
 - make4ht-joincolors fix: remove the hash character from the color name. This caused issues with colors specified in the hexadecimal format.
- 2019/04/02
 - dvisvgm_hashes fix: update also the lgfile.images table with generated filenames, in order to support tex4ebook
- 2019/04/01
 - fixed bug in dvisvgm_hashes extension: didn't check for table index existence in string concatenation

- 2019/03/21
 - version 0.2f released
- 2019/03/15
 - check for the image dimensions existence in the `odtimagesize domfilter`.
- 2019/03/13
 - don't use `odtimagesize domfilter` in the ODT format, the issue it fixes had been resolved in `tex4ht`.
- 2019/03/08
 - use `%USERPROFILE` for home dir search on Windows.
- 2019/01/28
 - added `joincolors domfilter` and `join_colors` extension. It can join CSS rules created for the LaTeX colors and update the HTML file.
- 2019/01/22
 - version 0.2e released
 - updated the `odttemplate filter`. It will use styles from the generated ODT file that haven't been present in the template file.
- 2019/01/10
 - version 0.2d released
- 2019/01/05
 - added `docbook` and `tei` output formats.
- 2018/12/19
 - new library: `make4ht-xtpipes.lua`. It contains code for `xtpipes` handling.
 - moved `Xtpipes` handling code from `formats/odt.lua`.
- 2018/12/18
 - new filter: `odttemplate`. It can be used for replacing style in a generated ODT file by a style from another existing ODT file.
 - new extension: `odttemplate`. Companioning extension for filter with the same name.
 - fixed bug in `make4ht-filters.lua`: the parameters table haven't been passed to filters.

- 2018/12/17
 - fixed extension handling. The disabling from the command line didn't take precedence over extensions enabled in the config file. Extensions also could be executed multiple times.
- 2018/11/08
 - removed replacing newlines by blank strings in the joincharacters domfilter. The issue it fixed doesn't seem to exist anymore, and it ate spaces sometimes.
- 2018/11/01
 - added t4htlinks domfilter
 - fixed the xtpipes and filters execution order in the ODT format
- 2018/10/26
 - fixed ODT generation for files that contains special characters for Lua string patterns
 - replace non-breaking spaces with entities. It caused issues in LO
- 2018/10/18
 - fixed the executable installation
- 2018/09/16
 - added the scale option for dvisvgm_hashes extension
- 2018/09/14
 - require the -dvi option with latexmk_build extension
- 2018/09/12
 - added xindy command for the build file
- 2018/09/03
 - expanded the --help option
- 2018/08/27
 - added odtimagesize domfilter
 - load odtimagesize by default in the ODT format
- 2018/08/23
 - released version 0.2c
- 2018/08/21

- added processor core detection on Windows
 - make processor number configurable
 - updated the documentation.
- 2018/08/20
 - added `dvisvgm_hashes` extension
- 2018/07/03
 - create the `mimetype` file to achieve the ODT file validity
- 2018/07/02
 - disabled conversion of XML entities for `&`, `<` and `>` characters back to Unicode, because it breaks XML validity
- 2018/06/27
 - fixed root dir detection
- 2018/06/26
 - added code for detection of TeX distribution root for MikTeX and TL
- 2018/06/25
 - moved call to `xtpipes` from `t4ht` to the ODT format drives. This should fix issues with path expansion in `tex4ht.env` in TeX distributions.
- 2018/06/22
 - added `mkutils.find_zip` function. It detects `zip` or `miktex-zip` executables
- 2018/06/19
 - added new filter: `entities-to-unicode`. It converts XML entities for Unicode characters back to Unicode.
 - execute `entities-to-unicode` filter on `text` and `math` files in the ODT output.
- 2018/06/12
 - added support for direct ODT file packing
- 2018/06/11
 - new function available for formats, `format.modify_build`
 - function `mkutils.delete_dir` for directory removal
 - function `mkutils.mv` for file moving

- started on packing of the ODT files directly by the format, instead of t4ht
- 2018/06/08
 - added support for filenames containing spaces
 - added support for filenames containing non-ascii characters
 - don't require sudo for the installation, let the user to install symbolic links to \$PATH
- 2018/05/03
 - released version 0.2b
 - bug fix: use only load function in Make:run, in order to support a local environment.
- 2018/05/03
 - released version 0.2a
 - renamed latexmk extension to latexmk_build, due to clash in TL
- 2018/04/18
 - staticsite extension:
 - * make YAML header configurable
 - * set the time and updated headers
 - don't override existing tables in filter_settings
- 2018/04/17
 - done first version of staticsite extension
- 2018/04/16
 - check for Git repo in the Makefile, don't run Git commands outside of repo
- 2018/04/15
 - added staticsite filter
 - working on staticsite extension
- 2018/04/13
 - use ipairs instead of pairs to traverse lists of images and image match functions
 - load extensions in the correct order
- 2018/04/09
 - released version 0.2

- disabled default loading of `common_domfilters` extension
- 2018/04/06
 - added `Make:enable_extension` and `Make:disable_extension` functions
 - documented the configuration file
- 2018/03/09
 - load the configuration file before extensions
- 2018/03/02
 - Aeneas execution works
 - Aeneas documentation
 - added support for `.make4ht` configuration file
- 2018/02/28
 - Aeneas configuration file creation works
- 2018/02/22
 - fixed bug in `fixinlines` DOM filter
- 2018/02/21
 - added Aeneas domfilter
 - fixed bugs in `joincharacters` DOM filter
- 2018/02/20
 - fixed bug in `joincharacters` DOM filter
 - make `woff` default font format for `mathjaxnode`
 - added documentation for `mathjaxnode` settings
- 2018/02/19
 - fixed bug in filter loading
 - added `mathjaxnode` extension
- 2018/02/15
 - use HTML5 as a default format
 - use `common_domfilters` implicitly for the XHTML and HTML5 formats
- 2018/02/12
 - added `common_domfilters` extension

- documented DOM filters
- 2018/02/12
 - handle XML parsing errors in the DOM handler
 - enable extension loading in Formatters
- 2018/02/11
 - fixed Tidy extension output to support LuaXML
 - fixed white space issues with joincharacters DOM filter
- 2018/02/09
 - fixed issues with the Mathjax filter
 - documented basic info about thd DOM filters
 - DOM filter optimalizations
- 2018/02/08
 - make Tidy extension configurable
 - documented filter settings
- 2018/02/07
 - added filter for Mathjax-node
- 2018/02/06
 - created DOM filter function
 - added DOM filter for spurious inline elements
- 2018/02/03
 - added settings handling functions
 - settings made available for extensions and filters
- 2017/12/08
 - fixed the mk4 build file loading when it is placed in the current working dir and another one with same filename somewhere in the TEXMF tree.
- 2017/11/10
 - Added new filter: svg-height. It tries to fix height of some of the images produced by dvisvgm
- 2017/10/06
 - Added support for output format selection. Supported formats are xhtml, html5 and odt

- Added support for extensions
- 2017/09/10
 - Added support for Latexmk
 - Added support of math library and tonumber function in the build files
- 2017/09/04
 - fixed bug caused by the previous change – the `-help` and `-version` didn't work
- 2017/08/22
 - fixed the command line option parsing for `tex4ht`, `t4ht` and `latex` commands
 - various grammar and factual fixes in the documentation
- 2017/04/26
 - Released version `v0.1c`
- 2017/03/16
 - check for `TeX capacity exceeded` error in the `LATEX` run.
- 2016/12/19
 - use full input name in `tex_file` variable. This should enable use of files without `.tex` extension.
- 2016/10/22
 - new command available in the build file: `Make:add_file(filename)`. This enables filters and commands to register files to the output.
 - use `ipairs` instead of `pairs` for traversing files and executing filters. This should ensure correct order of executions.
- 2016/10/18
 - new filter: replace colons in `id` and `href` attributes with underscores
- 2016/01/11
 - fixed bug in loading documents with full path specified
- 2015/12/06 version 0.1b
 - modified `lapp` library to recognize `--version` and
 - added `--help` and `--version` command line options
- 2015/11/30

- use kpse library for build file locating
- 2015/11/17
 - better -jobname handling
- 2015/09/23 version 0.1a
 - various documentation updates
 - mozhtf profile for unicode output is used, this should prevent ligatures in the output files
- 2015/06/29 version 0.1
 - major README file update
- 2015/06/26
 - added Makefile
 - moved INSTALL instructions from README to INSTALL