

# TOML

**TOML** is a file format for configuration files. It is intended to be easy to read and write due to obvious semantics which aim to be "minimal", and is designed to map unambiguously to a dictionary. Its specification is open-source, and receives community contributions. TOML is used in a number of software projects,<sup>[2][3]</sup> and is implemented in many programming languages.<sup>[2]</sup> The name "TOML" is an acronym for "Tom's Obvious, Minimal Language"<sup>[4]</sup> referring to its creator, Tom Preston-Werner.

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## TOML

<b><u>Filename extension</u></b>	.toml
<b><u>Internet media type</u></b>	<i>Not registered</i> <sup>[1]</sup>
<b><u>Developed by</u></b>	<u>Tom Preston-Werner</u> Community
<b><u>Initial release</u></b>	23 February 2013
<b><u>Latest release</u></b>	v1.0.0 (January 11, 2021)
<b><u>Type of format</u></b>	Data interchange
<b><u>Open format?</u></b>	Yes
<b><u>Website</u></b>	<u>toml.io</u> ( <u>https://toml.io/</u> ) 

## Syntax

TOML's syntax primarily consists of `key = "value"` pairs, `[section names]`, and `# comments`. TOML's syntax somewhat resembles that of .INI files, but it includes a formal specification, whereas the INI file format suffers from many competing variants.

Its specification includes a list of supported data types: String, Integer, Float, Boolean, Datetime, Array, and Table.

## Example

```
# This is a TOML document.

title = "TOML Example"

[owner]
name = "Tom Preston-Werner"
dob = 1979-05-27T07:32:00-08:00 # First class dates

[database]
server = "192.168.1.1"
ports = [ 8000, 8001, 8002 ]
connection_max = 5000
enabled = true

[servers]

# Indentation (tabs and/or spaces) is allowed but not required
```

```

[servers.alpha]
ip = "10.0.0.1"
dc = "eqdc10"

[servers.beta]
ip = "10.0.0.2"
dc = "eqdc10"

[clients]
data = [ ["gamma", "delta"], [1, 2] ]

# Line breaks are OK when inside arrays
hosts = [
    "alpha",
    "omega"
]

```

## Comparison to other formats

The following table draws on the [TOML specification](https://github.com/toml-lang/toml#user-content-spec) (<https://github.com/toml-lang/toml#user-content-spec>) to make a comparison to other popular configuration formats (INI, JSON, and YAML). See also [BespON](#) as introduced at [SciPy 2017](#), as well as a discussion of using TOML for parametrization of simulation modeling.<sup>[5]</sup>

Format comparison

Format	Formal standard	Flexible standard	Strongly typed	Easy implementation	Human-readable	Allows comments
<a href="#">JSON</a>	Yes	No	Yes	Yes	Yes	No
<a href="#">YAML</a>	Yes	No	Yes	No <sup>[6]</sup>	Yes	Yes
TOML	Yes	No	Yes	Yes	Yes	Yes
<a href="#">INI</a>	No	Yes	No	Yes	Yes	Yes

## Criticism

Since its first release TOML has received several critiques. The [StrictYAML](https://hitchdev.com/strictyaml/) (<https://hitchdev.com/strictyaml/>) project lists the following points as problematic in TOML:<sup>[7]</sup>

- TOML is verbose, it is not DRY and it is syntactically noisy
- TOML's hierarchies are difficult to infer from syntax alone
- Overcomplication: Like YAML, TOML has too many features
- In TOML the syntax determines the data types ("syntax typing")

The [libconfini](https://madmurphy.github.io/libconfini/) (<https://madmurphy.github.io/libconfini/>) project has since released a more extensive critique of TOML from the [INI](#) perspective,<sup>[8]</sup> listing the following points (among others) as problematic:

- TOML lets the configuration file decide about data types (syntax typing), when *de facto* it is the client application that decides, and any mismatching type will be anyway either ignored or converted to the expected type (depending on the parser)
- TOML re-introduces what human-friendly languages normally try to get rid of: a verbose syntax and the necessity of using quotes for strings
- TOML syntax is always case-sensitive, despite the fact that there are situations where configuration files *must* be case-insensitive (as, for instance, configuration files that map a FAT32 filesystem or HTML tags)

- TOML uses square brackets for arrays, although square brackets are already reserved for table names; furthermore any special syntax for arrays brings the language back to syntax typing
- A TOML table must be populated in a single step, so merging multiple TOML files is problematic
- TOML arbitrarily introduces a syntax for dates
- TOML allows (but discourages) the empty string as a key
- TOML's rules cannot be inferred from the content, therefore editing a TOML file requires prior knowledge of the language
- TOML is backward-incompatible with INI

## See also

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- [INI File](#)
- [JSON](#)
- [Recfiles](#)
- [YAML](#)


## References

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1. There is a mime type proposal for TOML consisting in `application/toml`, but this has never been officially registered among [IANA's Media Types](https://www.iana.org/assignments/media-types/media-types.xhtml) (<https://www.iana.org/assignments/media-types/media-types.xhtml>).
2. ["toml-lang/toml"](https://github.com/toml-lang/toml) (<https://github.com/toml-lang/toml>). *GitHub*.
3. ["The Manifest Format - The Cargo Book"](https://doc.rust-lang.org/cargo/reference/manifest.html) (<https://doc.rust-lang.org/cargo/reference/manifest.html>). *doc.rust-lang.org*.
4. ["toml-lang/toml"](https://github.com/toml-lang/toml) (<https://github.com/toml-lang/toml>). January 15, 2021 – via GitHub.
5. ["toml-intro.rst"](https://subversion.american.edu/aisaac/notes/toml-intro.html) (<https://subversion.american.edu/aisaac/notes/toml-intro.html>). *subversion.american.edu*.
6. ["YAML spec is also super complicated and writing parser for it is non-trivial \(fo... | Hacker News"](https://news.ycombinator.com/item?id=7938180) (<https://news.ycombinator.com/item?id=7938180>). *news.ycombinator.com*.
7. [What is wrong with TOML?](https://hitchdev.com/strictyaml/why-not/toml/) (<https://hitchdev.com/strictyaml/why-not/toml/>)
8. [An INI critique of TOML](https://github.com/madmurphy/libconfini/wiki/An-INI-critique-of-TOML) (<https://github.com/madmurphy/libconfini/wiki/An-INI-critique-of-TOML>)

## External links

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- [Official website](https://toml.io/) (<https://toml.io/>) 
- [toml](https://github.com/toml-lang/toml) (<https://github.com/toml-lang/toml>) on [GitHub](#)

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