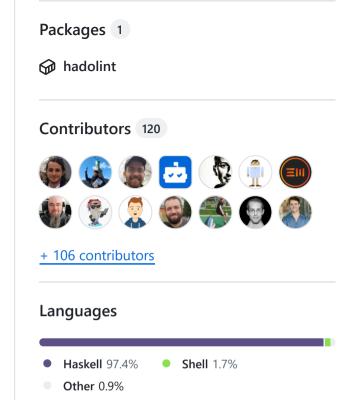


.pre-commit-hooks.yaml		
:pre commit nooks.yami	Add MD linter configuration	7 years ago
LICENSE	Must change license to GPL	10 years ago
☐ README.md	docs: Update TOC with Ignori	last year
🖺 Setup.hs	Port all tests over to HSpec	9 years ago
☐ ThirdPartyNotices.txt	Update ThirdPartyNotices.txt	3 years ago
Cabal.project	- remove haskell.nix	3 months ago
devenv.lock	- remove haskell.nix	3 months ago
devenv.nix	- remove haskell.nix	3 months ago
devenv.yaml	- remove haskell.nix	3 months ago
hadolint.cabal	remove static flag	3 months ago
integration_test.sh	Spelling (#936)	2 years ago
screenshot.png	[ImgBot] Optimize images	6 years ago



Haskell Dockerfile Linter

A smarter Dockerfile linter that helps you build <u>best practice</u> Docker images. The linter parses the Dockerfile into an AST and performs rules on top of the AST. It stands on the shoulders of <u>ShellCheck</u> to lint the Bash code inside RUN instructions.



```
Check the online version on hadolint.github.io/hadolint
```

```
DL4000 Specify a maintainer of the Dockerfile
  DL3006 Always tag the version of an image explicitely.
1 FROM debian
  SC1007 Remove space after = if trying to assign a value (for empty string, use var='' ... ).
  SC2154 node verson is referenced but not assigned.
  DL3009 Delete the apt-get lists after installing something
2 RUN node version= "0.10" \
   && apt-get update && apt-get -y install nodejs="$node verson"
4 COPY package.json usr/src/app
  DL3003 Use WORKDIR to switch to a directory
5 RUN cd /usr/src/app \
   && npm install node-static
  DL3011 Valid UNIX ports range from 0 to 65535
8 EXPOSE 80000
9 CMD ["npm", "start"]
```

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How to use

You can run hadolint locally to lint your Dockerfile.

```
hadolint <Dockerfile>
hadolint --ignore DL3003 --ignore DL3006 <Dockerfile> # exclude specific rules
hadolint --trusted-registry my-company.com:500 <Dockerfile> # Warn when using untrusted FROM images
```

Docker comes to the rescue, providing an easy way how to run hadolint on most platforms. Just pipe your Dockerfile to docker run:

```
docker run --rm -i hadolint/hadolint < Dockerfile
# OR
docker run --rm -i ghcr.io/hadolint/hadolint < Dockerfile</pre>
```

or using Podman:

```
podman run --rm -i docker.io/hadolint/hadolint < Dockerfile
# OR
podman run --rm -i ghcr.io/hadolint/hadolint < Dockerfile
```

or using Windows PowerShell:

```
cat .\Dockerfile | docker run --rm -i hadolint/hadolint
```

Install

You can download prebuilt binaries for OSX, Windows and Linux from the latest <u>release page</u>. However, if this does not work for you, please fall back to container (Docker), brew or source installation.

On OSX, you can use brew to install hadolint.

```
brew install hadolint
```

On Windows, you can use scoop to install hadolint.

```
scoop install hadolint
```

On distributions that have <code>nix</code> installed, you can use the <code>hadolint</code> package to run ad-hoc shells or permanently install <code>hadolint</code> into your environment.

As mentioned earlier, hadolint is available as a container image:

```
docker pull hadolint/hadolint
# OR
docker pull ghcr.io/hadolint/hadolint
```

If you need a container with shell access, use the Debian or Alpine variants:

```
docker pull hadolint/hadolint:latest-debian
# OR
docker pull hadolint/hadolint:latest-alpine
# OR
docker pull ghcr.io/hadolint/hadolint:latest-debian
# OR
docker pull ghcr.io/hadolint/hadolint:latest-alpine
```

You can also build hadolint locally. You need <u>Haskell</u> and the <u>cabal</u> build tool to build the binary.

If you want the <u>VS Code Hadolint</u> extension to use Hadolint in a container, you can use the following <u>wrapper script</u>:

```
#!/bin/bash
dockerfile="$1"
shift
docker run --rm -i hadolint/hadolint "$@" - < "$dockerfile"
```

CLI

```
hadolint --help

hadolint - Dockerfile Linter written in Haskell

Usage: hadolint [-v|--version] [-c|--config FILENAME] [DOCKERFILE...]
```

```
[--no-color] [-V|--verbose] [-f|--format ARG] [--error RULECODE]
                [--warning RULECODE] [--info RULECODE] [--style RULECODE]
                [--ignore RULECODE]
                [--trusted-registry REGISTRY (e.g. docker.io)]
                [--require-label LABELSCHEMA (e.g. maintainer:text)]
                [--strict-labels] [--disable-ignore-pragma]
                [-t|--failure-threshold THRESHOLD]
  Lint Dockerfile for errors and best practices
Available options:
  -h,--help
                           Show this help text
  -v,--version
                           Show version
                           Path to the configuration file
  -c,--config FILENAME
  --file-path-in-report FILEPATHINREPORT
                           The file path referenced in the generated report.
                           This only applies for the 'checkstyle' format and is
                           useful when running Hadolint with Docker to set the
                           correct file path.
                           Don't exit with a failure status code when any rule
  --no-fail
                           is violated
  --no-color
                           Don't colorize output
  -V,--verbose
                           Enables verbose logging of hadolint's output to
                           stderr
  -f,--format ARG
                           The output format for the results [tty | json |
                           checkstyle | codeclimate | gitlab codeclimate | gnu |
                           codacy | sonarqube | sarif] (default: tty)
  --error RULECODE
                           Make the rule `RULECODE` have the level `error`
                           Make the rule `RULECODE` have the level `warning`
  --warning RULECODE
                           Make the rule `RULECODE` have the level `info`
  --info RULECODE
                           Make the rule `RULECODE` have the level `style`
  --style RULECODE
  --ignore RULECODE
                           A rule to ignore. If present, the ignore list in the
                           config file is ignored
  --trusted-registry REGISTRY (e.g. docker.io)
                           A docker registry to allow to appear in FROM
                           instructions
  --require-label LABELSCHEMA (e.g. maintainer:text)
                           The option --require-label=label:format makes
                           Hadolint check that the label `label` conforms to
                           format requirement `format`
```

[--file-path-in-report FILEPATHINREPORT] [--no-fail]

```
--strict-labels

Do not permit labels other than specified in

`label-schema`

--disable-ignore-pragma

Disable inline ignore pragmas `# hadolint

ignore=DLxxxx`

-t,--failure-threshold THRESHOLD

Exit with failure code only when rules with a

severity equal to or above THRESHOLD are violated.

Accepted values: [error | warning | info | style |

ignore | none] (default: info)
```

Configure

Configuration files can be used globally or per project. Hadolint looks for configuration files in the following locations or their platform specific equivalents in this order and uses the first one exclusively:

- \$PWD/.hadolint.yaml
- \$XDG CONFIG HOME/hadolint.yaml
- \$HOME/.config/hadolint.yaml
- \$HOME/.hadolint/hadolint.yaml or \$HOME/hadolint/config.yaml
- \$HOME/.hadolint.yaml

In windows, the %LOCALAPPDATA% environment variable is used instead of XDG_CONFIG_HOME. Config files can have either yaml or yml extensions.

hadolint full yaml config file schema

```
ſĠ
                                        # name of threshold level (error | warning | info | style | ignore | none)
failure-threshold: string
                                        # Output format (tty | json | checkstyle | codeclimate | gitlab codeclimate | gnu | coda
format: string
ignored: [string]
                                        # list of rules
label-schema:
                                        # See Linting Labels below for specific label-schema details
  author: string
                                        # Your name
  contact: string
                                        # email address
  created: timestamp
                                        # rfc3339 datetime
  version: string
                                        # semver
  documentation: string
                                        # url
```

```
git-revision: string
                                  # hash
 license: string
                                  # spdx
                                  # true | false
no-color: boolean
                                  # true | false
no-fail: boolean
override:
 error: [string]
                                  # list of rules
 warning: [string]
                                  # list of rules
 info: [string]
                                  # list of rules
 style: [string]
                                  # list of rules
                                  # true | false
strict-labels: boolean
trustedRegistries: string | [string] # registry or list of registries
```

hadolint supports specifying the ignored rules using a configuration file. The configuration file should be in yaml format. This is one valid configuration file as an example:

```
ignored:
- DL3000
- SC1010
```

Additionally, hadolint can warn you when images from untrusted repositories are being used in Dockerfiles, you can append the trustedRegistries keys to the configuration file, as shown below:

```
ignored:
    - DL3000
    - SC1010

trustedRegistries:
    - docker.io
    - my-company.com:5000
    - "*.gcr.io"
```

If you want to override the severity of specific rules, you can do that too:

```
error:
        - DL3001
        - DL3002
      warning:
        - DL3042
        - DL3033
      info:
        - DL3032
      style:
        - DL3015
  failure-threshold Exit with failure code only when rules with a severity above THRESHOLD are violated (Available in v2.6.0+)
    failure-threshold: info
    override:
      warning:
        - DL3042
        - DL3033
      info:
        - DL3032
  Additionally, you can pass a custom configuration file in the command line with the --config option
    hadolint --config /path/to/config.yaml Dockerfile
  To pass a custom configuration file (using relative or absolute path) to a container, use the following command:
                                                                                                                                       ſĠ
    docker run --rm -i -v /your/path/to/hadolint.yaml:/.config/hadolint.yaml hadolint/hadolint < Dockerfile</pre>
    # OR
    docker run --rm -i -v /your/path/to/hadolint.yaml:/.config/hadolint.yaml ghcr.io/hadolint/hadolint < Dockerfile</pre>
  In addition to config files, Hadolint can be configured with environment variables.
```

```
NO COLOR=1
                                         # Set or unset. See https://no-color.org
                                         # Truthy value e.g. 1, true or yes
HADOLINT NOFAIL=1
                                         # Truthy value e.g. 1, true or yes
HADOLINT VERBOSE=1
                                         # Output format (tty | json | checkstyle | codeclimate | gitlab codeclimate | gnu | coc
HADOLINT FORMAT=json
                                         # threshold level (error | warning | info | style | ignore | none)
HADOLINT FAILURE THRESHOLD=info
                                         # comma separated list of rule codes
HADOLINT OVERRIDE ERROR=DL3010, DL3020
HADOLINT OVERRIDE WARNING=DL3010, DL3020
                                         # comma separated list of rule codes
HADOLINT OVERRIDE INFO=DL3010, DL3020
                                         # comma separated list of rule codes
                                         # comma separated list of rule codes
HADOLINT OVERRIDE STYLE=DL3010, DL3020
HADOLINT IGNORE=DL3010, DL3020
                                         # comma separated list of rule codes
                                         # Truthy value e.g. 1, true or yes
HADOLINT STRICT LABELS=1
HADOLINT DISABLE_IGNORE_PRAGMA=1
                                         # Truthy value e.g. 1, true or yes
                                         # comma separated list of registry urls
HADOLINT TRUSTED REGISTRIES=docker.io
HADOLINT REQUIRE LABELS=maintainer:text # comma separated list of label schema items
```

Non-Posix Shells

When using base images with non-posix shells as default (e.g. Windows based images) a special pragma hadolint shell can specify which shell the base image uses, so that Hadolint can automatically ignore all shell-specific rules.

```
FROM mcr.microsoft.com/windows/servercore:ltsc2022

# hadolint shell=powershell

RUN Get-Process notepad | Stop-Process
```

Ignoring Rules

Inline ignores

It is also possible to ignore rules by adding a special comment directly above the Dockerfile statement for which you want to make an exception for. Such comments look like # hadolint ignore=DL3001,SC1081. For example:

```
# hadolint ignore=DL3006
FROM ubuntu

# hadolint ignore=DL3003,SC1035
RUN cd /tmp && echo "hello!"
```

The comment "inline ignores" applies only to the statement following it.

Global ignores

Rules can also be ignored on a per-file basis using the global ignore pragma. It works just like inline ignores, except that it applies to the whole file instead of just the next line.

```
# hadolint global ignore=DL3003,DL3006,SC1035
FROM ubuntu

RUN cd /tmp && echo "foo"
```

Linting Labels

Hadolint is able to check if specific labels are present and conform to a predefined label schema. First, a label schema must be defined either via the command line:

```
hadolint --require-label author:text --require-label version:semver Dockerfile
```

or via the config file:

```
label-schema:
    author: text
    contact: email
    created: rfc3339
    version: semver
```

documentation: url
git-revision: hash
license: spdx

The value of a label can be either of text, url, semver, hash or rfc3339:

Schema	Description
text	Anything
rfc3339	A time, formatted according to RFC 3339
semver	A semantic version
url	A URI as described in RFC 3986
hash	Either a short or a long Git hash
spdx	An SPDX license identifier
email	An email address conforming to RFC 5322

By default, Hadolint ignores any label that is not specified in the label schema. To warn against such additional labels, turn on strict labels, using the command line:

hadolint --strict-labels --require-label version:semver Dockerfile

or the config file:

strict-labels: true

When strict labels is enabled, but no label schema is specified, hadolint will warn if any label is present.

Note on dealing with variables in labels

It is a common pattern to fill the value of a label not statically, but rather dynamically at build time by using a variable:

```
FROM debian:buster

ARG VERSION="du-jour"

LABEL version="${VERSION}"
```

To allow this, the label schema must specify text as value for that label:

```
label-schema:
version: text
```

Integrations

To get most of hadolint, it is useful to integrate it as a check in your CI or into your editor, or as a pre-commit hook, to lint your Dockerfile as you write it. See our Integration docs.

- Code Review Platform Integrations
- Continuous Integrations
- Editor Integrations
- Version Control Integrations

Rules

An incomplete list of implemented rules. Click on the error code to get more detailed information.

- Rules with the prefix DL are from hadolint. Have a look at Rules.hs to find the implementation of the rules.
- Rules with the sc prefix are from **ShellCheck** (only the most common rules are listed, there are dozens more).

Please create an issue if you have an idea for a good rule.

Rule	Default Severity	Description
<u>DL1001</u>	Ignore	Please refrain from using inline ignore pragmas # hadolint ignore=DLxxxx.
DL3000	Error	Use absolute WORKDIR.
<u>DL3001</u>	Info	For some bash commands it makes no sense running them in a Docker container like ssh, vim, shutdown, service, ps, free, top, kill, mount, ifconfig.
DL3002	Warning	Last user should not be root.
DL3003	Warning	Use WORKDIR to switch to a directory.
DL3004	Error	Do not use sudo as it leads to unpredictable behavior. Use a tool like gosu to enforce root.
DL3006	Warning	Always tag the version of an image explicitly.
DL3007	Warning	Using latest is prone to errors if the image will ever update. Pin the version explicitly to a release tag.
DL3008	Warning	Pin versions in apt-get install.
DL3009	Info	Delete the apt-get lists after installing something.
DL3010	Info	Use ADD for extracting archives into an image.
DL3011	Error	Valid UNIX ports range from 0 to 65535.
DL3012	Error	Multiple HEALTHCHECK instructions.
DL3013	Warning	Pin versions in pip.
DL3014	Warning	Use the -y switch.
DL3015	Info	Avoid additional packages by specifyingno-install-recommends.
DL3016	Warning	Pin versions in npm.
DL3018	Warning	Pin versions in apk add . Instead of apk add <package> use apk add <package>=<version> .</version></package></package>

Rule	Default Severity	Description
DL3019	Info	Use theno-cache switch to avoid the need to useupdate and remove /var/cache/apk/* when done installing packages.
DL3020	Error	Use COPY instead of ADD for files and folders.
DL3021	Error	COPY with more than 2 arguments requires the last argument to end with /
DL3022	Warning	COPYfrom should reference a previously defined FROM alias
DL3023	Error	COPYfrom cannot reference its own FROM alias
DL3024	Error	FROM aliases (stage names) must be unique
DL3025	Warning	Use arguments JSON notation for CMD and ENTRYPOINT arguments
DL3026	Error	Use only an allowed registry in the FROM image
DL3027	Warning	Do not use apt as it is meant to be an end-user tool, use apt-get or apt-cache instead
DL3028	Warning	Pin versions in gem install. Instead of gem install <gem> use gem install <gem>:<version></version></gem></gem>
DL3029	Warning	Do not useplatform flag with FROM.
DL3030	Warning	Use the -y switch to avoid manual input yum install -y <package></package>
DL3032	Warning	yum clean all missing after yum command.
DL3033	Warning	Specify version with yum install -y <package>-<version></version></package>
DL3034	Warning	Non-interactive switch missing from zypper command: zypper install -y
DL3035	Warning	Do not use zypper dist-upgrade.
DL3036	Warning	zypper clean missing after zypper use.
DL3037	Warning	Specify version with zypper install -y <package>[=]<version>.</version></package>
<u>DL3038</u>	Warning	Use the -y switch to avoid manual input dnf install -y <package></package>

Rule	Default Severity	Description
DL3040	Warning	dnf clean all missing after dnf command.
DL3041	Warning	Specify version with dnf install -y <package>-<version></version></package>
DL3042	Warning	Avoid cache directory with pip installno-cache-dir <package> .</package>
DL3043	Error	ONBUILD, FROM OR MAINTAINER triggered from within ONBUILD instruction.
DL3044	Error	Do not refer to an environment variable within the same ENV statement where it is defined.
DL3045	Warning	COPY to a relative destination without WORKDIR set.
DL3046	Warning	useradd without flag -1 and high UID will result in excessively large Image.
DL3047	Info	wget without flagprogress will result in excessively bloated build logs when downloading larger files.
DL3048	Style	Invalid Label Key
DL3049	Info	Label <label> is missing.</label>
DL3050	Info	Superfluous label(s) present.
DL3051	Warning	Label <label> is empty.</label>
DL3052	Warning	Label <label> is not a valid URL.</label>
DL3053	Warning	Label <1abel> is not a valid time format - must conform to RFC3339.
DL3054	Warning	Label <1abel> is not a valid SPDX license identifier.
DL3055	Warning	Label <1abel> is not a valid git hash.
DL3056	Warning	Label <1abel> does not conform to semantic versioning.
DL3057	Ignore	HEALTHCHECK instruction missing.
DL3058	Warning	Label <label> is not a valid email format - must conform to RFC5322.</label>

Rule	Default Severity	Description
DL3059	Info	Multiple consecutive RUN instructions. Consider consolidation.
DL3060	Info	yarn cache clean missing after yarn install was run.
DL3061	Error	Invalid instruction order. Dockerfile must begin with FROM, ARG or comment.
<u>DL4000</u>	Error	MAINTAINER is deprecated.
DL4001	Warning	Either use Wget or Curl but not both.
DL4003	Warning	Multiple CMD instructions found.
DL4004	Error	Multiple ENTRYPOINT instructions found.
DL4005	Warning	Use SHELL to change the default shell.
DL4006	Warning	Set the SHELL option -o pipefail before RUN with a pipe in it
<u>SC1000</u>		\$ is not used specially and should therefore be escaped.
<u>SC1001</u>		This \c will be a regular 'c' in this context.
<u>SC1007</u>		Remove space after = if trying to assign a value (or for empty string, use var='').
SC1010		Use semicolon or linefeed before done (or quote to make it literal).
SC1018		This is a unicode non-breaking space. Delete it and retype as space.
SC1035		You need a space here
SC1045		It's not foo &; bar, just foo & bar.
SC1065		Trying to declare parameters? Don't. Use () and refer to params as \$1, \$2 etc.
<u>SC1066</u>		Don't use \$ on the left side of assignments.
<u>SC1068</u>		Don't put spaces around the = in assignments.

Rule	Default Severity	Description
<u>SC1077</u>		For command expansion, the tick should slant left (`vs´).
SC1078		Did you forget to close this double-quoted string?
<u>SC1079</u>		This is actually an end quote, but due to next char, it looks suspect.
SC1081		Scripts are case sensitive. Use if, not If.
<u>SC1083</u>		This {/} is literal. Check expression (missing ;/\n ?) or quote it.
<u>SC1086</u>		Don't use \$ on the iterator name in for loops.
<u>SC1087</u>		Braces are required when expanding arrays, as in \${array[idx]}.
<u>SC1095</u>		You need a space or linefeed between the function name and body.
<u>SC1097</u>		Unexpected == . For assignment, use = . For comparison, use [] or [[]] .
<u>SC1098</u>		Quote/escape special characters when using eval, e.g. eval "a=(b)".
<u>SC1099</u>		You need a space before the #.
<u>SC2002</u>		Useless cat. Consider cmd < file or cmd file instead.
<u>SC2015</u>		Note that A && B C is not if-then-else. C may run when A is true.
<u>SC2026</u>		This word is outside of quotes. Did you intend to 'nest '"'single quotes'"' instead'?
<u>SC2028</u>		echo won't expand escape sequences. Consider printf.
<u>SC2035</u>		Use ./*glob* or *glob* so names with dashes won't become options.
<u>SC2039</u>		In POSIX sh, something is undefined.
<u>SC2046</u>		Quote this to prevent word splitting
SC2086		Double quote to prevent globbing and word splitting.

Rule	Default Severity	Description
SC2140		Word is in the form "A"B"C" (B indicated). Did you mean "ABC" or "A\"B\"C" ?
SC2154		var is referenced but not assigned.
SC2155		Declare and assign separately to avoid masking return values.
SC2164		Use cd exit in case cd fails.

Develop

If you are an experienced Haskeller, we would be very grateful if you would tear our code apart in a review.

To compile, you will need a recent Haskell environment and cabal-install.

Setup

1. Clone repository

git clone --recursive git@github.com:hadolint/hadolint.git

2. Install dependencies and compile source

cabal configure
cabal build

3. (Optional) Install Hadolint on your system

cabal install

The easiest way to try out the parser is using the REPL.

```
# start the repl
cabal repl
# overload strings to be able to use Text
:set -XOverloadedStrings
# import parser library
import Language.Docker
# parse instruction and look at AST representation
parseText "FROM debian:jessie"
```

Tests

Compile with unit tests and run them:

```
cabal configure --enable-tests
cabal build --enable-tests
cabal test
```

Run integration tests:

```
./integration_test.sh
```

AST

Dockerfile syntax is fully described in the <u>Dockerfile reference</u>. Just take a look at <u>Syntax.hs</u> in the <u>language-docker</u> project to see the AST definition.

Building against custom libraries

Hadolint uses many libraries to do the dirty work. In particular, language-docker is used to parse Dockerfiles and produce an AST which then can be analyzed. To build Hadolint against a custom version of such libraries, do the following. This example uses language-docker, but it would work with any other library as well.

