

Composer CMS: Content Make System

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Chapter 1

Composer CMS



“Creating Made Simple.”

Composer CMS v3.1	License: GPL
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1.1 Overview

Composer is a simple but powerful CMS based on Pandoc, Bootstrap and GNU Make. It is a document and website build system that processes directories or individual files in Markdown format.

Traditionally, CMS stands for Content Management System. Composer is designed to be a Content **Make** System. Written content is vastly easier to manage as plain text, which can be crafted with simple editors and tracked with revision control. However, professional documentation, publications, and websites require formatting that is dynamic and feature-rich.

Pandoc is an extremely powerful document conversion tool, and is a widely used standard for processing Markdown into other formats. While it has reasonable defaults, there are a large number of options, and additional tools are required for some formats and features.

Composer consolidates all the necessary components, simplifies the options, and prettifies the output formats, all in one place. It also serves as a build system, so that large repositories can be managed as documentation archives or published as Static Websites.

```
=====
$ >> Composer CMS v3.0 :: .../composer
=====
# MAKEFILE_LIST      [.../composer/Makefile]
# COMPOSER_INCLUDES  [.../composer/composer.mk]
# CURDIR             [.../composer]
# MAKECMDGOALS       [all] (all)
# MAKELEVEL          [1]
=====
I >> Creating      | .../composer :: Composer-v3.0_Manual.pdf
I >> Creating      | .../composer :: README.html
I >> Creating      | .../composer :: README.pdf
I >> Creating      | .../composer :: README.epub
I >> Creating      | .../composer :: README.revealjs.html
I >> Creating      | .../composer :: README.docx
```

1.2 Quick Start

Use make help to get started:

```
make [-f .../ Makefile] [ variables ] <filename>.<extension>
make [-f .../ Makefile] [ variables ] <target>
```

Create documents from source Markdown files (see Formatting Variables):

```
make README.html
make Composer-v3.1.Manual.html c_list="README.md LICENSE.md"
```

Save a persistent configuration (see Recommended Workflow and Configuration Settings):

```
make template >.composer.mk
$EDITOR .composer.mk
Composer-v3.1.Manual.html: override c_list := README.md LICENSE.md
make clean
make all
```

Recursively install and build an entire directory tree (see Recommended Workflow):

```
cd .../documents
mv .../composer .Composer
make -f .Composer/Makefile install-all
make all-all
```

See help—all for full details and additional targets.

1.3 Principles

The guiding principles of Composer:

- All source files in readable plain text
- Professional output, suitable for publication
- Minimal dependencies, and entirely command-line driven
- Separate content and formatting; writing and publishing are independent
- Inheritance and dependencies; global, tree, directory and file overrides
- Fast; both to initiate commands and for processing to complete

Direct support for key document types (see Document Formatting):

- Static Websites
- HTML
- PDF
- EPUB
- Reveal.js Presentations
- Microsoft Word & PowerPoint

1.4 Requirements

Composer has almost no external dependencies. All needed components are integrated directly into the repository, including Pandoc. Composer does require a minimal command-line environment based on GNU tools, particularly GNU Make, which is standard for all GNU/Linux systems. The Windows Subsystem for Linux for Windows and MacPorts for macOS both provide suitable environments.

The one large external requirement is TeX Live, and it can be installed using the package managers of each of the above systems. It is only necessary for creating PDF files.

Below are the versions of the components in the repository, and the tested versions of external tools for this iteration of Composer. Use check to validate your system.

Repository	Commit	License
Pandoc	2.18	GPL
YQ	v4.24.2	MIT
Bootstrap	v5.1.3	MIT

Repository	Commit	License
Bootswatch	v5.1.3	MIT
Font-Awesome	6.1.2	MIT / CC-BY
Water.css	d950cbc9f8607521587f	MIT
Markdown Viewer	059f3192d4ebf5fa9776	MIT
Markdown Themes	6b3643d0f703727d8472	None
Reveal.js	4.3.1	MIT

Project	Composer Version
GNU Bash	5.1.16
– GNU Coreutils	8.32
– GNU Findutils	4.9.0
– GNU Sed	4.8
GNU Make	4.3
– Pandoc	2.18
– YQ	4.24.2
– TeX Live (pdf)	2021 3.141592653-2.6-1.40.22

Markdown Viewer is included both for its CSS stylesheets, and for real-time rendering of Markdown files as they are being written. To install, follow the instructions in the README.md.

The versions of the integrated repositories can be changed, if desired (see Repository Versions).

Chapter 2

Composer Operation

2.1 Recommended Workflow

The ideal workflow is to put Composer in a top-level `.Composer` for each directory tree you want to manage, creating a structure similar to this:

```
.../.Composer
.../
.../tld/
.../tld/sub/
```

Then, it can be converted to a Composer documentation archive (Quick Start example):

```
make -f .Composer/Makefile install-all
make all-all
```

If specific settings need to be used, either globally or per-directory, `.composer.mk` files can be created (see Configuration Settings, Quick Start example):

```
make template >.composer.mk
$EDITOR .composer.mk
```

Custom targets can also be defined, using standard GNU Make syntax (see Custom Targets).

GNU Make does not support file and directory names with spaces in them, and neither does Composer. Documentation archives which have such files or directories will produce unexpected results.

It is fully supported for input files to be symbolic links to files that reside outside the documentation archive:

```
cd .../tld
ln -rs ../README.md ./
make README.html
```

Finally, it is best practice to install-force after every Composer upgrade, in case there are any changes to the Makefile template (see Primary Targets).

The archive is ready, and each directory is both a part of the collective and its own individual instance. Targets can be run per-file, per-directory, or recursively through an entire directory tree. The most commonly used targets are in Primary Targets.

Welcome to Composer. *Happy Making!*

2.2 Document Formatting

As outlined in Overview and Principles, a primary goal of Composer is to produce beautiful and professional output. Pandoc does reasonably well at this, and yet its primary focus is document conversion, not document formatting. Composer fills this gap by specifically tuning a select list of the most commonly used document formats.

Further options for each document type are in Formatting Variables. All improvements not exposed as variables will apply to all documents created with a given instance of Composer.

#WORK remove heredoc...

Note that all the files referenced below are embedded in the ‘Embedded Files’ and ‘Heredoc’ sections of the Makefile. They are exported by the `_release` target, and will be overwritten whenever it is run.

2.2.1 Static Websites

Bootstrap is a leading web development framework, capable of building static webpages that behave dynamically. Static sites are very easy and inexpensive to host, and are extremely responsive compared to truly dynamic webpages.

Composer uses this framework to transform an archive of simple text files into a modern website, with the appearance and behavior of dynamically indexed pages.

#WORKING

```
.../artifacts/bootstrap/bootstrap.js
.../artifacts/bootstrap/bootstrap.css
.../artifacts/composer/composer.site.css
.../artifacts/composer/composer.site.shade.light.css
.../artifacts/composer/composer.site.shade.dark.css
.../artifacts/images/logo.img
.../artifacts/images/icon.img
```

Bootswatch

#WORK

```
.../bootswatch/docs/index.html
```

#WORK

2.2.2 HTML

In addition to being a helpful real-time rendering tool, Markdown Viewer includes several CSS stylesheets that are much more visually appealing than the Pandoc default, and which behave like normal webpages, so Composer uses them for all HTML-based document types, including EPUB.

Information on installing Markdown Viewer for use as a Markdown rendering tool is in Requirements.

2.2.3 PDF

The default formatting for PDF is geared towards academic papers and the typesetting of printed books, instead of documents that are intended to be purely digital.

Internally, Pandoc first converts to LaTeX, and then uses TeX Live to convert into the final PDF. Composer inserts customized LaTeX to modify the final output:

```
.../artifacts/composer/composer.pdf.latex
```

2.2.4 EPUB

The EPUB format is essentially packaged HTML, so Composer uses the same Markdown Viewer CSS stylesheets for it.

2.2.5 Reveal.js Presentations

The CSS for Reveal.js presentations has been modified to create a more traditional and readable end result. The customized version is at:

```
.../artifacts/composer/composer.revealjs.css
```

It links in a default theme from the `.../reveal.js/dist/theme` directory. Edit the location in the file, or use `c_css` to select a different theme.

It is set up so that a logo can be placed in the upper right hand corner on each slide, for presentations that need to be branded. Simply copy an image file to the logo location:

```
.../artifacts/images/logo.img
```

To have different logos for different directories (using Recommended Workflow, Configuration Settings and Precedence Rules):

```
cd .../presentations
cp .../logo.img ./
ln -rs .../.Composer/artifacts/composer/composer.revealjs.css ./composer.css
echo 'override c_type := revealjs' >>./composer.mk
make all
```

2.2.6 Microsoft Word & PowerPoint

The internal Pandoc templates for these are exported by Composer, so they are available for customization:

```
.../artifacts/reference.docx
.../artifacts/reference.pptx
```

They are not currently modified by Composer.

2.3 Configuration Settings

Composer uses `.composer.mk` files for persistent settings and definition of Custom Targets. By default, they only apply to the directory they are in (see `COMPOSER_INCLUDE` in Control Variables). A `.composer.mk` in the main Composer directory will be global to all directories. The targets and settings in the most local file override all others (see Precedence Rules).

The easiest way to create a new `.composer.mk` is with the template target (Quick Start example):

```
make template >.composer.mk
$EDITOR .composer.mk
```

All variable definitions must be in the override `[variable] := [value]` format from the template target. Doing otherwise will result in unexpected behavior, and is not supported. The regular expression that is used to detect them:

```
override [[:space:]]+(\^[[:space:]]+)[[:space:]]+[:]=
```

Variables can also be specified per-target, using GNU Make syntax:

```
README.%.override c_toc := 0
README.revealjs.html: override c_toc :=
```

In this case, there are multiple definitions that could apply to `README.revealjs.html`, due to the `%` wildcard. Since the most specific target match is used, the final value for `c_toc` would be empty.

2.4 Precedence Rules

The order of precedence for `.composer.mk` files is global-to-local (see `COMPOSER_INCLUDE` in Control Variables). This means that the values in the most local file override all others.

Variable aliases, such as `COMPOSER_DEBUGIT/c_debug/V` are prioritized in the order shown, with `COMPOSER_*` taking precedence over `c_*`, over the short alias.

Selection of the CSS file can be done using `.composer.css` or the `c_css` variable, with `.composer.css` taking precedence (unless `c_css` comes from `.composer.mk`). The process for `.composer.css` files is identical to `.composer.mk` (see `COMPOSER_INCLUDE` in Control Variables).

All values in `.composer.mk` take precedence over everything else, including `.composer.css` and environment variables.

2.5 Specifying Dependencies

If there are files or directories that have dependencies on other files or directories being processed first, this can be done simply using GNU Make syntax in `.composer.mk`:

```
LICENSE.html: README.html
all-subdirs-artifacts: all-subdirs-pandoc
```

This would require `README.html` to be completed before `LICENSE.html`, and for `pandoc` to be processed before `artifacts`. Directories need to be specified with the `all-subdirs-*` syntax in order to avoid conflicts with target names (see Custom Targets). A good examples of this is the internal `__test` target, which is a common directory name.

Chaining of dependencies can be as complex and layered as GNU Make will support. Note that if a file or directory is set to depend on a target, that target will be run whenever the file or directory is called.

2.6 Custom Targets

If needed, custom targets can be defined inside a `.composer.mk` file (see Configuration Settings), using standard GNU Make syntax. Naming them as `*-clean` or `*-all` will include them in runs of the respective targets. Targets with any other names will need to be run manually, or included in `COMPOSER_TARGETS` (see Control Variables).

`#WORK ...or, via Specifying Dependencies`

There are a few limitations when naming custom targets. Targets starting with the regular expression `[_.]` are hidden, and are skipped by auto-detection. Additionally, there is a list of reserved targets in `Reserved`, along with a list of reserved variables.

Any included `.composer.mk` files are sourced early in the main Composer Makefile, so matching targets and most variables will be overridden. In the case of conflicting targets, GNU Make will produce warning messages. Variables will have their values changed silently. Changing the values of internal Composer variables is not recommended or supported.

A final note is that `*-clean` and `*-all` targets are stripped from `COMPOSER_TARGETS`. In cases where this results in an empty `COMPOSER_TARGETS`, there will be a message and no actions will be taken.

2.7 Repository Versions

There are a few internal variables used by `__update` to select the repository and binary versions of integrated components (see Requirements). These are exposed for configuration, but only within `.composer.mk`:

- `PANDOC_VER` (must be a binary version number)
- `PANDOC_CMT` (defaults to `PANDOC_VER`)
- `YQ_VER` (must be a binary version number)
- `YQ_CMT` (defaults to `YQ_VER`)
- `BOOTSTRAP_CMT`

- BOOTSWATCH_CMT
- FONTAWES_CMT
- WATERCSS_CMT
- MDVIEWER_CMT
- MDTHEMES_CMT
- REVEALJS_CMT

Binaries for Pandoc and YQ are installed in their respective directories. By moving or removing them, or changing the version number and foregoing `__update-all` (see Additional Targets), the system versions will be used instead. This will work as long as the commit versions match, so that supporting files are in alignment.

It is possible that changing the versions will introduce incompatibilities with Composer, which are usually impacts to the prettification of output files (see Document Formatting).

Chapter 3

Composer Variables

3.1 Formatting Variables

Variable	Purpose	Value
c_site ~ S	Enable Static Websites	
c_type ~ T	Desired output format	html
c_base ~ B	Base of output file	
c_list ~ L	List of input files(s)	
c_lang ~ g	Language for document headers	en-US
c_logo ~ b	#WORKING	logo.img
c_icon ~ i	#WORKING	icon.img
c_css ~ s	Location of CSS file	theme.html-default.css
c_toc ~ c	Table of contents depth	
c_level ~ l	Chapter/slide header level	2
c_margin ~ m	Size of margins (PDF)	0.8in
c_options ~ o	Custom Pandoc options	

Values (c_type)	Format	Extension
html	HyperText Markup Language	*.html
pdf	Portable Document Format	*.pdf
epub	Electronic Publication	*.epub
revealjs	Reveal.js Presentation	*.revealjs.html
docx	Microsoft Word	*.docx
pptx	Microsoft PowerPoint	*.pptx
text	Plain Text (well-formatted)	*.txt
markdown	Markdown (for testing)	*.md.txt

- Other *c_type* values will be passed directly to Pandoc
- Special *c_css* values:
 - *.composer.css* = Filesystem override of variable value
 - *css_alt* = Use the alternate default stylesheet
 - *0* = Revert to the Pandoc default
- Special *c_toc* value: *0* = List all headers, and number sections
- Special *c_level* value: *0* = Varies by *c_type* (see *help-all*)
- An empty *c_margin* value enables individual margins:
 - *c_margin_top* ~ *mt*
 - *c_margin_bottom* ~ *mb*

- `c_margin_left` ~ `ml`
- `c_margin_right` ~ `mr`

3.1.1 `c_site`

#WORK

3.1.2 `c_type` / `c_base` / `c_list`

The compose target uses these variables to decide what to build and how. The output file is `[c_base].<extension>`, and is constructed from the `c_list` input files, in order. The `<extension>` is selected based on the `c_type` table above. Generally, it is not required to use the compose target directly for supported `c_type` files, since it is run automatically based on what output file `<extension>` is specified.

The automatic input file detection works by matching one of the following (Quick Start example):

```
make README.html           ~ README (empty [COMPOSER_EXT])
make README.html           ~ README.md
make README.md.html        ~ README.md
make Composer-v3.1.Manual.html  c_list="README.md LICENSE.md"
```

Other values for `c_type`, such as `json` or `man`, for example, can be passed through to Pandoc manually:

```
make compose c_type="json" c_base="README" c_list="README.md"
make compose c_type="man" c_base="Composer-v3.1.Manual" c_list="README.md"
```

Any of the file types supported by Pandoc can be created this way. The only limitation is that the input files must be in Markdown format.

3.1.3 `c_lang`

- Primarily for PDF, this specifies the language that the table of contents (`c_toc`) and chapter headings (`c_level`) will use.

3.1.4 `c_logo`

#WORKING

3.1.5 `c_icon`

#WORKING

3.1.6 `c_css`

- By default, a CSS stylesheet from Markdown Viewer is used for HTML and EPUB, and one of the Reveal.js themes is used for Reveal.js Presentations. This variable allows for selection of a different file in all cases.
- The special value `css_alt` selects the alternate default stylesheet. Using 0 reverts to the Pandoc default.
- This value can be overridden by the presence of `.composer.css` files. See Precedence Rules for details.

3.1.7 `c_toc`

- Setting this to a value of [1–6] creates a table of contents at the beginning of the document. The numerical value is how many header levels deep the table should go. A value of 6 lists all header levels.
- Using a value of 0 lists all header levels, and additionally numbers all the sections, for reference.

3.1.8 `c_level`

- This value has different effects, depending on the `c_type` of the output document.
- For HTML, any value enables section-divs, which wraps headings and their section content in `<section>` tags and attaches identifiers to them instead of the headings themselves. This is for CSS styling, and is generally desired.
- For PDF, there are 3 top-level division types: part, chapter, and section. This sets the top-level header to the specified type, which changes the way the document is presented. Using part divides the document into “Parts”, each starting with a stand-alone title page. With this division type, each second-level heading starts a new “Chapter”. A chapter simply starts a new section on a new page, and lower-level headings continue as running portions within it. Finally, section creates one long running document with no blank pages or section breaks (like a HTML page). To set the desired value:
 - part ~ 0
 - chapter ~ 2
 - section ~ Any other value
- For EPUB, this creates chapter breaks at the specified level, starting the section on a new page. The special 0 simply sets it to the default value of 2.
- For Reveal.js Presentations, the top-level headings can persist on the screen when moving through slides in their sections, or they can rotate out as their own individual slides. Setting to 0 enables persistent headings, and all other values use the default.
- An empty value defers to the Pandoc defaults in all cases.

3.1.9 `c_margin`

- The default margins for PDF are formatted for typesetting of printed books, where there is a large amount of open space around the edges and the text on each page is shifted away from where the binding would be. This is generally not what is desired in a purely digital PDF document.
- This is one value for all the margins. Setting it to an empty value exposes variables for each of the individual margins: `c_margin_top`, `c_margin_bottom`, `c_margin_left` and `c_margin_right`.

3.1.10 `c_options`

- In some cases, it may be desirable to add additional Pandoc options. Anything put in this variable will be passed directly to Pandoc as additional command-line arguments.

3.2 Control Variables

Variable	Purpose	Value
<code>MAKEJOBS</code>	Parallel processing threads	1 (makejobs)
<code>COMPOSER_DOCOLOR</code>	Enable title/color sequences	(boolean)
<code>COMPOSER_DEBUGIT</code>	Use verbose output	(debugit)
<code>COMPOSER_INCLUDE</code>	Include all: .composer.mk	(boolean)
<code>COMPOSER_DEPENDS</code>	Sub-directories first: all	(boolean)
<code>COMPOSER_KEEPING</code>	Log entries / cache files	100 (keeping)
<code>COMPOSER_LOG</code>	Timestamped command log	.composed
<code>COMPOSER_EXT</code>	Markdown file extension	.md
<code>COMPOSER_TARGETS</code>	See: all/clean	config/targets
<code>COMPOSER_SUBDIRS</code>	See: all/clean/install	config/targets
<code>COMPOSER_EXPORTS</code>	See: all/clean/install	config
<code>COMPOSER_IGNORES</code>	See: all/clean/install	config

- *MAKEJOBS ~ c_jobs ~ J*
- *COMPOSER_DOCOLOR ~ c_color ~ C*
- *COMPOSER_DEBUGIT ~ c_debug ~ V*
- *(makejobs) = empty is disabled / number of threads / 0 is no limit*

- *(debugit)* = *empty is disabled / any value enables / 0 is full tracing*
- *(keeping)* = *empty is no limit / number to keep / 0 is none*
- *(boolean)* = *empty is disabled / any value enables*

3.2.1 MAKEJOBS

#WORK a small number of large directories will process faster than a large number of small ones, especially with site

- By default, Composer progresses linearly, doing one task at a time. If there are dependencies between items, this can be beneficial, since it ensures things will happen in a particular order. The downside, however, is that it is very slow.
- Composer supports GNU Make parallel execution, where multiple threads can be working through tasks independently. Experiment with lower values first. When recursing through large directories, each make that instantiates into a sub-directory has it's own jobs server, so the total number of threads running can proliferate rapidly.
- This can drastically speed up execution, processing thousands of files and directories in minutes. However, values that are too high can exhaust system resources. With great power comes great responsibility.
- A value of 0 does parallel execution with no thread limit.

3.2.2 COMPOSER_DOCOLOR

- Composer uses colors to make all output and help text easier to read. The escape sequences used to accomplish this can create mixed results when reading in an output file or a \$PAGER, or just make it harder to read for some.
- This is also used internally for targets like `_debug-file` and `template`, where plain text is required.

3.2.3 COMPOSER_DEBUGIT

- Provides more explicit details about what is happening at each step. Produces a lot more output, and can be slower. It will also be hard to read unless MAKEJOBS is set to 1.
- Full tracing using 0 also displays GNU Make debugging output.
- *When doing _debug, this is used to pass a list of targets to test (see Additional Targets).*

3.2.4 COMPOSER_INCLUDE

- On every run, Composer walks through the MAKEFILE_LIST, all the way back to the main Makefile, looking for `.composer.mk` files in each directory. By default, it only reads the ones in the main Composer directory and the current directory, in that order. This option enables reading all of them.
- In the example directory tree below, normally the `.composer.mk` in `.Composer` is read first, and then `tld/sub/.composer.mk`. With this enabled, it will read all of them in order from top to bottom: `.Composer/.composer.mk`, `.composer.mk`, `tld/.composer.mk`, and finally `tld/sub/.composer.mk`.
- This is why it is best practice to have a `.Composer` directory at the top level for each documentation archive (see Recommended Workflow). Not only does it allow for strict version control of Composer per-archive, it also provides a mechanism for setting Composer Variables globally.
- When using this option, care should be taken with “Local” variables from `template` (see Templates). They will be propagated down the tree, which is generally not desired except in very specific cases. Using `[COMPOSER_CURDIR]` to limit their scope is recommended (see below).
- The `[COMPOSER_CURDIR]` variable is set when reading in a `.composer.mk` file in the make running directory (the `$CURDIR`), and is empty otherwise. This provides a way to limit particular portions of the file to the local directory, regardless of whether `COMPOSER_INCLUDE` is set or not. An example of this is below.
- This setting also causes `.composer.yml` and `.composer.css` files to be processed in an identical manner (see Precedence Rules).

Example directory tree (see Recommended Workflow):

```
.../.Composer/Makefile
```

```
.../.Composer/.composer.mk
.../Makefile
.../.composer.mk
.../tld/Makefile
.../tld/.composer.mk
.../tld/sub/Makefile
.../tld/sub/.composer.mk
```

Example usage of the [COMPOSER_CURDIR] variable:

```
ifneq ($(COMPOSER_CURDIR),)
    [...]
endif
```

3.2.5 COMPOSER_DEPENDS

- When doing all-all, Composer will process the current directory before recursing into sub-directories. This reverses that, and sub-directories will be processed first.
- In the example directory tree in COMPOSER_INCLUDE above, the default would be: .../ , .../ tld, and then .../ tld/sub. If the higher-level directories have dependencies on the sub-directories being run first, this will support that by doing them in reverse order, processing them from bottom to top.
- This has no effect on install or clean.

3.2.6 COMPOSER_KEEPING

#WORK 0 deletes all. . .

3.2.7 COMPOSER_LOG

- Composer appends to a .composed log file in the current directory whenever it executes Pandoc. This provides some accounting, and is used by list to determine which *.md files have been updated since the last time Composer was run.
- This setting can change the name of the log file, or disable it completely (empty value).
- It is removed each time clean is run.

3.2.8 COMPOSER_EXT

- The Markdown file extension Composer uses: *.md. This is for auto-detection of files to add to COMPOSER_TARGETS, files to output for list, and other tasks. This is a widely used standard, including GitHub. Another commonly used extension is: *.markdown.
- In some cases, they do not have any extension, such as README and LICENSE in source code directories. Setting this to an empty value causes them to be detected and output. It also causes all other files to be processed, because it becomes the wildcard *, so use with care. It is likely best to use COMPOSER_TARGETS to explicitly set the targets list in these situations.

3.2.9 COMPOSER_TARGETS

#WORK does not pick up .* files/directories

- The list of output files to create or delete with clean and all. Composer does auto-detection using c_type and COMPOSER_EXT, so this does not usually need to be set. Hidden files that start with . are skipped.
- Setting this manually disables auto-detection. It can also include non-file targets added into a .composer.mk file (see Custom Targets).
- The .null target is special, and when used as a value for COMPOSER_TARGETS or COMPOSER_SUBDIRS it will display a message and do nothing. A side-effect of this target is that an actual file or directory named .null will never be created or removed by Composer.
- An empty value triggers auto-detection
- Use config or targets to check the current value.

3.2.10 COMPOSER_SUBDIRS

- The list of sub-directories to recurse into with install, clean, and all. The behavior and configuration is identical to COMPOSER_TARGETS above, including auto-detection and the .null target. Hidden directories that start with . are skipped.
- An empty value triggers auto-detection
- Use config or targets to check the current value.

3.2.11 COMPOSER_EXPORTS

#WORKING # this one will be complicated... maybe? # has, effectively, the same .null behavior as above... # also overridden by COMPOSER_IGNORES # document .targets token... # hidden variables... #
/.g/_data/zactive/coding/composer/Composer.export #
#

3.2.12 COMPOSER_IGNORES

#WORK either remove site here, or add it to the ones above...

- The list of COMPOSER_TARGETS and COMPOSER_SUBDIRS to skip with site, install, clean, and all. This allows for selective auto-detection, when the list of items to process is larger than those to leave alone.
 - Use config to check the current value.
-

Chapter 4

Composer Targets

4.1 Primary Targets

Target	Purpose
help	Basic help overview (default)
help-all	Console version of README.md (mostly identical)
template	Print settings template: .composer.mk
template-yml	Print settings template: .composer.yml
template-md	Print markdown file template
compose	Document creation engine (see Formatting Variables)
site	Static Websites from all Markdown files
[site-all]	Recursively create Static Websites
[site-force]	Recursively create Static Websites
install	Current directory initialization: Makefile
install-all	Do install recursively (no overwrite)
install-force	Recursively force overwrite of Makefile files
clean	Remove output files: COMPOSER_TARGETS :: *-clean
clean-all	Do clean recursively: COMPOSER_SUBDIRS
*-clean	Any targets named this way will also be run by clean
all	Create output files: COMPOSER_TARGETS :: *-all
all-all	Do all recursively: COMPOSER_SUBDIRS
*-all	Any targets named this way will also be run by all
list	Show updated files: *COMPOSER_EXT » COMPOSER_LOG

4.1.1 help / help-all

- Outputs all of the documentation for Composer. The README.md has a few extra sections covering internal targets, along with reserved target and variable names, but is otherwise identical to the help-all output.

4.1.2 template / template-yml / template-md

- Prints useful templates for creating new files (see Templates):
 - Composer .composer.mk (see Configuration Settings)
 - Composer site and Pandoc .composer.yml (see site)
 - Pandoc markdown

4.1.3 compose

- This is the very core of Composer, and does the actual work of the Pandoc conversion. Details are in the c_type / c_base / c_list section of Formatting Variables.

4.1.4 site

#WORK site rebuilds indexes, force recursively

4.1.5 install / install-all / install-force

- Creates the necessary Makefile files to set up a directory or a directory tree as a Composer archive. By default, it will not overwrite any existing files.
- Doing a simple install will only create a file in the current directory, whereas install-all will recurse through the entire directory tree. A full install-force is the same as install-all, with the exception that it will overwrite all Makefile files.
- The topmost directory will have the Makefile created for it modified to point to Composer.

4.1.6 clean / clean-all / *-clean

- Deletes all COMPOSER_TARGETS output files in the current directory, after first running all *-clean targets.
- Doing clean-all does the same thing recursively, through all the COMPOSER_SUBDIRS.

4.1.7 all / all-all / *-all

- Creates all COMPOSER_TARGETS output files in the current directory, after first running all *-all targets.
- Doing all-all does the same thing recursively, through all the COMPOSER_SUBDIRS.

4.1.8 list

- Outputs all the COMPOSER_EXT files that have been modified since COMPOSER_LOG was last updated (see both in Control Variables). Acts as a quick reference to see if anything has changed.
- Since the COMPOSER_LOG file is updated whenever Pandoc is executed, this target will primarily be useful when all is the only target used to create files in the directory.

4.2 Additional Targets

Target	Purpose
__release	Full upgrade to current release, repository preparation
__update	Update all included components (see Requirements)
__update-all	Complete __update, including binaries: Pandoc, YQ
__debug	Diagnostics, tests targets list in COMPOSER_DEBUGIT
__debug-file	Export __debug results to a plain text file
check	List system packages and versions (see Requirements)
check-all	Complete check package list, and system information
config	Show values of all Composer Variables
config-all	Complete config, including environment variables
targets	List all available targets for the current directory
init	#WORK
init-force	#WORK
commit	Timestamped Git commit of the current directory tree
commit-all	Automatic commit, without \$EDITOR step
export	#WORK

4.2.1 __release / __update / __update-all

#WORKING break this section up

- Using the repository configuration (see Repository Versions), these fetch and install all external components.
- The __update-all target also fetches the Pandoc and YQ binaries, whereas __update only fetches the repositories.

- In addition to doing `__update-all`, `__release` performs the steps necessary to turn the current directory into a complete clone of Composer.
- One of the unique features of Composer is that everything needed to compose itself is embedded in the Makefile.

Rapid cloning:

```
mkdir .../clone
cd .../clone
make -f .../.Composer/Makefile __release
```

4.2.2 `__debug` / `__debug-file`

- This is the tool to use for any support issues. Submit the output file to: composer@garybgenett.net
- Internally, it also runs:
 - `__test`
 - `check-all`
 - `config-all`
 - `targets`
- If issues are occurring when running a particular set of targets, list them in `COMPOSER_DEBUGIT`.
- For general issues, run in the top-level directory (see Recommended Workflow). For specific issues, run in the directory where the issue is occurring.

For example:

```
make COMPOSER_DEBUGIT="README.html Composer-v3.1.Manual.html" __debug-file
```

4.2.3 `check` / `check-all` / `config` / `config-all` / `targets`

#WORKING break this section up

```
#WORK site #WORK site-all #WORK site-force # site-clean # site-list # site-list-list # site-list-null # site-list-all
# site-list-% # site-library # site-.composer.mk # site-.composer.yml # site-template # site-template-__test #
site-template-config
```

- Useful targets for validating tooling and configurations.
- Use `check` to see the list of components and their versions, in relation to the system installed versions. Doing `check-all` will show the complete list of tools that are used by Composer.
- The current values of all Composer Variables is output by `config`, and `config-all` will additionally output all environment variables.
- A structured list of detected targets, `*-clean` and `*-all` targets, `COMPOSER_TARGETS`, and `COMPOSER_SUBDIRS` is printed by `targets`.
- Together, `config` and `targets` reveal the entire internal state of Composer.

4.2.4 `init` / `init-force`

#WORKING

4.2.5 `commit` / `commit-all`

- Using the directory structure in Recommended Workflow, `.../` is considered the top-level directory. Meaning, it is the last directory before linking to Composer.
- If the top-level directory is a Git repository (it has `<directory>.git` or `<directory>/git`), this target creates a commit of the current directory tree with the title format below.
- For example, if it is run in the `.../tld` directory, that entire tree would be in the commit, including `.../tld/sub`. The purpose of this is to create quick and easy checkpoints when working on documentation that does not necessarily fit in a process where there are specific atomic steps being accomplished.
- When this target is run in a Composer directory, it uses itself as the top-level directory. When calling Composer directly using `-f`, the current directory is used.

Commit title format:

```
[Composer CMS v3.1 :: 2023-03-06T10:53:46 -08:00]
```

4.2.6 export

#WORKING

4.3 Internal Targets

Target	Purpose
help-help	Complete README.md content (similar to help-all)
.template-install	The Makefile used by install (see Templates)
.template	The .composer.mk used by template (see Templates)
headers	Series of targets that handle all informational output
headers-template	For testing default headers output
headers-template-all	For testing complete headers output
.make_database	Complete contents of GNU Make internal state
.all_targets	Extracted list of all targets from .make_database
.null	Placeholder to specify or detect empty values
__update__test	#WORK
__setup	Extracts embedded files from Makefile, and does all
__setup-all	#WORK
__test	Test suite, validates all supported features
__test-file	Export __test results to a plain text file
check-help	Minimized check output (used for Requirements)
subdirs	Expands COMPOSER_SUBDIRS into *--subdirs--* targets

(None of these are intended to be run directly during normal use, and are only documented for completeness.)

Chapter 5

Reference

5.1 Configuration

5.1.1 Pandoc Extensions

Composer uses the markdown input format, with these extensions:

```
ascii_identifiers
auto_identifiers
emoji
fancy_lists
fenced_divs
footnotes
gfm_auto_identifiers
header_attributes
implicit_figures
implicit_header_references
inline_notes
intraword_underscores
line_blocks
link_attributes
markdown_in_html_blocks
pandoc_title_block
pipe_tables
raw_html
raw_tex
shortcut_reference_links
smart
strikeout
superscript
task_lists
yaml_metadata_block
```

5.1.2 Templates

The install target Makefile template (for reference only):

```
override COMPOSER_MY_PATH := $(abspath $(dir $(lastword $(MAKEFILE_LIST))))
override COMPOSER_TEACHER := $(abspath $(dir $(COMPOSER_MY_PATH)))/Makefile
include $(COMPOSER_TEACHER)
```

Use the template target to create .composer.mk files:

```
#####  
# Global  
  
# override MAKEJOBS := 1  
# override COMPOSER_DOCOLOR :=  
# override COMPOSER_DEBUGIT :=  
# override COMPOSER_KEEPING := 100  
# override COMPOSER_LOG := .composed  
# override COMPOSER_EXT := .md  
# override c_site :=  
# override c_type := html  
# override c_lang := en-US  
# override c_logo := $(COMPOSER_DIR)/artifacts/images/logo.img  
# override c_icon := $(COMPOSER_DIR)/artifacts/images/icon.img  
# override c_css := $(COMPOSER_DIR)/artifacts/themes/theme.html-default.css  
  
#####  
# ifneq ($(COMPOSER_CURDIR),)  
  
#####  
# Local  
  
# override COMPOSER_INCLUDE :=  
# override COMPOSER_DEPENDS :=  
# override COMPOSER_TARGETS := README.site.html README.html README.pdf README.epub README.  
# override COMPOSER_SUBDIRS := _site artifacts bin bootstrap bootswatch font-awesome markd  
# override COMPOSER_EXPORTS := *.html *.pdf *.epub *.revealjs.html *.docx *.pptx *.txt *.m  
# override COMPOSER_IGNORES := Composer.export  
# override c_base :=  
# override c_list :=  
# override c_toc :=  
# override c_level := 2  
# override c_margin := 0.8in  
# override c_margin_top :=  
# override c_margin_bottom :=  
# override c_margin_left :=  
# override c_margin_right :=  
# override c_options :=  
  
#####  
# endif
```

Use the template-yml target to create .composer.yml files:

```
# variables:  
#   title-prefix: null  
#   site-config:  
#     homepage: null  
#     brand: null  
#     copyright: null  
#     search_name: null  
#     search_site: null  
#     search_call: null  
#     search_form: null  
#     header: null  
#     footer: null  
#     css_shade: dark
```

```

#      copy_protect: null
#      cols_break: lg
#      cols_sticky: 1
#      cols_order:
#          - 1
#          - 2
#          - 3
#      cols_reorder:
#          - 1
#          - 3
#          - 2
#      cols_size:
#          - 3
#          - 7
#          - 2
#      cols_resize:
#          - 6
#          - 12
#          - 6
#      metainfo_null: '*(none)*'
#      metainfo: '<date> :: <title><|> — <author|; >'
#      taglist:
#          author:
#              title: Author
#              display: '*Authors: <|>, <|>*'
#          tags:
#              title: Tag
#              display: '*Tags: <|>, <|>*'
#      readtime: '*Reading time: <word> words, <time> minutes*'
#      readtime_wpm: 220
#      site-library:
#          folder: null
#          auto_update: null
#          digest_title: Latest Updates
#          digest_continue: '[...]'
#          digest_permalink: '*(permalink to full text)*'
#          digest_chars: 1024
#          digest_count: 10
#          digest_expanded: 0
#          digest_spacer: 1
#          sitemap_title: Site Map
#          sitemap_expanded: 0
#          sitemap_spacer: 1
#          lists_expanded: 0
#          lists_spacer: 1
#      site-nav-top: null
#      site-nav-bottom: null
#      site-nav-left: null
#      site-nav-right: null
#      site-info-top: null
#      site-info-bottom: null

```

Use the template-md target to create new markdown files:

```

title: "Composer CMS: Content Make System"
date: 2023-03-06

```

```
author:
  - Gary B. Genett
tags:
  - Composer
-----
*Happy Making!*
```

5.1.3 Defaults

The default `.composer.mk` in the Composer directory:

```
#####
# Composer CMS :: GNU Make Configuration
#####
ifneq ($(COMPOSER_CURDIR),)
#####

#####
# Wildcards

README.%: override c_logo := artifacts/images/logo-v1.0.png
README.%: override c_icon := artifacts/images/icon-v1.0.png
README.%: override c_toc := 0

#####
# Settings

override README.site.html := artifacts/README.site.md
README.site.html: override c_site := 1
README.site.html: override c_toc :=

override README.pdf := README.md LICENSE.md

override README.revealjs.html := artifacts/README.revealjs.md
README.revealjs.html: override c_toc :=

#####
endif
#####
# End Of File
#####
```

The template `.composer.yml` in the artifacts directory:

```
#####
# Composer CMS :: YAML Configuration
#####

variables:

#####
# site

  title-prefix: EXAMPLE SITE

#####
  site-config:
```

```

homepage: http://www.garybgenett.net/projects/composer
brand: LOGO / BRAND
#>> copyright: COPYRIGHT
copyright: |
    <!-- composer >> icon gpl >> -->
    <!-- composer >> icon cc-by-nc-nd >> -->
    <!-- composer >> icon copyright >> -->
    COPYRIGHT

#>> search_name: SEARCH
search_name: |
    <!-- composer >> icon search >> -->
search_site: https://duckduckgo.com
search_call: q
search_form: |
    <!-- composer >> form sites garybgenett.net >> -->
    <!-- composer >> form ia web >> -->
    <!-- composer >> form kae d >> -->
    <!-- composer >> form ko 1 >> -->
    <!-- composer >> form kp -1 >> -->
    <!-- composer >> form kv 1 >> -->
    <!-- composer >> form kz -1 >> -->

#>> header: null
#>> footer: null

#>> css_shade: dark
#>> copy_protect: null

#>> cols_break: lg
#>> cols_sticky: 1
#>> cols_order: [ 1, 2, 3 ]
#>> cols_reorder: [ 1, 3, 2 ]
#>> cols_size: [ 3, 7, 2 ]
#>> cols_resize: [ 6, 12, 6 ]

#>> metainfo_null: "*(none)*"
#>> metainfo: "<date> :: <title><|> — <author|; >"
#>> taglist:
#>>   author:
#>>     title: "Author"
#>>     display: "*Authors: <|>, <|>*"
#>>   tags:
#>>     title: "Tag"
#>>     display: "*Tags: <|>, <|>*"

#>> readtime: "*Reading time: <word> words, <time> minutes*"
#>> readtime_wpm: 220

#####
site-library:

    folder: #>> null
#>> auto_update: null

```

```
#>> digest_title: "Latest Updates"
#>> digest_continue: "[...]"
#>> digest_permalink: "*(permalink to full text)*"
#>> digest_chars: 1024
#>> digest_count: 10
#>> digest_expanded: 0
#>> digest_spacer: 1

#>> sitemap_title: "Site Map"
#>> sitemap_expanded: 0
#>> sitemap_spacer: 1

#>> lists_expanded: 0
#>> lists_spacer: 1

#####
site-nav-top:

MENU:
- MAIN: <composer_root>/index.html
- PAGES:
- Composer README: <composer_root>/../index.html
- spacer
- Introduction:
- _: <composer_root>/index.html
- Default Site: <composer_root>/null/index.html
- Configured Site: <composer_root>/config/index.html
- Pandoc Markdown: <composer_root>/pandoc/MANUAL.html
- Bootstrap Default: <composer_root>/bootstrap/site/content/docs/5.1/getting-sta
- Layout & Elements:
- _: <composer_root>/examples.html
- Metainfo Page: <composer_root>/config/pages.html
- Metainfo File: <composer_root>/config/pages/2020-01-01+template_00.html
- Themes & Shades: <composer_root>/themes/index.html
- Default Library Page:
- _: <composer_root>/_library/index.html
- Configured Library Page: <composer_root>/config/_library-config/index.html
#>> - Default Digest Page: <composer_root>/index-digest.html
#>> - Configured Digest Page: <composer_root>/config/index-digest.html

CONTENTS:
- CONTENTS:
- contents
#>> - contents 6
#>> - contents 0

SPACE:
- spacer
LIBRARY:
- DATES:
- library date
- AUTHORS:
- library author
- TAGS:
- library tags

#####
site-nav-bottom:
```

```

PATH:
- SITEMAP: <composer_root>/_library/sitemap.html
INFO:
- taglist author
- taglist tags

#####
site-nav-left:

BEGIN:
MENU:
- fold-begin 0 . 0 LEFT FOLD
- _: |
  * ITEM 1
  * ITEM 2
  * ITEM 3
- fold-end
MIDDLE:
- spacer
TEXT:
- box-begin 0 LEFT BOX
- _: |
  LEFT TEXT
- box-end
SPACE:
- spacer
CONTENTS:
- box-begin 0 CONTENTS
- metainfo
- contents
#>> - contents 6
#>> - contents 0
- taglist author
- taglist tags
- readtime
- box-end
END:

#####
site-nav-right:

BEGIN:
MENU:
- fold-begin 0 . 0 RIGHT FOLD
- _: |
  * ITEM 1
  * ITEM 2
  * ITEM 3
- fold-end
MIDDLE:
- spacer
TEXT:
- box-begin 0 RIGHT BOX
- _: |
  RIGHT TEXT

```

```
    - box-end
SPACE:
    - spacer
LIBRARY:
    - fold-begin group fold-library
    - fold-begin 0 0 fold-library DATES
    - library date
    - fold-end
    - fold-begin 0 0 fold-library AUTHORS
    - library author
    - fold-end
    - fold-begin 0 . fold-library TAGS
    - library tags
    - fold-end
    - fold-end group
END:

#####
site-info-top:

TEXT:
    - TOP TEXT
INFO:
#>> - metainfo
#>> - taglist author
#>> - taglist tags
#>> - readtime
ICON:
    - icon github https://github.com/garybgenett/composer Composer CMS
#>> - |
#>>      <!-- composer >> icon gpl >> -->
#>>      <!-- composer >> icon cc-by-nc-nd >> -->
#>>      <!-- composer >> icon copyright >> -->

#####
site-info-bottom:

TEXT:
    - BOTTOM TEXT
INFO:
#>> - metainfo
#>> - taglist author
#>> - taglist tags
    - readtime
ICON:

#####
# End Of File
#####
```

5.2 Reserved

5.2.1 Target Names

Do not create targets which match these, or use them as prefixes:


```
.all_targets
.make_database
.null
all
check
clean
commit
compose
config
export
headers
help
init
install
list
site
subdirs
targets
template
__debug
__release
__setup
__test
__update
```

5.2.2 Variable Names

Do not create variables which match these, and avoid similar names:

```
~
7Z
7Z_VER
BASE64
BASH
BASH_VER
BOOTSTRAP_ART_CSS
BOOTSTRAP_ART_JS
BOOTSTRAP_CMT
BOOTSTRAP_DEF_CSS
BOOTSTRAP_DEF_JS
BOOTSTRAP_DIR
BOOTSTRAP_DIR_CSS
BOOTSTRAP_DIR_JS
BOOTSTRAP_DOC_VER
BOOTSTRAP_LIC
BOOTSTRAP_SRC
BOOTSWATCH_CMT
BOOTSWATCH_CSS_ALT
BOOTSWATCH_CSS_DARK
BOOTSWATCH_CSS_LIGHT
BOOTSWATCH_CSS_SOLAR_DARK
BOOTSWATCH_CSS_SOLAR_LIGHT
BOOTSWATCH_DIR
BOOTSWATCH_LIC
BOOTSWATCH_SRC
CAT
CHECKIT
```

CHMOD
CLEANER
CODEBLOCK
COLUMNS
COLUMN_2
COMMENTED
COMPOSER
COMPOSER_ART
COMPOSER_BASENAME
COMPOSER_BIN
COMPOSER_CNAME
COMPOSER_COLOR
COMPOSER_COMPOSER
COMPOSER_CONTENTS
COMPOSER_CONTENTS_DIRS
COMPOSER_CONTENTS_EXT
COMPOSER_CONTENTS_FILES
COMPOSER_CSS
COMPOSER_CURDIR
COMPOSER_CUSTOM
COMPOSER_DEBUGIT
COMPOSER_DEBUGIT_ALL
COMPOSER_DEPENDS
COMPOSER_DIR
COMPOSER_DOCOLOR
COMPOSER_DOSETUP_DIR
COMPOSER_EXPORT
COMPOSER_EXPORTS
COMPOSER_EXPORTS_DEFAULT
COMPOSER_EXPORT_DEFAULT
COMPOSER_EXPORT_REGEX
COMPOSER_EXT
COMPOSER_EXT_DEFAULT
COMPOSER_EXT_SPECIAL
COMPOSER_FILENAME
COMPOSER_FIND
COMPOSER_FULLNAME
COMPOSER_HEADLINE
COMPOSER_HOMEPAGE
COMPOSER_ICON
COMPOSER_ICON_VER
COMPOSER_IGNORES
COMPOSER_IMAGES
COMPOSER_INCLUDE
COMPOSER_INCLUDES
COMPOSER_INCLUDES_LIST
COMPOSER_INCLUDES_TREE
COMPOSER_KEEPING
COMPOSER_LIBRARY
COMPOSER_LIBRARY_AUTO_UPDATE
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Happy Making!

Chapter 6

Composer CMS License

6.1 Copyright

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6.2 License

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6.2.2.2 1. Source Code.

The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

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The “Corresponding Source” for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work’s System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

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6.2.2.6 5. Conveying Modified Source Versions.

You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

- a) The work must carry prominent notices stating that you modified it, and giving a relevant date.

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6.2.2.7 6. Conveying Non-Source Forms.

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- e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

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```
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