
Guidedog-Handbuch

Handbuch und vollständige Odin-API-Referenz

01 / QUELLE

Mit Bedeutung schreiben.

02 / STRUKTUR

Beziehungen klären.

03 / VERÖFFENTLICHUNG

Auf Bildschirm und Papier lesen.

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Einmal schreiben. Klar erklären. Im Web und auf Papier veröffentlichen.

Guidedog erzeugt HTML-Websites und PDF-Bücher aus reStructuredText- und Markdown-Quellen. Eine Python-Umgebung oder externe LaTeX-Installation ist nicht nötig. Die Konvertierungseengine heißt **Guidedoc**. Typst setzt die PDF-Seiten; Guidedog erzeugt die Website direkt.

Ein kleines Projekt braucht ein Quelldokument, ein Inhaltsverzeichnis und `conf.toml`. Beginnen Sie mit [Das erste Projekt](#). Für konkrete Aufgaben dient [Praktische Aufgaben](#), für genaue Verträge [Referenz](#).

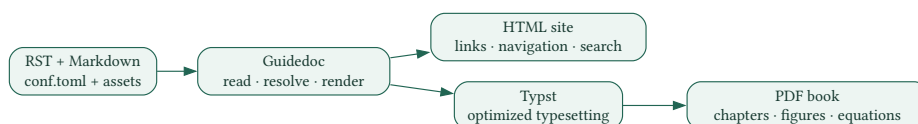


Abb. 1 Ein Quellprojekt, zwei Veröffentlichungen.

Tutorials

Folgen Sie diesen Seiten der Reihe nach. Jeder Schritt liefert ein prüfbares Ergebnis.

Das erste Projekt

Das Ziel ist klein: eine Seite im Browser und dieselbe Seite als PDF. Sie brauchen Guidedog. Für PDF dienen der eingebettete Compiler oder Typst ab 0.15.1. Siehe [Guidedog bauen und installieren](#).

Installieren Sie unter macOS das Release mit `brew install insanai/guidedog/guidedog`. Dabei wird der offizielle Tap hinzugefügt; der PDF-Compiler ist enthalten.

Das Projekt erstellen

Führen Sie dies in einem Verzeichnis aus, in dem `notes` noch nicht existiert:

```
guidedog quickstart notes -q -p "Field Notes" -a "Your name" -v 1.0
```

Guidedog schreibt Konfiguration, erstes RST-Dokument und editierbare Vorlagen. Es erstellt außerdem Ordner für Bilder, Audio und Video. Ein bestehendes Projekt wird nicht überschrieben.

```
notes/  
  conf.toml  
  index.rst  
  _templates/  
    layout.html  
    book.typ  
  _static/  
    guidedog.css  
    guidedog.js  
  assets/  
    images/  
    audio/  
    video/  
  _build/
```

RST-Dateien enthalten den Inhalt, Vorlagen die Darstellung. `quickstart` legt `_templates/layout.html` und `_templates/book.typ` direkt im Projekt an, nicht in externen Themen oder Paket-Caches. Beide sind jederzeit einsehbar und bearbeitbar.

Die erste Seite schreiben

Ersetzen Sie `notes/index.rst` durch:

```
Field Notes
=====

A useful explanation begins with a small example.

Measuring a square
-----

If the side has length :math:`s`, its area is :math:`s^2`.

.. math::

    A = s^2

.. note::

    State the units before comparing measurements.
```

Bauen und prüfen

```
guidedog build html notes -W
guidedog build pdf notes -W
```

Öffnen Sie `notes/_build/html/index.html` und das PDF in `notes/_build/pdf`. `-W` lässt den Build bei Warnungen fehlschlagen; behalten Sie es in Ihren Prüfungen. HTML enthält Navigation und Text, PDF ergänzt die Buchgestaltung. Formeln werden für jedes Ziel gesetzt. Die Einrichtung erklärt [Mathematik und Beweise](#).

Eine Änderung vornehmen

```
guidedog serve notes
```

Öffnen Sie die ausgegebene Adresse, bearbeiten und speichern Sie die Quelle und laden Sie den Browser neu. Vor der HTML-Auslieferung prüft Guidedog die Änderungszeiten und baut bei neueren Quellen erneut. Es löst keinen Browser-Reload aus. Strg+C beendet den Server.

Bauen Sie erneut, ohne etwas zu ändern. Unveränderte Dokumente werden wiederverwendet. Für den Nachweis aktueller Ausgabe muss nicht jede Seite neu gelesen werden. Weiter geht es mit [Ein kleines Buch erstellen](#).

Ein kleines Buch erstellen

Eine Site ist ein Dokumentgraph. Ein Buch braucht eine Lesereihenfolge. Ein `toctree` liefert beides.

Ein Kapitel hinzufügen

Erstellen Sie `notes/measurement.rst`:

```
Measurement
=====

A measurement has a value and a unit.
Write both. A bare number leaves the reader guessing.

.. _measurement-units:
```



```
Units
-----

Keep one unit within a comparison.
```

Ersetzen Sie den Inhalt von `notes/index.rst` durch:

```
Field Notes
=====

These notes explain how to make a comparison that another person can check.

.. toctree::
   :maxdepth: 2
   :numbered:

   measurement

Begin with :doc:`measurement`.
For the unit rule, see :ref:`measurement-units`.
```

Der Dokumentname lässt `.rst` weg. Ein Label benennt eine Idee im Dokument. Für Kapitel verwenden Sie Dokumentlinks, für einzelne Argumente Labels.

Ein Diagramm hinzufügen

Fügen Sie dies in `measurement.rst` ein:

```
.. graphviz::
   :caption: A comparison needs a common unit.
   :alt: Values are converted to one unit before they are compared.

   digraph comparison {
       rankdir=LR;
       "values" -> "common unit" -> "comparison";
   }
```

Guidedog verwendet die eingebundene Graphviz-Bibliothek. HTML erhält SVG, PDF ein Bild. Ein Diagramminterpretier im Browser ist unnötig. Die Bildunterschrift erklärt die Folgerung, der Alternativtext die Zeichnung.

Das Buch bauen

```
guidedog build html notes -W
guidedog build pdf notes -W
```

Das Kapitel erscheint in der Seitenleiste und im Inhaltsverzeichnis des Buchs. Folgen Sie dem Abschnittslink im Browser und prüfen Sie sein Ziel im PDF.

Als Nächstes hilft **Dokumente verfassen**. Halten Sie Kapitel so kurz, dass sie ein Thema erklären.

Themenleitfäden

Diese Kapitel erklären das Modell und geben genügend Hintergrund für eine Entscheidung.

Dokumente verfassen

Guidedog unterstützt reStructuredText (`.rst`) und MyST Markdown (`.md`). Beide werden in einen gemeinsamen semantischen Dokumentbaum eingelesen, aus dem HTML und PDF entstehen.

Das Quellformat wählen

Verwenden Sie reStructuredText für Domänen, komplexe Tabellen und erweiterbare Direktiven. MyST Markdown verbindet Markdown-Syntax mit Direktiven und Rollen nach Sphinx-Art.

Im Projekt wird Markdown als MyST gelesen. `guidedog convert` verwendet standardmäßig CommonMark, sofern MyST nicht ausdrücklich gewählt wird.

Überschriften und Struktur

Der Dokumenttitel bezeichnet die Seite; Abschnitte gliedern den Text. RST-Überschriften erhalten eine Unterstreichung, optional auch dieselbe Linie darüber. Die Linie darf nicht kürzer als der Titel sein.

Empfohlene Überschriftszeichen:

```
Document Title
=====

Section Heading
-----

Subsection
~~~~~

Sub-subsection
^^^^^^^^^^^^

Paragraph Heading
^^^^^^^^^^^^^^^^^^^^^^^^
```

Halten Sie Überschriftsebenen im Projekt einheitlich. MyST Markdown verwendet `#`, `##` und `###`.

Textformatierung und Inline-Markup

Inline-Markup soll Bedeutung vermitteln, nicht bloß verzieren:

Tabelle 1 Inline-Markup

Stil	reStructuredText	MyST Markdown
Fettdruck	<code>**strong text**</code>	<code>**strong text**</code>
<i>Betonung / Kursiv</i>	<i><code>*emphasized text*</code></i>	<i><code>*emphasized text*</code></i>
Inline-Code	<code><code>``inline code``</code></code>	<code><code>`inline code`</code></code>
Tiefstellung	<code><code>:sub:`text`</code></code>	<code><code>{sub}`text`</code></code>
Hochstellung	<code><code>:sup:`text`</code></code>	<code><code>{sup}`text`</code></code>

Literale Sternchen und Backticks werden mit einem Rückstrich maskiert:

`\*not italic\*`.

Listen

Guidedog unterstützt vier Listenarten:

Aufzählungslisten

```
* First item
* Second item with multiple lines
  of continuing explanation.
* Third item
```

Nummerierte Listen

```
1. Numbered item
2. Second item
#. Automatically numbered item
#. Next auto-numbered item
```

Definitionslisten

Eine Definitionsliste verbindet Begriffe mit Erklärungen. Der Begriff steht auf einer Zeile, die eingerückte Definition folgt direkt:

```
Workspace
  A bounded memory buffer supplied by the caller for document conversion.

Session
  A host-level coordinator that manages memory budgets and document caches.
```

Feldlisten

Feldlisten enthalten strukturierte Metadaten und Parameterbeschreibungen:

```
:Authors: Jane Doe, John Smith
:Version: 1.2
:Status: Active
```

Codeblöcke

`code-block` oder `sourcecode` zeigt Code mit Syntaxhervorhebung. Guidedog unterstützt über 35 Programmiersprachen:

```
.. code-block:: python
```

```

:linenos:
:caption: Server entry point
:emphasize-lines: 2, 4-5

def main():
    app = create_app()
    app.run(host="0.0.0.0", port=8080)

```

Codeblockoptionen:

- `:linenos:` Zeigt Zeilennummern neben dem Code.
- `:caption:` Title: Fügt eine Beschriftung über oder unter dem Codeblock ein.
- `:emphasize-lines:` 1, 3-5: Hebt die angegebenen Zeilen hervor.
- `:name:` label: Weist dem Codeblock ein Verweisziel zu.

Mit `literalinclude` binden Sie externe Quelldateien direkt ein:

```

.. literalinclude:: ../src/server.py
:language: python
:lines: 1-25
:linenos:

```

Hinweisblöcke

Hinweisblöcke heben Anmerkungen, Warnungen und zusätzliche Ratschläge hervor:

```

.. note::
    Helpful background context or implementation detail.

.. tip::
    Suggested best practices or workflow shortcuts.

.. important::
    Essential requirements that must not be overlooked.

.. warning::
    Conditions that could lead to unexpected behavior or lost work.

.. caution::
    Potential pitfalls or sensitive operational steps.

.. seealso::
    References to related chapters, specifications, or external guides.

```

Guidedog unterstützt auch `danger`, `error`, `hint` und `attention`. Für einen eigenen Titel verwenden Sie `admonition`:

```

.. admonition:: Design Rationale

    Explains why a particular architecture was chosen.

```

Tabellen

Guidedog unterstützt einfache Tabellen, Gittertabellen und direktivenbasierte Tabellen.

Einfache Tabellen

Einfache Tabellen begrenzen Spalten durch waagerechte Linien:

```

=====
A      B      A and B
=====
False  False  False

```

```

True   False  False
True   True   True
=====

```

Gittertabellen

Gittertabellen erlauben mehrzeilige Zellen und verbundene Zeilen oder Spalten:

```

+-----+-----+-----+
| Header row, column 1 | Column 2 | Column 3 |
+-----+-----+-----+
| Cell with multiple   | Second   | Third     |
| paragraphs of text.  | column   | column    |
+-----+-----+-----+

```

Listentabellen

`list-table` erzeugt Tabellen aus verschachtelten Listen. Breite Tabellen bleiben dadurch im Quelltext gut lesbar und wartbar:

```

.. list-table:: Project configurations
   :widths: 25 25 50
   :header-rows: 1

   * - Target
     - Builder
     - Description
   * - Website
     - ``html``
     - Static HTML documentation site
   * - Book
     - ``pdf``
     - Typeset PDF book powered by Typst

```

CSV-Tabellen

`csv-table` erzeugt eine Tabelle aus kommaseparierten Werten:

```

.. csv-table:: Comparative metrics
   :header: "Name", "Time (ms)", "Memory (MB)"
   :widths: 40, 30, 30

   "Cold build", 42, 12
   "Incremental", 3, 4

```

Bilder und Abbildungen

Mit `image` und `figure` fügen Sie Bilder, Screenshots und Diagramme ein:

```

.. image:: /assets/architecture.png
   :width: 600px
   :align: center
   :alt: System architecture diagram

.. figure:: /assets/flow.png
   :scale: 80%
   :align: center
   :alt: Execution flowchart

   Data flows sequentially through reader, resolver, and renderer.

```

`figure` ergänzt das Bild um eine Beschriftung und ein optionales Verweisziel.

Dokumentstruktur mit Inhaltsbäumen

`toctree` definiert Hierarchie, Navigation und Lesereihenfolge für HTML und PDF:

```
.. toctree::
  :maxdepth: 2
  :caption: User Guide
  :numbered:

  installation
  quickstart
  configuration
```

Häufige Optionen von `toctree`:

- `:maxdepth: N`: Gliederungstiefe im Inhaltsverzeichnis.
- `:caption: Title`: Gruppentitel über den Navigationseinträgen.
- `:numbered::` Nummeriert Kapitel und Überschriften.
- `:titlesonly::` Zeigt nur Dokumenttitel, keine inneren Abschnitte.
- `:hidden::` Erfasst die Lesereihenfolge, ohne eine Liste im Text auszugeben.
- `:glob::` Erlaubt Dokumentmuster wie `tutorials/*`.

Querverweise und Links

Explizite Zielmarken halten Verweise unabhängig vom Dateinamen stabil.

Zielmarken und `:ref:`

Setzen Sie die Zielmarke direkt vor eine Überschrift, Tabelle oder Abbildung:

```
.. _storage-model:

Storage model
-----

Caller storage is bounded and measured upfront.
```

Jedes Projektdokument kann auf dieses Ziel verweisen:

```
See :ref:`storage-model` for details.
See :ref:`custom link text <storage-model>`.
```

Dokumentverweise mit `:doc:`

Verweisen Sie über den Pfad ohne Dateiendung auf ein anderes Dokument:

```
Read the :doc:`configuration guide <../reference/configuration>` for details.
```

Glossarbegriffe mit `:term:`

Definieren Sie Begriffe mit `glossary`:

```
.. glossary::

  Workspace
    A fixed memory arena allocated by the caller for conversion passes.

  Pass
    An in-memory transformation step operating on the document AST.
```

Verweisen Sie mit der Rolle `:term:` auf einen Begriff:

```
Conversion runs within an allocated :term:`workspace`.
```

Dateidownloads mit `:download:`

Kopiert die Datei in den Downloadordner und erzeugt einen Link:

Download the `:download:`starter template <files/starter.toml>``.

Externe Links

Verweisen Sie auf externe Webadressen:

Visit ``Typst <https://typst.app>`_` for typography details.

Ersetzungen und Einbindungen

Definieren Sie wiederverwendbare Texte, Symbole oder Bilder:

```
.. |version| replace:: 1.0.0
.. |brand| replace:: **Field Notes**

Welcome to |brand|. version |version|.
```

So verwenden Sie reStructuredText-Inhalt in mehreren Dateien:

```
.. include:: ../shared/warnings.rst
```

MyST Markdown verfassen

MyST Markdown verwendet umzäunte Blöcke für dieselben semantischen Direktiven und Rollen:

```
# Project overview

Here is a paragraph with bold text, italic emphasis, and `inline code`.

```{note}
This note is rendered identically to a reStructuredText note directive.
```

```{code-block} python
:caption: Example function
:linenos:

def add(a, b):
 return a + b
```

```{toctree}
:maxdepth: 2
:caption: Navigation

first-chapter
second-chapter
```

See {ref}`storage-model` or consult the {doc}`../reference/configuration`.
```

Domänen

Eine Domäne bündelt Direktiven und Rollen zum Beschreiben und Verknüpfen von Objekten einer Sprache oder eines Fachgebiets.

Guidedog bietet native Implementierungen dieser Sphinx-Domänen:

- **Standarddomäne** (`std`): Kommandozeilenoptionen, Umgebungsvariablen, Begriffe und UI-Beschriftungen.
- **Python-Domäne** (`py`): Module, Klassen, Funktionen, Methoden, Attribute, Properties und Ausnahmen.

- **C-Domäne** (`c`): Funktionen, Typen, Strukturen, Unions, Aufzählungen, Aufzählungswerte, Variablen und Makros.
- **C++-Domäne** (`cpp`): Klassen, Konzepte, Templates, Namensräume, Methoden und Ausdrücke.
- **JavaScript-Domäne** (`js`): Funktionen, Methoden, Klassen und Eigenschaften.
- **Odin-Domäne** (`odin`): Odin-Pakete, Prozeduren, Strukturen, Unions und Aufzählungen; siehe [Odin dokumentieren](#).

Primärdomäne festlegen

`primary_domain` in `conf.toml` legt die Standarddomäne fest; Vorgabe ist `"py"`. Danach kann das Präfix entfallen: `.. function::` statt `.. py:function::` und `:func:`name`` statt `:py:func:`name``.

So wechseln Sie die Domäne lokal im Dokument:

```
.. default-domain:: c
```

Standarddomäne

Die Standarddomäne beschreibt Kommandozeilenwerkzeuge, Umgebungsvariablen und Dokumentverweise.

Direktiven

```
.. program:: mytool

.. option:: -c <config>, --config <config>
    Path to the configuration file.

.. envvar:: GUIDEDOG_THEME
    Specifies the default theme stylesheet.
```

Rollen

- `:doc:`path``: Verweist über einen relativen Pfad auf ein Projektdokument.
- `:ref:`label``: Verweist auf eine explizite Zielmarke `.. _label:`.
- `:term:`term``: Verweist auf einen in `glossary` definierten Begriff.
- `:option:`--config``: Verweist auf eine mit `option` beschriebene Kommandozeilenoption.
- `:envvar:`VARIABLE``: Verweist auf eine mit `envvar` beschriebene Umgebungsvariable.
- `:command:`name``: Kennzeichnet einen Systembefehlsnamen.
- `:file:`path``: Kennzeichnet Datei- und Ordnerpfade mit möglichen `{variable}`-Platzhaltern.
- `:kbd:`Ctrl+C``: Kennzeichnet Tasteneingaben.
- `:menuselection:`File --> Save As``: Formatiert eine Menüfolge.
- `:guilabel:`Submit``: Formatiert ein Bedienelement oder einen Button.
- `:pep:`8``: Verweist auf einen Python Enhancement Proposal.
- `:rfc:`7231``: Verweist auf einen RFC der IETF.

Python-Domäne

Die Python-Domäne beschreibt Python-Schnittstellen und Signaturen.

Direktiven

```
.. py:module:: pipeline.reader
   :synopsis: Document reading and normalization.

.. py:class:: DocumentReader(source_path: str, encoding: str = "utf-8")

   Base class for document readers.

.. py:method:: parse(content: bytes) -> Document

   Parses raw bytes into a document tree.

   :param content: Raw source content bytes.
   :return: Parsed document tree instance.
   :raises ValueError: If the source format is unrecognized.

.. py:attribute:: encoding
   :type: str

   The character encoding used for text decoding.
```

Direktiven sind `py:module`, `py:currentmodule`, `py:function`, `py:data`, `py:class`, `py:method`, `py:staticmethod`, `py:classmethod`, `py:attribute`, `py:property`, `py:exception`, `py:decorator` und `py:type`.

Rollen

- `:py:func:`name``: Verweist auf eine Python-Funktion.
- `:py:class:`name``: Verweist auf eine Python-Klasse.
- `:py:meth:`name``: Verweist auf eine Python-Klassen- oder Instanzmethode.
- `:py:attr:`name``: Verweist auf ein Python-Attribut.
- `:py:data:`name``: Verweist auf Python-Daten auf Modulebene.
- `:py:exc:`name``: Verweist auf eine Python-Ausnahmeklasse.
- `:py:mod:`name``: Verweist auf ein Python-Modul.

C-Domäne

Die C-Domäne beschreibt C-Bibliotheken und Header.

Direktiven

```
.. c:namespace:: gd

.. c:struct:: Workspace

   A contiguous memory buffer for in-memory document parsing.

.. c:member:: size_t capacity

   Total byte size of the storage slab.

.. c:function:: int gd_convert(Workspace *ws, const char *input, char *output,
   size_t out_len)

   Converts source text into HTML.

   :param ws: Pointer to the initialized workspace.
   :param input: Null-terminated input string.
   :param output: Destination buffer.
   :param out_len: Size of destination buffer.
   :returns: 0 on success, or an error code.
```

Rollen

- `:c:func:`name``: Verweist auf eine C-Funktion.
- `:c:member:`name``: Verweist auf ein C-Struktur- oder Unionmitglied.
- `:c:data:`name`` / `:c:var:`name``: Verweist auf eine C-Variable.
- `:c:type:`name``: Verweist auf einen C-Typedef oder Typ.
- `:c:struct:`name``: Verweist auf eine C-Struktur.
- `:c:union:`name``: Verweist auf eine C-Union.
- `:c:enum:`name``: Verweist auf eine C-Aufzählung.
- `:c:macro:`name``: Verweist auf ein C-Präprozessormakro.

C++-Domäne

Die C++-Domäne unterstützt moderne Konstrukte, Konzepte, Namensräume und Gültigkeitsbereiche.

Direktiven

```
.. cpp:namespace:: guidedog

.. cpp:concept:: template<typename T> Reader
    Specifies requirements for document reader types.

.. cpp:class:: template<typename Allocator> Builder
    Constructs AST document nodes.

.. cpp:function:: NodeId add_text(std::string_view text)
    Appends text to the active node.
```

Rollen

- `:cpp:class:`name``: Verweist auf eine C++-Klasse oder Struktur.
- `:cpp:func:`name``: Verweist auf eine C++-Funktion oder Methode.
- `:cpp:member:`name`` / `:cpp:var:`name``: Verweist auf ein Mitglied oder eine Variable.
- `:cpp:type:`name``: Verweist auf einen C++-Typalias oder Typedef.
- `:cpp:concept:`name``: Verweist auf ein C++20-Konzept.
- `:cpp:enum:`name``: Verweist auf eine C++-Aufzählung.

JavaScript-Domäne

Die JavaScript-Domäne beschreibt Browserskripte, Bibliotheken und Node.js-Module.

Direktiven

```
.. js:module:: theme

.. js:class:: ThemeController(options)
    Manages color themes and local storage persistence.

.. js:method:: toggleTheme()
    Toggles between light and dark modes.
```

Rollen

- `:js:func:`name``: Verweist auf eine JavaScript-Funktion.
- `:js:meth:`name``: Verweist auf eine JavaScript-Methode.
- `:js:class:`name``: Verweist auf eine JavaScript-Klasse.
- `:js:data:`name``: Verweist auf eine JavaScript-Variable.
- `:js:attr:`name``: Verweist auf eine JavaScript-Objekteigenschaft.
- `:js:mod:`name``: Verweist auf ein JavaScript-Modul.

Konventionen für Querverweise

Domänenverweise unterstützen folgende Modifikatoren:

- **Präfix ausblenden:** `~` vor dem Ziel zeigt nur den letzten Namensteil.
`:py:func:`~pipeline.reader.DocumentReader.parse`` erscheint als `parse()`.
- **Aktueller Gültigkeitsbereich:** Relative Verweise suchen zuerst im aktiven Modul oder Namensraum, danach global.
- **Exakte Übereinstimmung:** Ein vorangestelltes `.` sucht vom aktuellen Modul oder umschließenden Objekt aus.

Wie ein Projekt funktioniert

Die Projektwurzel enthält `conf.toml`. `root_doc` beginnt die Lesereihenfolge. Guidedog findet und liest Quelldokumente, löst ihre Beziehungen auf und veröffentlicht eine vollständige Generation.

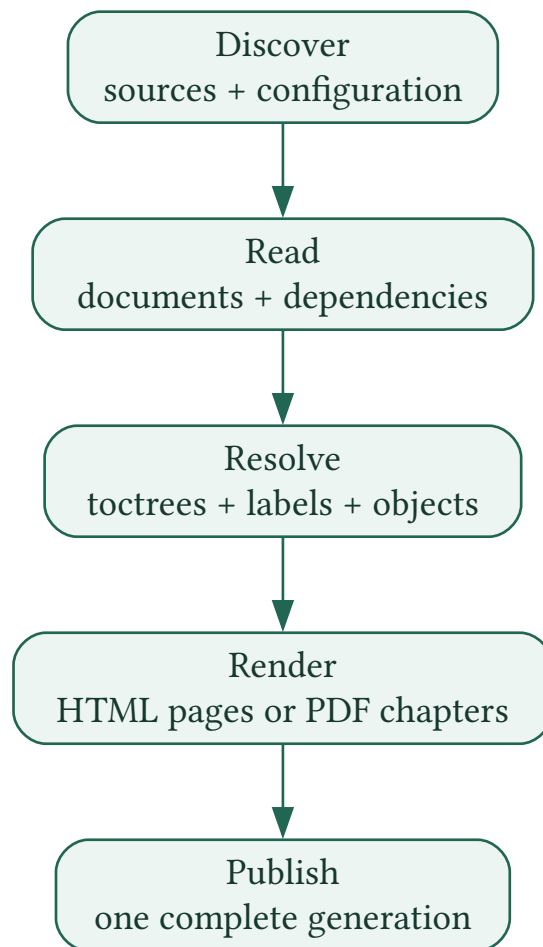


Abb. 2 Der Build trennt Ermittlung, Semantik, Darstellung und Veröffentlichung.

Dokumente und Ressourcen

Die Endung wählt den Reader. RST und Projekt-Markdown teilen den Graphen. Bilder und Downloads sind Ressourcen; verwendete werden kopiert. Theme-Dateien stehen in `html_static_path`. Includes müssen im Quellverzeichnis oder in `include_roots` bleiben.

Getrennte Projekte

Trennen Sie Handbuch und Designaufzeichnungen: Leser und Lesereihenfolge unterscheiden sich. Jedes Projekt hat eigene Konfiguration, Vorlagen, Cache und Ausgabe. Guidedog nutzt dafür `docs/manual` und `docs/gds`.

Inkrementelle Builds

Guidedog erfasst Eingaben und Abfragen je Ausgabe. Geänderte Quellen werden neu gelesen, geänderte Abhängigkeiten invalidieren ihre Nutzer. Vorlagenänderungen können alle Seiten betreffen. Unveränderte Dokumente lassen sich aus gespeicherten Objekten laden.

Der Cache ist ein Nachweis des früheren Builds, nicht die maßgebliche Quelle. `-E` verwirft die gespeicherte Umgebung für den nächsten Build. `-a` schreibt alle Ausgaben. Sie lösen unterschiedliche Probleme.

Wiederverwendung = gleiche Eingaben $\wedge$ gleiche Nachschlageergebnisse $\wedge$ Ausgabe vorhanden

Ein expliziter Vorlagenzeitstempel ist ebenfalls Eingabe. Eine Seite mit aktueller Minute kann sich trotz unveränderter Prosa ändern. Nutzen Sie `SOURCE_DATE_EPOCH` für eine feste Build-Zeit.

Veröffentlichung

Änderungen gehen in ein benachbartes Staging-Verzeichnis. Nach Fertigstellung und Flush von Dateien und Aufzeichnungen werden Generationen gewechselt. Leser sehen die vollständige alte oder neue Ausgabe. Unterbrochene Commits klärt der nächste Build. Design und Beweispflichten stehen in [Eine vollständige Generation veröffentlichen](#).

Mathematik und Beweise

Eine Gleichung ist nützlich, wenn sie eine Beziehung leichter prüfbar macht. Definieren Sie Symbole vor ihrer Nutzung und nennen Sie nötige Einheiten. Sie soll die Erklärung stützen, nicht ersetzen.

Inline- und abgesetzte Formeln

Nutzen Sie die Rolle `math` für kurze Ausdrücke und die Direktive `math` für abgesetzte Formeln. Schreiben Sie die gemeinsame LaTeX-Mathematikteilmenge beider Ziele.

```
A side of length :math:`s` encloses area :math:`s^2`.

.. math::
   :label: area-square

   A = s^2

The relation is :eq:`area-square`.
```

Ein Quadrat mit Seitenlänge s hat die Fläche s^2 .

$$A = s^2 \tag{1}$$

Die Beziehung steht in (1). Beschriftete Gleichungen bekommen stabile Ziele. HTML liefert MathJax-Markup; PDF übersetzt unterstütztes LaTeX in Typst-Mathematik. Nicht unterstützte PDF-Befehle werden gemeldet. Beliebige LaTeX-Pakete werden nicht ausgeführt.

Ein kleiner Beweis

U seien belastete Bytes, B das Limit und n die angefragte Allokation. Alle Werte seien nicht negativ und $U \leq B$.

Zulassungsregel. Die Anfrage wird genau dann zugelassen, wenn

$$n \leq B - U. \tag{2}$$

Behauptung. Eine zugelassene Anfrage erhält $U + n \leq B$.

Beweis. Addieren von U auf beiden Seiten von (2) ergibt $U + n \leq B$. Die Implementierung prüft die Subtraktionsform, statt zuerst das potenziell überlaufende $U + n$ zu berechnen. Beweis und Rechenfolge stimmen überein.

Grenze. Dies erfasst belasteten Hostspeicher, nicht die internen Allokationen des separaten Typst-Compilers. Ein Beweis gilt nur innerhalb seiner angegebenen Grenze.

HTML-Konfiguration

Diese Projekte enthalten MathJax 3.2.2 samt SVG-Schriftdateien und laden es nur auf Mathematikseiten. Nach dem Build sind sie offline lesbar. Diagrammskripte oder Webschriftendienste sind nicht erforderlich.

Eigene Projekte laden MathJax standardmäßig von einem CDN. Für eine lokale Kopie legen Sie es in `_static` ab und setzen:

```
html_static_path = ["_static"]
mathjax_path = "_static/tex-svg-full.js"
```

Webformeln brauchen JavaScript zum Satz; ohne es bleibt der Quelltext sichtbar. PDF-Formeln brauchen kein Browser-JavaScript. Siehe den [MathJax-Komponentenvertrag](#).

Diagramme zur Erklärung

Wählen Sie ein Diagramm passend zur Frage. Ablaufdiagramme erklären Entscheidungen, Blockdiagramme Zuständigkeiten, Sequenzen Reihenfolgen und Graphen Beziehungen. Nutzen Sie Prosa, wenn sie direkter antwortet.

Ein Flussdiagramm

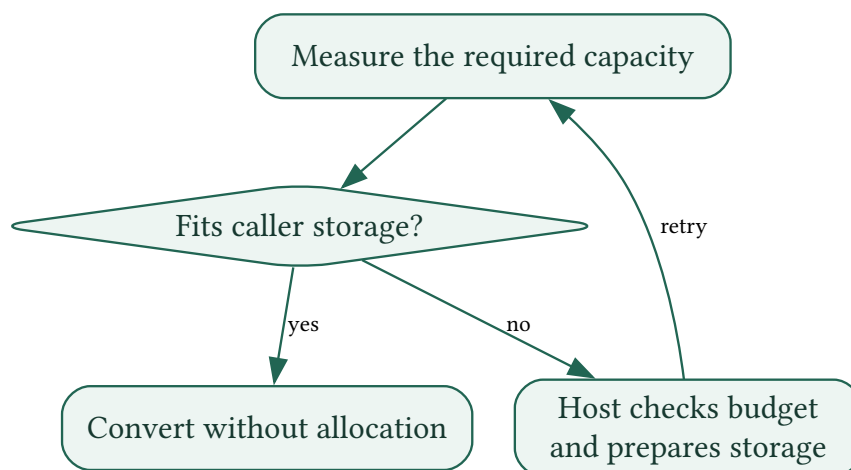


Abb. 3 Die Kapazität wird geprüft, bevor Speicher ausgeliehen oder vergrößert wird.

Die Zeichnung nennt beim Wachstumsschritt den Eigentümer. Sie deutet keine Allokation durch den Konvertierungskern an. Dieser Unterschied gehört zum Vertrag.

Einen Graphen erstellen

```
.. graphviz::
  :caption: Parsing precedes resolution.
  :alt: The source becomes a tree, then references are resolved.

  digraph pipeline {
    graph [rankdir=LR, bgcolor="transparent"];
    node [shape=box];
    "source" -> "tree" -> "resolved tree";
  }
```

graphviz, graph und digraph sind eingebaut. Guidedog rendert mit Graphviz. HTML erhält SVG, PDF die gerenderte Zeichnung. Beide nutzen denselben Graphquelltext.

Das Ergebnis lesbar gestalten

Halten Sie Knotenbeschriftungen kurz. Längere Regeln gehören unter die Zeichnung. Bevorzugen Sie eine Hauptrichtung und beschriften Sie Rückkanten mit Bedingungen. Nutzen Sie Form und Text neben Farbe; Druckleser haben womöglich keine Farbe.

Ergänzen Sie Alternativtext und Bildunterschrift. Prüfen Sie schmale Browserfenster und PDF-Seiten. Braucht das Diagramm winzige Schrift, teilen Sie es. Größen beschreibt [Bilder](#), [Video](#), [Audio](#) und [Downloads](#).

Typografie zum Lesen

Die Seitenstruktur soll vor dem gründlichen Lesen sichtbar sein. Ein kräftiger Titel, eine ruhige Navigation und eine angemessene Textspalte leisten das meiste. Farbe kennzeichnet Beziehungen oder Aktionen, trägt aber nie allein die Bedeutung.

Die Webseite

Das Layout hat Projektnavigation, Dokument und Seitenübersicht; kleine Bildschirme nutzen eine Navigationsschublade. Libertinus Serif und Sans sind enthalten. Titel nutzen fette Serifenschrift, Navigation, Labels und Bedienelemente die passende Sans. Komprimierte WOFF2-Dateien kommen von der Website, ohne Schriftendienstanfragen.

Hell ist der Standard. Es gibt auch Dunkel- und Systemmodus; die Wahl wird für dieselbe Browser-Origin gespeichert. System folgt dem Betriebssystem. Gedrucktes HTML nutzt helle Farben. Inhalt und Navigation funktionieren ohne JavaScript. Theme-Steuerung und erweiterte Suche sind progressive Ergänzungen.

Englische Prosa kann im Browser **Knuth–Plass–Zeilenumbruch** für den gesamten Absatz nutzen. Ein kleines Skript misst die geladene Schrift, erstellt Boxen, Abstände und Trennungsstrafen und wählt globale Umbrüche. Frank Liangs Musterverfahren liefert englische Trennstellen. Originale TeX-Muster und Bibliothekslizenzen sind enthalten.

Die Ergänzung erhält Hervorhebungen und Originaltext und berechnet bei Breitenänderungen neu. Kopieren innerhalb eines optimierten Absatzes liefert

den Quelltext ohne sichtbare Zeilenaufteilungen oder zusätzliche Trennstriche. Beim Drucken wird der normale Absatz für die Paginierung wiederhergestellt.

Links, Mathematik, Code, interaktive Inhalte, schmale Spalten und andere Sprachen nutzen Browserlayout. Das gilt auch ohne passende Abstandslösung. Die Website bleibt ohne JavaScript lesbar. Der Rückfall nutzt sprachabhängiges `hyphens: auto` und `text-wrap: pretty`; diese CSS-Regeln allein versprechen keine Knuth–Plass-Optimierung.

Die PDF-Seite

Das Buch nutzt wie das Web Libertinus mit Blocksatz, optimiertem Umbruch und sprachabhängiger Trennung. Es steuert auch Abstände, Kolumnentitel, Beschriftungen, Codeblöcke und Tabellenlinien. Schrift, Trennungskosten und Satzbreite wirken zusammen. Ein erzwungener Umbruch behebt lockeren Satz selten richtig.

Typst optimiert PDF-Absätze, die Webergänzung geeignete Prosa. Quelle, Schriften und visuelle Hierarchie sind gemeinsam; Umbrüche können abweichen. Siehe den [Typst-Textvertrag](#) und den [Browser-Trennungsvertrag](#).

Das Design ändern

Bearbeiten Sie `_static/editorial.css` für Gestaltungsvorgaben, `_templates/layout.html` für Struktur und `_templates/book.typ` für Drucksatz. Erhalten Sie Lesereihenfolge, Fokusmarkierungen, Labels und ausreichenden Kontrast.

Bauen Sie nach Änderungen beide Ziele und prüfen Sie Code, Tabellen, Diagramme und Formeln. Eine schöne Titelseite beweist nicht die Qualität des gesamten Buchs. Der Vorlagenvertrag steht in [Vorlagen](#), die ganze API in [API Reference](#) und im selben PDF.

Vorlagen

Eine Vorlage bestimmt die Darstellung, ohne den Quelltext zu duplizieren. Guidedog verwendet Jinja für HTML und Typst für PDF.

Guidedog-Vorlagen sind sichtbare, bearbeitbare Projektdateien. `guidedog quickstart` legt die tatsächlich verwendeten Vorlagen direkt im Projekt an:

- `_templates/layout.html` definiert die HTML-Struktur mit Jinja.
- `_templates/book.typ` definiert PDF-Layout, Typografie und Titelseite mit Typst.
- `_static/guidedog.css` und `_static/guidedog.js` liefern Standardstile und Browserfunktionen.

Vorlagen liegen im Projekt, nicht in externen Paketen oder Binärcaches. Nach dem Bearbeiten bauen Sie mit `guidedog build` neu und prüfen mit `guidedog serve`.

HTML-Vorlagen

Guidedog rendert `layout.html` mit der eingebauten Jinja-Engine. Das Layout kann in Teilvorlagen, Makrobibliotheken und mehrere Vererbungsstufen gegliedert werden.

Modulare Vorlagenstruktur

Vorlagen können beliebig auf Dateien und Unterordner in `templates_path` verteilt werden. Standard ist `["_templates"]`:

```
my-docs/
├── conf.toml
├── index.rst
└── templates/
    ├── layout.html
    ├── base.html
    ├── partials/
    │   ├── header.html
    │   ├── navigation.html
    │   ├── searchbox.html
    │   └── footer.html
    └── macros/
        └── components.html
```

Guidedog durchsucht Dateien und Unterordner in `templates_path`. Include- und Importpfade sind relativ zu diesen Ordnern:

Listing 1 `_templates/layout.html`

```
{% extends "base.html" %}

{% block header %}
    {% include "partials/header.html" %}
{% endblock %}

{% block footer %}
    {% include "partials/footer.html" %}
{% endblock %}
```

Jinja-Makros können in separaten Dateien definiert und bei Bedarf importiert werden:

Listing 2 `_templates/macros/components.html`

```
{% macro badge(label, type="info") %}
    <span class="badge badge-{{ type }}">{{ label }}</span>
{% endmacro %}
```

Listing 3 Makros in Vorlagen verwenden

```
{% import "macros/components.html" as ui %}
{{ ui.badge("New", type="success") }}
```

Themenvererbung mit `!layout.html`

Für Änderungen an einzelnen Themenbereichen genügt die Vererbung des eingebauten Layouts mit der Ausrufezeichensyntax von Sphinx:

Listing 4 _templates/layout.html

```
{# Inherit Guidedog's built-in layout #}
{% extends "!layout.html" %}

{# Inject custom metadata or web fonts into the document head #}
{% block extrahead %}
    {{ super() }}
    <link rel="stylesheet" href="{{ pathto('_static/custom.css', 1) }}">
{% endblock %}

{# Replace or extend the footer with custom content #}
{% block footer %}
    {% include "partials/footer.html" %}
{% endblock %}
```

`{% extends "!layout.html" %}` oder `{% extends "basic/layout.html" %}` lädt die Themenvorlage, statt die eigene `_templates/layout.html` rekursiv zu laden.

`{{ super() }}` gibt in einem überschriebenen Block den Elterninhalt aus. So lassen sich Ergänzungen davor oder danach einfügen.

Layoutblöcke

Das eingebaute `layout.html` definiert Blöcke nach den Sphinx-Konventionen:

| Block | Aufgabe |
|--------------------------|---|
| <code>doctype</code> | Dokumenttypdeklaration; Standard ist <code><!DOCTYPE html></code> . |
| <code>htmltitle</code> | Das <code><title></code> -Element in <code><head></code> . |
| <code>linktags</code> | Navigations- und Metalinks: <code>favicon</code> , <code>index</code> , <code>search</code> , <code>prev</code> und <code>next</code> . |
| <code>css</code> | Stylesheetlinks und eingebettete CSS-Wurzelvariablen. |
| <code>scripts</code> | JavaScript-Tags für Suche und interaktive Funktionen. |
| <code>extrahead</code> | Einfügapunkt am Ende von <code><head></code> für Schriften, Analyse und Metatags. |
| <code>header</code> | Kopfbereich direkt vor der Hauptnavigation. |
| <code>relbar1</code> | Obere Navigation mit Marke, Version, Suche und Themenwechsel. |
| <code>rootrellink</code> | Einfügapunkt vor verwandten Links. |
| <code>relbaritems</code> | Eigene Elemente in der Navigationsleiste. |
| <code>sidebar1</code> | Container der linken Navigationsleiste. |
| <code>sidebartoc</code> | Inhaltsbaum in <code>sidebar1</code> . |
| <code>breadcrumbs</code> | Hierarchischer Navigationspfad über dem Artikel. |
| <code>document</code> | Container um den Seiteninhalt. |
| <code>body</code> | Gerenderter HTML-Inhalt des Dokuments: <code>{{ body }}</code> . |
| <code>relbar2</code> | Untere Navigation zum vorherigen und nächsten Kapitel. |
| <code>footer</code> | Seitenfuß mit Urheberrecht, Aktualisierungszeitpunkt und Quelllinks. |
| <code>sidebar2</code> | Rechte Zusatzleiste mit der Seitengliederung. |

Vorlagen finden

Guidedog durchsucht `templates_path` aus `conf.toml` der Reihe nach, danach die eingebauten Vorlagen. Vorlagennamen sind relative Pfade; `..` darf nicht aus diesen Ordnern führen.

Alle Dateien und Unterordner in `templates_path` sind Buildabhängigkeiten. `guidedog build` und `guidedog serve` erkennen hinzugefügte, geänderte und entfernte Vorlagen und rendern die Website neu.

Seitenvariablen

Wo Sphinx einen Variablennamen vorgibt, verwendet Guidedog denselben. So lassen sich Teile von Sphinx-Themes übernehmen.

| Variable | Wert |
|--|---|
| <code>body</code> | Das Dokument als HTML. |
| <code>title</code> | Der Dokumenttitel. |
| <code>pagename</code> , <code>docname</code> | Der Dokumentname, etwa <code>usage/install</code> . Auf Seiten ohne Dokument ist <code>docname</code> leer und <code>pagename</code> enthält wie bei Sphinx den Seitennamen: <code>genindex</code> , <code>py-modindex</code> , <code>search</code> oder den Namen einer Vorlagenseite. |
| <code>toc</code> | Die aus Toctrees erzeugte Navigation als HTML. |
| <code>outline</code> | Die eigenen Abschnitte des Dokuments als HTML; leer, wenn keine vorhanden sind. |
| <code>prev</code> , <code>next</code> | Die Nachbarseiten in Lesereihenfolge mit <code>url</code> (auch <code>link</code>) und <code>title</code> ; an den Enden keine. |
| <code>project</code> , <code>version</code> ,
<code>release</code> , <code>copyright</code> ,
<code>language</code> | Die gleichnamigen Einstellungen. |
| <code>html_title</code> , <code>docstitle</code> | <code>html_title</code> , standardmäßig „<project> <release> documentation“. |
| <code>html_short_title</code> ,
<code>shorttitle</code> | <code>html_short_title</code> . |
| <code>root_doc</code> , <code>master_doc</code> | Der Name des Wurzeldokuments. |
| <code>pathto_root</code> | Der Pfad von der Seite zum Site-Stamm, etwa <code>../</code> . |
| <code>root_url</code> , <code>search_url</code> ,
<code>genindex_url</code> | Links zu Wurzelseite, Suchseite und allgemeinem Index. |
| <code>css_files</code> , <code>js_files</code> | Dateilisten mit <code>url</code> : zuerst Guidedogs Dateien, dann <code>html_css_files</code> und <code>html_js_files</code> . |
| <code>logo_url</code> , <code>favicon_url</code> | <code>html_logo</code> und <code>html_favicon</code> unter <code>_static</code> ; leer, wenn nicht gesetzt. |
| <code>accent</code> | <code>html_theme_options.accent</code> , die Theme-Farbe. |
| <code>sourcelink_url</code> | Die Dokumentquelle unter <code>_sources</code> , falls angezeigt; sonst leer. |
| <code>last_updated</code> | Das Build-Datum gemäß <code>html_last_updated_fmt</code> , falls gesetzt; sonst leer. |
| <code>show_copyright</code> ,
<code>show_sphinx</code> ,
<code>show_guidedog</code> ,
<code>has_source</code> ,
<code>show_source</code> | Die Einstellungen <code>html_show_*</code> und <code>html_copy_source</code> . |
| <code>builder</code> , <code>file_suffix</code> | Der Buildernamen, etwa <code>html</code> , und das Seitensuffix. |
| Jeder Schlüssel von
<code>html_context</code> | Der Wert behält seinen Typ wie bei Sphinx: <code>false</code> ist in <code>{% if %}</code> falsch, Zahlen bleiben Zahlen, Arrays werden Listen, Tabellen Wörterbücher in der Schlüsselreihen- |

| Variable | Wert |
|----------|--|
| | folge von <code>conf.toml</code> . <code>guidedog migrate</code> übernimmt literale Einträge aus <code>html_context</code> in <code>conf.py</code> . Berechnete Werte bleiben undefiniert und gelten in Vorlagen als falsch. |

`pathto` ist die Sphinx-Vorlagenfunktion. `pathto("usage/install")` gibt die Dokument-URL, `pathto("_static/logo.svg", 1)` eine Datei-URL unter der Websitewurzel zurück, jeweils relativ zur aktuellen Seite. Bei `singlehtml` wird ein Dokument zum Abschnitt: Der erste Aufruf ergibt dort `#document-usage-install`, auf Index- und Suchseiten `index.html#document-usage-install`. Nichtdokumentnamen wie `genindex` oder Vorlagenseiten liegen bei allen Buildern an der Websitewurzel.

Aus Vorlagen erzeugte Seiten

`html_additional_pages` erzeugt wie Sphinx Seiten allein aus Vorlagen. Jeder Schlüssel ist ein Seitenname, jeder Wert eine Vorlage in `templates_path`:

Listing 5 `conf.toml`

```
root_doc = "contents"

[html_additional_pages]
index = "indexcontent.html"
download = "download.html"
```

Eine Seitenvorlage erweitert gewöhnlich `layout.html` und füllt dessen Blöcke, damit sie wie die übrigen Seiten aussieht:

Listing 6 `_templates/indexcontent.html`

```
{% extends "layout.html" %}
{% block htmltitle %}<title>{{ shorttitle }}</title>{% endblock %}
{% block body %}
  <h1>{{ docstitle|e }}</h1>
  <p><a href="{{ pathto("tutorial/index") }}">Tutorial</a></p>
{% endblock %}
```

Die Vorlage erhält Variablen einer Seite ohne Dokument: `pagename` ist der Name (`index`), `title` und `body` sind leer. `pathto`, `toc`, `toctree()` und `html_context` funktionieren normal. `html`, `dirhtml` und `singlehtml` schreiben sie bei jedem Build als `<name>.html` (`html_file_suffix`) an die Wurzel. Änderungen an beliebigen Dateien in `templates_path` bauen alle Seiten neu.

Die Platzierung der Seite und Unterschiede zu Sphinx:

- Eine gleichnamige Seite ersetzt die Dokumentseite, wie bei Sphinx durch späteres Schreiben. `index = "landing.html"` macht `index.html` zur Landingpage; `index.rst` liefert weiterhin das Inhaltsverzeichnis. Bei `singlehtml` bleibt die Einzelseite; die Vorlagenseite wird mit Warnung ausgelassen.
- `dirhtml` schreibt `download.html` neben `genindex.html` und `search.html`, während Sphinx `download/index.html` schreibt. `pathto("download")` verweist auf diese Datei.
- Der Name muss eine Datei an der Websitewurzel bezeichnen. `"sub/page"` wird mit `build.additional_page` abgelehnt, da Links von der Wurzel ausgehen. Bereits belegte Namen wie `genindex` werden ebenfalls abgelehnt; Sphinx würde eine der Seiten überschreiben.

- `guidedog migrate` übernimmt `html_additional_pages` aus `conf.py`.

Fehler

Ein Vorlagenfehler stoppt den Build und zeigt Datei, Zeile, Quelltext und Korrekturhinweis:

```
TEMPLATE ERROR                                     template.error

_templates/base.html:1

No filter named 'default'.

Did you mean the filter 'default'?
```

Eine nicht definierte Variable wird wie in Jinja leer ausgegeben.

Ausufernde Vorlagen stoppen mit Fehler statt Absturz: bei mehr als 100 Syntaxebenen (Klammern, Tags, Operator-, Filter- oder `elif`-Ketten), mehr als 200 Makro-, Include- oder rekursiven Schleifenebenen oder über 512 KiB Rekursionsstack. Eine Liste, die sich selbst enthält, erscheint wie in Python als `[...]`.

PDF-Vorlagen

Das PDF-Buch wird mit Typst gesetzt. `_templates/book.typ` ist eine normale Typst-Datei mit einer `book`-Funktion. Guidedog schreibt den Buchquelltext folgendermaßen:

```
#import "/_templates/book.typ": book
#show: book.with(title: ..., author: ..., version: ..., date: ...,
  lang: ..., paper: ..., numbering: ..., logo: ...)
// the chapters, one per document of the root toctree
```

Alles, was das Buch gestaltet, steht in dieser Datei: Schriften, Seitenmaß und Ränder, Überschriften, Titelseite, Kolumnentitel und Inhaltsverzeichnis.

Parameter

Parameter	Wert
<code>title</code>	<code>title</code> des Buchs in <code>pdf_documents</code> , andernfalls <code>project</code> .
<code>author</code>	<code>author</code> des Buchs, andernfalls die Einstellung <code>author</code> .
<code>version</code>	<code>release</code> .
<code>date</code>	<code> today </code> : <code>today</code> , falls gesetzt, sonst das Build-Datum gemäß <code>today_fmt</code> .
<code>lang</code>	<code>language</code> .
<code>paper</code>	"a4" oder "us-letter", falls <code>pdf_paper_size</code> den Wert <code>letter</code> hat.
<code>numbering</code>	<code>true</code> , wenn ein Toctree die Option <code>numbered</code> hat.
<code>logo</code>	Der Pfad von <code>pdf_logo</code> ; fehlt, wenn nicht gesetzt.
<code>copyright</code>	<code>copyright</code> für das Kolophon; wird nur an eine Vorlage übergeben, die es annimmt.
<code>body</code>	Die Kapitel.

Vorlagen dürfen eigene Parameter mit Standardwerten ergänzen. Die quickstart-Vorlage hat `accent`, die Schriften `serif`, `sans`, `mono`, die Textgröße `size` und

page-ref. Mit einer Funktion wie `n => [p. #n]` ergänzt Letzteres Seitenzahlen bei Querverweisen.

Modulare Typst-Vorlagen

Typst-Stile, Makros und Titelseiten können auf mehrere `.typ`-Dateien in `_templates/` verteilt und mit `#import` und `#include` verbunden werden:

Listing 7 `_templates/book.typ`

```
#import "cover.typ": title-page
#import "typography.typ": apply-styles

#let book(
  title: "",
  author: "",
  version: "",
  date: "",
  lang: "en",
  paper: "a4",
  numbering: false,
  logo: none,
  body,
) = {
  apply-styles()
  title-page(title: title, author: author, version: version, logo: logo)
  body
}
```

Was eine Vorlage verwenden kann

Typst-Pakete

Pakete wie `#import "@preview/cetz:0.4.2"` werden beim ersten Einsatz heruntergeladen. `pdf_packages = "offline"` beschränkt den Build auf bereits vorhandene Pakete.

Schriften

Systemschriften sind wie beim Befehl `typst` verfügbar. Ergänzen Sie Ordner mit `pdf_font_paths`. `pdf_fonts = "embedded"` nutzt nur Typsts eingebaute Schriften für byteweise reproduzierbare Bücher.

Präambel

`pdf_preamble` benennt eine Typst-Datei nach `#show: book`, geeignet für einige `set`- und `show`-Regeln ohne eigene Vorlage.

Typst in einem Dokument

Dokumente sind `reStructuredText` und `Markdown`; Typst-Dateien sind keine Dokumente. Typst-Markup für das Buch kommt in einen `Raw-Block`, den Webseiten auslassen:

```
.. raw:: typst

   #align(center)[#text(size: 14pt)[Only in the book]]
```

`.. only:: pdf` beschränkt auch gewöhnliche Inhalte auf das Buch.

Typst-Fehler nennen Datei und Zeile, ob in Vorlage oder generiertem Buch. Jede PDF-Quelle liegt in `_build/pdf/sources/<pdf-filename>.typ`; für `reference-en.pdf` also `sources/reference-en.pdf.typ`. Ein Einzelbuch-Build behält auch `_build/pdf/book-<language>.typ` zur Prüfung. Bei Fehlern wird nichts veröf-

fentlicht; die Quelle bleibt am genannten Pfad unter `_build/.doctrees/failed`. Mehrere Bücher erhalten getrennte Fehlerquellen.

Eine neue Vorlage schreiben

Beginnen Sie mit den von quickstart geschriebenen Vorlagen, die alle Teile zeigen:

1. Behalten Sie das von der Standard-CSS erwartete `layout.html`-Markup bei oder ersetzen Sie zugleich `_static/guidedog.css`.
2. Verschieben Sie wiederkehrende Teile in eigene Dateien und nutzen Sie `include`, oder erstellen Sie `base.html` und erben Sie in `layout.html` mit `extends`.
3. Für das Buch ändern Sie die Regeln von `book` oder schreiben eine neue Funktion mit gleichem Namen und gleichen Parametern.

Verwenden Sie beim Bearbeiten `guidedog serve`. Speichern Sie und laden Sie den Browser neu; der Server baut geänderte Eingaben vor der Auslieferung.

Bilder, Video, Audio und Downloads

Legen Sie Ressourcen nahe beim erklärenden Dokument ab. Verwenden Sie relative Pfade oder `/` für die Quellwurzel. Guidedog kopiert verwendete Ressourcen. Videos bleiben im Web abspielbar; das PDF benennt die Aufnahme.

Bilder

```
.. image:: diagrams/pipeline.png
   :alt: The build pipeline
   :width: 480px

.. figure:: /screenshots/search.png

   Searching the site.
```

Seiten kopieren Bilder nach `_images`, Bücher betten sie ein. PNG, JPEG, GIF, SVG und WebP funktionieren in beiden. Ein fehlendes Bild erzeugt eine Warnung; die Seite behält den Alternativtext, das Buch lässt das Bild aus.

Video und Audio

Ein `image` oder `figure` mit Video (`.mp4`, `.webm`, `.ogv`, `.mov`, `.m4v`) oder Audio (`.mp3`, `.ogg`, `.oga`, `.m4a`, `.opus`, `.wav`, `.flac`, `.aac`) spielt die Datei ab, wie Docutils bei Videos:

```
.. figure:: media/tour.mp4
   :alt: A tour of the site
   :width: 640

   The two-minute tour.

.. image:: media/pronunciation.mp3
```

Seiten zeigen den Browserplayer und einen Dateilink für Browser ohne Wiedergabe. Ein Buch kann Medien nicht abspielen und benennt die Aufnahme in einem Kasten anstelle des Players. Textausgabe schreibt `[video: ...]` oder `[audio: ...]`.

Downloads

Die Rolle `download` verlinkt beliebige Dateien und kopiert sie nach `_downloads`:

```
Get :download:`the example project <examples/project.zip>`.
```

Dateien des Themes

`_static` enthält Stylesheets, Skripte, Schriften und Logos des Themes und wird unverändert nach `_static` der Site kopiert. `html_static_path` nennt den Ordner; `html_css_files`, `html_js_files`, `html_logo` und `html_favicon` seine Dateien. Inhaltsmedien gehören zu den Dokumenten, damit gemeinsames Verschieben die Links erhält.

Internationalisierung

Übersetzen Sie die Erklärung und bewahren Sie ihre Struktur. Guidedog extrahiert Kataloge, führt Übersetzungen zusammen und baut in der gewählten Sprache. Der Quelltext bleibt die Referenz. Fehlende Übersetzungen fallen auf ihn zurück, statt Text zu erfinden.

Arbeitsablauf

1. Erzeugen Sie Nachrichtenvorlagen mit dem Builder `gettext`:

```
guidedog build gettext
```

Für jede Textdomäne entsteht eine Vorlage (`.pot`) in `_build/gettext`. Jeder Absatz, Titel, Listeneintrag, jede Tabellenzeile, Bildunterschrift, Hinweisbox, jeder Begriff und jedes Feld wird zu einer Nachricht mit Quelldatei und Zeilennummer.

2. Erstellen oder aktualisieren Sie die Kataloge jeder Sprache wie mit `sphinx-intl update`:

```
guidedog intl update -l de -l fr
```

Die Kataloge entstehen in `locales/de/LC_MESSAGES/*.po`. Spätere Aufrufe führen die neuen Vorlagen wie `msgmerge` zusammen. Übersetzungen bleiben erhalten. Bei geändertem Ausgangstext wird die alte Übersetzung zur Prüfung als *fuzzy* markiert. Entfernte Nachrichten bleiben am Ende als veraltet (`#~`) erhalten, damit ihre Übersetzung später wieder verfügbar ist.

3. Füllen Sie jedes `msgstr`. Entfernen Sie nach Prüfung die Zeile `#, fuzzy`. Als *fuzzy* markierte Übersetzungen werden nicht verwendet.

```
msgid "Hello *world*, see the site_."
msgstr "Hallo *Welt*, siehe site_."
```

4. Prüfen Sie den Stand wie mit `sphinx-intl stat`:

```
guidedog intl stat -l de
```

5. Bauen Sie in dieser Sprache:

```
guidedog build html -D language=de
guidedog build pdf -D language=de
```

Oder setzen Sie `language = "de"` in `conf.toml`.

Jedes Buch erhält ein Sprachsuffix: Aus `manual.pdf` wird `manual-de.pdf`. Ein Build veröffentlicht eine vollständige Generation. Verwenden Sie getrennte Ziele, um mehrere Ausgaben zu behalten: etwa `guidedog build -b pdf docs build/books/de -D language=de` für Deutsch und `guidedog build -b pdf docs build/books/en -D language=en` für Englisch.

Wie bei anderen Eingaben werden nur Dokumente mit geändertem Katalog neu gelesen. Hinzufügen oder Entfernen eines Katalogs liest alle Dokumente erneut.

`guidedog intl` unterstützt die Optionen von `sphinx-intl`: `-p DIR` für Vorlagen (Standard `_build/gettext`), das wiederholbare `-l LANG` für Sprachen (Standard: Projektsprache), `-d DIR` für Kataloge (Standard: erster Eintrag in `locale_dirs`), `-w N` für die Zeilenbreite (Standard 76) sowie `--no-obsolete`.

Übersetzungen schreiben

Eine Nachricht ist der Quelltext eines Absatzes, Titels oder anderen Elements samt Markup: reStructuredText in `.rst`, Markdown in `.md`. Übersetzungen werden im selben Format gelesen und können Hervorhebungen, Links und Verweise enthalten.

Verweise müssen gleich bleiben. Bewahren Sie jeden Verweis in derselben Schreibweise und ändern Sie nur den umgebenden Text und seinen Titel:

```
msgid "See :ref:`install` and the site_."
msgstr "Siehe :ref:`Installation <install>` und die site_."
```

Lässt eine Übersetzung eine Referenz weg, warnt der Build wie Sphinx mit `inconsistent references in translated message` und verwendet die Übersetzung. Fügt sie eine Referenz hinzu, die im Original fehlt, lässt sich diese nicht auflösen: Der Build warnt und behält den Originaltext. Das gilt auch für vom Reader abgelehntes Markup; die Warnung zitiert dann die Übersetzung.

Abschnittsanker ändern sich nicht mit der Sprache. Übersetzte Titel behalten den Originalanker; interne und externe Links bleiben gültig.

Einstellungen

Die Standardeinstellungen haben Sphinx' Namen und Vorgaben. Guidedog bietet zusätzlich einen nur für die Extraktion geltenden Ausschluss unübersetzter Referenzanhänge.

Einstellung	Bedeutung
<code>language</code>	Die Build-Sprache, etwa <code>"de"</code> oder <code>"pt_BR"</code> .
<code>locale_dirs</code>	Katalogverzeichnisse relativ zum Quellordner. Jedes enthält <code>LANGUAGE/LC_MESSAGES/DOMAIN.po</code> oder eine kompilierte <code>.mo</code> -Datei. Standard ist <code>["locales"]</code> . Bei mehreren Verzeichnissen gewinnt das erste mit einer Übersetzung für die Nachricht.
<code>gettext_compact</code>	Bestimmt den Katalog für die Nachrichten eines Dokuments. Bei <code>true</code> (Standard) haben Dokumente auf oberster Ebene eigene Kataloge; Dokumente eines Ordners teilen dessen Katalog (<code>guide/usage.rst</code> nutzt <code>guide.po</code>). Bei

Einstellung	Bedeutung
	<code>false</code> erhält jedes Dokument einen eigenen. Ein Name legt einen gemeinsamen Katalog für alle Dokumente fest.
<code>gettext_location</code>	Schreibt die Fundstellen jeder Nachricht (#: ../../index.rst:12). Vorgabe: <code>true</code> .
<code>gettext_uuid</code>	Schreibt eine Kennung je Vorkommen, abgeleitet aus Dokument, Nachricht und Vorkommen. Sie bleibt zwischen Builds gleich.
<code>gettext_auto_build</code>	Kompiliert jedes <code>.po</code> für andere Werkzeuge in ein danebenliegendes <code>.mo</code> . Vorgabe: <code>true</code> . Guidedog selbst liest <code>.po</code> .
<code>gettext_additional_targets</code>	Weitere Inhalte: <code>index</code> (Indexeinträge), <code>literal-block</code> , <code>doctest-block</code> , <code>raw</code> und <code>image</code> (Alternativtext).
<code>gettext_allow_fuzzy_translations</code>	Verwendet auch fuzzy-Übersetzungen. Vorgabe: <code>false</code> .
<code>gettext_exclude_patterns</code>	Nur von der POT-Extraktion ausgeschlossene Dokumentpfadmuster, etwa <code>["api/**"]</code> . Vorgabe: <code>[]</code> . Die Dokumente bleiben in HTML und PDF.
<code>gettext_last_translator</code> , <code>gettext_language_team</code>	Last-Translator und Language-Team im Vorlagenkopf.
<code>figure_language_filename</code>	Bilddatei in der Build-Sprache. Standard: " <code>{root}.{language}{ext}</code> ". Bei <code>language = "de"</code> wird <code>img/logo.png</code> durch <code>img/logo.de.png</code> ersetzt, sofern vorhanden. Felder: <code>{root}</code> , <code>{path}</code> , <code>{basename}</code> , <code>{ext}</code> , <code>{docpath}</code> und <code>{language}</code> .
<code>translation_progress_class</code>	Vergibt die Klasse <code>translated</code> an übersetzte und <code>untranslated</code> an übrige Elemente (<code>true</code>). Wahlweise wird nur eine vergeben (" <code>translated</code> " oder " <code>untranslated</code> "), damit ein Stylesheet den verbleibenden Stand anzeigen kann.

Die Oberflächentexte von Guidedog

Guidedog erzeugt einige Texte selbst: Hinweisüberschriften, „Added in version 2.1“, „Fig. 1“, „Contents“, die Layouttexte „Previous“, „Next“, „Navigation“, „Search“, Such- und Indexseiten sowie „Version“ im Buch. Sie stammen aus der Textdomäne `guidedog` und werden in dieser Reihenfolge gesucht:

1. `locales/LANGUAGE/LC_MESSAGES/guidedog.po` des Projekts.
2. `locales/LANGUAGE/LC_MESSAGES/sphinx.po` des Projekts, wie bei Sphinx.
3. Der eingebaute Katalog für Deutsch, Spanisch, Französisch, Japanisch, brasilianisches Portugiesisch, Russisch und vereinfachtes Chinesisch.

Die englischen Texte dienen als Nachrichtenkennungen. Wo Sphinx dieselben Texte hat, stimmen die Kennungen überein; ein vorhandenes `sphinx.po` funktioniert daher weiter. Mit einem eigenen `guidedog.po` kann ein Projekt jeden Text ersetzen oder eine Sprache hinzufügen.

Vorlagen übersetzen wie bei Sphinx mit `_()`, `gettext()` und `ngettext()`:

```
<small>{{ _('Previous') }}</small>
{{ _('Last updated on %s.')|format(last_updated) }}
```

`numfig_format`, `html_title` und `html_short_title` folgen der Sprache, sofern sie nicht in `conf.toml` gesetzt sind.

Datumsangaben

`|today|`, das Buchdatum und `last_updated` folgen den Formatregeln von Sphinx. `today_fmt` und `html_last_updated_fmt` verwenden `strftime`; Monats- und Wochentagsnamen richten sich nach `language`. So ergibt `%b %d, %Y` auf Englisch „Sep 29, 2026“ und auf Deutsch „Sept. 29, 2026“. Bei leerem Format gilt `_( '%b %d, %Y' )`, das der Katalog übersetzen kann. Die Namen für die obigen Sprachen stammen aus Unicode CLDR. Andere Sprachen nutzen Englisch, wie Sphinx bei einer Babel unbekannten Sprache.

Es gilt das lokale Datum in der lokalen Zeitzone. Setzen Sie `SOURCE_DATE_EPOCH` (Sekunden seit 1970, UTC), um reproduzierbare Builds mit denselben Daten auf allen Rechnern zu erhalten.

Auf andere Projekte verweisen

Mit `sphinx.ext.intersphinx` werden hier nicht auflösbare Verweise in den Inventaren anderer Projekte gesucht, den `objects.inv` jeder Sphinx- oder Guidedog-Site. Geben Sie die Projekte in `conf.toml` an:

```
extensions = ["sphinx.ext.intersphinx"]

[intersphinx_mapping]
python = ["https://docs.python.org/3/", ""]
click = ["https://click.palletsprojects.com/", ["click.inv", ""]]
```

Jeder Eintrag enthält die Seitenadresse und den Ort des Inventars: URL, Datei relativ zum Quellverzeichnis oder `""` für das dortige `objects.inv`. Listen werden der Reihe nach versucht. Dies entspricht Sphinx' `intersphinx_mapping`, mit `""` statt Python's `None`; `guidedog migrate` konvertiert es.

Für Verweise ist dann nichts Neues nötig:

```
:func:`len`, :class:`list`, and :ref:`tut-packages` link into Python's
documentation.
:ref:`click:testing` looks only in Click's inventory.
:external+python:ref:`tut-packages` never looks in this project.
```

Links zeigen für Labels und Dokumente die Titel des anderen Projekts und einen Tooltip wie „(in Python v3.14)“. Wie bei Sphinx benötigen `:doc:`-Verweise den Projektnamen (`:doc:`python:tutorial/index``), da `intersphinx_disabled_reftypes` standardmäßig `["std:doc"]` ist.

Inventare werden zu Build-Beginn abgerufen und für `intersphinx_cache_limit` Tage in `_build/.doctrees/_intersphinx_cache__` gespeichert: Vorgabe 5; negative Werte behalten sie. Lokale Dateien werden bei jedem Build gelesen. Wie bei Sphinx wird bei einer URL-Weiterleitung das neue Verzeichnis zur Linkbasis und im Cache gespeichert, sodass Links identisch bleiben. Beispielsweise leitet `https://werkzeug.palletsprojects.com/objects.inv` nach `/en/stable/` weiter. `intersphinx_timeout` begrenzt jeden Download in Sekunden. Unerreichbare Projekte erzeugen eine Warnung; ihre Verweise bleiben unaufgelöst.

Guidedog schreibt sein eigenes `objects.inv` mit Seiten, Labels, Begriffen und Objekten, sodass andere Projekte ebenso hierher verweisen können.

Objekttypen deklarieren

Ein Projekt kann Namen außerhalb der Standarddomänen brauchen. Deklarieren Sie deren Objekttypen in TOML. Guidedog erzeugt dann Ziele, Indexeinträge und Rollen ohne Python-Erweiterung. Die Deklaration beschreibt Syntax, kein ausführbares Verhalten.

Ziele: `add_crossref_type`

```
[[crossref_types]]
directive = "setting"
role = "setting"
index = "pair: %s; setting"
```

`.. setting:: DEBUG` erzeugt ein Ziel mit ID `setting-DEBUG` und einen Indexeintrag; `:setting:DEBUG`` verlinkt es wie bei Sphinx. `index` entspricht Sphinx' `indextemplate`: der Typ (`single`, `pair`, `triple`, `see`, `seealso`) steht vor dem ersten Doppelpunkt, danach der Eintrag mit `%s` als Name.

Beschreibungen: `add_object_type`

```
[[object_types]]
directive = "django-admin"
role = "djadmin"
index = "pair: %s; django-admin command"
name = "first-word"
display = "django-admin %s"
program = true
```

`.. django-admin:: migrate [app_label]` beschreibt den Befehl wie jedes Objekt: Signatur, Inhalt, ID (`django-admin-migrate`) und Indexeintrag. In Sphinx kann `parse_node` die Signatur lesen; typische Aufgaben werden hier mit Feldern festgelegt:

`name`

`"whole"` (Vorgabe): der Name ist die ganze Signatur. `"first-word"`: der Name reicht bis zum ersten Leerzeichen; `b(reak) [lineno]` von `pdb` heißt etwa `b(reak)`.

`display`

Die Darstellung der Signatur, vertreten durch `%s`. Vorgabe ist die ursprüngliche Schreibweise.

`program`

`true`: Der Name wird zum Programm für nachfolgende Optionen, wie bei `.. program::`.

Weitere Namen für Direktiven

Eine Erweiterung kann Sphinx-Direktiven unter anderem Namen registrieren:

```
[directive_aliases]
django-admin-option = "option"
awaitablefunction = "py:function"
```

Ein Ziel ohne Domäne bezeichnet eine Standarddirektive oder eine der Standarddomäne. `py:function` nennt seine Domäne ausdrücklich.

Migration

`guidedog migrate` findet die in `conf.py` genannten Erweiterungen, die Projektmodule sind. Es liest ihre Aufrufe von `add_crossref_type`, `add_object_type` und `add_directive` ohne Ausführung und schreibt die Tabellen. Nicht deklarierbare `parse_node`-Funktionen (mit `name`, `display` und `program` nachbilden) sowie Python-Direktiven, Rollen und Ereignishandler werden gemeldet.

Python mit autodoc dokumentieren

Guidedog dokumentiert Python durch Lesen des Quelltexts. Das Paket wird nicht importiert. Docstrings und Signaturen werden Teil des Dokumentgraphen. Objekte, die erst zur Laufzeit entstehen, benötigen eine ausdrückliche Beschreibung. Diese Grenze ist bewusst gewählt.

Einrichtung

Tragen Sie die Erweiterung ein und geben Sie Guidedog die Paketverzeichnisse relativ zum Quellverzeichnis an, so wie `sys.path` sie Python mitteilt:

```
extensions = ["sphinx.ext.autodoc"]
autodoc_source_paths = ["../src"]
```

`guidedog migrate` erzeugt `autodoc_source_paths` aus den Zeilen in `conf.py`, die zum Paket führen, etwa `sys.path.insert(0, os.path.abspath('.'))`. Ein anderswo installiertes Paket wird nur gefunden, wenn Sie sein Verzeichnis hinzufügen, beispielsweise einen Quelltext-Checkout einer Abhängigkeit. Guidedog durchsucht niemals Pythons eigenes `site-packages`.

Die Direktiven funktionieren anschließend wie in Sphinx:

```
.. automodule:: shop.cart
   :members:
   :show-inheritance:

.. autoclass:: shop.Cart
   :members: add, remove
   :inherited-members:
```

Alle Optionen von Sphinx 9.1 werden mit derselben Bedeutung unterstützt: `:members:`, `:undoc-members:`, `:private-members:`, `:special-members:`, `:inherited-members:`, `:exclude-members:`, `:member-order:`, `:show-inheritance:`, `:imported-members:`, `:ignore-module-all:`, `:class-doc-from:`, `:no-value:`, `:annotation:`, `:no-index:`, `:no-index-entry:`, `:synopsis:`, `:platform:`, `:deprecated:` sowie die `no-`-Formen zum Aufheben von `autodoc_default_options`.

Einstellungen

Diese Einstellungen in `conf.toml` verwenden dieselben Namen, Werte und Standardwerte wie Sphinx.

`autodoc_source_paths`

Eine eigene Einstellung von Guidedog: die Verzeichnisse für Python-Module in Suchreihenfolge, relativ zum Quellverzeichnis. Es werden nur Dateien darunter gelesen. Symbolische Links, die nach außerhalb führen, werden abgewiesen.

autoclass_content

Welche Docstrings die Klasse beschreiben: `"class"` (Vorgabe), `"init"` oder `"both"`.

autodoc_class_signature

`"mixed"` (Vorgabe) oder `"separated"`; damit wird `__init__` als Methode dokumentiert.

autodoc_default_options

Eine Tabelle mit Optionen für jede Direktive, etwa `members = true` oder `member-order = "bysource"`. Der Wert `false` lässt die Option weg.

autodoc_docstring_signature

`true` (Vorgabe): Eine erste Docstring-Zeile wie `name(args) -> result` wird als Signatur verwendet.

autodoc_inherit_docstrings

`true` (Vorgabe): Ein Mitglied ohne eigenen Docstring übernimmt den der Basisklasse.

autodoc_member_order

`"alphabetical"` (Vorgabe), `"groupwise"` oder `"bysource"`.

autodoc_preserve_defaults

`false` (Vorgabe): Standardwerte werden wie mit `repr()` dargestellt. `true` zeigt die Schreibweise aus dem Quelltext.

autodoc_typehints

`"signature"` (Vorgabe), `"description"` (als Felder `:type:` und `:rtype:`), `"both"` oder `"none"`.

autodoc_typehints_description_target

`"all"` (Vorgabe), `"documented"` oder `"documented_params"`.

autodoc_typehints_format

`"short"` (Vorgabe) oder `"fully-qualified"`.

autodoc_use_type_comments

`true` (Vorgabe): Kommentare mit `# type:` gelten als Typannotationen.

strip_signature_backslash

Verdoppelt Backslashes in Signaturen, wie Sphinx.

autodoc_mock_imports, autodoc_type_aliases, autodoc_warningiserror

Die Einstellungen werden akzeptiert. Da nichts importiert wird, sind keine Mocks nötig. Typalias werden nicht angewendet.

Wie Guidedog das Verhalten von Python ermittelt

Namen werden nach den Bindungsregeln von Python aufgelöst. Mit `from .app import Flask` in der `__init__.py` eines Pakets verweist `flask.Flask` auf die Klasse in `flask/app.py`. autodoc zeigt dafür `:canonical: flask.app.Flask`. Basisklassen werden genauso aufgelöst. Die Methodenreihenfolge wird wie in Python berechnet; geerbte Mitglieder stammen aus dem Quelltext der Basisklassen. Namen, die nur unter `if TYPE_CHECKING:` importiert werden, existieren zur Laufzeit nicht. Entsprechende Annotationen bleiben daher wie in Sphinx unverändert.

Docstrings entsprechen den von Python gespeicherten Zeichenketten: Escape-Sequenzen werden ausgewertet und Einrückungen wie im Compiler von Python 3.13 entfernt. Attributdokumentation stammt aus denselben Stellen wie bei Sphinx: #-Kommentare nach der Zuweisung oder direkt darüber sowie ein unmittelbar folgender Stringliteral. Signaturen stammen aus `def`. Bei Klassen werden nach Pythons Suchregeln `__call__` der Metaklasse, `__new__` oder `__init__` verwendet; bei `dataclass` und `NamedTuple` die Felder. Varianten mit `@overload` ersetzen die Signatur der Implementierung.

Was sich ohne Ausführung von Python nicht feststellen lässt

Wenn sich Pythons Verhalten aus dem Quelltext nicht bestimmen lässt, nennt Guidedog das betroffene Objekt. Ist keine Dokumentation möglich, erscheint eine Warnung. Wird weniger als bei Sphinx dokumentiert, gibt es einen Hinweis, sichtbar mit `-v`.

- Ein kompiliertes Modul (`.so`, `.pyd`) enthält keinen lesbaren Quelltext. Seine Objekte werden deshalb nicht gefunden.
- Ein zur Laufzeit erzeugter Wert (`app = Flask(__name__)`, `now = datetime.now()`) erhält kein `:value:`. Berechnete Standardwerte werden in ihrer Quelltextform gezeigt.
- Eine Funktion, die durch einen Dekorator außerhalb der Quellpfade entsteht (`@click.command()`), wird als ursprüngliche Funktion dokumentiert.
- Eine Klasse aus einem Paket außerhalb der Quellpfade wird nach ihrem Importpfad benannt. Dieser kann vom definierenden Modul abweichen. Mitglieder, Konstruktorsignatur und vererbte Docstrings sind unbekannt.
- Die Docstrings eingebauter Typen sind unbekannt. Eine Methode ohne eigenen Docstring, die ihn von `dict` erben würde, wird daher ausgelassen.
- Python-Erweiterungen für autodoc-Ereignisse (`autodoc-process-docstring`, `autodoc-skip-member` usw.) werden nicht ausgeführt.
- Module mit unrealistisch tiefer Verschachtelung werden mit der Warnung `autodoc.too_deep` nicht analysiert. Python selbst lehnt 200 verschachtelte Klammern ab. Guidedog lehnt außerdem +-Ketten mit einigen Hundert Operanden ab.
- Arbeit, die sich vervielfachen kann, ist begrenzt. Die Namenssuche über Importe und Aliase endet nach 48 Schritten je Pfad und insgesamt 100,000 Schritten. Typalias und Konstanten werden bis zu 10,000 Schritte expandiert, danach in Quelltextform gezeigt. Die MRO wird bis zu einer Tiefe von 100 Klassen verfolgt. Eine Direktive erzeugt höchstens 10,000 weitere Direktiven; darüber erscheint `autodoc.limit`. Diese letzte Grenze erreicht nur eine Klasse, die sich unter ihrem eigenen Namen selbst enthält.

Die meisten dieser Einschränkungen lassen sich beheben, indem die Quellverzeichnisse der fehlenden Pakete zu `autodoc_source_paths` hinzugefügt werden.

Erneuter Build

Jede von einer autodoc-Direktive gelesene Python-Datei ist eine Abhängigkeit der Seite. Nach einer Änderung wird die Seite beim nächsten Build neu gelesen. Seiten mit nicht gefundenen Objekten werden bei jedem Build erneut gelesen und erkennen das Objekt, sobald es im Quelltext vorhanden ist.

Sicherheit

Beim Dokumentationsbuild wird der Projektcode niemals ausgeführt. Guidedog liest Python-Quelltext als Text und verwendet dieselbe Pfadbegrenzung wie für Includes: nur unterhalb von `autodoc_source_paths` und ohne Links nach außerhalb.

Odin dokumentieren

Die Odin-Domäne gibt Paketen, Prozeduren, Typen und Mitgliedern benannte Ziele. Guidedog erzeugt API-Seiten durch Parsen des Odin-Codes, ohne Compiler oder Paket auszuführen. Auch generierte Signaturen benötigen einen nützlichen Vertrag.

Objekte beschreiben

Ein Paket legt den Kontext für nachfolgende Angaben fest, wie ein Python-Modul:

```
.. odin:package:: core:strings
:synopsis: Procedures to manipulate UTF-8 encoded strings.
:imports: rt=base:runtime

.. odin:procedure:: @(require_results) clone :: proc(s: string,
allocator := context.allocator) -> (res: string, err: rt.Allocator_Error)
#optional_allocator_error

    Clones a string.

    :param s: The string to be cloned.
    :result res: The cloned string.
    :result err: An allocator error, or ``nil``.

.. odin:struct:: Builder :: struct

    A dynamic byte buffer.

    .. odin:field:: buf: [dynamic]byte
```

Signaturen werden wie Odin-Deklarationen in einer Zeile geschrieben und ebenso angezeigt. Die folgenden Beispiele sehen so aus:

```
shapes.Kind :: enum u8
```

```
Circle = 1
```

```
@(require_results) shapes.area :: proc(side: f32, scale: f32
= 1) -> (a: f32, ok: bool) #optional_ok
```

Vermisst ein Quadrat.

Parameter: **side** – Seine Seitenlänge.

Rückgabe:

- **a** – Seine Fläche.
- **ok** – Ob seine Art bekannt ist.

Direktiven und die akzeptierten Signaturen:

odin:package und odin:currentpackage

Akzeptiert `core:fmt` oder einen Pfad unter den Projektwurzeln wie `readers/sphinx`. Objektnamen nutzen den Importpfad: `core:fmt.println`. `odin:currentpackage` ändert den Kontext ohne Ziel; `None` hebt ihn auf. Optionen: `:synopsis:`, `:platform:`, `:deprecated:`, `:no-index:` und `:imports:` für Importaliaspaare `alias=package` (`gd=core rst=readers/rst`), sodass `gd.Node_Id` auf `core.Node_Id` verweist. `:private:` nennt private Typen und private Gruppenmitglieder (State Rules `catalog_text`). Ohne verlinkbare Beschreibung erscheinen sie als Text; generierte Seiten listen sie automatisch.

odin:procedure (oder odin:proc)

`name :: proc(params) -> results` unterstützt Attribute vor dem Namen (`@(require_results)`), `#force_inline` vor `proc`, Aufrufkonventionen (`proc "c" (...)`), Standardparameter (`x := 1, x: int = 1`), polymorphe `$T`-Parameter, `..`-Variadik, `using`, `#c_vararg`, benannte Ergebnisse, Tags (`#optional_ok`) und `where`. `name(params) -> results` ist die Kurzform.

odin:procgroupp

`name :: proc{a, b}`: Jedes Mitglied verlinkt auf seine Prozedur.

odin:struct, odin:union, odin:enum, odin:bitset, odin:bitfield, odin:type

`Name :: struct($T: typeid) #packed`, `Name :: union #no_nil {A, B}`,
`Name :: enum u8`, `Name :: bit_set[Flag; u8]`, `Name :: bit_field u32`.
`odin:type` unterstützt eigenständige Typen und Aliasse (`Handle :: distinct uintptr`, `Callback :: proc(x: int) -> bool`). Der Typinhalt enthält seine Mitglieder.

odin:field und odin:enumerator

Innerhalb eines Typs: `name: Type` mit Tag (`name: string `json:"n"``) oder Bitbreite (`low: u8 | 3`) sowie `Name` oder `Name = 3`. Ihre Namen lauten `Type.member`.

odin:const, odin:var, odin:foreign

`NAME :: 64` oder `NAME : int : 64`; `name: Type`, `name := value` oder `name: Type = value; libc "system:c"` für einen Fremdimport.

Alle Objekte akzeptieren Sphinx-Optionen: `:no-index:`, `:no-index-entry:`, `:no-contents-entry:`, `:no-typesetting:`. Hinzu kommen `:package:` (anderes Paket), `:private:` und `:deprecated:` message (zeigen bei fehlendem Signaturattribut `@(private)` und `@(deprecated="message")`), `:availability:` `Windows`, `Linux` (erste Inhaltszeile mit Verfügbarkeit) sowie `:foreign:` `libc` (Fremdblockprozedur). Mehrere Signaturzeilen beschreiben ein Objekt für verschiedene Ziele; nur die erste erhält ID und Indexeintrag.

Namen an Typstellen werden zuerst im Paket und Typ der Signatur, dann wie geschrieben aufgelöst. Eingebaute Typen (`int`, `string`, `rawptr`, `typeid`, `any` usw.), Schlüsselwörter, polymorphe Namen (`$T` und folgendes `T`, auch im umgebenden Typ), Arraylängen, Standardwerte, Konstanten, Tags und `where`-Klauseln bleiben unverlinkter Originaltext.

Rollen und IDs

`:odin:pkg:`, `:odin:proc:`, `:odin:type:` (Strukturen, Unions, Aufzählungen, Bitmengen und -felder usw.), `:odin:const:`, `:odin:var:`, `:odin:field:`,

`:odin:enumerator:` und `:odin:obj:` (alle) verlinken Objekte. Wie bei Python zeigt ~ nur das Ende (`:odin:proc:` ~`core:fmt.println`` zeigt `println`); ein führendes . sucht Namensenden. Gesucht wird im Kontexttyp und -paket, nach dem geschriebenen Namen und nach dem Pfadteil hinter `:` oder `/`. So findet `fmt.println core:fmt.println` und `sphinx.Config readers/sphinx.Config`, entsprechend Odin. Aliasse aus `:imports:` gehen vor. Bei `default-domain:: odin` oder `primary_domain = "odin"` entfällt `odin:`.

Objekt-IDs entstehen mit `Sphinx-make_id` aus `odin-` und dem vollständigen Namen: `odin-core-fmt.println`, `odin-readers-sphinx.Config.docname`. Großschreibung und Punkte bleiben; `:` und `/` werden Bindestriche. IDs sind lesbar, buildstabil und unterscheiden Pakete mit gleichem Endnamen. Paket-IDs bestehen aus `odin-package-` und Pfad. Indexeinträge lauten etwa „println (procedure in core:fmt)“. `objects.inv` listet alle unter `odin` und Typ (`odin:procedure`, `odin:struct`, `odin:field` usw.), Pakete zuerst wie Sphinx-Module.

Informationsfelder werden wie in anderen Domänen gruppiert: `:param name:` mit `:type name:`, `:result name:` für benannte Ergebnisse sowie `:returns:` und `:rtype:`.

Aus Quelltext generieren

Geben Sie die Paketverzeichnisse relativ zum Quellordner an:

```
odin_autoapi_dirs = ["../src"]
odin_collections = {core = "/usr/local/lib/odin/core"} # optional
```

Unter `odin_autoapi_dirs` gilt der relative Pfad als Name (`src/shapes/round` wird `shapes/round`); in Sammlungen der Odin-Importname (`core:strings`). Die Generierungsdirektiven funktionieren dann wie `autodoc`:

```
.. odin:autopackage:: shapes
   :members:
   :undoc-members:
   :member-order: groupwise

.. odin:autoproc:: shapes.area
.. odin:autotype:: Shape
```

`odin:autopackage` schreibt Paket und Dokumentkommentar sowie mit `:members:` alle oder ausgewählte Deklarationen. `odin:autoproc`, `odin:autoprocgroup`, `odin:autotype`, `odin:autoconst` und `odin:autovar` schreiben eine Deklaration im Kontext oder als `package.name`. Optionen: `:members:`, `:undoc-members:`, `:private-members:` (sonst ausgelassene `@(private)`), `:exclude-members:`, `:member-order:` (Standard `source` nach Datei und Position; `alphabetical`; `groupwise` mit „Types“, „Procedures“, „Procedure groups“, „Constants“, „Variables“, „Foreign imports“) und `:no-index:`.

Dokumentkommentare sind `//`-Zeilen oder `/* */`-Blöcke direkt über Deklarationen sowie Zeilenendkommentare von Feldern oder Enumeratoren. Ihr Klartext wird so zu `reStructuredText`:

- Absätze bleiben Absätze; eine Folge von `- item`-Zeilen bleibt eine Liste.
- Ein eingerückter Block nach einer Leerzeile oder Doppelpunktzeile (Example:) wird `code-block:: odin`, nach `Output:` dagegen `text`. Eine stärker als der Text unmittelbar nach einer Absatzzeile eingerückte Zeile setzt den Absatz fort.

- `Inputs:` mit `- name: text` wird zu `:param name:`-Feldern; `Returns:` zu `:result name:` oder ohne Namen `:returns:`, entsprechend der Odin-Kernbibliothek.
- Eine mit `NOTE:` oder `WARNING:` beginnende Zeile wird zur Anmerkung oder Warnung.
- ``code`` ist Literaltext. Andere Markupzeichen von reStructuredText (`*`, `|`, `_` am Wortende usw.) werden escaped, sodass der Kommentar unverändert erscheint und keine Warnung erzeugt.

API-Seiten

Mit `odin_autoapi_dirs` erhält jedes Paket beim Lesen eine eigene Seite wie bei sphinx-autoapi. `api/shapes` enthält `odin:autopackage:: shapes` mit `odin_autoapi_options`; `api/index` listet Pakete samt Kurzbeschreibung. Die Seiten gehören zu toctree, Suche, Gesamtindex, `singlehtml` und PDF, werden aber nie in den Quellordner geschrieben. Einstellungen:

`odin_autoapi_dirs`

Paketordner für die Seitengenerierung, relativ zum Quellordner. Nur Dateien darunter und unter `odin_collections` werden gelesen; herausführende Links werden abgelehnt.

`odin_collections`

Tabelle von Sammlungsamen und Ordnern für Direktivenargumente wie `core:strings`. Diese Pakete erhalten keine Seiten.

`odin_autoapi_root`

Der Seitenordner, standardmäßig `"api"`. Ein gleichnamiges Quelldokument behält seinen Platz; eine Warnung wird ausgegeben.

`odin_autoapi_options`

Standard: `["members", "undoc-members"]`; `private-members` lässt sich ergänzen.

`odin_autoapi_member_order`

`"source"` (Standard), `"alphabetical"` oder `"groupwise"`.

`odin_autoapi_add_tocentry`

`true` (Standard): `api/index` wird dem ersten toctree des Hauptdokuments hinzugefügt.

`odin_autoapi_generate_api_docs`

`true` (Standard); bei `false` werden die Ordner nur für Direktiven gelesen.

Typen undokumentierter Pakete (`core:io.Writer`) sind nicht verlinkbar. Unter `-n` unterdrückt `nitpick_ignore_regex = [["odin:type", "(core|base):.*"]]` diese Meldungen. Auch Guidedogs `docs/api` wird so gebaut.

Plattformen

Dokumentiert werden Odins Build-Ziele nach seinen Dateiregeln. `*_windows.odin`, `*_linux_arm64.odin` und `*_amd64.odin` gelten nur für entsprechende Ziele. `#+build linux, darwin` und `#+build !windows` (auch altes `//+build`) schränken weiter ein. Ein dateiweites `when ODIN_OS == .Windows` wird samt `else` nach Zielen aufgeteilt, wenn es nur `ODIN_OS` und `ODIN_ARCH` vergleicht. `*_test.odin` und `#+ignore` entfallen. Gemeinsame Deklarationen erscheinen einmal, teilweise

verfügbare mit „Availability: Windows“. Verschiedene Signaturen erscheinen je Zielmenge; nur die erste erhält eine ID. Eingeschränkte Pakete nennen `:platform:`.

Erneuter Build

Jede gelesene Odin-Datei ist eine Seitenabhängigkeit. Nach Quelländerungen werden nur Seiten des betroffenen Pakets neu gelesen. Der Paketindex wird bei Hinzufügen, Entfernen oder geänderter Kurzbeschreibung erneuert. `guidedog serve` prüft vor HTML-Auslieferung die Änderungszeiten in `odin_autoapi_dirs` und `odin_collections`. Laden Sie nach Änderungen die Browserseite neu.

Grenzen

- Der Code wird nur geparkt, nicht kompiliert oder typgeprüft. Typen und Konstantenwerte erscheinen wie geschrieben; Werte über 100 Zeichen entfallen. Es gibt keine Inferenz. Bei `A :: B` entscheidet der Name: Ein groß beginnender, nicht vollständig großgeschriebener Name oder ein eingebauter Typ gilt als Typ.
- `when`-Bedingungen außer Vergleichen von `ODIN_OS` und `ODIN_ARCH` werden nicht ausgewertet; beide Zweige werden dokumentiert.
- Private Typen erscheinen als Text, da sie ohne `:private-members:` keine Einträge haben. Das generierte Paket nennt sie in `:private:`, sodass `-n` sie nicht meldet.
- `core:odin/parser` lehnt Prozeduren mit `#optional_ok` und einer `where`-Klausel ab. Die Datei wird gemeldet; lesbare Teile werden dennoch dokumentiert.
- Odins Parser braucht bei tiefer Verschachtelung viel Stack; einige hundert Klammern können einen Thread überfordern. Dateien weit jenseits realer Tiefe (etwa 50 Klammer- oder Typebenen oder tausend `else`-Glieder) entfallen mit `odin.autodoc.nesting`. Der Rest wird dokumentiert. `when` wertet `&&`, `||` und `!` bis 64 Ebenen aus; längere Bedingungen gelten als unausgewertet.

Praktische Aufgaben

Jede Seite beginnt mit einer konkreten Aufgabe und nennt Befehl und Ergebnis.

Guidedog bauen und installieren

Unter macOS mit Homebrew installieren

Verwenden Sie auf Macs mit Apple Silicon oder Intel den offiziellen Tap `insanai/homebrew-guidedog`:

```
brew tap insanai/guidedog
brew install insanai/guidedog/guidedog
guidedog --version
```

Homebrew wählt das Release-Archiv für Ihren Prozessor und prüft dessen SHA-256. Das Paket enthält Typst, Graphviz und tree-sitter. Für HTML und PDF brauchen Sie weder einen Odin-Compiler noch eine Python-Umgebung oder eine separate Typst-Installation. Das Release setzt macOS 12 oder neuer voraus.

Erstellen Sie Ihr erstes Projekt mit [Das erste Projekt](#). So aktualisieren Sie eine installierte Version:

```
brew update
brew upgrade insanai/guidedog/guidedog
```

Prüfen Sie das installierte Paket mit `brew test insanai/guidedog/guidedog`. Der Test erstellt ein Projekt und erzeugt HTML und PDF.

Aus dem Quellcode bauen

Verwenden Sie die in `tools/odin-release.txt` festgelegte Odin-Werkzeugkette. Das Release nutzt Odin `dev-2026-10` und Typst `0.15.1`. Für den Build mit gemeinsam genutzten Bibliotheken sind die Graphviz-Entwicklungsbibliotheken nötig.

Entwicklungsbuild

Im Stammverzeichnis des Repositorys:

```
mkdir -p build
native/tree-sitter/build.sh
odin build cmd/guidedog -out:build/guidedog -o:speed -vet -strict-style
build/guidedog --version
build/guidedog formats
```

Der tree-sitter-Build liefert die festgelegte Python-Grammatik für quelltext-basiertes autodoc. Installieren Sie Graphviz-Entwicklungsdateien über die Paketverwaltung. Ohne Typst-Brücke verwendet der PDF-Build ein installiertes typst. Wählen Sie es bei Bedarf mit `--typst=/absolute/path/to/typst` aus.

Eingebetteter Compiler

Bauen Sie die nativen Abhängigkeiten einmal und linken Sie sie in das Odin-Programm:

```
cargo build --release --manifest-path native/typst_bridge/Cargo.toml
native/graphviz/build.sh
odin build cmd/guidedog -out:build/guidedog -o:speed \
  -define:GUIDEDOG_TYPST_BRIDGE=true -define:GRAPHDOG_STATIC=true
```

Die Typst-Brücke besteht aus Rust-Code außerhalb der allokatonsfreien Grenze von Guidedog. Ein eingebetteter Build muss kein separates Typst-Programm starten. Die eigenen Speicherkosten des Compilers bleiben jedoch bestehen.

Nennen Sie die Ausgabe unter Windows `build/guidedog.exe`. Nehmen Sie das Programm in `PATH` auf, um `guidedog` ohne Pfadangabe zu verwenden.

Dokumentation bauen und veröffentlichen

Bauen Sie in das normale Ausgabeverzeichnis des Projekts:

```
guidedog build html docs/manual -j auto -W
guidedog build pdf docs/manual -W
```

Die Website liegt in `docs/manual/_build/html`. PDF und erzeugter Typst-Quelltext liegen in `docs/manual/_build/pdf`. Ein Webserver kann das HTML-Verzeichnis statisch ausliefern. Ein Odin-Server ist im Betrieb nicht erforderlich.

Das Ausgabeverzeichnis wählen

Der Aufruf im Sphinx-Stil nennt Quelle und Ziel ausdrücklich:

```
guidedog build -b html docs/manual build/manual-site -W
```

Halten Sie Ausgaben außerhalb der Quellen. Guidedog verweigert einen Aufbau, bei dem die Veröffentlichung den Quellbaum ersetzen würde. Eigene Ziele nutzen einen stabilen benachbarten Cache wie `build/.manual-site.guidedog/.doctrees`. Im Ausgabeverzeichnis liegt daher nur die Veröffentlichung.

Vorschau und Prüfung

```
guidedog serve docs/manual
guidedog build dummy docs/manual -n -W
```

Der Dummy-Builder liest das Projekt und löst Referenzen auf, ohne eine Veröffentlichung zu erzeugen. Er eignet sich für eine schnelle semantische Prüfung, nicht für das endgültige Seitenlayout.

Ein reproduzierbarer Zeitpunkt

```
SOURCE_DATE_EPOCH=1790812800 guidedog build html docs/manual -W
```


Damit wird die Build-Zeit festgelegt. Reproduzierbarkeit hängt auch von Quellen, Vorlagen, Schriften, Compilerversionen und Ressourcen ab. Eine feste Uhrzeit allein genügt nicht.

Veröffentlichen Sie das vollständige Verzeichnis nach erfolgreichem Build. Ein erfolgreicher Prozessabschluss ist notwendig. Nach Vorlagenänderungen bleibt eine Sichtprüfung erforderlich.

Ein Sphinx-Projekt migrieren

Guidedog folgt dem Projektaufbau von Sphinx und vielen seiner Einstellungsnamen. `conf.py` und Python-Erweiterungen werden nicht ausgeführt. Die Migration beginnt damit, Daten von ausführbarer Konfiguration zu trennen.

```
guidedog migrate path/to/conf.py
guidedog build html path/to/docs --diagnostics=json
```

`migrate` liest literale Einstellungen und schreibt `conf.toml`. Berechnete Werte, die eine menschliche Entscheidung erfordern, werden gemeldet. Es importiert das Projekt nicht und führt kein Python aus. Prüfen Sie das Ergebnis, bevor Sie es als gleichwertig behandeln.

In drei Schritten vorgehen

1. Korrigieren Sie den Dokumentgraphen. Prüfen Sie Wurzel, Suffixe, Ausschlüsse und Includes.
2. Korrigieren Sie die Verweise. Prüfen Sie Domänen, Inventare und eigene Objekttypen.
3. Korrigieren Sie die Darstellung. Prüfen Sie Vorlagen, Diagramme, Mathematik und beide Ausgaben.

Eine unbekannte Direktive kann aus einer projektspezifischen Erweiterung stammen. Ein erfolgreicher HTML-Build beweist nicht, dass deren Semantik nachgebildet wurde. Lesen Sie die Diagnosen. Entscheiden Sie dann zwischen Ersatz, unterstütztem Alias oder einer dokumentierten Einschränkung.

Unterstützte Funktionen und Nachweise zu CPython, Django und Flask stehen in [Kompatibilität mit Sphinx](#). Deklarative eigene Objekte beschreibt [Objekttypen deklarieren](#).

Eine Codebasis dokumentieren

Ein öffentlicher Name braucht einen Vertrag. Erklären Sie Eingabe, Ergebnis, Eigentümerschaft und Fehlerbedingungen. Eine Signatur allein ist kein Handbuch.

Odin

```
odin_autoapi_dirs = ["../lib"]
odin_autoapi_root = "api"
odin_autoapi_options = ["members", "undoc-members"]
```

Guidedog liest Odin-Quelltext mit dem Odin-Parser. Das dokumentierte Paket wird weder kompiliert noch ausgeführt. Generierte Seiten werden Teil des

Dokumentgraphen und Objektinventars. Das getrennte API-Projekt liegt in `docs/api`. Direktiven, Signaturen und Optionen stehen in [Odin dokumentieren](#).

Python

```
extensions = ["sphinx.ext.autodoc"]
autodoc_source_paths = ["../src"]
```

Guidedog parst Python-Quelltext, statt ihn zu importieren. Das vermeidet Import-Nebenwirkungen. Zur Laufzeit erzeugte Objekte können jedoch fehlen. Beschreiben Sie diese ausdrücklich, falls sie zur öffentlichen Schnittstelle gehören. Die genauen Erkennungsregeln stehen in [Python mit autodoc dokumentieren](#).

Projekte verknüpfen

Veröffentlichen Sie das erzeugte `objects.inv` mit der Website. Andere Projekte können Namen dann über intersphinx-Zuordnungen auflösen. Verwenden Sie für reproduzierbare Builds explizite Zuordnungen. Siehe [Auf andere Projekte verweisen](#).

Diese Dokumentation pflegen

Es gibt drei Guidedog-Projekte: `docs/manual`, `docs/api` und `docs/gds`. Handbuch und GDS wurden mit `guidedog quickstart` angelegt. Bearbeiten Sie deren erzeugte Vorlagen direkt. Designaufzeichnungen gehören nicht ins Inhaltsverzeichnis des Handbuchs.

Das Handbuch bauen

Im Stammverzeichnis des Repositorys:

```
build/guidedog build html docs/manual -j auto -W
build/guidedog build pdf docs/manual -W
build/guidedog serve docs/manual
```

Das Handbuch enthält die vollständige Odin-API-Referenz im Inhaltsverzeichnis. Der PDF-Befehl erzeugt ein Buch mit Links zwischen Erläuterungen und Deklarationen. Handbuch und getrenntes API-Projekt generieren die Referenz aus `lib/`. Eine kopierte API-Vorlage muss nicht synchron gehalten werden.

Um das API-Projekt separat zu bauen:

```
build/guidedog build html docs/api -W
build/guidedog build pdf docs/api -W
```

Diskussionen bauen und prüfen

```
build/guidedog gds index
build/guidedog gds check
build/guidedog gds build --target=both
```

Die GDS-CLI verwaltet Metadaten, Nummern, Zustand und Wiederherstellung. Die RST-Veröffentlichung ruft die Projektengine auf und erzeugt die vollständige HTML-Website sowie ein PDF je Aufzeichnung. Ein Selektor begrenzt nur die PDFs. HTML bleibt eine zusammenhängende Website mit vollständigem Katalog.

Eine ausgewählte PDF-Vorschau nutzt `_build/selected/<artifact>/pdf` und lässt den Katalog in `_build/pdf` bestehen.

```
build/guidedog gds build guidedoc-odin --target=pdf
build/guidedog build html docs/gds -W
build/guidedog build pdf docs/gds -W
```

Die normalen Projektbefehle funktionieren ebenfalls. Das GDS-Projekt verwendet sein eigenes `conf.toml` und `_build`. Der Arbeitsablauf steht in `docs/gds/workflow.rst`.

Vor der Veröffentlichung

Prüfen Sie Links, Diagnosen, breite Tabellen und Codeblöcke. Rendern Sie nach Typografieänderungen die PDF-Seiten. Testen Sie HTML bei Desktop- und Handbreite sowie im hellen und dunklen Modus. Formeln und Diagramme müssen offline funktionieren. Bei Engineänderungen sind die passenden Bibliotheks- und Integrationstests auszuführen.

Referenz

Diese Seiten beschreiben die Verträge zum Nachschlagen und Durchsuchen. Für ein erstes Beispiel beginnen Sie mit einem Tutorial.

Kommandozeilenreferenz

Mit `guidedog` lassen sich Dokumentationsprojekte über die Kommandozeile verwalten, bauen, ansehen, übersetzen und konvertieren.

Allgemeine Syntax

```
guidedog <command> [arguments] [options]
guidedog --version
guidedog --help
```

Exitcodes

Tabelle 6 Exitstatus

Exitcode	Bedingung
0	Erfolg: Alle Vorgänge sind abgeschlossen; es gibt keine unbehandelten Fehler.
1	Build- oder Konvertierungsfehler; auch Warnungen, die durch <code>-w</code> als Fehler gelten.
2	Fehler in der Kommandozeilensyntax oder unbekannte Option.
3	Eine Ressourcengrenze wurde erreicht oder Speicher war nicht verfügbar.
4	Ein Dateivorgang oder externer Compiler ist fehlgeschlagen.
5	Interner Fehler; die Diagnose erläutert die Meldung.
70	Absturz; die vorherige Veröffentlichung bleibt verfügbar.

Befehlsübersicht

Tabelle 7 CLI-Befehle

Befehl	Aufgabe
<code>quickstart [DIR]</code>	Legt ein Dokumentationsprojekt mit direkt bearbeitbaren Vorlagen und Einstellungen an.
<code>build [BUILDER] [DIR]</code>	Baut das Dokumentationsprojekt im gewünschten Ausgabeformat.
<code>serve [DIR]</code>	Startet einen lokalen HTTP-Vorschauserver, der bei Dateiänderungen neu baut.
<code>clean [DIR]</code>	Entfernt erzeugte Dateien und Caches.
<code>convert INPUT</code>	Konvertiert eine einzelne Datei oder die Standardeingabe direkt.
<code>migrate [conf.py]</code>	Überträgt Sphinx-Konfigurationen aus <code>conf.py</code> in deklaratives <code>conf.toml</code> .
<code>intl <update stat></code>	Aktualisiert PO-Kataloge oder zeigt den Übersetzungsstand.
<code>formats</code>	Listet eingebaute Reader, Renderer und Angaben zur Formatkonformität auf.
<code>gds <COMMAND></code>	Verwaltet die Entwurfsunterlagen von Guidedog Discussions und ihren Lebenszyklus.

guidedog quickstart

Legt einen Projektordner mit `conf.toml`, `index.rst`, Vorlagen in `_templates/` und Stilen in `_static/` an:

```
# Interactive prompt
guidedog quickstart docs

# Non-interactive creation with predefined options
guidedog quickstart docs -q -p "My Project" -a "Author Name" -v 1.0 -l en
```

Optionen:

- `-q`: Überspringt interaktive Fragen und verwendet die Kommandozeilenwerte.
- `-p, --project NAME`: Legt den angezeigten Projektnamen fest.
- `-a, --author NAME`: Legt den Namen des Autors oder der Organisation fest.
- `-v VERSION`: Legt die Kurzversion fest, etwa `1.0`.
- `-r RELEASE`: Legt die vollständige Releasekennung fest, etwa `1.0.0-rc1`.
- `-l LANGUAGE`: Legt die Projektsprache fest; Standard ist `en`.
- `--sep`: Legt getrennte Ordner `source/` und `build/` an.
- `--suffix EXT`: Legt die Dateiendung der Quelldokumente fest; Standard ist `.rst`.

guidedog build

Koordiniert das Lesen, das Auflösen von Inhaltsbäumen und Querverweisen sowie die Ausgabe:

```
# Standard project build
guidedog build html docs
guidedog build pdf docs
```

```
# Sphinx-build compatibility syntax
guidedog build -b html docs _build/html
guidedog build -M html docs _build
```

Unterstützte Builder:

- `html`: Erzeugt eine HTML-Website mit Suche und Navigation.
- `dirhtml`: Erzeugt Verzeichnis-URLs wie `dir/index.html`.
- `singlehtml`: Fasst alle Dokumente auf einer HTML-Seite zusammen.
- `pdf`: Setzt PDF-Bücher mit Typst; Aliase sind `latex` und `latexpdf`.
- `text`: Erzeugt eine Textdatei je Dokument.
- `gettext`: Extrahiert übersetzbare Texte in GNU-gettext-POT-Vorlagen.
- `dummy`: Analysiert Dokumentbäume und löst Verweise auf, ohne Ausgabedateien zu schreiben.

Buildoptionen:

- `-a`: Schreibt alle Ausgabedateien unabhängig vom Änderungszeitpunkt.
- `-E`: Baut die Umgebung ohne zwischengespeicherten Zustand neu auf.
- `-W`: Lässt den Build bei Warnungen fehlschlagen.
- `--keep-going`: Verarbeitet mit `-W` auch die übrigen Dokumente und meldet alle Fehler vor dem Beenden.
- `-n`: Warnt bei allen unaufgelösten Querverweisen.
- `-j N` / `-j auto`: Legt die Parserthreads fest; `auto` entspricht der Zahl der CPU-Kerne.
- `-D name=value`: Überschreibt eine Einstellung aus `conf.toml` für diesen Aufruf, etwa `-D language=de`.
- `-D table.key=value`: Setzt einen Schlüssel einer Tabelleneinstellung wie `html_context` und behält die übrigen Schlüssel, wie `sphinx-build`.
- `-t TAG`: Definiert ein Tag für `only`-Direktiven.
- `-c DIR`: Gibt den Ordner mit `conf.toml` an.
- `-C`: Baut, ohne eine `conf.toml` zu laden.
- `-v`: Zeigt zusätzliche Hinweise und Zeitstatistiken an.
- `-q`: Zeigt nur Warnungen und Fehler.
- `--color=always|never|auto`: Steuert die ANSI-Farbausgabe im Terminal.
- `--diagnostics=json`: Schreibt maschinenlesbare JSON-Diagnosen auf die Standardfehlerausgabe.
- `--budget=MiB`: Begrenzt den vom Projekthost gehaltenen Speicher; Standard sind 1024 MiB.
- `--memory=ram|disk`: Bestimmt das Verhalten beim Ausschöpfen des Speicherbudgets.
- `--untrusted`: Lässt eingebettetes Rohmarkup aus und deaktiviert Netzwerkabrufe. Das ist eine Fähigkeitsrichtlinie, keine Prozesssandbox.

guidedog serve

Startet einen lokalen HTTP-Server mit Dateiüberwachung. Änderungen an Quellen, Vorlagen oder Assets lösen einen Neubau und das Neuladen des Browsers aus:

```
# Serve current project on default port (8000)
```

```
guidedog serve docs

# Serve on custom port and host
guidedog serve docs --port 9000 --host 0.0.0.0
```

Optionen:

- `-p`, `--port` PORT: Lokaler Port; Standard ist 8000.
- `--host` HOST: IP-Adresse zum Binden; Standard ist 127.0.0.1.

guidedog clean

Löscht den Buildordner und den gespeicherten Umgebungszustand:

```
guidedog clean docs
```

guidedog convert

Konvertiert Dateien oder die Standardeingabe ohne Projektordner oder Konfiguration:

```
# Convert reStructuredText to HTML
guidedog convert guide.rst --output guide.html

# Convert Markdown to PDF
guidedog convert guide.md --to pdf --output guide.pdf

# Stream conversion from standard input to standard output
cat document.md | guidedog convert - --from commonmark --to html --output -
```

Optionen:

- `-o`, `--output` FILE: Ausgabepfad; `-` bedeutet Standardausgabe.
- `--to` FORMAT: Zielformat: `html`, `pdf` oder `text`; wird auch aus dem Dateinamen abgeleitet.
- `--from` FORMAT: Quellreader: `rst`, `commonmark`, `myst` oder `typst`; wird auch aus der Endung abgeleitet.
- `--force`: Überschreibt vorhandene Ausgabedateien ohne Rückfrage.
- `--strict`: Schlägt bei jeder Warnung fehl.
- `--raw=allow|omit`: Regelt eingebetteten Rohcode; Standard ist `omit`.
- `--emit-typst` FILE: Schreibt den erzeugten Typst-Zwischencode in eine separate Datei.

guidedog migrate

Überträgt Sphinx-Einstellungen aus `conf.py` in deklaratives `conf.toml`:

```
# Convert conf.py in-place
guidedog migrate docs/conf.py

# Output to a specific file
guidedog migrate docs/conf.py -o docs/conf.toml --force
```

Optionen:

- `-o` FILE: Schreibt in den angegebenen Pfad; `-` verwendet die Standardausgabe.
- `--force`: Überschreibt vorhandene `conf.toml`-Dateien.

guidedog intl

Verwaltet Übersetzungskataloge für mehrsprachige Dokumentation:

```
# Step 1: Extract POT templates
guidedog build gettext docs

# Step 2: Create or update language PO catalogs
guidedog intl update -l de -l fr docs

# Check translation completion percentages
guidedog intl stat -l de docs
```

Optionen für intl update:

- `-l`, `--language LANG`: Zielsprachencode; kann mehrfach angegeben werden.
- `-p`, `--pot-dir DIR`: Pfad zu den extrahierten POT-Vorlagen.

guidedog formats

Zeigt eingebaute Reader, Renderer, Syntaxlexer und die Ergebnisse der Konformitätstests:

```
guidedog formats
```

guidedog gds

Verwaltet Architekturvorschläge (RFCs) von Guidedog Discussions:

```
guidedog gds new "Feature Title" --author="Name"
guidedog gds list --state=prediscussion
guidedog gds show 0003
guidedog gds promote 0003 --dry-run
guidedog gds state 0003 --to=accepted --reason="Consensus reached"
guidedog gds index
guidedog gds check --render
guidedog gds recover --rollback
```

Konfigurationsreferenz

Jedes Projekt verwendet `conf.toml` im Stammordner. Guidedog liest deklarative TOML-Daten und führt keinen beliebigen Konfigurationscode aus.

Viele Schlüssel entsprechen Sphinx-Variablen aus `conf.py`. Das erleichtert die Migration mit `guidedog migrate conf.py`.

Minimale Konfiguration

Grundlegende Metadaten genügen. Für ausgelassene Schlüssel gelten Standardwerte:

```
project = "Field Notes"
author = "Your Name"
version = "1.0"
release = "1.0.0"
language = "en"
root_doc = "index"
source_suffix = [".rst", ".md"]
templates_path = ["_templates"]
html_static_path = ["_static"]
pdf_paper_size = "a4"
```

Projektmetadaten

Tabelle 8 Metadatenoptionen

Schlüssel	Typ	Standard	Beschreibung
<code>project</code>	Zeichenkette	<code>"Python"</code>	Angezeigter Name des Projekts.
<code>author</code>	Zeichenkette	<code>" "</code>	Name des Autors oder der Organisation.
<code>copyright</code>	Zeichenkette	<code>" "</code>	Urheberrechtsangabe im Seitenfuß.
<code>version</code>	Zeichenkette	<code>" "</code>	Kurzversion, etwa <code>"1.0"</code> .
<code>release</code>	Zeichenkette	<code>" "</code>	Vollständige Version einschließlich Alpha- oder Beta-Kennung, etwa <code>"1.0.0b1"</code> .
<code>language</code>	Zeichenkette	<code>"en"</code>	ISO-Sprachcode für Satz, Silbentrennung und Übersetzung, etwa <code>"de"</code> oder <code>"zh_CN"</code> .
<code>today</code>	Zeichenkette	<code>" "</code>	Eigener Datumstext; sonst wird das aktuelle Datum mit <code>today_fmt</code> formatiert.
<code>today_fmt</code>	Zeichenkette	<code>" "</code>	Formatstring für Dokumentdaten.

Allgemeine Optionen

Tabelle 9 Optionen zur Erkennung und Analyse

Schlüssel	Typ	Standard	Beschreibung
root_doc	Zeichenkette	"index"	Dokument für das Wurzelinhaltsverzeichnis.
source_suffix	Array	[".rst"]	Als Dokumentquellen erkannte Dateiendungen.
exclude_patterns	Array	[]	Glob-Muster für Dateien und Ordner, die bei der Quellsuche ausgelassen werden.
include_roots	Array	[]	Erlaubte externe Stammordner für Quelldateien.
templates_path	Array	[]	Ordner mit HTML- und PDF-Vorlagen; werden vor eingebauten Vorlagen durchsucht.
extensions	Array	[]	Zu aktivierende, nativ implementierte Sphinx-Erweiterungen, etwa "sphinx.ext.autodoc".
primary_domain	Zeichenkette	"py"	Standarddomäne für Direktiven und Rollen ohne Präfix, etwa "py", "c" oder "odin".
highlight_language	Zeichenkette	"default"	Standardsprache für Codeblöcke ohne Sprachangabe.
pygments_style	Zeichenkette	""	Pygments-Hervorhebungsstil für das helle Thema.
pygments_dark_style	Zeichenkette	""	Syntaxhervorhebung für das dunkle Thema.
smartquotes	Boolescher Wert	true	Wandelt gerade Anführungszeichen und Striche in typografische Zeichen um.
rst_prolog	Zeichenkette	""	reStructuredText-Fragment vor jedem Dokument.
rst_epilog	Zeichenkette	""	reStructuredText-Fragment nach jedem Dokument.

Nummerierung und Mathematik

Tabelle 10 Nummerierungsoptionen

Schlüssel	Typ	Standard	Beschreibung
<code>numfig</code>	Boolescher Wert	<code>false</code>	Nummeriert Abbildungen, Tabellen und Codeblöcke automatisch.
<code>numfig_secnum_depth</code>	Ganzzahl	<code>1</code>	Gliederungstiefe in Abbildungsnummern; <code>1</code> ergibt etwa Fig. 2.1.
<code>numfig_format</code>	Tabelle	siehe unten	Nummernpräfixe für <code>"figure"</code> , <code>"table"</code> und <code>"code-block"</code> .
<code>math_number_all</code>	Boolescher Wert	<code>false</code>	Nummeriert alle abgesetzten Gleichungen automatisch.
<code>math_eqref_format</code>	Zeichenkette	<code>"({number})"</code>	Format für Gleichungsverweise mit <code>:eq:</code> .
<code>mathjax_path</code>	Zeichenkette	URL	CDN-Adresse oder lokaler Pfad des MathJax-JavaScript-Pakets.

Standardwerte für `numfig_format`:

```
[numfig_format]
figure = "Fig. %s"
table = "Table %s"
code-block = "Listing %s"
section = "Section %s"
```

Diagnosen und strenge Prüfung

Tabelle 11 Diagnoseoptionen

Schlüssel	Typ	Standard	Beschreibung
<code>nitpicky</code>	Boolescher Wert	<code>false</code>	Warnt bei unaufgelösten Querverweisen und ungültigen Zielen.
<code>nitpick_ignore</code>	Array	<code>[]</code>	Array aus <code>[type, target]</code> -Paaren, die von strengen Warnungen ausgenommen sind.
<code>suppress_warnings</code>	Array	<code>[]</code>	Codes der zu unterdrückenden Warnungskategorien.
<code>keep_warnings</code>	Boolescher Wert	<code>false</code>	Nimmt Warnungen in die veröffentlichten Dokumente auf.

HTML-Ausgabeoptionen

Tabelle 12 HTML-Optionen

Schlüssel	Typ	Standard	Beschreibung
html_theme	Zeichenkette	"guidedog"	Thema für die HTML-Ausgabe.
html_theme_options	Tabelle	{}	Schlüssel-Wert-Optionen für das HTML-Thema.
html_title	Zeichenkette	abgeleitet	Titel im Browserreiter.
html_short_title	Zeichenkette	abgeleitet	Kurztitel für die Navigationspfade.
html_logo	Zeichenkette	" "	Logopfad relativ zum Quellordner.
html_favicon	Zeichenkette	" "	Pfad zur Favicon-Datei.
html_static_path	Array	[]	Ordner, die in das ausgegebene <code>_static/</code> kopiert werden.
html_extra_path	Array	[]	Ordner, die unverändert in die Ausgabewurzel kopiert werden.
html_css_files	Array	[]	Zusätzliche CSS-Dateien, die HTML-Seiten laden.
html_js_files	Array	[]	Zusätzliche JavaScript-Dateien, die HTML-Seiten laden.
html_permaLinks	Boolescher Wert	true	Fügt Absätzen und Abschnitten dauerhafte Links hinzu.
html_permaLinks_icon	Zeichenkette	"¶"	Zeichen oder Text für dauerhafte Links.
html_baseurl	Zeichenkette	" "	Kanonische Basis-URL für Site-maps und Metadaten.
html_context	Tabelle	{}	Wörterbuch zusätzlicher Variablen für Jinja-Vorlagen.
html_additional_pages	Tabelle	{}	Zusätzliche Seiten: { "page_name" = <code>template.html</code> }

PDF- und Typst-Optionen

Tabelle 13 PDF-Optionen

Schlüssel	Typ	Standard	Beschreibung
pdf_paper_size	Zeichenkette	"a4"	Papierformat: "a4" oder "us-letter".
pdf_logo	Zeichenkette	" "	Logopfad für die Titelseite.
pdf_toplevel_sectioning	Zeichenkette	"chapter"	Oberste Buchgliederung: "chapter" oder "part".
pdf_show_urls	Zeichenkette	"no"	URL-Anzeige im Druck: "no", "inline" oder "footnote".
pdf_preamble	Zeichenkette	" "	Typst-Rohcode für den erzeugten Dokumentvorspann.
pdf_font_paths	Array	[]	Zusätzliche Suchordner für OTF-/TTF-Schriften.
pdf_packages	Zeichenkette	"download"	Strategie zur Paketauflösung: "download" oder "offline".
typst	Zeichenkette	"typst"	Programmname oder absoluter Pfad zur Typst-CLI.

PDF-Bücher definieren

Die Tabelle `[[pdf_documents]]` definiert ein oder mehrere Bücher des Projekts:

```
[[pdf_documents]]
root = "index"
file = "guide.pdf"
title = "Field Notes Complete Guide"
author = "Author Name"

[[pdf_documents]]
root = "reference/index"
file = "reference.pdf"
title = "Field Notes Reference"
author = "Author Name"
```

MyST-Markdown-Optionen

Tabelle 14 MyST-Markdown-Optionen

Schlüssel	Typ	Standard	Beschreibung
<code>myst_enable_extensions</code>	Array	<code>["dollarmath"]</code>	Syntaxerweiterungen: "colon_fence", "deflist", "dollarmath", "fieldlist", "tasklist", "substitution".
<code>myst_heading_anchors</code>	Ganzzahl	<code>0</code>	Gliederungstiefe für automatische Titellanker; 0 deaktiviert sie.
<code>myst_substitutions</code>	Tabelle	<code>{}</code>	Variablenersetzungen in Markdown: <code>{key = "value"}</code> .
<code>myst_url_schemes</code>	Array	<code>["http", ...]</code>	Als externe Links erkannte URI-Schemata.
<code>myst_commonmark_only</code>	Boolescher Wert	<code>false</code>	Beschränkt den Parser auf CommonMark ohne MyST-Erweiterungen.

Intersphinx-Optionen

```

extensions = ["sphinx.ext.intersphinx"]
intersphinx_cache_limit = 5
intersphinx_timeout = 30

[intersphinx_mapping]
python = ["https://docs.python.org/3/", ""]
click = ["https://click.palletsprojects.com/", ["click.inv", ""]]

```

Den vollständigen Ablauf beschreibt [Auf andere Projekte verweisen](#).

Python-autodoc-Optionen

Tabelle 15 Autodoc-Optionen

Schlüssel	Typ	Standard	Beschreibung
<code>autodoc_source_paths</code>	Array	<code>[]</code>	Modulsuchpfade für die statische Python-Analyse.
<code>autoclass_content</code>	Zeichenkette	<code>"class"</code>	Quelle des Klassen-docstrings: "class", "init" oder "both".
<code>autodoc_member_order</code>	Zeichenkette	<code>"alphabetical"</code>	Mitgliederreihenfolge: "alphabetical", "bysource" oder "groupwise".
<code>autodoc_typehints</code>	Zeichenkette	<code>"signature"</code>	Position der Typhinweise: "signature", "description" oder "none".
<code>autodoc_default_options</code>	Tabelle	<code>{}</code>	Standardoptionen für alle <code>auto*</code> -Direktiven.

Die vollständigen Erkennungsregeln stehen in [Python mit autodoc dokumentieren](#).

Odin-API-Dokumentationsoptionen

Tabelle 16 Odin-Domänenoptionen

Schlüssel	Typ	Standard	Beschreibung
<code>odin_autoapi_dirs</code>	Array	<code>[]</code>	Quellordner für die Suche nach Odin-Paketen.
<code>odin_autoapi_root</code>	Zeichenkette	<code>"api"</code>	Ausgabeunterordner für erzeugte Odin-API-Dokumentation.
<code>odin_autoapi_options</code>	Array	<code>["members", "undoc-members"]</code>	Filter für einzuschließende Mitglieder.
<code>odin_autoapi_member_order</code>	Zeichenkette	<code>"source"</code>	Mitgliederreihenfolge: <code>"source"</code> oder <code>"alphabetical"</code> .

Die vollständige Verwendung der Odin-Domäne beschreibt [Odin dokumentieren](#).

Internationalisierungsoptionen

Tabelle 17 i18n-Optionen

Schlüssel	Typ	Standard	Beschreibung
<code>locale_dirs</code>	Array	<code>["locales"]</code>	Suchordner für gettext-Kataloge.
<code>gettext_compact</code>	Boolescher Wert	<code>true</code>	Fasst Dokumentmeldungen je Ordner in einem Katalog zusammen.
<code>gettext_uuid</code>	Boolescher Wert	<code>false</code>	Schreibt stabile UUIDs in POT-Meldungen.
<code>gettext_auto_build</code>	Boolescher Wert	<code>true</code>	Kompiliert <code>.po</code> beim Build in binäre <code>.mo</code> -Kataloge.
<code>figure_language_filename</code>	Zeichenkette	<code>"{root}.\n{language}\n{ext}"</code>	Dateinamenvorlage zur Auswahl lokalisierter Bilder.

Den Übersetzungsablauf beschreibt [Internationalisierung](#).

Reader, Renderer und Builder

Ein Reader versteht eine Quellsprache, ein Renderer schreibt einen Dokumentbaum, ein Builder koordiniert das Projekt und veröffentlicht die Ausgabe. Das sind verschiedene Aufgaben.

Tabelle 18 Verarbeitungswege

Eingabe	Reader	Weg
RST im Projekt	RST mit eingebauter Sphinx-Schicht	Vom Projektgraphen zu HTML, Typst/PDF, Text oder Katalogen.
Markdown im Projekt	MyST-kompatible Markdown-Schicht	Derselbe Projektgraph und dieselben Builder.
<code>convert file.md</code>	CommonMark als Vorgabe	Ein Dokument nach HTML oder Typst/PDF.
<code>convert file.typ</code>	Nativer Typst-Adapter	Typst-Kompilierung außerhalb des semantischen Baums von Guidedoc.

Builder

`html`

Eine HTML-Datei je Dokument, mit Indizes, Suche und Inventar.

`dirhtml`

Dokument-URLs im Verzeichnisstil.

`singlehtml`

Eine HTML-Hauptseite mit Dokumentabschnitten und lokalen Verweisen.

`pdf`

Vom Projekt definierte Typst-Bücher. LaTeX-Builder-Aliase wählen diesen Weg.

`text`

Textdateien für die Dokumente.

`gettext`

Nachrichtenvorlagen für Übersetzungen.

`dummy`

Liest und löst das Projekt auf, ohne ein Artefakt zu veröffentlichen.

Abdeckung ist ein Nachweis

`guidedog formats` zeigt die tatsächlich vorhandenen Adapter. Die Kompatibilitätsseite dokumentiert feste Testsuiten und reale Projekte. CommonMark-Erfolg beweist keine vollständige MyST-Abdeckung; RST-Lesen nicht das Verhalten aller Python-Erweiterungen. Siehe [Kompatibilität mit Sphinx](#).

Fehlermeldungen

Eine Diagnose soll das Problem benennen, seinen Ort zeigen und einen hilfreichen nächsten Schritt nennen. Guidedog speichert diese Angaben als strukturierte Daten. Das Terminal ergänzt Farben und Quellmarkierungen. JSON enthält die Daten ohne Terminalgestaltung.

Diagnosen lesen

```

UNDEFINED SUBSTITUTION                                rst.substitution.undefined

guide/page.rst:4: See |logo| here.
                   ^^^^^^

The substitution "|logo|" is not defined.
No output was written.

Add a definition, e.g. ".. |name| replace:: text".

```

Eine Diagnose hat vier Teile, stets in dieser Reihenfolge:

1. **Die Titelzeile.** Der Titel nennt die Problemart in Großbuchstaben; Warnungen und Hinweise beginnen mit `WARNING:` und `NOTE:`. Rechts steht der Diagnosecode, etwa `rst.substitution.undefined`: ein stabiler Name für die Suche.
2. **Der Ort.** Datei und Zeile, die Quellzeile selbst und eine Markierung unter der betroffenen Stelle. Probleme ohne bestimmte Zeile, etwa ein fehlender Ordner oder eine Option, zeigen nur den Pfad oder keine Ortsangabe.
3. **Was passiert ist.** Die Erklärung und bei Bedarf die Folge für die Ausgabe: hier, dass nichts geschrieben wurde.
4. **Was zu tun ist.** Der Hinweis erscheint im Farbterminal grün und nennt eine konkrete Handlung. Bei mehreren Lösungen wird die wahrscheinlichste zuerst genannt.

Farben unterstreichen nur, was der Text bereits sagt. `--color=never` schaltet sie ab, `--color=always` behält sie auch außerhalb eines Terminals bei.

Jeder Hinweis zeigt einen nächsten Schritt

Guidedog verlangt dies auch von eigenen Meldungen: Ein Hinweis beginnt mit einer Handlung („Add“, „Pass“, „Set“, „Rename“, „Run“) und nennt deren Ziel, etwa `--budget=MIB`, `root_doc` in `conf.toml` oder eine Direktivenoption. `tests/hints_test.odin` prüft alle möglichen Meldungen und verwirft leere Hinweise, Wiederholungen sowie „report this“ ohne benötigte Angaben. Zulässig sind auch Vorschläge, die die Korrektur benennen („Did you mean numfig?“), und handlungsfreie Anmerkungen mit „Nothing to do:“ samt Begründung.

Liegt der Fehler bei Guidedog, sagt der Hinweis dies ausdrücklich und bittet um eine Meldung mit Befehl, auslösendem Input und Ausgabe von `guidedog --version`.

Diagnosen für Programme

`--diagnostics=json` schreibt jeden Bericht als ein JSON-Objekt je Zeile auf die Standardfehlerausgabe, für Editoren und kontinuierliche Integration:

```

{"schema":1,"code":"rst.substitution.undefined","severity":"error",
 "title":"UNDEFINED SUBSTITUTION","message":"The substitution \"|logo|\" is not
 defined.",
 "hint":"Add a definition, e.g. \".. |name| replace:: text\".", "path":"guide/
 page.rst",
 "line":4,"column":5,"end_line":4,"end_column":11,"source":"See |logo| here.",
 "category":""}

```

Hier ist die Ausgabe umbrochen; jedes Objekt steht tatsächlich in einer Zeile. `schema` bezeichnet die Formatversion und ändert sich nur mit den Feldern.

Prüfen Sie sie zuerst. Spalten zählen Unicode-Skalare ab 1, keine Bytes oder Terminalzellen. `source` enthält die ganze ursprüngliche Zeile. Das Terminal zeigt einen begrenzten Ausschnitt und richtet den Marker nach dem Escapen von Steuerzeichen und Messen breiter Zeichen aus. `category` ist die Kategorie aus `suppress_warnings` oder leer.

Wenn der Speicher nicht reicht

Speichermangel führt ebenfalls zu einer Diagnose, nie zu einem Absturz. Es gibt zwei Fälle:

host.budget (SPEICHERBUDGET ERREICHT)

Der Build erreicht sein Speicherbudget (`--budget=MIB`, Standard 1 GiB). Der Bericht nennt den Schritt und bei Vorlagen die anfordernde Zeile. Im Terminal fragt er einmal: Budget erhöhen, Arbeitsspeicher auf Platte verwenden oder stoppen. Andernfalls stoppt er. `--budget` oder `--memory=disk` legt die Wahl vorab fest. Der Hinweis nennt dasselbe Budget als Zahl, etwa:

```
Build again with --budget=256, or with --memory=disk to keep working memory
on
disk (slower); or split the work into smaller files.
```

Der Vorschlag umfasst den belegten Speicher plus das Vierfache der abgelehnten Anforderung (der Schritt hält auch Ausgabe und Schreibkopie) oder das doppelte alte Budget, je nachdem, was größer ist. Er wird auf 64 MiB aufgerundet. Passt der Schritt in den freien Speicher, überschreitet er diesen nicht. Andernfalls nennt der Hinweis das und empfiehlt zuerst `--memory=disk`:

```
Build again with --memory=disk to keep working memory on disk (slower):
the step
needs a budget of about 1408 MiB, more than the 900 MiB this machine has
free. Or
free that memory and build with --budget=1408, or split the document.
```

host.memory (SPEICHER ERSCHÖPFT)

Das System verweigert eine vom Budget erlaubte Anforderung. Der Befehl stoppt ohne diesen Speicher: Ein Build veröffentlicht nichts, eine GDS-Änderung erfolgt ganz oder gar nicht, `convert` schreibt eine ganze Seite oder keine. Geben Sie Speicher frei oder verringern Sie die Threads (`-j 1`) und wiederholen Sie den Befehl. Nach dem Veröffentlichungsbeschluss braucht der Ausgabewechsel keinen Speicher; eine Ablehnung kann ihn nicht halbwegs stoppen. Fehlt Speicher zur Planung einer früheren offenen Veröffentlichung, bleibt sie für den nächsten Build bestehen.

Beide enden mit Status 3.

Exit-Status

Jeder Befehl endet mit einem dieser Statuswerte, damit Skripte Fehlerarten unterscheiden können:

Sta- tus	Bedeutung
0	Erfolg. Die Ausgabe wurde geschrieben und bei einem Build veröffentlicht.

Sta- tus	Bedeutung
1	Problem im Input: Dokumentfehler, Ablehnung durch Richtlinien (Raw-Inhalt ohne <code>--raw</code>), unlesbares Dokument oder eine durch <code>-w</code> bzw. <code>--strict</code> als Fehler behandelte Warnung.
2	Falscher Befehlsaufruf: unbekannte Option oder unbekannter Befehl, fehlender oder ungültiger Wert oder ungültige Einstellung in <code>conf.toml</code> bzw. <code>-D</code> .
3	Eine Grenze wurde erreicht: Speicherbudget (<code>--budget</code>), Verschachtelungstiefe (<code>--max-depth</code>), Knotenzahl (<code>--max-nodes</code>), Stack (<code>--stack-kib</code>), zu große Quelle oder fehlender Systemspeicher.
4	Eine Datei oder ein externes Programm ist fehlgeschlagen: nicht lesbarer oder beschreibbarer Pfad, während des Lesens geänderte Datei oder Typst, das nicht startet oder beendet wird.
5	Guidedog ist intern fehlgeschlagen; die Diagnose bittet um eine Fehlermeldung.
70	Bei einem Absturz zeigt Guidedog <code>GUIDEDOG CRASHED (internal error)</code> , den Befehl, den Fehler und die Ausgabe von <code>guidedog --version</code> . Als Meldestelle nennt es den Issue-Tracker des Builds oder dessen Anbieter. Da erst am Ende veröffentlicht wird, bleibt die vorherige Ausgabe erhalten.
130	Der Befehl wurde mit Strg+C unterbrochen; veröffentlichte Dateien blieben unverändert.

Ein aus beliebigem Grund fehlgeschlagener Build belässt die vorige Ausgabe und die Build-Aufzeichnungen unverändert. Beheben Sie das Problem und bauen Sie erneut.

Kompatibilität mit Sphinx

Guidedog folgt Sphinx, wo dies die Projektmigration erleichtert, und prüft die Kompatibilität für jede Funktion. Python-Konfiguration und beliebige Python-Erweiterungen werden nicht ausgeführt. **Ein erfolgreicher Build belegt einen erfolgreichen Build, keine vollständige Gleichwertigkeit.**

Projekte und Veröffentlichung

Tabelle 20 Projektoperationen

Operation	Implementiertes Verhalten
Projektstruktur und Build-Optionen	Quell- und Ausgabeverzeichnisse im Sphinx-Stil; <code>-a -E -W -n -D -t -j -b -M -c -C</code> .
Konfiguration	TOML-Daten mit den vertrauten Sphinx-Namen. Die Migration wandelt Literale um und meldet berechnete Werte.
HTML-Builder	<code>html</code> , <code>dirhtml</code> und <code>singlehtml</code> . Anker in der Einzel-seite enthalten den Dokumentnamen.
Weitere Builder	<code>text</code> , <code>gettext</code> und <code>dummy</code> . <code>pdf</code> verwendet <code>Typst</code> ; <code>latex</code> und <code>latexpdf</code> wählen denselben Weg.
Vorlagen	Guidedogs Jinja-Implementierung, typisiertes <code>html_context</code> , Layout-Vererbung und zusätzliche Seiten.
Inkrementelle Builds	Änderungen an Quellen, Abhängigkeiten, Vorlagen, Konfiguration und Referenzsuchen machen die betroffene Ausgabe ungültig.
Veröffentlichung	Eine vollständige Generation. Bei einem fehlgeschlagenen Build bleibt die zuvor veröffentlichte Generation erhalten.

`-D` akzeptiert für boolesche Werte `true` und `false` oder 1 und 0. Ein Projekt mit `contents` ohne `index` kann `contents` unter Ausgabe einer Warnung als Wurzel verwenden. Zusätzliche Vorlagenseiten liegen auch bei `dirhtml` als Dateien im Site-Stamm. Der genaue Vertrag steht in [Vorlagen](#).

Unveränderte Seiten melden ihre Diagnosen erneut. Damit bedeutet `-w` bei einem sauberen und einem unveränderten Build dasselbe. Die Seite eines gelöschten Dokuments wird entfernt. Die Veröffentlichung nutzt ein wiederherstellbares Journal. Der nächste Build bereinigt einen unterbrochenen Commit. Invariante und Plattformgrenzen stehen in [Eine vollständige Generation veröffentlichen](#).

Die Builder `epub`, `man`, `texinfo`, `linkcheck`, `doctest`, `coverage` und `changes` sind nicht verfügbar. Bei ihrer Angabe erscheint eine Korrekturhilfe. `tools/linkcheck` im Repository ist ein separates Prüfwerkzeug.

Quellformate

Tabelle 21 Konformitätsnachweise für festgelegte Versionen

Reader	Nachweise und Grenzen
<code>reStructuredText</code>	98 Korpusquellen stimmen mit den verglichenen Docutils-Bäumen und Kennungen überein. Quellpositionen und einige Verwaltungsattribute sind vom Vergleich ausgenommen.
<code>CommonMark 0.31.2</code>	Alle 652 Beispiele der Spezifikation bestehen.
<code>MyST 0.16.1 reference</code>	215 von 218 Reader-Testfällen und 8 von 10 Sphinx-Testbuilds stimmen überein. Die übrigen Unterschiede sind dokumentiert.

Diese Tests verwenden festgelegte Versionen und belegen keine Kompatibilität mit allen späteren Veröffentlichungen. `guidedog` `formats` zeigt die Nachweise für Reader und Renderer des Programms. Die Reader-Verzeichnisse enthalten weitere Konformitätshinweise.

`rst_prolog` folgt den anfänglichen bibliografischen Feldern, `rst_epilog` dem Quelltext. Beide werden nicht in Markdown eingefügt. `only` und `ifconfig` behalten ihre Abschnitte bei erfüllter Bedingung. Die Platzierung kann von Sphinx abweichen, wenn ein bedingter Abschnitt die umgebende Gliederungsebene ändert. Abschnittstitel in `MyST-eval-rst` sind Fehler.

Verweise und Domänen

Guidedog implementiert Toctrees, Labels, Glossare, Abschnitts- und Abbildungsnummern sowie Verweise mit `ref`, `doc`, `numref`, `term`, `download`, `any`, `keyword`, `option`, `envvar` und `token`. Objekte können in Toctrees, Seitenleisten und Seitenübersichten erscheinen.

Die Standard-, Python-, C-, C++-, JavaScript-, reStructuredText- und Mathematikdomänen sind implementiert. Die Odin-Domäne ist eine eigene Erweiterung von Guidedog für Pakete, Deklarationen, Signaturen und generierte API-Seiten. Quelltextbasierte Erkennung und Grenzen beschreibt [Odin dokumentieren](#).

Parameter-, Rückgabe-, Ausnahme- und Variablenfelder bilden strukturierte Beschreibungen. Kanonische Namen werden zu Aliasen für Verweise und Inventare. Python-Standardwerte und Annotationen behalten ihre Quellschreibweise; Sphinx kann sie durch Pythons Unparser neu ausgeben. C++-Deklarationen veröffentlichen Sphinx-kompatible Kennungsversionen und Symbolinventare. Verschachtelungsgrenzen gelten weiterhin. Verschachtelte Klammern werden in linearer Zeit geparkt.

`numref` ersetzt einen Nummernplatzhalter und meldet unnummerierte Ziele. Abschnitte werden in Lesereihenfolge nummeriert. Ein Dokument erhält nur einmal Nummern; ein zweiter nummerierter Toctree meldet den Konflikt. Formatersetzung und Kennungsdetails sind durch Referenztests belegt.

Allgemeiner Index, Modulindex und Suche sind eingebaut. Die Suche findet Wortpräfixe; Sphinx' englisches Stemming wird nicht nachgebildet.

Deklarative Objekttypen ersetzen eine nützliche Klasse von Registrierungen durch Python-Erweiterungen. `object_types`, `crossref_types` und `directive_aliases` beschreiben die Daten. Ein eigenes Python-`parse_node` wird durch deklarative Namens-, Anzeige- und Programmregeln ersetzt. Nicht darstellbarer Code wird bei der Migration gemeldet. Siehe [Objekttypen deklarieren](#).

Verhalten eingebauter Erweiterungen

Tabelle 22 Grenzen der Erweiterungen

Verhalten	Status
<code>todo</code> , <code>ifconfig</code> , <code>extlinks</code> , <code>autosectionlabel</code>	Eingebaut. Für fest eingetragene <code>extlinks</code> kann eine passende Rolle vorgeschlagen werden.
<code>graphviz</code>	Das eingebundene Graphviz erzeugt statische Zeichnungen. Die Ressourcengrenzen gelten.
<code>intersphinx</code>	Lokale und abgerufene Inventare. Windows unterstützt derzeit nur lokale Dateien.
<code>githubpages</code>	Eingebaute Veröffentlichungsdateien für statische Sites.
<code>mathjax</code> und <code>imgmath</code>	HTML-Formeln verwenden MathJax. Für PDF wird die unterstützte LaTeX-Teilmenge in Typst übersetzt.
<code>myst_parser</code>	Die implementierte Markdown-Projektschicht.
<code>doctest</code> -Direktiven	Die Inhalte werden angezeigt. Der Projektbuilder führt ihre Tests nicht aus.
<code>autodoc</code>	Python-Quelltext wird gelesen, ohne das Paket zu importieren oder auszuführen.

Quelltextbasiertes autodoc erkennt nicht jedes zur Laufzeit erzeugte Objekt. Kompilierte Module, externe Dekoratoren, berechnete Werte und Ereignishooks haben ausdrückliche Grenzen. Python 3.13 und festgelegte Sphinx-Documenter-Tests dienen als Referenz. Alle Einstellungen und Ausnahmen stehen in [Python mit autodoc dokumentieren](#).

`autosummary`, `napoleon`, `viewcode` und beliebige Python-Erweiterungen liegen außerhalb dieses Weges. Nicht unterstützte Erweiterungen in der Konfiguration werden gemeldet. Unbekannte Direktiven und Rollen werden mit `Quellposition` gemeldet. **Ausgelassene Inhalte müssen vor der Veröffentlichung geprüft werden.** Andere Themenamen werden akzeptiert, nutzen aber Guidedogs Theme-Implementierung.

Vertrauen und Ressourcengrenzen

Ein normaler Build akzeptiert Raw-HTML und Typst, Vorlagen und Netzwerkinventare des Projekts. Lokale Zugriffe bleiben im Quellverzeichnis und ausdrücklich freigegebenen Wurzeln. Symbolische Links erweitern diese Grenze nicht. Vorlagen, statische Dateien, Includes, Bilder, Schriften und API-Quellen folgen derselben Regel.

Graphviz-Bildressourcen werden relativ zum Dokument aufgelöst und begrenzt. Unterstützte Bilddaten werden in die Zeichnung eingebettet. `imagepath` und `fontpath` erweitern die Grenze nicht. Typst läuft mit einer privaten Wurzel, die die lesbaren Verzeichnisse enthält. Buchvorlagen und Präambeln bleiben damit innerhalb der deklarierten Ressourcen.

`--untrusted` begrenzt Zugriffe auf den Quellordner. Raw-Inhalte, unsichere URLs, externe Ressourcen, Typst-Projektvorlagen und Präambeln werden mit Diagnosen ausgelassen. Inventare und Typst-Pakete werden nicht abgerufen.

Graphen mit Ressourcenanforderungen erscheinen mit Warnung als Code. Dieser Modus begrenzt weder Speicher noch Laufzeit des nativen Compilers.

Das Host-Budget beträgt standardmäßig 1 GiB. Speicher wird vor der Zuweisung reserviert. Seitenarbeitsbereiche werden danach freigegeben; Projektgraph und Kataloge bleiben im Speicher und wachsen mit dem Projekt. Lese-Worker koordinieren die Zulassung. Abgelehnte Anforderungen nennen die fehlgeschlagene Operation und Korrekturmöglichkeiten.

`--memory=ram` stoppt am verwalteten Budget. `--memory=disk` erlaubt speicher-abgebildete temporäre Dateien für verwalteten Arbeitsspeicher. Beibehaltene Host-Daten zählen weiterhin zum RAM-Budget. `--disk-budget` begrenzt den abgebildeten Speicher; die Richtlinie lässt außerdem eine Plattenreserve. Nicht-interaktive Befehle warten nie auf Antworten. Bekannter freier Spielraum kann mit `GUIDEDOG_AVAILABLE_MIB` angegeben werden.

`--max-depth`, `--max-nodes` und `--stack-kib` begrenzen die Dokumentverarbeitung. Änderungen machen Lese- und Ausgabecaches ungültig. Tiefe und Stack-Kapazität müssen zusammenpassen. Native Zuweisungen von Graphviz, tree-sitter und Typst liegen außerhalb des Host-Budgets. Für harte Grenzen sind Betriebssystemlimits nötig. Siehe [Fehlermeldungen](#) und [Speicher und Eigentümerschaft](#).

Verifikation und reale Projekte

`tools/sphinxdiff` vergleicht 42 festgelegte Sphinx-Testwurzeln: Seiten, Kennungen, Inhaltslinks, Inventare, Nummerierung und Diagnosen. Gespeicherte Ergebnisse und README erklären bewusste Unterschiede, etwa genaue Quellpositionen, stabile Nummern in Lesereihenfolge und ausdrückliche Meldungen für ausgelassene formatspezifische Raw-Inhalte.

Die Remote-Validierung am 1. Oktober 2026 führte saubere und unveränderte HTML- und PDF-Builds für CPython, Django und Flask aus. Alle zwölf waren erfolgreich; Diagnosen und Linkergebnisse entsprachen der Basis. Außerdem bestanden 1,039 Linux-Tests und 94 gezielte AddressSanitizer-Tests.

Diese Projekte enthalten nicht unterstützte Python-Erweiterungskonstrukte. Die Diagnosen bleiben Teil des Nachweises. Ein Exit-Status von null bedeutet nicht, dass alle privaten Direktiven wiedergegeben wurden. Wenn die Veröffentlichung keine Diagnosen erlaubt, verwenden Sie `-w`.

Historische Messungen und Quellrevisionen stehen in `docs/manual/evidence/manuals.md`. Der letzte Remote-Prüfbericht liegt in `build/review-remote-20261001/report.txt`. Die Messungen beschreiben die aufgetragenen Arbeitslasten, keine allgemeinen Geschwindigkeits- oder Speicher-grenzen.

Interna

Diese Kapitel erläutern die Gründe der Implementierung und aktuelle Verträge. GDS hält Entscheidungen und Prüfzustände in einem getrennten Projekt fest.

Die Guidedoc-Engine

Guidedoc ist der Konvertierungskern. Er leiht Speicher vom Aufrufer, liest eine Quelle, baut einen semantischen Baum, führt Pässe aus, misst die Ausgabe und erzeugt Bytes. Er öffnet keine Dateien und veröffentlicht keine Artefakte.

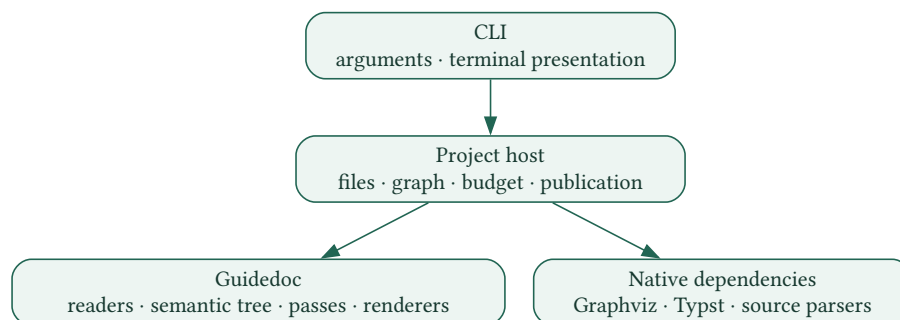


Abb. 4 Für externe Wirkungen ist der Host zuständig; für die Dokumentsemantik Guidedoc.

Die Grenze

Die Kernkonvertierung allokiert nicht. Der Aufrufer stellt Knotenspalten, Textspeicher, Diagnosen und Ausgabekapazität bereit. Der Host darf zur Vorbereitung Speicher allokieren. Fremde Compiler haben eigene Regeln. Die Garantie betrifft die Konvertierungsgrenze, nicht den gesamten Prozess.

Der Baum

Knoten besitzen typisierte IDs. Häufig genutzte Spalten enthalten Art und Teilbaumbereich; seltener genutzte Tabellen die jeweiligen Nutzdaten. Die flache Präorderdarstellung erlaubt Teilbaumsprünge ohne eine Kette von Heap-Zeigern.

Für Knoten i sei e_i das exklusive Teilbaumende. Der Teilbaum belegt $[i, e_i)$. Für ein Blatt gilt $e_i = i + 1$; ein Elternknoten endet nach seinen Nachfahren. Den Intervallbeweis enthält [Invarianten vor Algorithmen](#).

Die API

Die Kern-API ist explizit: Speicher initialisieren, konvertieren, Ergebnis prüfen, zurücksetzen. Registries sind Werte mit Reader-, Pass- und Renderer-Beschreibungen. Es gibt weder Laufzeit-Plug-insuche noch globale Registrierungsnebenwirkungen. Die wenigen Verben erleichtern die Nutzung aus anderen Odin-Programmen.

Eigentümerschaft ist die zentrale Regel. Workspace-Ansichten verfallen beim Zurücksetzen oder Wiederverwenden. Ein vom Host gehaltenes Ergebnis muss langlebigeren Text besitzen. Die genauen Signaturen in `core` stammen aus demselben Odin-Code wie `docs/api`. Das Handbuch-PDF enthält sie mit internen Links. Die Designaufzeichnung ist GDS 0003 in `docs/gds`.

Invarianten vor Algorithmen

Eine nützliche Invariante sagt, was während des Algorithmus gilt und worauf der Aufrufer danach vertrauen darf. Schreiben Sie sie vor der Schleife.

Teilbaumintervalle in Präorder

Der Baum werde in Präorder ausgegeben: Jeder Knoten kommt vor seinen Kindern, jeder Teilbaum ist zusammenhängend. e_i sei der erste Index nach Knoten i und allen seinen Nachfahren.

$$\text{subtree}(i) = [i, e_i), \quad i < e_i \leq N. \quad (3)$$

Behauptung. Der Durchlauf kann den Teilbaum überspringen, indem er zu e_i vorrückt.

Beweis. Wegen der Zusammenhängigkeit liegen alle Nachfahren vor e_i . Nach Definition des exklusiven Endes liegen spätere Knoten bei e_i oder dahinter. Der Sprung überspringt daher genau den Teilbaum. Der Validator prüft die Voraussetzungen, bevor ein Renderer darauf vertraut.

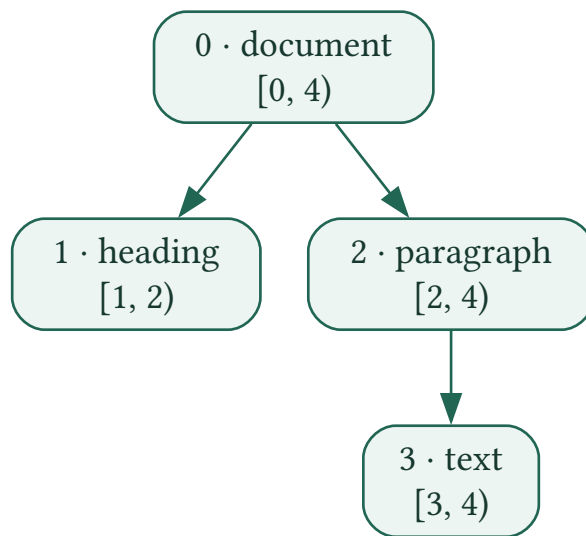


Abb. 5 Das Intervall eines Elternknotens umfasst die Intervalle seiner Kinder.

Ein vollständiger Durchlauf besucht jeden Knoten einmal und kostet $O(N)$. Ein Teilbaumsprung erfordert nur eine Indexänderung. Nutzdatenverarbeitung hat weiterhin ihre eigenen Kosten. Ein Sprung in konstanter Zeit bedeutet keine Darstellung in konstanter Zeit.

Vor der Ausgabe messen

Der Renderer misst zunächst die Bytezahl m . Die Ausgabekapazität des Aufrufers sei c .

$$m \leq c \implies \text{Ausgabe darf beginnen} .$$

Messung und Ausgabe folgen denselben Regeln. Eine erfolgreiche Ausgabe schreibt genau m Bytes. Fehler liefern kein gültiges Teilartefakt. Der Host verwaltet die Veröffentlichung; unvollständige Bytes können daher keine frühere Ausgabe ersetzen.

Gültigkeit des Caches

Ein Cache-Schlüssel muss alle ergebniswirksamen Daten erfassen. Quellen allein genügen nicht: Includes, Vorlagen, Konfiguration, Referenzauflösung, Ressourcen und Adapterversionen wirken mit. Wiederverwendung setzt übereinstimmende dokumentierte Abhängigkeiten voraus. Fehlende Ausgabe verhindert sie auch bei passendem Schlüssel.

Tests setzen fehlschlagende Allokatoren an der Kerngrenze ein und vergleichen die Ausgabe. Sie prüfen auch Imports. Bloßes Zählen von Allokationen könnte eine Ablehnung übersehen, die Dokumentteile stillschweigend verwirft.

Eine vollständige Generation veröffentlichen

Leser dürfen keine halb aktualisierte Website sehen. Das ist eine Eigenschaft der Veröffentlichung, getrennt von Parsing und Rendering.

Die Invariante

P sei der veröffentlichte Ausgabebaum. Während der Vorbereitung bleibt er unverändert. Der nächste Baum Q ist vor dem Commit-Beschluss vollständig. Das Journal nennt Ausgabe und zugehörige Aufzeichnungen.

Die Vorbereitung kann fehlschlagen. Der Host verwirft die unvollständige Generation. **Ein beschlossener Commit kann unterbrochen werden.** Der nächste Build beendet oder stellt ihn anhand des Journals wieder her. Er rät nicht anhand eines Staging-Verzeichnisnamens.

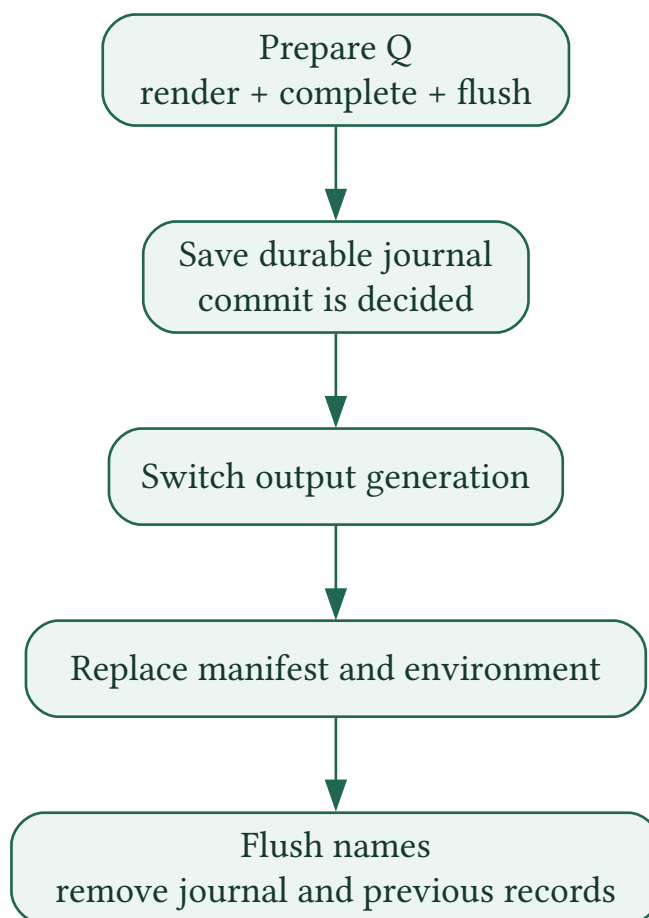


Abb. 6 Das dauerhafte Journal trennt die Vorbereitung vom beschlossenen Commit.

Warum der Cache außerhalb der Ausgabe liegt

Ein Verzeichnistausch verschiebt seinen gesamten Inhalt. Ein darin liegendes Journal würde während der beschriebenen Operation mitwandern und gerade bei der Wiederherstellung keinen stabilen Ort haben. Guidedog hält Aufzeichnungen

außerhalb des Ausgabebaums. Eigene Ziele nutzen deshalb einen benachbarten Cache.

Dauerhaftigkeit und Sichtbarkeit

Dateiinhalte zu flushen ist nicht dasselbe wie Verzeichnisnamen zu flushen. Der Algorithmus berücksichtigt beides vor dem Löschen des Journals. Der Verzeichnistausch unterscheidet sich je Plattform; das Wiederherstellungsprotokoll berücksichtigt dies. Siehe `lib/project/commit.odin` und `lib/project/publish.odin`.

Dies schützt die Projektveröffentlichung, ist aber keine verteilte Transaktion mit einem Hostinganbieter. Einen erfolgreichen Build auf einen Server zu kopieren ist eine eigene Aufgabe des Deploymentwerkzeugs.

Speicher und Eigentümerschaft

Ein Budget ist ein Abrechnungsvertrag. Es hat nur dann Bedeutung, wenn die Belastung so lange besteht wie der zugehörige Speicher.

Die Anrechnung folgt dem Speicher

Reservieren Sie Bytes vor der Allokation und lösen Sie die Belastung nach der Freigabe. Beim Pufferersatz können alter und neuer Puffer gleichzeitig bestehen. Rechnen Sie in dieser Phase die gesamte neue Allokation an. Nur den Zuwachs anzurechnen unterschätzt die Spitze.

Spitze beim Ersetzen = sonstiger belegter Speicher + alter Puffer + neuer Puffer .

Die Sitzung gibt ihre eigenen Eingaben frei. Eingaben des Aufrufers bleiben dessen Verantwortung. `read_owned` und `read_kept` machen den Unterschied deutlich. Kürzeres Lesen verkleinert die bereits erfolgte Allokation nicht.

Ein bekannter Nullwert ist kein unbekannter Wert

Eine Speicherprüfung kann fehlenden Spielraum feststellen oder den Spielraum nicht ermitteln können. Die Richtlinie trennt diese Zustände mit einem Wissensflag statt beide als null abzubilden. Unter Linux gelten lesbare cgroup-Grenzen der sichtbaren Vorfahren. Nur der freie Hostspeicher kann bei Containern irreführen.

Diagnosen überleben ihre Arbeitsbereiche

Ein Bericht nach Sitzungsende muss Titel, Quelle und Korrekturtext besitzen. Er darf keinen freigegebenen Puffer ausleihen. Interne Quellbereiche nutzen Byteoffsets, sichtbare Spalten Unicode-Skalare. Terminalmarker berücksichtigen separat die Darstellungsbreite.

Die verbleibende Grenze

Guidedog misst seinen verwalteten Arbeitsspeicher. Typst und native Abhängigkeiten verwalten eigene Allokationen. Große PDFs können das Hostbudget weit überschreiten. Die entfernte CPython-Prüfung maß einschließlich Typst etwa 14,5 GiB Spitzen-RSS. Das belegt diese Last, keinen allgemeinen Höchstwert. Optionen bei Budgetüberschreitung stehen in [Fehlermeldungen](#).

Über dieses Handbuch

Dieses Handbuch beschreibt das implementierte Werkzeug und seine bewusst gesetzten Grenzen. Das separate GDS-Projekt enthält Vorschläge, Entscheidungen und den Verlauf der Begutachtung. Eine bessere Gestaltung ändert den Status eines Vorschlags nicht.

Der Aufbau folgt der Arbeit mit dem Werkzeug: Tutorials zum Lernen, Themenkapitel zum Verstehen, Anleitungen für konkrete Aufgaben und Referenzseiten zum Nachschlagen. Die Kapitel zum Innenleben erklären Invarianten und Beweise.

Der Text verwendet kleine Beispiele, benennt Annahmen und formuliert Aussagen direkt. Erklärungen sollen sich überprüfen lassen. Die Gestaltung setzt auf zurückhaltende Farben, deutliche Überschriften, eine gut lesbare Serifenschrift und barrierearme Navigation. Wortlaut und Gestaltung eines bestimmten Autors werden nicht nachgeahmt.

Dieses Projekt wurde mit `guidedog quickstart` angelegt und wird mit Guidedog gebaut. Der Text steht in RST, die Diagramme in Graphviz und die Gleichungen in mathematischer LaTeX-Notation. Typst wird nur für die PDF-Satzvorlage verwendet.

Nachweise der Builds

Die Fernprüfung vom 2026-10-01 umfasste vollständige und inkrementelle HTML- und PDF-Builds für CPython, Django und Flask. Alle zwölf Befehle waren erfolgreich. Diagnosen und Linkprüfungen entsprachen dem bisherigen Referenzstand. 1.039 Linux-Tests und 94 gezielte Sanitizer-Tests bestanden. Das belegt das Verhalten des geprüften Stands, keine vollständige Sphinx-Kompatibilität. Die verbleibenden Grenzen stehen in [Kompatibilität mit Sphinx](#).

Befehle zur Pflege der Dokumentation stehen in [Diese Dokumentation pflegen](#).

Guidedog

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Einmal schreiben. Klar erklären. Im Web und auf Papier veröffentlichen.

Guidedog erzeugt HTML-Dokumentation und PDF-Bücher aus reStructuredText und Markdown. Es ist in Odin geschrieben. Die Konvertierungseengine heißt **Guidedoc**; Typst setzt die PDF-Seiten. Python oder LaTeX sind nicht nötig.

Sphinx dient als Vorbild für den Schreibablauf. Guidedog ist ein eigenständiges System: deklarative TOML-Konfiguration, statische API-Analyse und keine Ausführung von Python-Konfiguration oder -Erweiterungen. Vollständige Sphinx-Kompatibilität ist kein Ziel.

Ein Projekt beginnen

```
guidedog quickstart docs
guidedog build html docs
guidedog build pdf docs
guidedog serve docs
```

Das Projekt enthält `conf.toml`, `index.rst`, `_templates/layout.html`, `_templates/book.typ` und `_static/`. Vorlagen sind gewöhnliche, bearbeitbare Dateien. HTML bietet Navigation, Suche, hervorgehobenen Code, Diagramme und Gleichungen. PDF bietet Kapitel, Querverweise, Abbildungen, Register und sprachgerechten Satz.

Standard ist das helle Thema; Dunkel- und Systemthema sind wählbar. Die Einstiegsseiten des Handbuchs und der Repositoryübersicht erkennen die Browsersprache. Eine gespeicherte Wahl hat Vorrang; direkte Links zu einer Ausgabe oder einem Kapitel bleiben maßgeblich.

```
guidedog convert notes.md --to pdf --output notes.pdf
guidedog clean docs
guidedog migrate conf.py
```

Installieren

Jedes [Release](#) enthält ein Archiv für Linux (x86-64 und ARM64), macOS (Apple Silicon und Intel) und Windows (x86-64). Jedes Archiv bringt Typst, Graphviz

und tree-sitter mit, sodass für Websites und Bücher nichts weiter installiert sein muss. Linux braucht glibc 2.35 oder neuer und libcurl, macOS Version 12 oder neuer. Laden Sie das Archiv für Ihr System und SHA256SUMS herunter, prüfen Sie es und installieren Sie es dann:

```
sha256sum -c --ignore-missing SHA256SUMS      # on macOS: shasum -a 256 -c --
ignore-missing SHA256SUMS
tar -xzf guidedog-linux-amd64.tar.gz
sudo install guidedog-linux-amd64/guidedog /usr/local/bin/
```

Installieren Sie Guidedog unter macOS aus dem offiziellen [Homebrew-Tap](#). Homebrew wählt das Archiv für Apple Silicon oder Intel. Der Tap unterstützt auch Linux:

```
brew tap insanai/guidedog
brew install insanai/guidedog/guidedog
guidedog --version
```

Unter Windows entpacken Sie das Archiv und nehmen seinen Ordner in PATH auf; die Graphviz-DLLs und config8 bleiben neben guidedog.exe. Die Programme sind nicht codesigniert: Unter macOS entfernen Sie die Quarantäne einer im Browser heruntergeladenen Datei mit `xattr -d com.apple.quarantine guidedog`. Die Versionshinweise beschreiben die Grenzen jeder Plattform.

Aus dem Quellcode bauen

Installieren Sie Odin dev-2026-10 (tools/install-toolchain.sh odin DIR lädt und prüft es), einen C-Compiler und unter Linux die Entwicklungspakete von libcurl, expat und zlib. Bauen Sie zuerst die nativen Bibliotheken, dann Guidedog:

```
native/tree-sitter/build.sh
native/graphviz/build.sh
tools/release/build.sh
```

build/guidedog nutzt dann für PDF ein installiertes Typst 0.15.1. Um den Typst-Compiler wie die Releases einzubetten, installieren Sie Rust und Cargo und führen Sie aus:

```
native/typst_bridge/build.sh
tools/release/build.sh --release --typst-bridge
```

Unter Windows verwenden Sie Git Bash mit den C++-Werkzeugen von Visual Studio und LLVM. Für Graphviz gibt es keinen statischen Windows-Build; führen Sie daher native/graphviz/windows.sh statt build.sh aus. Es installiert die offiziellen DLLs von Graphviz 16.1.0, die tools/release/build.sh neben build/guidedog.exe kopiert. tools/release/suites.sh führt die Testsuiten aus, und [RELEASING.md](#) beschreibt den Releaseablauf.

Mit Guidedog übersetzen

```
mkdir -p docs/manual/_editions
build/guidedog build -b gettext docs/manual docs/manual/locales/templates -W
build/guidedog intl update -p docs/manual/locales/templates \
    -l zh_CN -l ja -l ko -l hi -l es -l de docs/manual
build/guidedog intl stat -l zh_CN -l ja -l ko -l hi -l es -l de docs/manual
```

```
build/guidedog build -b html docs/manual docs/manual/_editions/de \
-D language=de -D 'html_extra_path=[]' -W
```

Übersetzen und prüfen Sie die `msgstr`-Werte der PO-Dateien. Guidedog extrahiert POT, führt Kataloge zusammen, zeigt den Stand und baut jede Ausgabe. Übersetzungen verfasst es nicht selbst. Befehle, Pfade, Code, API-Namen und Verweisziele bleiben unverändert. Nur Handbuch und Repositoryübersicht werden übersetzt; API und GDS bleiben Englisch. Zum Zusammenstellen aller Ausgaben und PDFs siehe die [Buildanleitung](#).

Auf GitHub wählen Sie die README-Sprache über die Links oben. Die automatische Sprachwahl erfolgt auf der erzeugten Dokumentationswebsite.

Lesen und einbetten

- **Handbuch:** Tutorials, Themen, Aufgaben, Referenz und interne Struktur.
- **API-Referenz:** aus Odin-Quellcode erzeugt und im PDF-Handbuch als Anhang enthalten.
- **Bibliotheksleitfaden:** vom Aufrufer verwaltete Workspaces, Speicher und Konvertierungsbeispiele.
- **Vorlagen:** HTML mit Jinja und Bücher mit Typst anpassen.
- **GDS:** nummerierte Entwurfsunterlagen und Implementierungsentscheidungen.
- **Betaprüfung:** Korrekturen, Prüfungen, Unterstützungsumfang und offene Releasebedingungen.

Guidedoc nutzt Speicher des Aufrufers und liefert strukturierte Diagnosen. Der Host verwaltet Dateien, Budgets, Caches, Veröffentlichung und native Compiler. `--untrusted` begrenzt Fähigkeiten, ist aber keine Prozesssandbox und begrenzt nicht sämtliche nativen Ressourcen. Die Beta richtet sich an vertrauenswürdige Dokumentationsprojekte unter macOS und Linux.

Danksagung und Lizenz

Erstellt von **Vikrant Rathore**, unterstützt von **Ronak Rathore** und **Kanak Rathore**. Beiträge über Issues und Pull Requests sind willkommen. Autorenangaben verwenden Namen oder Handles, keine persönlichen E-Mail-Adressen. Git-Identitätseinstellungen werden separat verwaltet.

Dank an Sphinx und Georg Brandl, Docutils und David Goodger, Typst, Treesitter und Max Brunsfeld, Graphviz sowie Ginger Bill und die Odin-Gemeinschaft.

Guidedog steht unter der [GNU Affero General Public License v3.0 oder neuer](#) (AGPL-3.0-or-later). Für andere Lizenzbedingungen wenden Sie sich an die Autoren. [NOTICE](#) beschreibt, wie Sie sie erreichen, und nennt die Komponenten Dritter, etwa die mitgelieferten Schriften, die ihre eigenen Lizenzen behalten.

Eine zusätzliche Erlaubnis gestattet, Guidedog zusammen mit Graphviz zu linken und weiterzugeben; siehe [NOTICE](#).

API Reference

- `autodoc` – Package autodoc generates the reStructuredText that Sphinx’s sphinx.ext.autodoc generates (Sphinx 9.1), from Python source analysed by lib/pyscan instead of imported modules: the same directives (,,...
- `cli` – Package cli is the guidedog command: run parses a command line, does what it asks, and returns the exit status.
- `core` – Generated by tools/casefold from tools/data/CaseFolding-17.0.0.txt ; do not edit.
- `defaults` – Package defaults assembles the built-in readers and renderers into an explicit, immutable registry.
- `fetch`
- `gds` – Package gds is the GDS process of docs/gds (GDS 0001) as a library: it loads the discussion records of a directory into a Catalog, plans changes to them (a new draft, a promotion, a state or label change, the regenerated index) as a Plan, applies a plan as one recoverable transaction under a lock.
- `gettext` – Package gettext reads, writes, merges, and looks up GNU gettext message catalogs: PO and POT text files, and compiled MO files.
- `graphdog` – Package graphdog turns Graphviz DOT source into SVG (or PNG, or laid-out DOT) by calling the Graphviz C library in process.
- `highlight` – Generated by tools/pygments_styles from pygments-2.19.2’s style modules and sphinx-9.1.0’s pygments_styles.py; do not edit.
- `highlight/guidedoc` – Package highlight_guidedoc connects the highlight library to Guidedoc’s renderers.
- `host` – Package host composes the allocation-free core with memory, files, and retries.
- `i18n` – Package i18n translates Guidedoc documents the way Sphinx does with gettext: it extracts every translatable message of a document into a POT template (Sphinx’s gettext builder), and it replaces each message with its translation from a catalog (Sphinx’s Locale transform), re-parsing the translation as inline markup of the document’s own language.
- `inventory`
- `jinja`
- `odindoc` – Package odindoc reads Odin packages by static analysis, with Odin’s own parser (core:odin/parser), and writes the reStructuredText of the Guidedoc odin domain that documents them, as sphinx.ext.autodoc writes the Python domain’s: packages, procedures, procedure groups, types and

their fields or enumerators, constants, variables, and foreign imports, each with its doc comment turned into reST.

- `project` – Package `project` builds a documentation project the way Sphinx does: a source directory with `conf.toml`, builders writing `_build/<builder>`, and incremental builds.
- `pyscan` – Package `pyscan` analyses Python source statically, through tree-sitter: modules and their docstrings, `__all__`, and imports; classes with their bases, decorators, and members in source order; functions with their parameters as written; and the attribute documentation Sphinx’s `ModuleAnalyzer` finds (`#:` comments and docstrings after assignments).
- `readers/commonmark` – Package `commonmark` reads Markdown into a Guidedoc document without calling an allocator, as two readers with distinct ids: „commonmark“ (reader, read, read_inline) is pure CommonMark 0.31.2 and takes no settings; „myst“ (myst_reader, read_myst, read_myst_inline) is the MyST Markdown that Sphinx projects write (myst-parser 0.16.1): directives, roles, targets, comments, front matter, footnotes, GFM tables, and the optional syntax that `Settings.enable_extensions` turns on.
- `readers/rst` – Package `rst` reads reStructuredText as the Docutils markup specification defines it, implemented independently.
- `readers/rst/inline` – Package `rst_inline` parses reStructuredText inline markup and resolves references.
- `readers/sphinx` – Package `sphinx` reads reStructuredText with the Sphinx layer: Sphinx’s directives, roles, and domains (GDS „Guidedog: everything Sphinx does, the Odin way“), implemented independently on the base reader’s extension interface.
- `render/html` – Package `html` renders a Guidedoc document as HTML without calling an allocator.
- `render/text` – Package `text_render` renders a Guidedoc document as plain text without calling an allocator, following the conventions of Sphinx’s text builder: paragraphs wrapped at 70 columns, titles underlined with `= - ~` and the other section characters, „* „, and „1.
- `render/typst` – Package `typst_render` encodes a validated Guidedoc document as one Typst source file.
- `tree-sitter` – Package `tree-sitter` is a thin binding of the tree-sitter C library and its Python grammar: parsers, trees, nodes, and cursors, and nothing more.
- `typst` – Package `typst` adapts the Typst toolchain for the host.

autodoc

Package `autodoc` generates the reStructuredText that Sphinx’s `sphinx.ext.autodoc` generates (Sphinx 9.1), from Python source analysed by `lib/pyscan` instead of imported modules: the same directives („... py:class:: Name(signature)“ with `:module:`, `:canonical:`, „Bases: ...“), docstrings prepared as `prepare_docstring` prepares them, and members chosen, filtered, and ordered as `autodoc`’s options say. What static analysis cannot know (compiled modules, objects made at run time, members of classes outside the source roots) is reported as a note naming the object, never guessed silently.

It is a host library: it reads files through pyscan and allocates with the context allocator, freeing none of it, so a host runs it in an arena, the same as pyscan's: a Session and every Result live until the arena is freed.

Types

autodoc.Config :: struct

Config holds the conf.toml settings autodoc reads, with Sphinx's names and defaults (see `default_config`).

autoclass_content: string

„class“, „init“, „both“.

autodoc_class_signature: string

„mixed“, „separated“.

autodoc_default_options: []Default_Option

autodoc_docstring_signature: bool

autodoc_inherit_docstrings: bool

autodoc_member_order: string

„alphabetical“, „bysource“, „groupwise“.

autodoc_mock_imports: []string

autodoc_preserve_defaults: bool

autodoc_typehints: string

„signature“, „description“, „none“, „both“.

autodoc_typehints_description_target: string

„all“, „documented“, „documented_params“.

autodoc_typehints_format: string

„short“, „fully-qualified“.

autodoc_type_aliases: []Type_Alias

autodoc_use_type_comments: bool
--

python_display_short_literal_types: bool

strip_signature_backslash: bool
--

tab_width: int

typehint_fields: bool

typehint_fields writes the fields of autodoc_typehints = „description“ into the text (true by default); Sphinx adds them to the parsed field lists instead, so comparisons with its generated text turn it off.

autodoc. Default_Option :: struct
--

Default_Option is one autodoc_default_options entry: a value, or true for a flag.

name: string

value: string

flag: bool

the setting is true: the option is given without a value.

autodoc. Message :: struct

Message is a problem to report where the directive stands, Elm-style.

severity: Severity

code: string

title: string

text: string

hint: string

```
autodoc.Option :: struct
```

Option is a directive option as written; value is „ for a flag.

```
name: string
```

```
value: string
```

```
autodoc.Request :: struct
```

Request is one autodoc directive: its name (autoclass, automodule, ...), argument, options, content, and the reader's context (the current py:module and py:class).

```
directive: string
```

```
argument: string
```

```
options: []Option
```

```
content: []string
```

```
module: string
```

```
class: string
```

```
autodoc.Result :: struct
```

Result is the generated reST (lines without line breaks; empty when there is nothing to add) and the messages about it.

```
lines: [dynamic]string
```

```
messages: [dynamic]Message
```

```
autodoc.Session :: struct
```

Session is autodoc's state across the directives of one build: the analysed project, and the modules whose analyser annotations autodoc has merged into their classes (as `_ensure_annotations_from_type_comments` does the first time it documents a data or attribute from them), which changes the members found afterwards.

```
project: ^py.Project
```

```
merged: map[string]bool
```

```
autodoc.Severity :: enum u8
```

```
Note
```

```
Warning
```

```
Error
```

```
autodoc.Type_Alias :: struct
```

```
name: string
```

```
target: string
```

Procedures

```
autodoc.default_config :: proc() -> Config
```

default_config is Sphinx 9.1's defaults for the settings autodoc reads.

```
autodoc.document :: proc(session: ^Session, config: ^Config,  
request: Request) -> Result
```

document generates the reST of one autodoc directive, as AutodocDirective.run does before parsing it: the lines, and messages about them (an unknown directive or a bad option is an Error and no lines; what analysis cannot know is a note naming the object; never a panic). Modules are analysed through the session's project as needed; the result lives in the context arena.

```
autodoc.session_init :: proc(s: ^Session, project:  
^py.Project)
```

session_init starts a session over an analysed project, which it borrows for the session's life; its map lives in the context arena.

cli

Package cli is the guidedog command: run parses a command line, does what it asks, and returns the exit status. It is the command's whole surface; everything

else here is private. It allocates with `context allocator` and never frees, so the command runs it in an arena (`cmd/guidedog`), which frees everything at once.

Procedures

```
cli.run :: proc(args: []string) -> int
```

`run` runs the command line args (without the program name) and returns the exit status: 0 on success, and on failure the status the problem names, after reporting it on standard error. It allocates with `context allocator`, an arena the caller frees, through a `host.Guard`: when that allocator refuses memory, the command changes no record and ends with `host.memory` (exit 3), reported without allocating.

```
cli.version_text :: proc(buffer: []u8) -> string
```

`version_text` writes into `buffer` what `guidedog --version` prints before the Typst compiler it finds, the versions built into the program, and returns it. It allocates nothing, so the crash report is prepared with it at start (`cmd/guidedog`).

Constants

```
cli.FULL_VERSION :: VERSION + VERSION_SUFFIX
```

`FULL_VERSION` is what the command prints as its version: `VERSION` and `VERSION_SUFFIX`.

```
cli.LICENSE_NOTICE
```

`LICENSE_NOTICE` is what `guidedog --licenses` prints before the notices of the libraries linked in.

```
cli.VERSION :: "0.2.0"
```

`VERSION` is the Guidedog release this program belongs to, the one version ``guidedog --version``, `guidedog --help`, and the crash report name. The file `VERSION` at the repository root holds the same text for release tooling, and `version_test.odin` fails when the two differ. The Guidedoc engine's own version (`core.VERSION`) and document schema are reported beside it; they are separate because programs embed the engine without this command.

```
cli.VERSION_SUFFIX :: #config(GUIDEDOG_VERSION_SUFFIX, "")
```

`VERSION_SUFFIX` is build metadata appended to `VERSION`, for development builds such as `-define:GUIDEDOG_VERSION_SUFFIX=+3fe1d8a` (Semantic Versioning's „+“ form). A release build has none.

core

Generated by tools/casfold from tools/data/CaseFolding-17.0.0.txt ; do not edit.

Types

```
core.Admonition_Kind :: enum i32
```

Generic

Attention

Caution

Danger

Error

Hint

Important

Note

Tip

Warning

Seealso

Todo

```
core.Align :: enum u8
```

None

Left

Center

Right

```
core.Anchor_Extra :: struct
```

Anchor_Extra is the id of an element a renderer generates for a node:

- an entry of a table of contents: owner is the Contents, item the Section;
- a footnote of target-notes: owner is the directive, item the first target (or anonymous reference) with the URI it lists, number its footnote number;
- the footnote reference target-notes adds after a reference: owner is the reference, item the directive, note the item of its footnote, number the same.

```
owner: Node_Id
```

```
item: Node_Id
```

```
note: Node_Id
```

```
span: u32
```

```
number: i32
```

```
core.Anchor_Ids :: struct
```

```
span: u32
```

```
core.Anchors :: struct
```

Anchors gives nodes stable, unique identifiers: HTML ids and Typst labels. Every renderer and the project host build the same table, so internal links agree across targets and the labels a project records are the ids its pages publish. The ids are the ones Docutils gives a document read as Sphinx reads it (auto_id_prefix „id“), so a project that moves from Sphinx keeps its links and bookmarks:

- An explicit Id attribute is used verbatim (terms, equations, domain objects).
- Every element Docutils names gets one id when Docutils' parser or transforms name it, in the same order (anchors_order.odin): the id made from its name by make_id, or, when the name gives none or only an id already used, the next „idN“. Elements without a name (footnote references, anonymous targets) always take the next „idN“.
- Targets and names Docutils does not write (external and indirect targets, names of embedded URIs) still take their id, so later ids are numbered as Docutils numbers them, but no node carries it.
- A label (an internal block Target) gives its id to the element it names, after the element's own ids.

- Elements a renderer generates have ids too (anchor_extras): the entries of a table of contents and the footnotes of target-notes with their references.

A node may have several ids: anchor_of returns the primary one, and anchor_ids iterates all of them for renderers that emit the others as aliases.

index: []u32

per node: its first span, or NONE.

spans: []Text

ranges of bytes.

next: []u32

per span: the node's next span, or NONE.

count: int

bytes: Buffer

prefix: string

prefix_length: int

the bytes the prefix takes before an id.

names: Symbol_Table

every id: the node that carries it, or NONE.

counter: int

labels: []u32

per node: the first id labels give it, until they follow its own.

own: []u8

room for the longest name a node carries by itself.

extras: []Anchor_Extra

sorted by owner, then in the order the ids were given.

extra_count: int

```
core.Arg_Kind :: enum u8
```

None

Int

Span

Static

```
core.Attribute :: struct
```

key: Attribute_Key

name: Text

the key text when key is Custom.

value: Text

```
core.Attribute_Key :: enum u8
```

Custom

Class

Id

Name

Language

Alt

Width

Height

Scale

Align**Format****Title****Target****Start****Widths****Source****core.Attribute_Range** :: *struct***first**: u32**count**: u32**core.Attributes** :: *struct***next**: u32**end**: u32**core.Buffer** :: *struct*

Buffer is a bounded byte accumulator over caller-provided bytes. The first write that does not fit sets overflow, and every later write is dropped, so the bytes are always a prefix of what was written; a caller that sees overflow must report it. wanted counts every byte asked for, stored or not: writing into a zero Buffer measures, and scratch_buffer then takes exactly that much.

bytes: []u8**used**: int**wanted**: int**overflow**: bool


```
core.Builder :: struct
```

Builder appends nodes in preorder. Open nodes form a bounded stack; closing a node patches its subtree end. The first failure poisons the builder: later calls do nothing, so an ignored capacity failure cannot produce a truncated document. The engine gives a reader or pass a builder over one bank for one stage: text is copied into the bank's pool, ids and Text values index that bank, and nothing a builder returns outlives the stage unless the stage succeeds. Adapters change nodes through these procedures; b.snap is visible so a reader can decode text straight into the pool after text_used, adding what it wrote to text_used before text_close.

```
snap: ^Snapshot
```

```
open: Stack(Node_Id)
```

```
reports: ^Reports
```

```
limits: Limits
```

```
status: Status
```

```
need: Capacity_Need
```

```
work: u64
```

```
cancel: Cancel_Probe
```

```
core.Cancel_Probe :: struct
```

```
procedure: proc(user: rawptr) -> bool
```

```
user: rawptr
```

```
core.Capacity_Need :: struct
```

```
region: Region
```

```
minimum: u64
```

```
exact: bool
```

```
core.Cell_Info :: struct
```

```
row_span: u16
```

```
col_span: u16
```

```
align: Align
```

```
core.Children :: struct
```

```
next: u32
```

```
end: u32
```

```
core.Conformance :: enum u8
```

```
Planned
```

```
Partial
```

```
Conformant
```

```
core.Content :: enum u8
```

```
Nothing
```

```
Blocks
```

```
Inlines
```

```
Structure
```

children are restricted to specific kinds; see `child_allowed`.

```
core.Content_Policy :: enum u8
```

```
Refuse
```

an error that names the construct and the policy.

```
Omit
```

a warning; the content is left out.

Allow

trusted content is emitted.

```
core.Diagnostic :: struct
```

```
using msg: Message
```

```
span: Source_Span
```

```
args: [2]Diagnostic_Arg
```

```
core.Diagnostic_Arg :: struct
```

Diagnostic_Arg is an integer, a quoted source span, or static text.

```
kind: Arg_Kind
```

```
int: i64
```

```
span: Source_Span
```

```
static: string
```

```
core.Document :: struct
```

Document is a checked handle to one build of a snapshot bank of a workspace. It borrows the workspace and is valid until the next conversion, reset, or rebuild of its bank, whichever comes first; document_valid tells.

```
ws: ^Workspace
```

```
generation: u32
```

```
revision: u32
```

the bank's revision when the document was built.

```
bank: u8
```

```
core.Document_Reading :: enum i32
```

Document_Reading is a Document's `value`: who read it, which decides the ids the transforms after reading give (anchors_order.odin). The Sphinx layer marks what it reads, as Sphinx adds transforms of its own to Docutils'.

Docutils

Sphinx

```
core.Emit_Mode :: enum u8
```

A renderer has one encoding procedure. The engine runs it in Measure mode, with reports enabled, to check support and count bytes; then in Write mode to store them.

Measure

Write

```
core.Emitter :: struct
```

Emitter is where a renderer writes. It never fails: Measure mode counts bytes, and Write mode stores them in the caller's output, which the engine sized by measuring.

mode: Emit_Mode

out: []u8

written: int

source_map: []Map_Entry

mapped: int

```
core.Highlighter :: struct
```

Highlighter writes highlighted HTML for a code block. It belongs to the caller's trust boundary and may allocate, but it must write the same bytes for the same input every time, because the renderer measures before it writes. It returns false to let the renderer write plain escaped code instead.

```
procedure: proc(user: rawptr, language, code: string, e: ^Emitter) -> bool
```

```
user: rawptr
```

```
core.INVALID_NODE :: Node_Id(max(u32))
```

```
core.Label :: enum u8
```

Label names a word or phrase a renderer writes by itself, not taken from the document, or that a reader writes into it (the group names of Sphinx’s info fields). A host translates them (Sphinx ships them in sphinx.po) and passes them in Render_Options.labels, and to a reader in its own options. Labels holding „%s“ take a value there (a version number).

Attention

Caution

Danger

Error

Hint

Important

Note

Tip

Warning

See_Also

Todo

Contents

Version_Added

Version_Changed

Version_Deprecated

Version_Removed

Section_Author

Module_Author

Code_Author

Link_Heading

Link_Definition

Link_Image

Link_Table

Link_Code

Link_Equation

Link_Term

Parameters

Variables

Raises

Returns

Return_Type

Return_Values

Template_Parameters**Throws****Arguments****Availability**

```
core.Labels :: [Label]string
```

```
core.Limits :: struct
```

```
max_depth: int
```

nested blocks and inline markup.

```
max_nodes: int
```

```
max_work: u64
```

reader and resolution steps.

```
max_include_depth: int
```

```
max_included_bytes: int
```

```
max_expansion: int
```

substitution nesting.

```
stack_bytes: int
```

stack_bytes bounds the machine stack a recursive reader or renderer uses; o means DEFAULT_STACK_BYTES. The conversion thread needs this much more stack (stack.odin).

```
core.Line_View :: struct
```

Line_View is one line of a source as readers hand it to each other: its text without the line break, and the source offset of text[o]. The reST and Markdown readers share it, so nested content passes between them as it is, without converting or casting.

```
text: string
```

offset: u32

core.Link_Info :: struct

destination: Text

title: Text

name: Text

normalized reference name, when named.

resolved: Node_Id

meaningful only when kind is Internal.

kind: Link_Kind

core.Link_Kind :: enum u8

External

destination is a URL or path.

Email

destination is an address; HTML adds mailto:.

Internal

resolved is a node in this document.

Unresolved

name awaits resolution; an error, or a warning and problematic text

Project

under Policy.keep_documents_with_errors.

destination is a project anchor key in another document (books).

core.List_Info :: struct

style: List_Style

delimiter: u8

„‘, ‚’“, or „(, for „(1“; bullet character for bullets.

start: i32

core.List_Style :: enum u8

Bullet

Arabic

Lower_Alpha

Upper_Alpha

Lower_Roman

Upper_Roman

core.Map_Entry :: struct

Map_Entry records that generated output from offset on came from span.

offset: u32

span: Source_Span

core.Math_Style :: enum u8

Math_Style is how HTML writes math for a script (MathJax, KaTeX) to typeset.

Plain

class „math“, the text in $\backslash(\backslash)$ or $\backslash[\backslash]$, as Docutils writes it.

Sphinx

as Sphinx’s mathjax extension: its classes, and displayed math in parts

```
core.Media_Kind :: enum u8
```

Media_Kind is what an image node shows. As in Docutils, an image directive naming a video file plays it; Guidedoc treats audio files the same way. Renderers decide from the path.

Image

Video

Audio

```
core.Message :: struct
```

Message is a static description of one problem. Packages declare them as constants, so a report never formats or copies text.

code: string

severity: Severity

status: Status

title: string

message: string

„{0}“ and „{1}“ name the arguments.

hint: string

```
core.Node :: struct
```

kind: Node_Kind

flags: Node_Flags

subtree_end: u32

value: i32

text: Text

payload: u32

span: Source_Span

attributes: Attribute_Range

core.Node_Flag :: *enum* u8

Tight

List: items render without paragraph spacing.

Anonymous

Reference or Target: anonymous hyperlink.

Auto

Footnote or reference: auto-numbered.

Symbol

Footnote or reference: auto-symbol.

Local

Contents: only the enclosing section.

Header

Row or Cell: belongs to a header.

Referenced

Target or Footnote: something refers to it.

Generated

Created by resolution rather than markup.

core.Node_Flags :: *bit_set*[Node_Flag; u8]

core.Node_Id :: *distinct* u32

```
core.Node_Kind :: enum u8
```

Document

Title

Block structure.

Subtitle

Section

Heading

Paragraph

Block_Quote

Attribution

List

List_Item

Definition_List

Definition_Item

Term

Classifier

Definition

Field_List

Field

Field_Name

Field_Body**Option_List****Option_Item****Option_Group****Option****Option_Argument****Option_Description****Line_Block****Line****Code_Block****Preformatted****Doctest_Block****Math_Block****Raw_Block****Thematic_Break****Table****Table_Head****Table_Body****Row**

Cell**Figure****Caption****Legend****Admonition****Topic****Sidebar****Rubric****Container****Compound****Footnote****Citation****Target****Comment****Substitution_Definition****Contents****Directive****Toctree**

Sphinx layer (GDS „Guidedog: everything Sphinx does, the Odin way“).

Toctree_Entry

Only**Glossary****Version_Modified****Desc****Desc_Signature****Desc_Content****Hlist****Production_List****Production****Index****Text**

Inline content.

Emphasis**Strong****Code****Link****Reference****Image****Footnote_Reference****Citation_Reference**

Substitution_Reference

Inline_Target

Math

Raw_Inline

Soft_Break

Hard_Break

Subscript

Superscript

Title_Reference

Abbreviation

Role

Xref

Sphinx layer inlines.

Desc_Name

Desc_Addname

Desc_Annotation

Desc_Parameterlist

Desc_Parameter

Desc_Optional

Desc_Returns

```
core.Pass :: struct
```

A pass reads an immutable document and may rebuild it into the destination builder.

```
name: string
```

```
procedure: proc(user: rawptr, doc: Document, b: ^Builder)
-> Pass_Outcome
```

```
user: rawptr
```

```
core.Pass_Outcome :: enum u8
```

```
Unchanged
```

```
Rebuilt
```

```
Failed
```

```
core.Policy :: struct
```

```
raw: Content_Policy
```

raw HTML, raw Typst, raw LaTeX.

```
unsafe_urls: Content_Policy
```

javascript:, vbscript:, and non-image data: URLs.

```
math: Content_Policy
```

math the target cannot translate.

```
includes: bool
```

whether include directives may request resources.

```
strict: bool
```

warnings fail the conversion.

```
keep_documents_with_errors: bool
```

keep_documents_with_errors keeps a document whose content has errors, as Docutils does below its halt level: an unknown directive or role,

an unresolved reference, or a bad option is still reported as an error, but the construct is left out (or rendered as problematic text) and the status is Ok. Renderers report such problems as warnings. Errors that leave no usable tree still fail: capacity, limits, cancellation, invalid storage, and validation. See `content_error`.

```
core.ROOT :: Node_Id(0)
```

```
core.Read_Context :: struct
```

```
ws: ^Workspace
```

```
b: ^Builder
```

```
source: Source_Id
```

```
options: Read_Options
```

```
policy: Policy
```

```
limits: Limits
```

```
resources: Resource_Provider
```

```
reports: ^Reports
```

```
scratch: ^Scratch
```

```
included: int
```

bytes of included sources, charged against `max_included_bytes`.

```
core.Read_Extension :: struct
```

`Read_Extension` carries a reader's own settings (`rst.Settings`, `sphinx.Config`, `commonmark.Settings`, or a third-party reader's type): a pointer the caller owns and the type it points to. `read_extension` makes one, and a reader takes it back with `reader_settings`, which refuses settings of another type, so settings meant for one reader are never read as another's. The zero value means the reader's defaults.

```
data: rawptr
```

id: typeid

```
core.Read_Inline_Proc :: #type proc(ctx: ^Read_Context, span:
Source_Span) -> Status
```

Read_Inline_Proc parses a span of ctx.source as inline content of the builder's open node, with the reader's settings (ctx.options.extension), as a translated message is parsed. It neither resolves references nor reports unresolved ones: the caller owns the surrounding document. span.source must be ctx.source.

```
core.Read_Options :: struct
```

promote_title: bool

RST: a lone top-level section becomes the title.

tab_width: int

RST tab stops; zero means 8.

today: string

RST date substitutions, e.g. 2026-09-29.

extension: Read_Extension

the reader's own settings; zero: its defaults.

```
core.Read_Proc :: #type proc(ctx: ^Read_Context) -> Status
```

Read_Proc reads ctx.source into ctx.b and returns its status; see Reader.

```
core.Read_Result :: struct
```

using result: Result

document: Document

```
core.Reader :: struct
```

id: string

name: string

version: string

conformance: Conformance

read: Read_Proc

read_inline: Read_Inline_Proc

optional; see Read_Inline_Proc.

<code>core.Region :: enum u8</code>

None

Nodes

Text

Attributes

Lists

Links

Cells

Sources

Scratch

Reports

Output

Source_Map

Second_Bank

the workspace has no bank B, which passes that rebuild write.

<code>core.Registry :: struct</code>

readers: []Reader

```
renderers: []Renderer
```

```
core.Render_Context :: struct
```

```
view: View
```

```
doc: Document
```

```
out: ^Emitter
```

```
reports: ^Reports
```

```
options: Render_Options
```

```
policy: Policy
```

```
limits: Limits
```

```
scratch: ^Scratch
```

```
core.Render_Options :: struct
```

```
standalone: bool
```

a complete document rather than a body fragment.

```
reference_profile: bool
```

CommonMark reference HTML, for conformance tests.

```
title: string
```

overrides the document's own title.

```
language: string
```

BCP 47 tag; „en“ when empty.

```
stylesheet: string
```

standalone HTML: CSS emitted in a style element.

```
section_numbers: bool
```

anchor_prefix: string

prepended to every anchor, e.g. a document ID in a book.

permalinks: bool

HTML: a link to each heading, caption, and signature.

permalink_icon: string

„¶“ when empty.

secnumber_suffix: string

after section numbers; „ „ when empty.

highlighter: Highlighter

labels: ^Labels

the words renderers write, translated; nil: English.

math: Math_Style

math_inline: [2]string

HTML math delimiters for the script that typesets it, with Math_Style.Sphinx; empty: $(\)$ inline and $[\]$ displayed, as Sphinx's mathjax_inline and mathjax_display default to.

math_display: [2]string

core.Render_Proc :: #type proc(ctx: ^Render_Context) -> Status

Render_Proc writes ctx.view with ctx.out and returns its status; see Renderer.

core.Renderer :: struct

id: string

name: string

version: string

media_type: string

conformance: Conformance

render: Render_Proc

core.Reports :: struct

items: []Diagnostic

used: int

suppressed: int

truncated: bool

muted: bool

write mode repeats the checked encoding without reporting.

primary: Diagnostic

has_primary: bool

errors: int

warnings: int

fatal: Status

the first error that is not a content error; see content_error.

core.Request :: struct

source: Source

reader: string

renderer: string

read: Read_Options

render: Render_Options

policy: Policy**limits:** Limits**passes:** []Pass**resources:** Resource_Provider**cancel:** Cancel_Probe**source_map:** []Map_Entry

optional; filled by renderers that support it.

```
core.Resource_Provider :: struct
```

Resource_Provider belongs to the caller's trust boundary and may allocate. The core passes the requesting source and the name as written; the provider returns borrowed UTF-8 text valid for the whole conversion, and a canonical name for cycle checks.

```
procedure: proc(user: rawptr, from: Source, name:
string) -> (text: string, canonical: string, status:
Resource_Status)
```

user: rawptr

```
core.Resource_Status :: enum u8
```

Ok**Missing****Refused****Limit**

the host's memory budget cannot hold it.

```
core.Result :: struct
```

Result is the outcome of a stage. reports borrows the workspace's reports region, valid until the next conversion or reset; primary is the first error by value, so it survives both. On Capacity, need names the region to enlarge.


```
status: Status
```

```
written: int
```

```
reports: []Diagnostic
```

```
primary: Diagnostic
```

```
need: Capacity_Need
```

```
mapped: int
```

source_map entries written.

```
suppressed: int
```

```
truncated: bool
```

```
core.Scratch :: struct
```

```
bytes: []u8
```

```
used: int
```

```
high: int
```

high-water mark, for sizing evidence.

```
core.Scratch_Mark :: distinct int
```

Scratch is stage-local storage carved from the caller's byte slice. Taking scratch advances a used-count; it is not an allocator call. A stage records a mark and releases to it when it finishes.

```
core.Severity :: enum u8
```

```
Note
```

```
Warning
```

```
Error
```

```
core.Slab_Plan :: struct
```

```
nodes: int
```

```
attributes: int
```

```
lists: int
```

```
links: int
```

```
cells: int
```

```
text: int
```

```
scratch: int
```

```
sources: int
```

```
reports: int
```

```
output: int
```

```
second_bank: bool
```

```
core.Snapshot :: struct
```

```
nodes: Table(Node)
```

```
attributes: Table(Attribute)
```

```
lists: Table(List_Info)
```

```
links: Table(Link_Info)
```

```
cells: Table(Cell_Info)
```

```
text: []u8
```

```
text_used: int
```

```
core.Snapshot_Storage :: struct
```

```
nodes: []Node
```

```
attributes: []Attribute
```

```
lists: []List_Info
```

```
links: []Link_Info
```

```
cells: []Cell_Info
```

```
text: []u8
```

```
core.Source :: struct
```

```
name: string
```

```
text: string
```

```
core.Source_Entry :: struct
```

```
using source: Source
```

```
parent: Source_Id
```

the including source; itself for the main source.

```
included_at: Source_Span
```

the include directive, when included.

```
use: Source_Use
```

how an included source is read.

```
core.Source_Id :: distinct u16
```

```
core.Source_Span :: struct
```

Source_Span is a half-open byte range in a source of the workspace source table.

source: Source_Id

start: u32

end: u32

core. Source_Use :: <i>enum</i> u8

Source_Use tells how the reader uses an included source: parsed as markup (include), or shown as it is (literalinclude, a graph file). Hosts can tell a document's parts from files it only quotes, as Sphinx's env.included does.

Parsed

Literal

core. Stack :: <i>struct</i> (\$T: <i>typeid</i>)

Stack is a bounded LIFO over caller-provided items.

items: []T

used: int

core. Stack_Guard :: <i>struct</i>

base: uintptr

limit: uintptr

core. Status :: <i>enum</i> u8

Ok

Invalid_Input

Unsupported

Policy

Capacity

Limit**Cancelled****Internal****core.Storage** :: struct

Storage lists every region a workspace borrows. All lengths are capacities.

banks: [2]Snapshot_Storage**scratch:** []u8**sources:** []Source_Entry**reports:** []Diagnostic**core.Symbol** :: struct

Symbol_Table is open addressing over caller-provided slots. It never grows. The load factor stays at or below one half, and probes are bounded, so hostile keys cost a bounded amount of work and end in a limit report rather than a slow scan.

hash: u64**key:** string

borrowed; must outlive the table.

value: u32**used:** bool**core.Symbol_Status** :: enum u8**Ok****Duplicate****Full**

Probe_Limit**core.Symbol_Table** :: struct**slots**: []Symbol**count**: int**max_probe**: int**core.Table** :: struct(\$T: typeid)

Table is a caller-owned SoA slice with a used-count. Appending never allocates.

rows: []T**used**: int**core.Text** :: struct

Text is a byte range in the active snapshot's text pool.

start: u32**length**: u32**core.View** :: struct

View is the read-only form renderers and passes traverse. Obtaining a view checks the handle once; accessors are then plain bounds-checked indexing. Strings they return borrow the snapshot's text pool or the sources, valid while the document is valid. An id out of range is a programming error (a bounds-check panic), not a data error: ids come from the view itself.

snap: ^Snapshot**sources**: []Source_Entry**core.Workspace** :: struct

Workspace is one conversion's borrowed storage. A document handle names a generation (one conversion, from read to render) and a bank's revision (one

build of that bank); both only grow, so a handle to a cleared or rebuilt bank never becomes valid again.

banks: [2]Snapshot

revisions: [2]u32

raised whenever a bank is cleared to be built again.

active: int

generation: u32

scratch: Scratch

sources: []Source_Entry

sources_used: int

reports: Reports

keep_errors: bool

the read's Policy.keep_documents_with_errors; passes honour it.

output: []u8

optional; set by init_workspace_from_bytes for convert_text.

ready: bool

Procedures

```
core.add_attribute :: proc(b: ^Builder, id: Node_Id, key:
Attribute_Key, value: Text, name := Text{})
```

add_attribute requires that id is the most recently begun node, so each node's attributes stay contiguous.

```
core.add_attribute_string :: proc(b: ^Builder, id: Node_Id,
key: Attribute_Key, value: string, name := "")
```

add_attribute_string copies value (and name, for a Custom key) into the text pool and adds the attribute as add_attribute does.

```
core.add_flags :: proc(b: ^Builder, id: Node_Id, f:
Node_Flags)
```

add_flags adds flags to node id; nothing happens once the builder has failed.

```
core.add_leaf :: proc(b: ^Builder, kind: Node_Kind, span:
Source_Span, text := Text{}) -> (Node_Id, bool) #optional_ok
```

add_leaf adds a closed node of kind with text (borrowed from the bank's pool) and no children; it fails as begin_node does.

```
core.add_source :: proc(ctx: ^Read_Context, name, text:
string) -> (Source_Id, bool)
```

add_source registers text that is not a file, such as a configured prologue, so nodes parsed from it carry spans into it. The text must outlive the conversion.

```
core.add_text :: proc(b: ^Builder, s: string) -> Text
```

add_text copies s into the text pool.

```
core.admonition_label :: proc(o: Render_Options, k:
Admonition_Kind) -> string
```

admonition_label is the title of an admonition kind; „ for a generic admonition.

```
core.admonition_name :: proc(k: Admonition_Kind) -> string
```

admonition_name returns the static class name of an admonition kind („note“, „tip“).

```
core.anchor_extras :: proc(a: ^Anchors, owner: Node_Id) -
> []Anchor_Extra
```

anchor_extras returns the ids generated for a node's sake (see Anchor_Extra), in the order they were given.

```
core.anchor_ids :: proc(a: ^Anchors, id: Node_Id) ->
Anchor_Ids
```

anchor_ids iterates every id of a node, the primary one first.

```
core.anchor_of :: proc(a: ^Anchors, id: Node_Id) -> (string,
bool)
```

anchor_of returns the primary id of a node, borrowed from the anchor table, or false when the node has none.


```
core.arg_int :: proc(v: i64) -> Diagnostic_Arg
```

arg_int makes an integer diagnostic argument.

```
core.arg_span :: proc(s: Source_Span) -> Diagnostic_Arg
```

arg_span makes a diagnostic argument that quotes the source text of s.

```
core.arg_static :: proc(s: string) -> Diagnostic_Arg
```

arg_static makes a diagnostic argument of static text, which must outlive the reports.

```
core.attribute :: proc(v: View, id: Node_Id, key:
Attribute_Key) -> (string, bool)
```

attribute returns the value of node id's first attribute with key, borrowed from the view, or false when it has none.

```
core.attributes :: proc(v: View, id: Node_Id) -> Attributes
```

attributes starts an iteration over every attribute of node id, for next_attribute.

```
core.begin_node :: proc(b: ^Builder, kind: Node_Kind, span:
Source_Span) -> (Node_Id, bool) #optional_ok
```

begin_node opens a node of kind as the last child of the current node, to be closed with end_node. It fails, poisoning the builder and returning INVALID_NODE, when the nesting is illegal (child_allowed), a limit is reached, or the nodes region is full.

```
core.buffer_string :: proc(b: ^Buffer) -> string
```

buffer_string returns the bytes written, borrowed from the buffer's storage.

```
core.buffer_write :: proc(b: ^Buffer, s: string)
```

buffer_write appends s, or sets overflow and drops it, and every later write, when it does not fit; wanted counts it either way.

```
core.buffer_write_byte :: proc(b: ^Buffer, c: u8)
```

buffer_write_byte appends one byte, as buffer_write does.

```
core.build_anchors :: proc(ctx: ^Render_Context, a: ^Anchors,
headings: bool) -> Status
```

build_anchors takes its storage from the render context's scratch. Identifiers are made from text in the snapshot's pool, and folding never more than

doubles its length, so twice the pool plus a fixed overhead per anchor always suffices. A node's own name is gathered in room measured for the longest one.

```
core.builder_capacity :: proc(b: ^Builder, region: Region,
minimum: u64)
```

`builder_capacity` poisons the builder with a Capacity status whose need names region and the minimum it lacks, reporting CORE_CAPACITY; nothing happens if it already failed.

```
core.builder_fail :: proc(b: ^Builder, d: Diagnostic)
```

`builder_fail` reports `d` and poisons the builder with its status (the first failure wins); later builder calls do nothing.

```
core.builder_finish :: proc(b: ^Builder) -> Status
```

`builder_finish` closes the root. Every other node must already be closed.

```
core.builder_init :: proc(b: ^Builder, snap: ^Snapshot,
scratch: ^Scratch, reports: ^Reports, limits: Limits,
root_span: Source_Span) -> Status
```

`builder_init` starts a builder over `snap` with its open-node stack taken from `scratch`, and opens the root Document node at `root_span`. The engine calls it for every read and pass; tests use it to drive a reader's pieces. It returns Capacity, with `b.need` set, when `scratch` cannot hold the stack. The builder borrows every argument for one stage.

```
core.cell_info :: proc(v: View, id: Node_Id) -> Cell_Info
```

`cell_info` returns the cell payload of node `id`, or a cell spanning one row and one column when it has none.

```
core.check_render :: proc(ws: ^Workspace, doc: Document,
renderer: Renderer, request: Request) -> Result
```

`check_render` runs the renderer in measure mode and reports its exact output size, as need, and every support problem, without writing. `doc` must be a valid document of `ws`.

```
core.child_count :: proc(v: View, id: Node_Id) -> int
```

`child_count` counts the children of node `id`, in time linear in their number.

```
core.children :: proc(v: View, id: Node_Id) -> Children
```

`children` starts an iteration over the children of node `id`, for `next_child`.

```
core.code_caption :: proc(v: View, id: Node_Id) -> Node_Id
```

code_caption is a code block's Caption child (its parsed Custom caption), or INVALID_NODE when it has none.

```
core.content_error :: proc(status: Status) -> bool
```

content_error tells whether an error's status describes the content (an unknown directive or role, a bad option, an unresolved reference, content refused by policy) rather than a tree that cannot be used: capacity, limits, cancellation, or a bug. Policy.keep_documents_with_errors keeps documents whose errors are all content errors.

```
core.content_model :: proc(k: Node_Kind) -> Content
```

content_model tells what children nodes of kind k may have; see child_allowed. The switch is exhaustive, so a new kind does not compile until it says.

```
core.contents_scope :: proc(v: View, contents: Node_Id) ->
(first, end: Node_Id, base: int)
```

contents_scope is the range of nodes a table of contents lists and the number of sections around that range.

```
core.convert :: proc(ws: ^Workspace, registry: Registry,
request: Request, output: [u8]) -> Result
```

convert reads, optionally transforms, and renders one source into output, which the caller owns; on success output[:written] holds it, and on failure written is 0. It starts a new workspace generation, which invalidates every earlier document, even on failure. It checks the registry first (validate_registry). The result borrows the workspace: its reports are valid until the next conversion or reset. It never allocates; every failure is a status with a primary diagnostic.

```
core.convert_text :: proc(ws: ^Workspace, registry: Registry,
reader, renderer, text: string, name := "input") -> (string,
Result)
```

convert_text converts text with default_request and the workspace's own output region (set by the slab initializers; convert with an output slice otherwise). The returned string borrows that region and is valid until the next conversion or reset of the workspace; on failure it is „“ and the result says why.

```
core.copy_payload :: proc(b: ^Builder, v: View, from, to: Node_Id)
```

copy_payload copies a node's list, cell, or link row, with its texts, to the node to of b's document; passes that rebuild a document share it.

```
core.copy_subtree :: proc(b: ^Builder, v: View, id: Node_Id)
-> Node_Id
```

copy_subtree copies a node and its descendants from a document view into a builder, including text, attributes, and payload rows, and returns the copy of id. Copies are appended in order, one per node, so the copy of a descendant d is copy + (d - id): a pass can adjust copies with set_value, set_text, add_flags, and set_kind. Internal link targets keep their numbering only when the pass copies the whole document in order. On failure the builder is poisoned and the result is INVALID_NODE.

```
core.current :: proc(b: ^Builder) -> Node_Id
```

current returns the innermost open node, or INVALID_NODE when none is open.

```
core.current_kind :: proc(b: ^Builder) -> Node_Kind
```

current_kind returns the kind of the innermost open node; Document when none is open.

```
core.custom_attribute :: proc(v: View, id: Node_Id, name: string) -> (string, bool)
```

custom_attribute returns the value of node id's Custom attribute named name, borrowed from the view, or false when it has none.

```
core.decode_last_rune :: proc(s: string, end: int) -> (rune, int)
```

decode_last_rune decodes the UTF-8 character ending at byte end of s, as decode_rune.

```
core.decode_rune :: proc(s: string, i: int) -> (rune, int)
```

decode_rune decodes the UTF-8 character starting at byte i of s and returns it with its width; an invalid byte decodes as the replacement character, width 1.

```
core.default_limits :: proc() -> Limits
```

default_limits returns the documented limits by value; zero limits never mean unlimited.

```
core.default_policy :: proc() -> Policy
```

default_policy returns the safe policy by value: raw content, unsafe URLs, and math the target cannot translate are refused; includes may be requested.

```
core.default_read_options :: proc() -> Read_Options
```

default_read_options returns the read options by value: RST title promotion on, tab width 8, and no reader settings.

```
core.default_request :: proc(name, text, reader, renderer:
string) -> Request
```

default_request assembles a complete Request with the documented defaults: default_read_options, a standalone render, default_policy, and default_limits, with no passes, resource provider, or cancellation probe. It borrows name and text. Change fields afterwards; lib/defaults has typed read options for the built-in readers.

```
core.diagnostic :: proc(m: Message, span: Source_Span, a :=
Diagnostic_Arg{}, b := Diagnostic_Arg{}) -> Diagnostic
```

diagnostic builds a Diagnostic by value from a static message, a span, and up to two arguments; it copies nothing.

```
core.document_valid :: proc(doc: Document) -> bool
```

document_valid reports whether doc still names the snapshot it was built as: the same generation, the active bank, and the bank's revision at that time.

```
core.dump_tree :: proc(v: View, e: ^Emitter)
```

dump_tree writes a readable, deterministic outline of a document. Tests use it as a renderer-independent golden format:

```
document
  section value=1
    heading value=1
      text "Title"
```

```
core.emit :: proc(e: ^Emitter, s: string)
```

emit writes s: Measure mode counts it, Write mode also stores it in the output.

```
core.emit_byte :: proc(e: ^Emitter, c: u8)
```

emit_byte writes one byte, as emit does.

```
core.emit_int :: proc(e: ^Emitter, value: i64)
```

emit_int writes value in decimal, as emit does.

```
core.emit_mark :: proc(e: ^Emitter, span: Source_Span)
```

emit_mark records that output from here on originates at span.

```
core.emit_rune :: proc(e: ^Emitter, r: rune)
```

emit_rune writes r UTF-8 encoded, as emit does.

```
core.encode_rune :: proc(r: rune) -> ([4]u8, int)
```

encode_rune returns r encoded as UTF-8 and the number of bytes used.

```
core.end_node :: proc(b: ^Builder, id: Node_Id)
```

end_node closes id, which must be the innermost open node, and records its subtree end; closing out of order poisons the builder.

```
core.extension_as :: proc(e: Read_Extension, $T: typeid) ->
(settings: ^T, ok: bool)
```

extension_as returns the settings e carries as ^T: nil and true when e is empty, nil and false when it carries another type. It neither reports nor allocates.

```
core.extra_anchor :: proc(a: ^Anchors, owner, item: Node_Id)
-> (string, bool)
```

extra_anchor returns the id of an element generated for owner and item.

```
core.extra_text :: proc(a: ^Anchors, e: Anchor_Extra) ->
string
```

extra_text is the id of a generated element.

```
core.find_reader :: proc(r: Registry, id: string) -> (Reader,
bool)
```

find_reader returns the reader of r with id, by value, or false.

```
core.find_renderer :: proc(r: Registry, id: string) ->
(Renderer, bool)
```

find_renderer returns the renderer of r with id, by value, or false.

```
core.first_child :: proc(v: View, id: Node_Id) -> Node_Id
```

first_child returns the first child of node id, or INVALID_NODE when it has none.

```
core.first_problem :: proc(r: ^Reports) -> Diagnostic
```

first_problem returns the primary error, or the first warning when there is none.

```
core.has_children :: proc(v: View, id: Node_Id) -> bool
```

has_children tells whether node id has any child.

```
core.has_class :: proc(v: View, id: Node_Id, class: string) -> bool
```

has_class looks through every class attribute; a value may hold several classes.

```
core.id_fold :: proc(r: rune) -> string
```

id_fold is the ASCII transliteration make_id gives a lowercase rune („é“ gives „e“, „²“ gives „2“), from Unicode’s decompositions, or “ when it has none. The string is static.

```
core.include_source :: proc(ctx: ^Read_Context, from: Source_Id, name: string, span: Source_Span, use := Source_Use.Parsed) -> (Source_Id, bool)
```

include_source asks the host for a resource named by a directive in source from, records it in the source table, and returns its ID. Every refusal is reported at span. use says whether the reader parses the text or shows it as it is.

```
core.init_workspace :: proc(ws: ^Workspace, storage: Storage) -> Result
```

init_workspace borrows storage. It checks alignment-free invariants: every region is disjoint, and bank A can hold at least a root node. Initializing a workspace again invalidates every document of its earlier storage.

```
core.init_workspace_from_bytes :: proc(ws: ^Workspace, slab: []u8) -> Result
```

init_workspace_from_bytes carves the regions of slab_plan(estimate) from slab, one bank, for the largest input estimate whose plan fits, and initializes the workspace. The workspace borrows slab, which must outlive it; a slab too small for any plan is a capacity result. For passes that rebuild, use init_workspace_with_plan.

```
core.init_workspace_with_plan :: proc(ws: ^Workspace, slab: []u8, p: Slab_Plan) -> Result
```

init_workspace_with_plan carves exactly the regions of p from slab, and the rest of the slab becomes scratch. It is the authoritative path:

`init_workspace_from_bytes` only chooses a plan. A plan that cannot be sized is `Invalid_Input`; a slab smaller than `plan_bytes(p)` is a capacity result.

```
core.is_ascii_alnum :: proc(c: u8) -> bool
```

`is_ascii_alnum` tells whether `c` is an ASCII letter or digit.

```
core.is_ascii_digit :: proc(c: u8) -> bool
```

`is_ascii_digit` tells whether `c` is an ASCII digit.

```
core.is_ascii_punct :: proc(c: u8) -> bool
```

`is_ascii_punct` tells whether `c` is ASCII punctuation, as `CommonMark` defines it.

```
core.is_ascii_space :: proc(c: u8) -> bool
```

`is_ascii_space` tells whether `c` is ASCII white space: space, tab, LF, CR, FF, or VT.

```
core.is_unicode_punctuation :: proc(r: rune) -> bool
```

`is_unicode_punctuation` follows `CommonMark 0.31`: general categories P and S.

```
core.is_unicode_whitespace :: proc(r: rune) -> bool
```

`is_unicode_whitespace` follows `CommonMark`: Zs characters, tab, LF, FF, and CR.

```
core.kept_message :: proc(policy: Policy, m: Message) -> Message
```

`kept_message` is `m` as a renderer reports it: a content error becomes a warning when the policy keeps documents with errors, so the page is still written.

```
core.kind :: proc(v: View, id: Node_Id) -> Node_Kind
```

`kind` returns the kind of node `id`.

```
core.kind_name :: proc(k: Node_Kind) -> string
```

`kind_name` returns the static name of a node kind, as dumps and diagnostics write it.

```
core.label :: proc(o: Render_Options, l: Label) -> string
```

`label` returns a label in the render's language, or in English when it has none.


```
core.line_bounds :: proc(text: string, offset: int) ->
(start, end: int)
```

line_bounds returns the byte range of the line containing offset, without the break.

```
core.line_column :: proc(text: string, offset: int) -> (line,
column: int)
```

line_column converts a byte offset into a 1-based line and byte column.

```
core.link_info :: proc(v: View, id: Node_Id) -> (Link_Info,
bool)
```

link_info returns the link payload of node id, or false and an unresolved link when it has none.

```
core.list_info :: proc(v: View, id: Node_Id) -> List_Info
```

list_info returns the list payload of node id, or a bullet list starting at 1 when it has none.

```
core.load_object :: proc(ws: ^Workspace, bytes: []u8, limits:
Limits) -> Read_Result
```

load_object rebuilds a document from bytes written by write_object into bank A of a new workspace generation. bytes must outlive the document: source names and texts are views into them.

```
core.make_id :: proc(out: ^Buffer, name: string)
```

make_id turns a name into an identifier matching `[a-z](-?[a-z0-9]+)*`: letters are lowercased and transliterated to ASCII (ID_FOLDS, derived from Unicode data), every other run of characters becomes one hyphen, and leading digits and hyphens are dropped, as published Sphinx URLs expect. The result may be empty.

```
core.media_kind :: proc(path: string) -> Media_Kind
```

media_kind reads a path's extension, ignoring case, a query, and a fragment.

```
core.next_anchor_id :: proc(a: ^Anchors, it: ^Anchor_Ids) ->
(string, bool)
```

next_anchor_id returns the next id of an anchor_ids iteration, borrowed from the anchor table; false ends it.

```
core.next_attribute :: proc(v: View, it: ^Attributes) ->
(Attribute, bool)
```

next_attribute returns the next attribute of an attributes iteration, whose Text values index the view's pool; false ends it.

```
core.next_child :: proc(v: View, it: ^Children) -> (Node_Id,
bool)
```

next_child returns the next child of a children iteration; false ends it.

```
core.nfd_first :: proc(s: string) -> rune
```

nfd_first returns the first character of s in NFD, as Sphinx takes an index entry's letter: `unicodedata.normalize("NFD", s[o])[o]`.

```
core.no_reader_settings :: proc(ctx: ^Read_Context) -> bool
```

no_reader_settings is reader_settings for a reader that takes no settings: any extension is reported (CORE_SETTINGS_NONE) and the result is false.

```
core.node :: proc(v: View, id: Node_Id) -> Node
```

node returns node id by value.

```
core.node_count :: proc(v: View) -> int
```

node_count returns the number of nodes in the document, the root included.

```
core.node_text :: proc(v: View, id: Node_Id) -> string
```

node_text returns the text of node id, borrowed from the view.

```
core.normalize_label :: proc(out: ^Buffer, label: string)
```

normalize_label writes the case-folded label with runs of white space collapsed to one space and the ends trimmed. It is used for CommonMark labels and RST names.

```
core.normalize_nfd_into :: proc(dst: []u8, s: string) -> (n:
int, ok: bool) #optional_ok
```

normalize_nfd_into writes s in Normalization Form D into dst, the caller's storage, and returns the length of the whole normal form. It never allocates and never borrows s: the result is always `dst[:n]`. When dst is too small, ok is false, n is the size dst needs, and dst holds only a prefix; a nil dst measures.

```
core.offset_in :: proc "contextless" (outer, inner: string) -> (int, bool)
```

offset_in returns where inner starts in outer when inner is a slice of outer's bytes, and false otherwise (an empty inner included). It compares addresses only and reads neither string, so it is safe for any two strings.

```
core.parent_of :: proc(v: View, id: Node_Id) -> Node_Id
```

parent_of scans backwards; it is linear and meant for diagnostics, not traversal.

```
core.plain_text :: proc(v: View, id: Node_Id, out: ^Buffer)
```

plain_text writes the concatenated text of a subtree, as used for alt text and ids.

```
core.plan_bytes :: proc(p: Slab_Plan) -> (bytes: int, ok: bool) #optional_ok
```

plan_bytes returns the slab size a plan needs. ok is false when a capacity is negative or the size overflows, which init_workspace_with_plan reports.

```
core.pool_string :: proc(b: ^Builder, t: Text) -> string
```

pool_string returns the text t of the builder's pool; it borrows the bank for the stage.

```
core.pop :: proc(s: ^Stack($T)) -> (v: T, ok: bool)
```

pop removes and returns the top item; false when the stack is empty.

```
core.push :: proc(s: ^Stack($T), v: T) -> bool
```

push appends v; false, changing nothing, when the stack is full.

```
core.read_document :: proc(ws: ^Workspace, reader: Reader, request: Request) -> Read_Result
```

read_document parses the request's source into bank A of a new generation and validates it. The document borrows the workspace and the request's source text, which must outlive it; it is valid until the next conversion, reset, or rebuild of bank A, and is returned only on success.

```
core.read_extension :: proc(settings: ^$T) -> Read_Extension
```

read_extension wraps a pointer to a reader's settings with their type. It borrows settings, which must outlive the read.

```
core.reader_settings :: proc(ctx: ^Read_Context, $T: typeid)
-> (settings: ^T, ok: bool)
```

reader_settings is extension_as at a reader's entry: settings of another type are reported (CORE_SETTINGS_TYPE, naming both types' packages) and ok is false; the reader then returns Invalid_Input before reading anything. nil and true mean the defaults.

```
core.render_document :: proc(ws: ^Workspace, doc: Document,
renderer: Renderer, request: Request, output: [u8] -> Result
```

render_document checks and measures, then writes into the caller's output only if it fits; otherwise the result is Capacity with the exact size needed, and output is untouched. doc must be a valid document of ws, and stays valid.

```
core.report :: proc(r: ^Reports, d: Diagnostic)
```

report records a diagnostic. The first error is kept by value in primary even when storage is full, so capacity failures remain explainable.

```
core.report_message :: proc(r: ^Reports, m: Message, span:
Source_Span, a := Diagnostic_Arg{}, b := Diagnostic_Arg{})
```

report_message reports the message m at span with its arguments, as report does.

```
core.reset_workspace :: proc(ws: ^Workspace)
```

reset_workspace invalidates every document and clears all used-counts.

```
core.resolve_link :: proc(b: ^Builder, row: u32, target:
Node_Id, kind: Link_Kind, destination := Text{})
```

resolve_link records the resolution of a link row during a reader's resolve stage.

```
core.scratch_buffer :: proc(s: ^Scratch, n: int) -> (b:
Buffer, missing: u64, ok: bool)
```

scratch_buffer takes a Buffer of n bytes from scratch, usually the wanted count of a measuring pass into a zero Buffer; ok is false, with the bytes missing, when scratch cannot hold it. The caller releases the scratch.

```
core.scratch_mark :: proc(s: ^Scratch) -> Scratch_Mark
```

scratch_mark records how much scratch is taken, for scratch_release.

```
core.scratch_release :: proc(s: ^Scratch, m: Scratch_Mark)
```

scratch_release gives back every scratch item taken since m; slices taken after m must not be used afterwards.

```
core.scratch_take :: proc(s: ^Scratch, $T: typeid, n: int) ->
(items: []T, missing: u64, ok: bool)
```

scratch_take returns n zeroed elements of T, or ok = false with the bytes missing.

```
core.set_cell :: proc(b: ^Builder, id: Node_Id, info:
Cell_Info)
```

set_cell stores info as node id's cell payload; a full cells region poisons the builder with Capacity.

```
core.set_kind :: proc(b: ^Builder, id: Node_Id, k: Node_Kind)
```

set_kind changes the kind of node id, as a pass does to a copy; validation checks the result. Nothing happens once the builder has failed.

```
core.set_link :: proc(b: ^Builder, id: Node_Id, info:
Link_Info) -> u32
```

set_link stores info as node id's link payload and returns its row, for resolve_link, or NONE when the builder has failed or the links region is full (Capacity).

```
core.set_list :: proc(b: ^Builder, id: Node_Id, info:
List_Info)
```

set_list stores info as node id's list payload; a full lists region poisons the builder with Capacity.

```
core.set_span_end :: proc(b: ^Builder, id: Node_Id, end: u32)
```

set_span_end moves the end of node id's source span, as a reader learns where a construct ends; nothing happens once the builder has failed.

```
core.set_text :: proc(b: ^Builder, id: Node_Id, t: Text)
```

set_text sets the text of node id; nothing happens once the builder has failed.

```
core.set_value :: proc(b: ^Builder, id: Node_Id, v: i32)
```

set_value sets the value of node id (a heading level, a list count, and so on); nothing happens once the builder has failed.

```
core.slab_plan :: proc(input_bytes: int, second_bank :=
false) -> (p: Slab_Plan, ok: bool) #optional_ok
```

slab_plan estimates capacities for an input of the given size. The estimate is generous for prose and typical technical documents; tables and heavy markup may need more, which a capacity result reports. ok is false when a capacity would overflow.

```
core.source_entry :: proc(v: View, id: Source_Id) ->
Source_Entry
```

source_entry returns the source-table entry of id (the main source is 0), borrowed from the view, or a zero entry when id is out of range.

```
core.source_of :: proc(ctx: ^Read_Context, id: Source_Id) -
> string
```

source_of returns the text of source id, borrowed from the workspace's source table for the read.

```
core.source_text :: proc(v: View, span: Source_Span) ->
string
```

source_text returns the source bytes a span covers, or „“ for an invalid span.

```
core.spend :: proc(b: ^Builder, steps: u64 = 1) -> bool
```

spend charges work against limits.max_work and polls cancellation periodically.

```
core.split_label :: proc(s: string) -> (before, after:
string)
```

split_label splits a label at its „%s“: the text before and after the value.

```
core.stack_diagnostic :: proc(g: Stack_Guard, span:
Source_Span) -> Diagnostic
```

stack_diagnostic is the Limit a guard's recursion reports.

```
@(require_results) core.stack_exhausted :: proc "contextless"
(g: Stack_Guard) -> bool
```

stack_exhausted reports whether the next frame would take the stack past the budget. A zero guard (never started) is never exhausted.

```
@(require_results, no_sanitize_address) core.stack_guard ::  
proc "contextless" (limits: Limits) -> Stack_Guard
```

stack_guard starts measuring at the caller's frame, with the limits' stack budget.

```
core.stack_slice :: proc(s: ^Stack($T)) -> []T
```

stack_slice returns the items in the stack, bottom first, borrowed from its storage.

```
core.subtree_end :: proc(v: View, id: Node_Id) -> Node_Id
```

subtree_end returns the id after the last descendant of node id.

```
core.symbol_get :: proc(t: ^Symbol_Table, key: string) ->  
(value: u32, found: bool)
```

symbol_get returns the value stored for key, or NONE and false when it is absent.

```
core.symbol_put :: proc(t: ^Symbol_Table, key: string, value:  
u32) -> (existing: u32, status: Symbol_Status)
```

symbol_put inserts key. For a duplicate it leaves the table unchanged and returns the existing value.

```
core.symbol_set :: proc(t: ^Symbol_Table, key: string, value:  
u32) -> bool
```

symbol_set replaces the value of an existing key.

```
core.symbol_table_init :: proc(t: ^Symbol_Table, s: ^Scratch,  
capacity: int) -> (missing: u64, ok: bool)
```

symbol_table_init takes $2 * \text{capacity}$ slots (rounded to a power of two) from scratch.

```
core.text :: proc(v: View, t: Text) -> string
```

text returns the string t names in the snapshot's text pool, borrowed from the view.

```
core.text_close :: proc(b: ^Builder, start: u32) -> Text
```

text_close returns the Text pushed since start (text_open), or an empty Text when the builder has failed.

```
core.text_open :: proc(b: ^Builder) -> u32
```

text_open starts a run of pushed text: the offset text_close measures from.

```
core.text_push :: proc(b: ^Builder, s: string)
```

text_push copies s into the text pool; a full pool poisons the builder with Capacity.

```
core.text_push_byte :: proc(b: ^Builder, c: u8)
```

text_push_byte copies one byte into the text pool, as text_push does.

```
core.text_push_rune :: proc(b: ^Builder, r: rune)
```

text_push_rune copies r, UTF-8 encoded, into the text pool, as text_push does.

```
core.text_rewind :: proc(b: ^Builder, start: u32)
```

text_rewind drops text pushed since start; used when a tentative parse is abandoned.

```
core.top :: proc(s: ^Stack($T)) -> ^T
```

top returns a pointer to the top item, valid until the next push or pop, or nil when the stack is empty.

```
core.transform_document :: proc(ws: ^Workspace, doc: Document, passes: []Pass, limits := Limits{}) -> Read_Result
```

transform_document runs passes in order. A rebuilding pass writes the inactive bank, which is validated before it becomes active; on failure the old bank stays valid and is returned as the document. A workspace without a second bank fails before a pass runs, with Capacity and need.region Second_Bank. doc must be a valid document of ws. Zero limits mean default_limits.

```
core.trusted_policy :: proc() -> Policy
```

trusted_policy suits conformance tests and content the caller wrote.

```
core.unwrap_node :: proc(b: ^Builder, id: Node_Id)
```

unwrap_node removes a closed node and keeps its descendants in place, as when an RST section becomes the document title. Links that resolved to the removed node resolve to the node that takes its index. Validation still runs after the reader finishes.


```
core.validate :: proc(snap: ^Snapshot, sources:
[]Source_Entry, scratch: ^Scratch, limits: Limits) ->
(Status, Diagnostic)
```

validate checks every structural invariant of a finished snapshot. It needs a stack of open subtree ends, taken from scratch and released before returning.

```
core.validate_registry :: proc(r: Registry) -> Result
```

validate_registry checks that every adapter has an ID, a version, and a procedure, and that no ID is registered twice. convert checks its registry the same way before using it, so a bad registry fails with Invalid_Input instead of the first match silently winning; a host may call this once where it builds a registry.

```
core.view :: proc(doc: Document) -> (View, bool)
```

view checks doc once (document_valid) and returns its read-only View, which borrows the workspace until doc becomes invalid; false for a stale or foreign handle.

```
core.workspace_size :: proc(input_bytes: int) -> (bytes: int,
ok: bool) #optional_ok
```

workspace_size returns the slab size, in bytes, of slab_plan(input_bytes): one bank, for conversions without rebuilding passes. ok is false when the size cannot be represented. Size a workspace for passes with a plan (see above).

```
core.write_id :: proc(out: ^Buffer, name: string)
```

write_id lowercases letters, keeps letters and digits, and joins every other run of characters with one hyphen. It names documents and chapters, whose names may start with digits; make_id names anchors.

```
core.write_object :: proc(v: View, e: ^Emitter)
```

write_object serializes the document in view v. Use Measure mode first for its size.

Constants

```
core.BUILDER_OPEN :: max(u32) - 1
```

```
core.CORE_CAPACITY
```

```
core.CORE_DEPTH
```

```
core.CORE_NODES
```

`core.CORE_STACK`

`core.CORE_UNHANDLED_KIND`

`core.CORE_WORK`

`core.DEFAULT_STACK_BYTES :: (512 << 10) * ASAN_FRAME_SCALE`

DEFAULT_STACK_BYTES is the stack a reader or renderer may use when Limits.stack_bytes is 0. It holds the default max_depth of every recursive path with room to spare, and with STACK_RESERVE it fits a 1 MiB thread, the smallest default stack of the supported platforms' threads (Windows; Odin's threads on Unix take RLIMIT_STACK, usually 8 MiB).

`core.INCLUDE_MISSING`

`core.NONE :: max(u32)`

`core.SCHEMA_VERSION :: 1`

`core.STACK_RESERVE :: (128 << 10) * ASAN_FRAME_SCALE`

STACK_RESERVE is the stack a conversion needs below its deepest guard.

`core.VERSION :: "0.2.0"`

VERSION is the engine's version. It is released with Guidedog and so far follows its version (cli.VERSION), but is kept apart because programs embed the engine without the command. SCHEMA_VERSION counts the incompatible changes to documents saved as objects.

Variables

`@(rodata) core.ENGLISH_LABELS`

ENGLISH_LABELS are the labels in English, Sphinx's msgids; renderers fall back to them.

`@(rodata) core.LIST_STYLE_NAMES`

defaults

Package defaults assembles the built-in readers and renderers into an explicit, immutable registry. Embedders may build their own registry from any subset.

Procedures

```
defaults.myst_options :: proc(settings: ^commonmark.Settings,
base := gd.Read_Options{}) -> gd.Read_Options
```

myst_options reads with the „myst“ reader’s settings, from commonmark.default_settings or sphinx.markdown_settings. It borrows settings, as rst_options does.

```
defaults.registry :: proc() -> gd.Registry
```

registry returns the built-in registry by value; it borrows static tables, valid for the whole program. Readers: „rst“, „sphinx“, „commonmark“ (pure CommonMark), and „myst“ (MyST Markdown). Renderers: „html“, „typst“, and „text“.

```
defaults.rst_options :: proc(settings: ^rst.Settings, base :=
gd.Read_Options{}) -> gd.Read_Options
```

rst_options reads with the „rst“ reader’s settings (rst.default_settings() to start). It borrows settings; base, when not zero, supplies the other read options.

```
defaults.sphinx_options :: proc(config: ^sphinx.Config,
base := gd.Read_Options{}) -> gd.Read_Options
```

sphinx_options reads with the „sphinx“ reader’s configuration (sphinx.default_config() to start). It borrows config, as rst_options does.

fetch

Types

```
fetch.Error :: enum u8
```

None

Unsupported

not http, https, or a file; or no libcurl on this platform.

Missing

no such file.

Network

the connection or transfer failed.

Timeout**Status**

the server answered with a status other than 2xx.

Too_Large

`fetch.Options` :: *struct*

Options bound one get. The zero value is the defaults.

timeout_ms: int

the whole transfer; 0: 30 seconds; below 0: none.

max_bytes: int

0: 64 MiB.

user_agent: string

`fetch.Result` :: *struct*

Result is what get read, or why it could not. Its data, url, and message are allocated with the allocator given to get, and the caller owns them: destroy frees them.

data: []u8

url: string

where the data came from, after redirects.

status: int

the HTTP status, or 0 for files.

error: Error

message: string

what went wrong, for a report.

Procedures

```
fetch.destroy :: proc(r: ^Result, allocator :=
context.allocator)
```

destroy frees what get allocated for r, with the same allocator, and clears r.

```
fetch.get :: proc(location: string, options: Options,
allocator := context.allocator) -> Result
```

get reads a URL or path, allocating the result with allocator; the caller owns it and frees it with destroy. It fails with an Error in the result, never a panic: a file that is missing, a transfer that fails, times out, answers with a status other than 2xx, or grows beyond max_bytes. It blocks until the transfer ends; threads may call it at once.

Foreign imports

```
foreign import fetch.curl "system:curl"
```

Verfügbarkeit: Darwin, Linux, FreeBSD, OpenBSD, NetBSD, WASI, JS, Orca, Freestanding.

gds

Package gds is the GDS process of docs/gds (GDS 0001) as a library: it loads the discussion records of a directory into a Catalog, plans changes to them (a new draft, a promotion, a state or label change, the regenerated index) as a Plan, applies a plan as one recoverable transaction under a lock. RST publication uses the project engine; Typst typesets PDF. Failure is a Problem that carries the exit status, never a panic. It allocates with context.allocator and frees nothing, so a caller runs it in an arena, as `guidedog gds` does, and frees the arena when done.

Types

```
gds.Catalog :: struct
```

```
records: [dynamic]Record
```

```
reserved: int
```

```
gds.Change :: struct
```

```
path: string
```

```
before: string
```

after: string

existed: bool

present: bool

gds.Field *:: struct*

name: string

literal: string

gds.Options *:: struct*

dir: string

command: string

identifier: string

author: string

slug: string

labels: string

state: string

label: string

to: string

reason: string

evidence: string

discussion: string

record: string

target: string

number: int

dry_run: bool

check_only: bool

historical: bool

render: bool

rollback: bool

gds.Plan :: struct

changes: [dynamic]Change

summary: string

gds.Problem :: struct

code: string

title: string

path: string

message: string

hint: string

exit: int

gds.Record :: struct

number: string

slug: string

title: string**state:** string**kind:** string**created:** string**updated:** string**discussion:** string**authors:** []string**labels:** []string**path:** string**text:** string**historical:** bool**fields:** [dynamic]Field

Procedures

```
gds.apply :: proc(dir: string, plan: Plan) -> Problem
```

apply writes a plan's changes as one transaction under dir: each file must still have the contents the plan was made from, a journal records the originals first, and every file is replaced atomically, so an interrupted apply can be rolled back by recover. Hold lock while planning and applying.

```
gds.build :: proc(o: Options, c: Catalog, engine: string) -> (string, Problem)
```

build publishes o.target „pdf“, „html“, or „both“ (the default). An RST catalog uses the project engine: HTML is a complete site and o.record selects separate PDF books. A legacy Typst catalog compiles records directly into docs/build. It returns the output paths, comma-separated. Typst is needed only for RST PDF or legacy publication; engine names its program, unless the compiler is embedded. Publication is staged so a compiler failure cannot replace a previously good output.


```
gds.check_index :: proc(dir: string, c: Catalog) -> Problem
```

check_index is a Problem when the registry or bundle of dir differs from what index_plan would write.

```
gds.check_sources :: proc(c: Catalog) -> Problem
```

check_sources checks that every record other than a historical one has the sections the discussion template requires; the first missing one is a Problem.

```
gds.edit_plan :: proc(o: Options, c: Catalog) -> (plan: Plan, p: Problem)
```

edit_plan plans the change o.command asks of the record o.identifier names: promote (a draft takes the next number), state (a move the process allows, with its reason and evidence), or label; with the index refreshed. It changes nothing; apply writes the plan. A historical record, or a move the process forbids, is a Problem.

```
gds.index_plan :: proc(dir: string, c: Catalog) -> (plan: Plan, p: Problem)
```

index_plan plans the regenerated registry.typ and bundle.typ of dir for the catalog; the plan has no changes when they are current.

```
gds.load :: proc(dir: string) -> (catalog: Catalog, p: Problem)
```

load reads the discussion directory dir (records/*.rst or legacy *.typ), and the numbers it reserves, into a catalog allocated in the context arena. It fails with a Problem, and changes nothing, when an update awaits recovery, a record is unreadable, too large, or malformed, or two records claim one number or slug.

```
gds.lock :: proc(dir: string) -> (^os.File, Problem)
```

lock takes the lock of the discussion directory dir and returns its file, which the caller holds while it plans and applies, and closes to release; another command holding it is a Problem. A kernel lock is released even if the process crashes. The lock file is kept: unlinking it would allow two processes to lock different inodes at the same path.

```
gds.new_plan :: proc(o: Options, c: Catalog) -> (plan: Plan, p: Problem)
```

new_plan plans a new draft record for o.identifier: its file, from the template, and the refreshed index. It changes nothing; apply writes the plan. A bad or taken slug, or no author (–author, or git’s user.name), is a Problem.

```
gds.next_number :: proc(o: Options, c: Catalog) -> (int, Problem)
```

`next_number` is the number a promoted draft takes: `o.number` when it is free, else one past the highest that a record, the registry's reservation, or a `gds/` branch of the repository in `o.dir` holds. A number already reserved, or above 9999, is a Problem.

```
gds.now :: proc() -> datetime.DateTime
```

`now` is the moment a build is stamped with. As in Sphinx and other reproducible builds, `SOURCE_DATE_EPOCH` (seconds since 1970, in UTC) sets it; otherwise it is the local time, in the local time zone, which stays loaded for the life of the process.

```
gds.parse_record :: proc(path, source: string) -> (r: Record, p: Problem)
```

`parse_record` reads RST metadata or legacy `#let gds-...` lines from `source`; the record borrows `path` and `source`. A missing, repeated, unknown, or invalid field, a bad slug, or dates out of order is a Problem.

```
gds.problem :: proc(code, title, path, message, hint: string, exit := 1) -> Problem
```

`problem` makes a Problem: its code („gds.slug“), title, the path it concerns, what went wrong, a hint, and the exit status the command returns for it.

```
gds.recover :: proc(dir: string, dry_run: bool) -> Problem
```

`recover` finishes an interrupted apply: it restores every file the journal names to its original contents and removes the journal; `dry_run` only checks that it can. No journal is no work.

```
gds.replace_field :: proc(source, key, literal: string) -> string
```

`replace_field` returns `source` with the value of the metadata field `key` replaced by the Typst literal (quoted, as „\“accepted\““), allocated in the context arena.

```
gds.resolve :: proc(c: Catalog, id: string) -> (Record, Problem)
```

`resolve` finds the one record an identifier names: its number (7 or „0007“), slug, title, or file name. The record borrows the catalog; no match, or more than one, is a Problem that lists the candidates.

```
gds.today :: proc() -> string
```

`today` is now's date, as YYYY-MM-DD.

Constants

```
gds.LABELS
```

```
gds.STATES :: []string{"prediscussion", "discussion",  
"accepted", "published", "committed", "abandoned"}
```

gettext

Package `gettext` reads, writes, merges, and looks up GNU `gettext` message catalogs: PO and POT text files, and compiled MO files. Its lookups follow the C library's `gettext`, `ngettext`, and `pgettext`; state is explicit, a `Catalog` or a `Translator`, instead of the C library's process-wide domain table. It imports only Odin's core packages.

Types

```
gettext.Bound_Catalog :: struct
```

`Bound_Catalog` is a catalog a translator serves for a domain.

```
domain: string
```

```
catalog: Catalog
```

```
gettext.Catalog :: struct
```

`Catalog` is one message catalog. Everything it holds lives in its own arena, so `destroy` frees it at once. Lookups use an index built on first use.

```
name: string
```

file name, or the name given to `parse_po`.

```
header: Message
```

the `msgid` „ entry; its `strs[0]` holds the header fields.

```
has_header: bool
```

```
messages: [dynamic]Message
```

```
plural: Plural_Rule
```

allow_fuzzy: bool

look fuzzy translations up (gettext_allow_fuzzy_translations).

index: Index

arena: ^Catalog_Arena

nil when even it could not be allocated.

allocator: mem.Allocator

the arena's allocator; everything above lives in it.

owner: mem.Allocator

allocated the arena itself.

gettext.**Catalog_Arena** :: struct

Catalog_Arena is what a catalog owns: a growing arena on the allocator make_catalog was given. Once refused memory it refuses everything (refused), so a catalog is never built from a mix of what was and was not allocated; catalog_refused tells.

using arena: runtime.Arena

refused: bool

gettext.**Error** :: struct

Error explains a problem in the style of Elm's compiler: where, what, and what to do. kind == .None means success. Strings are allocated with the allocator the failing procedure was given; destroy_error frees them.

kind: Error_Kind

file: string

line: int

1-based; 0 when the problem has no line.

column: int

1-based byte column of the problem in excerpt; 0 for none.

excerpt: string

the offending line.

message: string

hint: string

`gettext.Error_Kind :: enum u8`

None

Syntax

the PO text breaks the format.

Duplicate

a message is defined twice.

Charset

the catalog is not UTF-8.

Encoding

bytes that are not valid UTF-8.

Plural

a Plural-Forms header that cannot be used.

Mo_Format

a truncated or inconsistent MO file.

Io

the file could not be read or written.

Memory

there was not enough memory to hold the catalog.

`gettext.Header_Field :: struct`

Header_Field is one „Name: value“ line of the header entry.

name: string

value: string

gettext.**Index** :: struct

Index is a catalog's lookup table, built once from its messages. The translations it serves are copied into one pool, each form followed by „\n“, so every string a lookup returns is a slice of pool: a reader can parse them as one source (see pool_of).

built: bool

fuzzy: bool

built with allow_fuzzy.

slots: []i32

open addressing over entries; -1 is empty.

entries: []Index_Entry

forms: []string

slices of pool.

pool: string

gettext.**Index_Entry** :: struct

message: i32

in messages, or -1 for the header.

first: i32

first form in forms.

count: i32

gettext.**Merge_Options** :: struct

fuzzy_matching: bool

look for similar messages (msgmerge without -N).

keep_obsolete: bool

keep translated messages that left the template as „#~“.

stats: ^Merge_Stats

when set, what the fuzzy search did (fuzzy.odin).

gettext.Merge_Stats :: struct

Merge_Stats counts what a merge's fuzzy search did; set Merge_Options.stats to read it.

searches: int

msgids searched for (each distinct msgid once).

bounds: int

candidates whose byte counts were compared (similarity_bound).

comparisons: int

candidates compared in full (similarity).

work: int

bytes those comparisons read.

cut_short: int

searches the work bound stopped before they had looked everywhere.

gettext.Message :: struct

Message is one catalog entry. strs holds the msgstr, or msgstr[o..n) of a plural message; an empty string is an untranslated form.

ctx: string

has_ctx: bool

msgctxt „“ is a context too, different from none.

id: string

id_plural: string

has_plural: bool

strs: [dynamic]string

comments: [dynamic]string

„# „ translator comments.

notes: [dynamic]string

„#.“ comments for translators, from the extractor.

references: [dynamic]string

„#.“ locations, file:line each.

flags: [dynamic]string

„#“, flags other than fuzzy, e.g. „c-format“.

fuzzy: bool

obsolete: bool

„#~“: kept for reuse, never looked up.

previous: Previous

has_previous: bool

line: int

where the entry starts in its file; 0 when built in code.

gettext.**Plural_Node** :: struct

op: Plural_Op

a: i16

b: i16

c: i16


```
value: u64
```

```
gettext.Plural_Op :: enum u8
```

```
Number
```

```
N
```

```
Not
```

```
Mul
```

```
Div
```

```
Mod
```

```
Add
```

```
Sub
```

```
Less
```

```
Greater
```

```
Less_Equal
```

```
Greater_Equal
```

```
Equal
```

```
Not_Equal
```

```
And
```

```
Or
```

```
Choose
```

```
a ? b : c
```

```
gettext.Plural_Problem :: struct
```

Plural_Problem is where and why an expression was refused; column is 1-based.

```
message: string
```

static text.

```
column: int
```

```
gettext.Plural_Rule :: struct
```

Plural_Rule is a compiled Plural-Forms header: nplurals and the plural expression.

```
nplurals: int
```

```
nodes: [MAX_PLURAL_NODES]Plural_Node
```

```
count: int
```

```
root: int
```

```
gettext.Previous :: struct
```

Previous holds a fuzzy message's earlier msgctxt, msgid, and msgid_plural (the „#|“ comments msgmerge writes), so a translator sees what changed.

```
ctx: string
```

```
has_ctx: bool
```

```
id: string
```

```
id_plural: string
```

```
has_plural: bool
```

```
gettext.Reference_Style :: enum u8
```

```
Wrapped
```

„#: a.rst:1 b.rst:2“, wrapped at the width, as msgmerge writes.

One_Per_Line

one „#:“ line per location, as Sphinx’s gettext builder writes.

None

no locations (gettext_location = False).

gettext.**Stats** :: *struct*

translated: int

fuzzy: int

untranslated: int

obsolete: int

gettext.**Translator** :: *struct*

Translator serves several text domains, each from a chain of catalogs: the first bound catalog that translates a message wins, as Sphinx searches locale_dirs in order before its own catalogs. It stands in for the C library’s global state (bindtextdomain, textdomain, setlocale).

language: string

domain: string

the current domain (textdomain); „messages“ by default.

bound: [dynamic]Bound_Catalog

allocator: mem.Allocator

gettext.**Write_Options** :: *struct*

width: int

lines are wrapped to this many characters; 0 or less: no wrapping.

references: Reference_Style

previous: bool

write „#|“ previous msgids of fuzzy messages.

obsolete: bool

write „#~“ obsolete messages.

Procedures

```
gettext.add_catalog :: proc(tr: ^Translator, domain: string,
cat: Catalog)
```

add_catalog binds a catalog to a domain after those already bound; the translator owns it from now on.

```
gettext.add_message :: proc(cat: ^Catalog, m: Message) ->
^Message
```

add_message appends a copy of m, cloning its strings into the catalog's arena, and returns the copy, which the catalog owns, or nil when the arena refused the memory. The pointer is valid until the next message is added (the list may then move). The index is rebuilt on the next lookup.

```
gettext.bind_text_domain :: proc(tr: ^Translator, domain,
dir: string, allow_fuzzy := false) -> (found: bool, err:
Error)
```

bind_text_domain looks for dir/<language>/LC_MESSAGES/<domain>.po, then .mo, trying the language, then its base language (pt_BR, then pt), and binds the first catalog found, which the translator then owns. found is false, with no error, when there is none; an error is allocated with the translator's allocator (destroy_error).

```
gettext.build_index :: proc(cat: ^Catalog)
```

build_index (re)builds the lookup table, in the catalog's arena. Lookups call it when the catalog changed or allow_fuzzy was toggled; call it yourself to pay the cost up front.

```
gettext.catalog_bytes :: proc(cat: ^Catalog) -> int
```

catalog_bytes is what cat's arena holds, in bytes: what a host charges for keeping it.

```
gettext.catalog_refused :: proc(cat: ^Catalog) -> bool
```

catalog_refused tells whether cat's arena was refused memory, so that what it holds may be incomplete. The readers then fail with an error of kind Memory.

```
gettext.charset :: proc(cat: ^Catalog) -> string
```

charset returns the charset the header's Content-Type names, or „ without one.

```
gettext.clone_message :: proc(cat: ^Catalog, m: Message) -> Message
```

clone_message copies m and its strings into the catalog's arena.

```
gettext.compile_plural :: proc(expr: string, nplurals: int) -> (Plural_Rule, Plural_Problem)
```

compile_plural compiles an expression for nplurals forms.

```
gettext.default_merge_options :: proc() -> Merge_Options
```

default_merge_options is msgmerge's default: fuzzy matching on, obsolete messages kept.

```
gettext.default_write_options :: proc() -> Write_Options
```

default_write_options wraps at 76 columns, as sphinx-intl (through Babel) does.

```
gettext.destroy :: proc(cat: ^Catalog)
```

destroy frees a catalog and everything it holds.

```
gettext.destroy_error :: proc(err: Error, allocator := context.allocator)
```

destroy_error frees the strings of an error; an error of kind Memory has static text, which it leaves alone.

```
gettext.destroy_translator :: proc(tr: ^Translator)
```

destroy_translator frees the translator and every catalog bound to it.

```
gettext.domain_plural :: proc(tr: ^Translator, domain, id, id_plural: string, n: int) -> string
```

domain_plural is dngettext.

```
gettext.domain_plural_with_context :: proc(tr: ^Translator, domain: string, ctx: Maybe(string), id, id_plural: string, n: int) -> string
```

domain_plural_with_context is dnpgettext.

```
gettext.domain_text :: proc(tr: ^Translator, domain, id:
string) -> string
```

domain_text is dgettext.

```
gettext.domain_with_context :: proc(tr: ^Translator, domain,
ctx, id: string) -> string
```

domain_with_context is dpgettext.

```
gettext.escape_string :: proc(s: string, allocator :=
context.allocator) -> string
```

escape_string escapes a value for a PO string: backslash, quote, and the control characters C names. The result is allocated with allocator; the caller owns it.

```
gettext.find :: proc(cat: ^Catalog, id: string, ctx:
Maybe(string) = nil) -> ([string, bool])
```

find returns the translated forms of a message, slices of the index pool. ctx nil means no context. A fuzzy message is found only when allow_fuzzy is set.

```
gettext.find_catalog_file :: proc(dir, language, domain:
string, allocator := context.allocator) -> (string, bool)
```

find_catalog_file returns the path of a domain's catalog for a language, if any, allocated with allocator; the caller owns it.

```
gettext.format_error :: proc(err: Error, allocator :=
context.allocator) -> string
```

format_error renders an error as a friendly report, in a string allocated with allocator that the caller owns („ for no error):

```
-- PO SYNTAX ERROR ----- de/index.po:12

This string has no closing quote.

12| msgstr "Hallo
   |      ^
Hint: End the string with " on the same line; continue on the next line.
```

```
gettext.format_stats :: proc(s: Stats, allocator :=
context.allocator) -> string
```

format_stats writes sphinx-intl's summary line, allocated with allocator; the caller owns it.

```
gettext.header_field :: proc(cat: ^Catalog, name: string) ->
(string, bool)
```

header_field returns the value of a header field, compared case-insensitively.

```
gettext.language_candidates :: proc(language: string,
allocator := context.allocator) -> []string
```

language_candidates lists the catalog directory names to try for a language, most specific first: „pt-BR“ gives pt-BR, pt_BR, and pt; „sr@latin“ gives it, then sr. The list and each of its strings are allocated with allocator, apart from language and from each other; the caller owns them. A candidate whose copy is refused is left out.

```
gettext.load_mo :: proc(path: string, allocator :=
context.allocator) -> (Catalog, Error)
```

load_mo reads a compiled catalog. Its messages have no comments or references. The catalog owns its arena, made with allocator (destroy); an error is allocated with allocator too (destroy_error).

```
gettext.load_po :: proc(path: string, allow_fuzzy := false,
allocator := context.allocator) -> (Catalog, Error)
```

load_po reads a PO or POT file. Errors are allocated with allocator.

```
gettext.make_catalog :: proc(name := "", allocator :=
context.allocator) -> Catalog
```

make_catalog returns an empty catalog with a germanic plural rule (n != 1). The catalog owns an arena, made with allocator, that holds everything added to it; destroy frees it whole.

```
gettext.make_translator :: proc(language: string,
allocator := context.allocator) -> Translator
```

make_translator returns a translator for language with no catalogs bound, in the „messages“ domain. It allocates with allocator; destroy_translator frees it and the catalogs bound to it.

```
gettext.merge :: proc(def, ref: ^Catalog, options :=
Merge_Options{fuzzy_matching = true, keep_obsolete = true},
allocator := context.allocator) -> Catalog
```

merge updates a translation (def) to a new template (ref), as msgmerge and sphinx-intl update do. The result has the template's messages in the template's order, with its locations, notes, and flags:

- a message found in def keeps its translation, translator comments, and fuzzy flag;

- a new message similar to an old translated one gets that translation, marked fuzzy, with the old msgid kept as its previous msgid („#|“);
- old translated messages the template lost become obsolete („#~“).

The header is def's, with the template's POT-Creation-Date. The result is a new catalog that owns its arena, made with allocator (destroy); def and ref are borrowed.

```
gettext.new_message :: proc(cat: ^Catalog) -> Message
```

new_message returns an empty message whose lists use the catalog's arena.

```
gettext.parse_mo :: proc(data: []u8, name := "<mo>",  
allocator := context.allocator) -> (Catalog, Error)
```

parse_mo decodes MO bytes into a catalog that copies what it keeps into its own arena, made with allocator (destroy), so data may be freed afterwards. Every offset is checked, so a damaged file gives an error, allocated with allocator (destroy_error).

```
gettext.parse_plural_forms :: proc(value: string,  
allocator := context.allocator) -> (Plural_Rule, Error)
```

parse_plural_forms compiles a Plural-Forms header value such as „nplurals=2; plural=(n != 1);“. The rule is a value; an error, allocated with allocator (destroy_error), carries the value as its excerpt.

```
gettext.parse_po :: proc(text: string, name := "<string>",  
allow_fuzzy := false, allocator := context.allocator) ->  
(Catalog, Error)
```

parse_po parses PO or POT text. name labels errors and the catalog. The catalog copies what it keeps, so text may be freed afterwards.

```
gettext.plural_forms_for :: proc(language: string) -> string
```

plural_forms_for returns a Plural-Forms header value for a language, for a new catalog: the rules the GNU gettext manual lists for common languages, and the germanic rule (n != 1) for others. „pt_BR“ and „pt-BR“ find „pt_BR“, then „pt“. The value is static; the candidates are tried in the temp allocator.

```
gettext.plural_index :: proc(rule: ^Plural_Rule, n: u64) -  
> int
```

plural_index returns the msgstr index for n; out-of-range results select form 0, as the C library does.


```
gettext.pool_of :: proc(cat: ^Catalog) -> string
```

pool_of returns the text every translation of the catalog is a slice of, so a caller can register it once as a source and give parsed translations exact spans.

```
gettext.save_po :: proc(cat: ^Catalog, path: string,
options := Write_Options{width = 76, previous = true,
obsolete = true}, allocator := context.allocator) -> Error
```

save_po writes a catalog to a file, formatting it in the temp allocator; an error is allocated with allocator (destroy_error).

```
gettext.set_header_field :: proc(cat: ^Catalog, name, value:
string)
```

set_header_field replaces a header field, or appends it, keeping the others in order; the catalog's arena holds the copy.

```
gettext.similarity :: proc(a, b: string) -> f64
```

similarity is $2 \cdot M / (|a| + |b|)$, where M is the length of the longest common subsequence of bytes: 1 for equal strings, 0 for strings with nothing in common. It is the measure msgmerge's fstrcmp approximates. Long strings are compared by their first FUZZY_PREFIX bytes.

```
gettext.sort_by_reference :: proc(cat: ^Catalog)
```

sort_by_reference orders messages by their first location: file name, then line number as a number, then msgid; messages without locations go last. Obsolete messages keep their place after the live ones. Each message's own locations are sorted the same way, as Sphinx sorts them.

```
gettext.stats :: proc(cat: ^Catalog) -> Stats
```

stats counts messages as sphinx-intl stat does; the header does not count.

```
gettext.text_domain :: proc(tr: ^Translator, domain: string)
```

text_domain sets the current domain, as textdomain does; the translator owns its copy.

```
gettext.translated :: proc(m: Message) -> bool
```

translated reports whether every form of m has a translation.

```
gettext.translation :: proc(cat: ^Catalog, id: string, ctx:
Maybe(string) = nil) -> (string, bool)
```

translation returns a message's singular translation when there is one.

```
gettext.write_mo :: proc(cat: ^Catalog, include_fuzzy :=
false, allocator := context.allocator) -> []u8
```

write_mo compiles a catalog as msgfmt does: the header and every translated message, sorted by key, with a hash table. Fuzzy messages are left out unless include_fuzzy. The bytes are allocated with allocator; the caller owns them. They are nil when the memory was refused: a compiled catalog is never shorter than its 28-byte header.

```
gettext.write_po :: proc(cat: ^Catalog, options :=
Write_Options{width = 76, previous = true, obsolete = true},
allocator := context.allocator) -> string
```

write_po writes a catalog as PO text: the header, then the messages in order, then the obsolete ones, each entry laid out as msgmerge lays it out. The output depends on nothing but the catalog and the options, so files diff cleanly. The text is allocated with allocator; the caller owns it.

Procedure groups

```
gettext.plural :: proc{catalog_plural, translator_plural}
```

plural is ngettext.

```
gettext.plural_with_context ::
proc{catalog_plural_with_context,
translator_plural_with_context}
```

plural_with_context is npgettext.

```
gettext.text :: proc{catalog_text, translator_text}
```

text is gettext, on a catalog or on a translator's current domain.

```
gettext.with_context :: proc{catalog_with_context,
translator_with_context}
```

with_context is pgettext.

Constants

```
gettext.FUZZY_MIN_WORK :: 1 << 26
```

```
gettext.FUZZY_THRESHOLD :: 0.6
```

FUZZY_THRESHOLD is msgmerge's: a changed message inherits the translation of the most similar old message when their similarity is at least this.

```
gettext.FUZZY_WORK_PER_BYTE :: 256
```

Variables

```
@(rodata) gettext.ERROR_TITLES
```

graphdog

Package graphdog turns Graphviz DOT source into SVG (or PNG, or laid-out DOT) by calling the Graphviz C library in process. It depends only on Odin's core packages and Graphviz.

Example:

```
import "core:fmt"
import "lib/graphdog"
source := "digraph { a -> b }"
ctx := graphdog.init()
defer graphdog.close(&ctx)
svg, err := graphdog.render(&ctx, source, {engine = .Dot}) // svg: the
// caller's
if err.kind != .None do fmt.Println(graphdog.format_error(err, source,
    "g.dot"))
defer delete(svg)
```

Threads. Graphviz keeps process-wide state (the parser, the error handler, plugin tables), so it is not thread-safe even across separate contexts. graphdog therefore holds one process-wide mutex around every call into Graphviz: render from as many threads as you like, but renders run one at a time.

Types

```
graphdog.Attribute :: struct
```

One -G/-N/-E default. Like dot, it overrides the graph's own defaults (node [shape=box]) but not attributes written on a single node or edge.

```
kind: Attribute_Kind
```

```
name: string
```

```
value: string
```

```
graphdog.Attribute_Kind :: enum u8
```

What a default attribute applies to: -G, -N and -E on the dot command line.

```
Graph
```

```
Node
```

```
Edge
```

```
graphdog.Context :: struct
```

A Graphviz context: loaded plugins and nothing else. Make one with `init` and keep it; loading plugins is the expensive part.

```
gvc: ^GVC
```

```
graphdog.Engine :: enum u8
```

Layout engines. Each one is a Graphviz layout plugin: `.Dot` comes from `dot_layout`, the rest from `neato_layout`. The zero value is `.Dot`, like the `dot` command.

```
Dot
```

hierarchical, for directed graphs

```
Neato
```

spring model (stress majorization)

```
Fdp
```

spring model (force directed)

```
Sfdp
```

multiscale force directed, for large graphs

```
Circo
```

circular

```
Twopi
```

radial

```
Osage
```

clustered array packing

```
Patchwork
```

squarified treemap

```
graphdog.Error :: struct
```

Error says what went wrong and how to fix it. `line` and `column` are 1-based positions in the source (`column` counts characters), or 0 when Graphviz does

not say. message is one sentence, in Graphviz's own words when it gave any; hint is advice for the author. render allocates near, message and hint with its allocator; delete_error frees them.

kind: Error_Kind

line: int

column: int

near: string

the text Graphviz stopped at, for .Syntax and .Html_Label

message: string

hint: string

graphdog.**Error_Kind** :: enum u8

None

Syntax

the DOT source does not parse

Html_Label

an HTML-like label (label=<...>) is malformed

Empty_Input

the source holds no graph

Missing_Engine

this Graphviz has no plugin for the layout engine

Missing_Format

this Graphviz has no plugin for the output format

Layout

the layout engine reported an error

Render

the renderer reported an error

Out_Of_Memory**File_Refused**

the caller refused a file the graph names (Options.files)

Not_Initialized

render was called with a context that init did not make

graphdog.**File_Access** *:: struct*

File_Access decides each file name a graph gives through attribute („src“ for an): it returns the path Graphviz may open, „“ to leave the attribute out, or ok false to refuse the graph, which render reports as a .File_Refused error.

```
procedure: proc(user: rawptr, attribute, name: string) ->
(path: string, ok: bool)
```

user: rawptr

graphdog.**Format** *:: enum u8*

Output formats. The zero value is .Svg, which the core plugin always provides.

Svg

standalone SVG 1.1 document, UTF-8

Png

needs the cairo (pango) or gd plugin; the static build has neither

Dot

the input with layout positions attached, like `dot -Tdot`

graphdog.**Options** *:: struct*

engine: Engine

format: Format

attributes: []Attribute

warnings: ^[dynamic]string

When set, each Graphviz warning („using box for unknown shape boxx“) is appended, allocated with the allocator given to render.

files: File_Access

When set, decides every file the graph names before Graphviz may open it (see files.odin); otherwise Graphviz opens what the graph names, as dot does.

reserve: Reserve

When set, counts the output before render allocates it.

graphdog.**Reserve** :: struct

Reserve lets the caller count the output before render allocates it: false refuses the bytes, and render reports .Out_Of_Memory.

procedure: proc(user: rawptr, bytes: int) -> bool

user: rawptr

Procedures

graphdog.**close** :: proc(ctx: ^Context)

close frees the context. Output and errors returned by render stay valid.

graphdog.**delete_error** :: proc(err: Error, allocator := context.allocator)

delete_error frees the strings of an error that render returned, with the allocator given to render.

graphdog.**engine_name** :: proc(engine: Engine) -> string

engine_name is the Graphviz name of an engine („dot“, „neato“, ...).

graphdog.**error_title** :: proc(kind: Error_Kind) -> string

error_title is a short upper-case title for the kind of error, such as „DOT SYNTAX ERROR“.

```
graphdog.format_error :: proc(err: Error, source, name:
string, allocator := context.allocator) -> string
```

`format_error` writes `err` the way Elm writes compiler errors: a title rule naming the file, the source line with a caret under the problem, what went wrong, and a hint. `name` labels the source („`diagram.dot`“, „`<stdin>`“); `source` is the text given to render. The text is allocated with `allocator`, and the caller owns it.

```
-- DOT SYNTAX ERROR -----
diagram.dot

3 |  b -> -> c
   ^ ^
Graphviz stopped at `->`.

Hint: An edge needs a node on each side, like `a -> b`. ...
```

```
graphdog.format_message :: proc(title, name, message, hint:
string, allocator := context.allocator) -> string
```

`format_message` writes an error that has no source to point at, such as a bad command line option, in the same shape as `format_error`. The text is allocated with `allocator`, and the caller owns it.

```
graphdog.init :: proc() -> (ctx: Context, ok: bool)
#optional_ok
```

`init` creates a Graphviz context and loads its plugins. `ok` is false only when Graphviz cannot allocate one.

```
graphdog.parse_engine :: proc(name: string) -> (Engine, bool)
```

`parse_engine` maps a Graphviz engine name to an `Engine`.

```
graphdog.parse_format :: proc(name: string) -> (Format, bool)
```

`parse_format` maps a -T format name to a `Format`.

```
graphdog.render :: proc(ctx: ^Context, source: string,
options := Options{}, allocator := context.allocator) ->
(output: []u8, err: Error)
```

`render` lays out one graph from DOT source and renders it. On success `output` holds the rendered bytes, allocated with `allocator` (`string(output)` for SVG); Graphviz’s own buffers are already freed. On failure `output` is nil and `err` says what went wrong and how to fix it; its strings are allocated with `allocator` too (see `delete_error`). Only the first graph in `source` is rendered, as with `dot` without `-O`.


```
graphdog.version :: proc(ctx: ^Context) -> string
```

version is the linked Graphviz version, such as „16.1.0“. It is owned by Graphviz and valid until close.

Constants

```
graphdog.FILE_ATTRIBUTES :: [?]string{"image", "shapefile",  
"imagepath", "fontpath"}
```

FILE_ATTRIBUTES are the attributes through which Graphviz reads files.

```
graphdog.STATIC :: #config(GRAPHDOG_STATIC, false)
```

The raw Graphviz C API that graphdog uses, and nothing more. Every signature was checked against the headers of Graphviz 16.1 (Homebrew) and 2.42 (Debian); where they differ, the note says how this binding stays correct for both.

Linking. By default graphdog links the shared libraries that a package manager installs:

```
macOS    brew install graphviz    Odin already passes -L/opt/homebrew/  
lib and                                     -L/usr/local/lib, and Homebrew's  
dylibs carry                               absolute install names, so no rpath  
is needed.  
Linux    apt install libgraphviz-dev the libraries are on the default  
search path.
```

GRAPHDOG_LINK_FLAGS adds linker flags for any other prefix, for example

```
-define:GRAPHDOG_LINK_FLAGS="-L/opt/gv/lib -Wl,-rpath,/opt/gv/lib"
```

-define:GRAPHDOG_STATIC=true links the static libraries that native/graphviz/build.sh builds instead, and preloads the dot, neato and core plugins (see static.odin), so the program needs no Graphviz installation at run time.

Windows has no static build: native/graphviz/windows.sh installs the official Graphviz release for Windows (the same version, checked against its SHA-256) into native/graphviz/out, and graphdog links its import libraries there. The program then needs the DLLs and the plugin list (config8) from native/graphviz/out/bin beside it, which is how the Windows release archive ships them.

Foreign imports

```
@(extra_linker_flags = #config(GRAPHDOG_LINK_FLAGS, ""))
foreign import graphdog.graphviz {"../..../native/graphviz/
out/lib/libgvplugin_dot_layout.a", "../..../native/graphviz/
out/lib/libgvplugin_neato_layout.a", "../..../native/graphviz/
out/lib/libgvplugin_core.a", "../..../native/graphviz/out/lib/
libgvc.a", "../..../native/graphviz/out/lib/libpathplan.a",
"../..../native/graphviz/out/lib/libxdot.a", "../..../native/
graphviz/out/lib/libcgraph.a", "../..../native/graphviz/out/
lib/libcdt.a", "../..../native/graphviz/out/lib/libutil.a",
"../..../native/graphviz/out/lib/libvpasc.a", "system:expat",
"system:z", "system:c++"}
```

Verfügbarkeit: Darwin.

The attribute takes only literals, so the vendored directory is spelled out.

```
@(extra_linker_flags = #config(GRAPHDOG_LINK_FLAGS, ""))
foreign import graphdog.graphviz {"../..../native/graphviz/
out/lib/libgvplugin_dot_layout.a", "../..../native/graphviz/
out/lib/libgvplugin_neato_layout.a", "../..../native/graphviz/
out/lib/libgvplugin_core.a", "../..../native/graphviz/out/lib/
libgvc.a", "../..../native/graphviz/out/lib/libpathplan.a",
"../..../native/graphviz/out/lib/libxdot.a", "../..../native/
graphviz/out/lib/libcgraph.a", "../..../native/graphviz/out/
lib/libcdt.a", "../..../native/graphviz/out/lib/libutil.a",
"../..../native/graphviz/out/lib/libvpasc.a", "../..../native/
graphviz/out/lib/libexpat.a", "../..../native/graphviz/out/lib/
libz.a", "system:stdc++", "system:m"}
```

Verfügbarkeit: Windows, Linux, FreeBSD, OpenBSD, NetBSD, WASI, JS, Orca, Freestanding.

```
@(extra_linker_flags = #config(GRAPHDOG_LINK_FLAGS, ""))
foreign import graphdog.graphviz {"../..../native/graphviz/out/
lib/gvc.lib", "../..../native/graphviz/out/lib/cgraph.lib"}
```

Verfügbarkeit: Windows.

```
@(extra_linker_flags = #config(GRAPHDOG_LINK_FLAGS, ""))
foreign import graphdog.graphviz {"system:gvc",
"system:cgraph"}
```

Verfügbarkeit: Darwin, Linux, FreeBSD, OpenBSD, NetBSD, WASI, JS, Orca, Freestanding.

highlight

Generated by tools/pygments_styles from pygments-2.19.2's style modules and sphinx-9.1.0's pygments_styles.py; do not edit.

Types

```
highlight.Color :: struct
```

Color is a CSS colour as Pygments normalizes it: six hex digits, case kept.

```
hex: [6]u8
```

```
set: bool
```

```
highlight.Html_Lines :: struct
```

Html_Lines numbers and emphasizes lines as Pygments does for Sphinx's :linenos: and :emphasize-lines: (linenos="inline", hl_lines): each line starts with `<span class="linenos"> 7</span>`, and an emphasized line, number included, is wrapped in `<span class="hll">...\n</span>`.

```
first: int
```

the first line's number; 0 leaves lines unnumbered.

```
emphasized: proc(user: rawptr, line: int) -> bool
```

by 1-based line; nil for none.

```
user: rawptr
```

```
highlight.Lexer :: enum u8
```

Lexer names a language. .Default and .Guess are Sphinx's pseudo languages: tokenize resolves them against the code (see resolve).

```
Text
```

```
Python
```

```
Pycon
```

```
Pytb
```

```
C
```

```
Cpp
```

Rust**Go****Java****Kotlin****Csharp****Swift****Zig****Odin****Javascript****Typescript****Json****Yaml****Toml****Ini****Xml****Html****Css****Bash****Console**

Powershell**Sql****Diff****Makefile****Dockerfile****Rst****Markdown****Latex****Typst****Dot****Default****Guess**

```
highlight.Lexer_Info :: struct
```

```
name: string
```

Pygments' lexer name, e.g. „Python“.

```
aliases: []string
```

the names code blocks use; the first is the canonical one.

```
filenames: []string
```

glob patterns: „*.py“, „Makefile“.

```
mimetypes: []string
```

```
step: Step
```

spec: ^Code_Spec

the rule tables of lexers built on the code engine.

highlight.**Look** :: struct

Look is a token kind's resolved style.

color: Color

background: Color

border: Color

bold: bool

italic: bool

underline: bool

highlight.**Output** :: struct

Output is caller storage for the writers. They never allocate: bytes that fit go into buf, and written counts every byte the output needs, so a nil buf measures the output and a second call with a buffer of that size writes it. The same input always gives the same bytes.

buf: []u8

written: int

highlight.**Problem** :: struct

kind: Problem_Kind

name: string

the language or style as written.

lexer: Lexer

suggestion: string

a close name, for „Did you mean“.

line: int

Lexing_Error: 1-based line and column (in characters) of

column: int

the first Error token,

excerpt: string

the line it is on,

near: string

and its text.

highlight.**Problem_Kind** :: *enum* u8

None

Unknown_Language

Sphinx: „Pygments lexer name ‚x‘ is not known“.

Unknown_Style

pygments_style names no style.

Lexing_Error

Sphinx: „Lexing literal_block ... resulted in an error“.

highlight.**Scanner** :: *struct*

Scanner tokenizes one input. Create it with scanner_init and read tokens with next_token, or let tokenize and highlight_html drive it.

code: string

pos: int

limit: int

steps see code[:limit]; an inner lexer sees its region only.

state: State

inner: State

a nested lexer: Python after a pycon prompt, CSS in <style>.

region: int

the inner lexer runs while pos < region.

region_start: int

nested: bool

queue: [QUEUE_SIZE]Token

head: int

count: int

highlight.**Style** :: *enum* u8

Style is a pygments_style: every style Pygments ships, and Sphinx's sphinx and none.

Abap

Algol

Algol_Nu

Arduino

Autumn

Borland

Bw

Coffee

Colorful

Default**Dracula****Emacs****Friendly****Friendly_Grayscale****Fruity****Github_Dark****Gruvbox_Dark****Gruvbox_Light****Igor****Inkpot****Lightbulb****Lilypond****Lovelace****Manni****Material****Monokai****Murphy****Native**

None

Nord

Nord_Darker

One_Dark

Paraiso_Dark

Paraiso_Light

Pastie

Perldoc

Rainbow_Dash

Rrt

Sas

Solarized_Dark

Solarized_Light

Sphinx

Staroffice

Stata_Dark

Stata_Light

Tango

Trac

Vim

Vs

Xcode

Zenburn

```
highlight.Style_Info :: struct
```

name: string

dark: bool

the background is dark.

background: string

the .highlight background.

highlight: string

emphasized lines (.hll).

line_number: string

line_number_background: string

special_line_number: string

special_background: string

base: string

the root token's definition, inherited by all.

rules: []Style_Rule

```
highlight.Style_Rule :: struct
```

Style_Rule is one entry of a style's dict; a style has at most one per kind.

kind: Token_Kind

```
definition: string
```

```
highlight.Token :: struct
```

Token is a run of the input: `code[start:end]` has kind. The tokens tokenize returns are contiguous, cover every byte exactly once, and never hold two neighbours of one kind.

```
start: u32
```

```
end: u32
```

```
kind: Token_Kind
```

```
highlight.Token_Kind :: enum u8
```

Token_Kind mirrors Pygments' token hierarchy. Each kind has Pygments' dotted name (`kind_name`), its short CSS class (`kind_class`) and its parent (`kind_parent`), so the stylesheets Sphinx themes already ship style Guidedog's output unchanged.

```
Text
```

```
Whitespace
```

```
Escape
```

```
Error
```

```
Other
```

```
Keyword
```

```
Keyword_Constant
```

```
Keyword_Declaration
```

```
Keyword_Namespace
```

```
Keyword_Pseudo
```

Keyword_Reserved

Keyword_Type

Name

Name_Attribute

Name_Builtin

Name_Builtin_Pseudo

Name_Class

Name_Constant

Name_Decorator

Name_Entity

Name_Exception

Name_Function

Name_Function_Magic

Name_Property

Name_Label

Name_Namespace

Name_Other

Name_Tag

Name_Variable

Name_Variable_Class

Name_Variable_Global

Name_Variable_Instance

Name_Variable_Magic

Literal

Literal_Date

String

String_Affix

String_Backtick

String_Char

String_Delimiter

String_Doc

String_Double

String_Escape

String_Heredoc

String_Interpol

String_Other

String_Regex

String_Single

String_Symbol**Number****Number_Bin****Number_Float****Number_Hex****Number_Integer****Number_Integer_Long****Number_Oct****Operator****Operator_Word****Punctuation****Punctuation_Marker****Comment****Comment_Hashbang****Comment_Multiline****Comment_Preproc****Comment_Preproc_File****Comment_Single****Comment_Special**

Generic**Generic_Deleted****Generic_Emph****Generic_Emph_Strong****Generic_Error****Generic_Heading****Generic_Inserted****Generic_Output****Generic_Prompt****Generic_Strong****Generic_Subheading****Generic_Traceback****Punctuation_Indicator**

Pygments' YAML lexer uses two types outside its standard set; HTML gives them the classes of their ancestors too, as Pygments does.

Literal_Scalar_Plain**Generic_Underline**

Types only Pygments' styles name: github-dark's `Generic.Underline`, gruvbox's `Comment.PreProc` (not `Comment.Preproc`), and the LilyPond lexer's, which lilypond styles. `Token.String` and `Token.Number` are not `Literal.String` and `Literal.Number`.

Comment_PreProc**Name_Lvalue**

Name_Backslash_Reference

Name_Builtin_Articulation

Name_Builtin_Clef

Name_Builtin_Context

Name_Builtin_Context_Property

Name_Builtin_Dynamic

Name_Builtin_Grob

Name_Builtin_Grob_Property

Name_Builtin_Header_Variable

Name_Builtin_Markup_Command

Name_Builtin_Music_Command

Name_Builtin_Music_Function

Name_Builtin_Paper_Variable

Name_Builtin_Repeat_Type

Name_Builtin_Scale

Name_Builtin_Scheme_Builtin

Name_Builtin_Scheme_Function

Name_Builtin_Translator

Token_String

Token_String_Escape**Token_String_Symbol****Token_Number****Pitch****Chord_Modifier**

Procedures

```
highlight.check_code :: proc(language, code: string) ->
Problem
```

`check_code` finds what Sphinx would warn about when it highlights code as language: an unknown language, or code that does not lex as the language it is marked as. Blocks in the „default“ language never warn; they fall back to plain text.

```
highlight.check_style :: proc(name: string) -> Problem
```

`check_style` reports a `pygments_style` that names no style.

```
highlight.count_tokens :: proc(lexer: Lexer, code: string) -
> int
```

`count_tokens` is how many tokens tokenize needs for code.

```
highlight.find_lexer :: proc(name: string) -> (Lexer, bool)
```

`find_lexer` finds a lexer by alias („py“, „c++“), as Pygments' `get_lexer_by_name` does, ignoring case; failing that by file name („setup.py“, „Makefile“) or MIME type.

```
highlight.find_lexer_for_filename :: proc(path: string) ->
(Lexer, bool)
```

`find_lexer_for_filename` matches the base name of a path against the lexers' patterns.

```
highlight.find_style :: proc(name: string) -> (Style, bool)
```

`find_style` finds a style by its Pygments name, ignoring case.

```
highlight.guess_lexer :: proc(code: string) -> Lexer
```

guess_lexer picks a lexer from the code alone, as Sphinx's „guess“ language does. JSON that parses cleanly is JSON; otherwise the rule table decides.

```
highlight.has_errors :: proc(lexer: Lexer, code: string) -> bool
```

has_errors reports whether lexing code produces an Error token, which is when Sphinx warns that a block does not lex as its language.

```
highlight.highlight_html :: proc(lexer: Lexer, code: string, out: ^Output)
```

highlight_html lexes code and writes its HTML without a token buffer.

```
highlight.highlight_html_lines :: proc(lexer: Lexer, code: string, lines: Html_Lines, out: ^Output)
```

highlight_html_lines lexes code and writes it as write_html_lines does.

```
highlight.highlight_typst :: proc(lexer: Lexer, code: string, out: ^Output)
```

highlight_typst lexes code and writes its Typst array without a token buffer.

```
highlight.kind_class :: proc(kind: Token_Kind) -> string
```

kind_class is the CSS class Pygments' HtmlFormatter writes: „k“, „s2“, „c1“; „“ for Text, which HTML writes without a span.

```
highlight.kind_is :: proc(kind, ancestor: Token_Kind) -> bool
```

kind_is reports whether kind is ancestor or one of its descendants, as Pygments' ttype in Token.String does.

```
highlight.kind_name :: proc(kind: Token_Kind) -> string
```

kind_name is Pygments' dotted name without the „Token.“ root: „Literal.String.Double“.

```
highlight.kind_parent :: proc(kind: Token_Kind) -> (Token_Kind, bool)
```

kind_parent is the kind's parent; false for kinds directly below the root.

```
highlight.lexer_alias :: proc(lexer: Lexer) -> string
```

lexer_alias is the lexer's canonical alias: „python“, „cpp“.

```
highlight.lexer_info :: proc(lexer: Lexer) -> Lexer_Info
```

lexer_info is the lexer's static description: name, aliases, file patterns, and MIME types.

```
highlight.lexer_name :: proc(lexer: Lexer) -> string
```

lexer_name is Pygments' name for the lexer: „Python“, „C++“.

```
highlight.next_token :: proc(s: ^Scanner) -> (Token, bool)
```

next_token returns the next token; adjacent tokens of one kind come back merged.

```
highlight.output_fits :: proc(out: ^Output) -> bool
```

output_fits reports whether everything written so far is in the buffer.

```
highlight.output_string :: proc(out: ^Output) -> string
```

output_string is what fits in the buffer; it is the whole output when output_fits.

```
highlight.put :: proc(out: ^Output, s: string)
```

put writes s to out: what fits into the buffer, and counts all of it.

```
highlight.put_byte :: proc(out: ^Output, c: u8)
```

put_byte writes one byte to out, as put does.

```
highlight.put_html :: proc(out: ^Output, text: string)
```

put_html writes text escaped as Pygments escapes it: & < > „ and „.

```
highlight.resolve :: proc(lexer: Lexer, code: string) -> Lexer
```

resolve makes Sphinx's choices for a code block. .Default is Python, or a Python console session when the code starts with „>>>“, and falls back to .Text when that does not lex cleanly. Python blocks that start with „>>>“ are console sessions too. .Guess guesses from the code. Every other lexer is itself.

```
highlight.resolve_style :: proc(style: Style) -> (looks: [Token_Kind]Look, base: Look)
```

resolve_style resolves every kind's look: its parent's, changed by its own rules.

```
highlight.scanner_init :: proc(s: ^Scanner, lexer: Lexer,
code: string)
```

scanner_init prepares s to tokenize code. The pseudo lexers .Default and .Guess are resolved against the code first. Inputs are limited to 4 GiB.

```
highlight.style_name :: proc(style: Style) -> string
```

style_name is the style's pygments_style name, as find_style takes it: „github-dark“.

```
highlight.suggest_lexer :: proc(name: string) -> string
```

suggest_lexer is the alias closest to a name that find_lexer does not know, for „Did you mean“ hints; „“ when nothing is close.

```
highlight.token_text :: proc(t: Token, code: string) ->
string
```

token_text is the input a token covers.

```
highlight.tokenize :: proc(lexer: Lexer, code: string,
buffer: []Token) -> (tokens: []Token, need: int)
```

tokenize fills buffer with the tokens of code and returns them. need is how many the whole input has; when it exceeds len(buffer), tokens holds only the first ones, and a buffer of need tokens holds them all. tokenize never allocates.

```
highlight.write_css :: proc(style: Style, selector: string,
out: ^Output)
```

write_css writes the stylesheet Pygments writes for the style with the selector, as Sphinx writes _static/pygments.css with „highlight“. It ends without a newline.

```
highlight.write_html :: proc(tokens: []Token, code: string,
out: ^Output)
```

write_html writes tokens of code as Pygments' HTML.

```
highlight.write_html_lines :: proc(tokens: []Token, code:
string, lines: Html_Lines, out: ^Output)
```

write_html_lines writes tokens of code as Pygments' HTML with numbered or emphasized lines. The whole block is lexed at once, so a string or comment across lines keeps its colour on every line.

```
highlight.write_problem :: proc(p: Problem, location: string,
out: ^Output)
```

write_problem writes an Elm-style report; location, such as „index.rst:12“, heads it.

```
-- UNKNOWN LANGUAGE ----- index.rst:12

I do not know how to highlight "pyhton", so this block is shown as plain
text.

Hint: Did you mean "python"?
```

```
highlight.write_typst :: proc(tokens: []Token, code: string,
out: ^Output)
```

write_typst writes tokens of code as a Typst array of lines. A final newline does not start another line.

```
highlight.write_typst_theme :: proc(style: Style, out:
^Output)
```

write_typst_theme writes a style as a Typst dictionary: „background“ is the block’s fill, „text“ the default text settings, and each class maps to its text settings (fill, weight, style), with „underline“, „background“ and „border“ where set.

Variables

```
highlight.STYLES
```

highlight/guidedoc

Package highlight_guidedoc connects the highlight library to Guidedoc’s renderers. It is separate so that the highlight library itself depends on nothing but Odin’s core.

Procedures

```
guidedoc.highlighter :: proc() -> gd.Highlighter
```

highlighter is the value for Render_Options.highlighter: code blocks become the HTML Pygments writes for Sphinx, with its short CSS classes.

```
guidedoc.typst_highlighter :: proc() -> gd.Highlighter
```

typst_highlighter is for a Typst renderer that draws code with Guidedog’s colours rather than Typst’s: it writes code as write_typst’s array of lines, for the book template’s gd-highlight function (see the README). It returns false for plain text and languages it does not know, so the renderer can keep Typst’s own raw block for those.

host

Package `host` composes the allocation-free core with memory, files, and retries. Everything here may allocate; the core's zero-allocation contract ends at `gd` calls.

Ownership, unless a procedure says otherwise: what a procedure returns (a string, a slice, a report, a problem's text) is allocated in `context allocator` and belongs to the caller, which frees it with that allocator's arena rather than piece by piece; its arguments are borrowed for the call only. A failure is a `Problem` (`exit ! = 0`) or a false result, never a panic. The surface is listed in `lib/host/README.md`.

Types

host.Arena :: *struct*

Arena hands out memory from blocks it takes from a backing allocator (a `Meter`, usually) and frees them all at once. It is `core:mem`'s `Dynamic_Arena` made safe for a backing that refuses: a block the backing refuses leaves the arena as it was, and the request fails with `.Out_Of_Memory`, where `Dynamic_Arena` would go on handing out memory at address `0`. The blocks are linked through a header at their start, so the arena allocates nothing besides them; each block is used through bounds-checked slices of itself. It is not safe for use by several threads at once.

backing: `mem.Allocator`

block: `int`

bytes of a block; `0`: `ARENA_BLOCK_BYTES`.

blocks: `^Arena_Block`

the newest first; the first is the one being filled.

last: `[]byte`

the latest allocation from the first block, which can grow.

bytes: `int`

the bytes of every block held.

host.Artifact_Request :: *struct*

`Artifact_Request` is one conversion of `guidedog convert`. Its strings and slices are borrowed for the call.

input: `string`

path, or `„-“`, for standard input.

from: Format

to: Target

output: string

path, or „-“, for standard output.

emit_typst: string

optional path for the intermediate Typst source.

force: bool

policy: gd.Policy

limits: gd.Limits

read: gd.Read_Options

render: gd.Render_Options

typst_program: string

Typst program name or path.

typst_options: typst.Options

packages and fonts.

roots: []string

approved resource roots; the input's directory by default.

budget: int

allocator: mem.Allocator

session regions; unset: context.allocator. Must reclaim frees.

host.Artifact_Result :: struct

Artifact_Result is what convert_artifact did: exit 0 and the published path (or the bytes for standard output), or exit != 0 and the problem; reports either way. All of it is allocated in the caller's context.allocator.

exit: int

reports: []Report

problem: Problem

written: string

the published path, or „ for standard output.

stdout: []u8

bytes to print when output is „-„.

host.Budget :: struct

Budget bounds the memory sessions hold at once: one session's alone, or, shared, the total of a parallel build's threads. A session reserves what it will allocate before allocating it, and releases it when it frees it.

Units of work that run at once (the threads of a parallel read) join the budget while they run. A reservation the budget cannot hold now waits while another joined unit is still running, since that one will release what it holds when it finishes; when every other unit is waiting too, nothing would be released, and it is refused. So a reservation never waits for itself, and waiting units never wait for each other: a build whose units together need more than the budget refuses some of them.

A reservation the budget cannot hold, and no unit will make room for, goes to the budget's policy (Budget_Policy): it is refused, unless the policy raises the limit or spills working memory to disk.

limit: int

used: int

active: int

units joined: see budget_join.

waiting: int

joined units waiting in reserve.

peak: int

the most used at once.

mutex: `sync.Mutex`

freed: `sync.Cond`

policy: `Budget_Policy`

stopped: `bool`

the policy chose to stop: later refusals do not ask again.

refused_used: `int`

What the budget held, and was asked for, when it last refused (budget_hint).

refused_need: `int`

host.Budget_Policy *:: struct*

Budget_Policy is what a budget does when it cannot hold a reservation (Budget). With no on_refusal, and spill not set, the reservation is refused: the step that asked fails with host.budget. on_refusal can raise the limit, or turn on spilling; spill set from the start spills without asking. Spilling sends working memory past the limit (sessions' storage, and what Meters allocate) to disk: slower, but bounded by the Disk's own limit and free space. Other reservations, such as a file a build keeps in memory, are still refused.

on_refusal: `On_Refusal`

user: `rawptr`

disk: `^Disk`

borrowed; the owner destroys it after the build is released.

spill: `bool`

locate: `proc(user: rawptr) -> Report`

locate says where the work that asked for memory is, for Refusal.place; it is called, with locate_user, from inside the allocator that asked.

locate_user: `rawptr`

```
host.Confinement :: enum u8
```

Confinement is where a path lies with respect to the roots a project reads from.

Inside

confined: below a root once every link is followed.

Outside

the path as written is below no root.

Through_Link

written below a root, but a link on the way leads out of the roots.

```
host.Disk :: struct
```

Disk is working memory on disk: memory-mapped temporary files, used when a build's budget is exhausted and the build may go on slowly rather than stop (Budget_Policy). Each file is written out in full before it is mapped, so the disk space is taken before the memory is handed out and writing to it never meets a full disk. On Linux, macOS, and the BSDs a file is removed as soon as it is mapped, so the system reclaims it however the process ends, a crash or Ctrl+C included; on Windows it is created to be deleted when closed.

A Disk hands out memory from its files, as an arena does from its blocks, and counts the allocations each file holds: a file is unmapped when its last allocation is freed, or by disk_destroy, and nothing reads it after. It is safe for use by several threads at once. Its zero value, with dir set, is ready to use; the owner calls disk_destroy once nothing allocated from it is used any more.

```
dir: string
```

the folder of the temporary files; „ for the system's.

```
limit: int
```

the most bytes mapped at once; 0: the free space, less DISK_MARGIN.

```
used: int
```

bytes mapped now.

```
peak: int
```

the most bytes mapped at once.

refused: int

bytes a refused request asked for, or 0.

failure: Disk_Failure

why the latest request was refused.

chunks: ^Disk_Chunk

the newest first; the first is the one being filled.

mutex: sync.Mutex

host.**Disk_Failure** :: *enum* u8

Disk_Failure is why a Disk refused a request.

None

Limit

the disk budget (Disk.limit) cannot hold it.

Space

the disk lacks the free space, less DISK_MARGIN.

System

the system could not create, write, or map the file.

host.**Files** :: *struct*

Files provides included resources from approved roots. It refuses Docutils' „<standard>“ includes, names that leave the roots, and names that pass through a symbolic link. Links are checked on the path as written, component by component with lstat, before it is resolved; then the resolved path must still lie in a root. The rule is therefore the same on Windows, macOS, and Linux.

roots: []string

max_bytes: int

project: string

When set, a name starting with / is relative to this directory, as Sphinx reads /path in include and literalinclude; otherwise such a name is absolute.

canonical: []string

the roots, resolved; filled by files_provider.

ledger: ^Ledger

When set, each file's size is charged here before it is read (see read_file); a file the budget cannot hold is refused. The caller settles it when the files go.

host.**Folder_Entry** :: struct

Folder_Entry is a name in a folder, what it names (a symbolic link is .Symlink, whatever it leads to), and its inode, as the listing gives it: two names with the same inode on the same file system are the same file. inode is 0 where the system gives none.

name: string

type: os.File_Type

inode: u64

host.**Format** :: enum u8

Format is the markup convert_artifact reads.

Rst

Commonmark

Typst

host.**Guard** :: struct

Guard is an allocator that watches another for refusals. Guidedog's libraries do not all stop at a failed allocation: they go on with what they have, never touching memory they were refused (tests/allocation_failure_test.odin holds them to that), so their result may be incomplete. A caller that must know its

work is whole allocates through a Guard and asks `guard_problem` when the work ends.

The first refusal trips the guard, and from then on it refuses every allocation itself: memory that ran out once is not relied on again, so the work that follows only shrinks, and nothing is built from a mix of what was and was not allocated. Frees still reach the backing allocator. A guard may be shared by threads.

backing: `mem.Allocator`

tripped: `i32`

atomic: 1 once an allocation was refused.

refused: `int`

atomic: bytes the first refused allocation asked for.

host.Identity *:: struct*

Identity is a file's or a folder's device and inode, which a rename keeps. The zero value is none: the path does not exist, or the system gives no inode (Windows may not).

device: `u64`

inode: `u64`

host.Ledger *:: struct*

Ledger counts what one unit of work (reading a document, rendering a page, composing a book) holds of a budget besides its sessions: the files it reads, the graphs it draws. Each charge is made before the memory is allocated, and settle releases them all when the unit frees its memory. A ledger without a budget counts nothing.

budget: `^Budget`

held: `int`

refused: `int`

bytes a refused charge asked for, or 0.

```
host.Meter :: struct
```

Meter is an allocator that charges a ledger for each allocation before passing it to its backing allocator. It is for work whose memory is not known in advance, such as rendering a page's layout or parsing a saved environment. A charge the budget refuses is refused before anything is allocated: the allocation fails with `.Out_Of_Memory`, the ledger records the refused bytes (`ledger.refused`), and the step that asked stops with `metered_refusal`'s problem. Code behind a meter must therefore handle a failed allocation; see „Memory“ in `lib/host/README.md` for what the build's steps do.

When the budget spills (`Budget_Policy`), an allocation it cannot hold comes from the policy's `Disk` instead, and is freed there. Freed memory from the backing allocator are not discharged one by one (an arena's allocator is told no sizes); `settle` returns the step's charges when it frees its memory.

`prepaid` holds bytes charged ahead (`meter_prepay`) that allocations use before charging anew.

```
backing: mem.Allocator
```

```
ledger: ^Ledger
```

```
prepaid: int
```

```
host.On_Refusal :: proc(user: rawptr, r: Refusal) ->
Refusal_Decision
```

`On_Refusal` decides what a budget does with a reservation it cannot hold. It is called at most once at a time, while the budget's other reservations wait; it must not reserve from the budget itself.

```
host.Problem :: struct
```

Problem is a host failure: files, the Typst backend, or command usage.

```
code: string
```

```
title: string
```

```
path: string
```

```
message: string
```

```
hint: string
```

```
exit: int
```

```
host.Refusal :: struct
```

Refusal is what a budget tells its policy when it cannot hold a reservation: the bytes asked for, what the budget holds, and its limit; and where the work that asked is, as the policy's locate says (a report's path, line, and excerpt; zero when unknown), so that a question names the place a report would.

```
need: int
```

```
used: int
```

```
limit: int
```

```
disk: bool
```

the policy has a Disk to go on with.

```
place: Report
```

```
host.Refusal_Choice :: enum u8
```

Refusal_Choice is what a build does when its budget cannot hold a reservation: stop with the budget's problem, raise the budget, or go on with working memory on disk.

```
Stop
```

```
Raise
```

to Refusal_Decision.limit.

```
Disk
```

```
host.Refusal_Decision :: struct
```

```
choice: Refusal_Choice
```

```
limit: int
```

Raise: the new limit in bytes, more than Refusal.limit.


```
host.Report :: struct
```

Report is a diagnostic with its template filled in and its position resolved.

```
schema: int
```

```
code: string
```

```
severity: string
```

```
title: string
```

```
message: string
```

```
hint: string
```

```
path: string
```

```
line: int
```

```
column: int
```

```
end_line: int
```

```
end_column: int
```

```
excerpt: string `json:"- "`
```

```
marker: string `json:"- "`
```

```
source: string
```

the complete source line, for JSON consumers; columns count runes.

```
category: string
```

The warning's category as „type.subtype“, such as „ref.term“, which a host may let users silence (Sphinx's `suppress_warnings`); „“ for none.

```
host.Session :: struct
```

Session owns the storage of one conversion so reports stay valid while it lives. Its storage, output, and source map are reserved from shared when that is set (the threads of a parallel build share one), and otherwise from a budget of its own of limit bytes. allocator supplies its regions (context.allocator when unset); it must outlive the session and reclaim freed regions to bound actual memory across retries. A shared budget's policy may raise its limit; all reservations use that same limit.

```
allocator: mem.Allocator
```

```
ws: gd.Workspace
```

```
storage: gd.Storage
```

```
sizes: Sizes
```

```
output: []u8
```

```
result: gd.Result
```

```
source_map: []gd.Map_Entry
```

```
map_size: int
```

source map entries; 0 for none.

```
retries: int
```

```
ready: bool
```

```
limit: int
```

0: DEFAULT_BUDGET.

```
shared: ^Budget
```

nil: own.

```
own: Budget
```

held: int

bytes reserved for the storage, output, and source map.

inputs: ^Kept_File

owned input buffers; freed before releasing kept.

kept: int

bytes reserved for owned input buffers and their records.

refused: int

bytes a refused reservation asked for, or 0; max(int): too many.

denied: bool

the system refused an allocation of refused bytes the budget allowed.

disk: ^Disk

where the regions are when the budget spilled them; nil: memory.

allocated: mem.Allocator

the allocator that owns the current regions.

host.Sizes :: struct

Sizes are region capacities in elements (bytes for text and scratch).

nodes: int

attributes: int

lists: int

links: int

cells: int

text: int

scratch: int

sources: int

reports: int

output: int

second_bank: bool

needed only for passes.

host.Target :: enum u8

Target is the artifact convert_artifact publishes.

Html

Pdf

Procedures

host.arena_allocator :: proc(a: ^Arena) -> mem.Allocator

arena_allocator returns an allocator that allocates from a; it borrows a. Free does nothing; Free_All frees every block.

host.arena_destroy :: proc(a: ^Arena)

arena_destroy frees every block of a, which is empty after and may be used again. Nothing allocated from a may be used after it.

host.arena_init :: proc(a: ^Arena, backing: mem.Allocator, block := 0)

arena_init starts an empty arena over backing, which must outlive it, taking blocks of block bytes (0: ARENA_BLOCK_BYTES; tests use small ones to reach every allocation).

host.available_memory :: proc() -> (bytes: int, ok: bool)

available_memory is the memory the system could give the process now without swapping, as it reports it: MemAvailable on Linux, lowered to what the process's cgroup still allows, the available physical memory on Windows, and the free and inactive pages on macOS; or GUIDEDOG_AVAILABLE_MIB when it is set to a number. ok is false when it cannot say. It allocates nothing.

```
host.backend_problem :: proc(program: string) -> Problem
```

backend_problem is the problem of a Typst program that cannot be found; program is borrowed into it.

```
host.budget_advice :: proc(used, need, limit, available: int,  
disk: bool, other: string, available_known := false) ->  
string
```

budget_advice is the hint budget_hint gives, for a step that asked for need bytes while the budget held used of its limit, on a machine with available bytes free (0 when unknown unless available_known is true). It names the budget to build with (suggest_budget); when that is more than the free memory, it says so, and names keeping working memory on disk first, when disk is there to offer. It is allocated.

```
host.budget_hint :: proc(b: ^Budget, need: int, other:  
string) -> string
```

budget_hint is the hint of a budget's problem (budget_advice): the budget the refused step fits in, from what b held and was asked for when it last refused (need, the bytes the step needed, when b refused nothing itself), capped by the memory the machine has free; keeping working memory on disk, when the caller gave b a Disk; and the other way out the caller names. It is allocated.

```
host.budget_join :: proc(b: ^Budget)
```

budget_join counts a unit of work that runs at once with others until budget_leave.

```
host.budget_leave :: proc(b: ^Budget)
```

budget_leave ends a unit budget_join counted, waking reservations that waited for it.

```
host.budget_limit :: proc(b: ^Budget) -> int
```

budget_limit is b's limit now: on_refusal may have raised it since it was set.

```
host.budget_problem :: proc(what, path: string, bytes: int,  
b: ^Budget) -> Problem
```

budget_problem explains a charge the budget refused: what needed the bytes, and where. what and path are borrowed into it; the message is allocated.

```
host.budget_report :: proc(s: ^Session) -> (Report, bool)
```

budget_report explains a session that stopped at its budget, or at an allocation the system refused, or returns false. The message is allocated.

```
host.cancel_probe :: proc() -> gd.Cancel_Probe
```

`cancel_probe` returns a probe with which the core polls the Ctrl+C flag (`catch_interrupts`) during long conversions; it holds no state of its own.

```
host.canonical_roots :: proc(roots: []string) -> []string
```

`canonical_roots` resolves roots to absolute paths, as `confined` compares paths with them; a root that cannot be resolved is kept as written. The slice is allocated.

```
host.catch_interrupts :: proc()
```

`catch_interrupts` makes Ctrl+C (SIGINT) set a flag instead of ending the process, for the whole process: `was_interrupted` reads it, and `cancel_probe` gives it to the core. A program calls it once, at the start.

```
host.charge :: proc(l: ^Ledger, bytes: int) -> bool
```

`charge` reserves bytes for the unit, waiting as `Budget` describes, or returns false, reserving nothing and recording the refused bytes (`l.refused`). A nil ledger, or one without a budget, accepts every charge.

```
host.confined :: proc(roots: []string, path: string) -> bool
```

`confined` reports whether a file a project reads (a document, an image, a template, a static file) lies in one of the canonical roots once every link on its way is followed. Where the system resolves paths (POSIX) the resolved path decides; on Windows, where it does not, a path through a link is refused.

```
host.confinement :: proc(roots: []string, path: string) -  
> Confinement
```

`confinement` tells whether `confined` accepts a path, and why not when it does not, so a refusal can say whether the path itself or a link on its way leads outside. A refused path has a link leading out when one of its folders is itself confined: the path is written below a readable folder, and something below that folder leads away.

```
host.containing_root :: proc(roots: []string, path: string) -  
> (string, bool)
```

`containing_root` returns the root of roots that path is written below, or false. It compares the paths as written (case-insensitively on Windows) and follows no link; `confined` is the check that does.

```
host.convert_artifact :: proc(registry: gd.Registry, req:
Artifact_Request) -> Artifact_Result
```

convert_artifact is the host route from a file to a published HTML or PDF artifact: read the input, convert it in a session of req.budget bytes, run Typst for PDF, and publish the output atomically (publish), or return it in stdout for „-“. Guidedoc conversion inside it is allocation-free; reading, Typst, and publishing are not. The result, its reports, and stdout are allocated in context allocator and owned by the caller; the session is destroyed before it returns. A failure sets exit and problem and leaves any existing output unchanged.

```
host.crash_on_assertion :: proc(prefix, message: string, loc:
runtime.Source_Code_Location) -> !
```

crash_on_assertion reports a panic or a failed assertion in Odin code, with its message and where it was raised, and exits with CRASH_EXIT.

```
host.default_stack_budget :: proc(stack: int) -> int
```

default_stack_budget is the budget to use when none is asked for: the default, or less on a thread too small for it.

```
host.describe :: proc(d: gd.Diagnostic, sources:
[]gd.Source_Entry) -> Report
```

describe fills a diagnostic's templates and resolves its span against sources into a Report: path, line, column, excerpt and marker. It borrows d and sources for the call; the report's strings are allocated and do not refer to the sources afterwards.

```
host.describe_all :: proc(s: ^Session) -> []Report
```

describe_all describes what the session's conversion reported, and the budget it reached if any (budget_report). The reports are allocated and do not borrow the session, so they outlive session_destroy.

```
host.destroy_storage :: proc(st: gd.Storage, allocator :=
context.allocator)
```

destroy_storage frees every region of storage make_storage allocated with allocator; a region left nil is skipped, so it also frees a partly made storage.

```
host.discharge :: proc(l: ^Ledger, bytes: int)
```

discharge returns bytes the unit has freed before it ends.

```
host.disk_allocator :: proc(d: ^Disk) -> mem.Allocator
```

disk_allocator returns an allocator that allocates from d's files; it borrows d. Free returns an allocation, and unmaps its file once the file holds none; Free_All is not supported (disk_destroy unmaps everything).

```
host.disk_destroy :: proc(d: ^Disk)
```

disk_destroy unmaps every file of d, freed or not; nothing allocated from d may be used after it. d may be used again.

```
host.disk_owns :: proc(d: ^Disk, p: rawptr) -> bool
```

disk_owns reports whether p lies in one of d's files.

```
host.display_path :: proc(name: string) -> string
```

display_path returns name relative to the working directory when that is shorter to read (not above it by three folders or more), and name itself otherwise or for „ and „-„. The result may borrow name; a relative one is allocated.

```
host.dump :: proc(s: ^Session, doc: gd.Document) -> string
```

dump returns the tree outline of a successfully read document, allocated, or „ when the document is no longer valid; tests use it.

```
host.each_chunk :: proc(path: string, user: rawptr, each:
proc(user: rawptr, chunk: [ju8) -> bool) -> bool
```

each_chunk reads a file through a CHUNK_BYTES buffer, giving each chunk to each until it returns false. It returns whether the whole file was read and accepted.

```
host.excerpt_at :: proc(r: ^Report, text: string, line,
column: int)
```

excerpt_at fills a report's excerpt and marker at a 1-based line and Unicode scalar column, for positions in sources Guidedoc generated, such as a composed book.

```
host.exchange :: proc(a, b: string) -> (swapped: bool, err:
os.Error)
```

Verfügbarkeit: Windows, Darwin, Linux, FreeBSD, OpenBSD, NetBSD.
exchange: see switch.odin. macOS swaps with rename_np and RENAME_SWAP. It allocates nothing (fixed.odin).


```
host.exit_code :: proc(status: gd.Status) -> int
```

exit_code maps a conversion status to the process exit status Guidedog's commands use: 0 ok, 1 invalid input or policy, 3 capacity or limits, 5 internal, 130 cancelled.

```
host.files_provider :: proc(f: ^Files) ->  
gd.Resource_Provider
```

files_provider resolves f.roots and returns a gd.Resource_Provider that serves includes through f, which it borrows: f and its roots must outlive every conversion the provider is given to. Each file it serves is allocated in the context allocator of the conversion's caller and charged to f.ledger when that is set.

```
host.fitting_budget :: proc(available: int) -> int
```

fitting_budget is a budget that fits in the free memory: nine tenths of it, in steps of 16 MiB; 0 when there is no room for even that minimum. Callers must not offer a zero budget to the CLI, where it means the default budget.

```
host.folders_of :: proc(paths: []string, top: string) ->  
[]string
```

folders_of lists, once each and in order, the folders that hold paths and the folders between them and top (top included): the folders whose names a publication adds or changes. A path not below top gives only its own folder.

```
host.grow_session :: proc(s: ^Session, need:  
gd.Capacity_Need) -> bool
```

grow_session enlarges the region need names, for the next prepare_session; false when the enlarged sizes cannot be represented, which counts as the budget reached.

```
host.guard_allocator :: proc(g: ^Guard) -> mem.Allocator
```

guard_allocator returns an allocator that allocates from g.backing until it refuses once, and then refuses everything (see Guard); it borrows g, which must outlive every allocation made through it.

```
host.guard_problem :: proc(g: ^Guard, what: string) ->  
(Problem, bool)
```

guard_problem is host.memory (exit 3) when an allocation through g was refused, with what, a static sentence naming the work, as its message; or false. Its text is static, since the memory to write more has run out.

```
host.guard_tripped :: proc(g: ^Guard) -> bool
```

guard_tripped tells whether an allocation through g was refused. A caller may poll it to stop long work early; guard_problem explains it.

```
host.identity :: proc(path: string) -> (id: Identity, err: os.Error)
```

identity is the identity of what is at path; {} with no error when nothing is. It allocates nothing.

```
host.install_crash_reporter :: proc(args: []string, version: string)
```

install_crash_reporter prepares the crash report for the command line args (the program name first) and version, what `guidedog --version` prints (one or more lines), and installs the handlers that print it: for faults and traps: signals on POSIX, an unhandled-exception filter on Windows. It allocates nothing. The caller also sets `context.assertion_failure_proc` to `crash_on_assertion`, so a panic or failed assertion is reported with its message.

```
host.interrupted_problem :: proc() -> Problem
```

interrupted_problem is the problem, with exit status 130, of a command stopped by Ctrl+C.

```
host.io_problem :: proc(path: string, err: os.Error) -> Problem
```

io_problem explains an operating-system error on path; path is borrowed into it.

```
host.is_stage_name :: proc(name: string) -> bool
```

is_stage_name is whether name is one stage_file gives a temporary file: STAGE_PREFIX, STAGE_DIGITS digits, then nothing or one extension. Any other name, however close, is not Guidedog's.

```
host.link_file :: proc(from, to: string, type: os.File_Type) -> (copied: bool, err: os.Error)
```

link_file makes to name the same file as from: a hard link, or, where the file system cannot link it (FAT, some network shares), a copy, which copied reports and the caller must flush. A symbolic link is made again, to the same target. An existing to is an error, never replaced. A regular file is linked or copied without allocating (fixed.odin).

```
host.list_folder :: proc(dir: string, allocator :=
context.allocator) -> (entries: []Folder_Entry, err:
os.Error)
```

Verfügbarkeit: Windows, Darwin, Linux, FreeBSD, OpenBSD, NetBSD.

list_folder lists a folder's entries, „.“ and „..“ left out, in the order the system gives them, with each entry's type from the listing itself (d_type): unlike os.read_all_directory_by_path it opens no entry, which matters for a folder of thousands of files. An entry whose type the file system does not give is read with lstat. The names are allocated in allocator; an allocation that fails is an error.

```
host.main_stack_bytes :: proc() -> int
```

Verfügbarkeit: Windows, Darwin, Linux, FreeBSD, OpenBSD, NetBSD.

main_stack_bytes is the stack of the main thread.

```
host.make_storage :: proc(s: Sizes, allocator :=
context.allocator) -> (st: gd.Storage, ok: bool) #optional_ok
```

make_storage allocates storage of the sizes with allocator; the caller owns it and frees it with destroy_storage. ok is false, and nothing is kept allocated, when any region cannot be allocated: a region is never left nil. It reserves nothing from a Budget; a Session does that before calling it.

```
host.meter_allocator :: proc(m: ^Meter) -> mem.Allocator
```

meter_allocator returns an allocator that charges m.ledger and allocates from m.backing; it borrows m, which must outlive every allocation made through it.

```
host.meter_prepay :: proc(m: ^Meter, bytes: int) -> bool
```

meter_prepay charges bytes ahead, for work whose memory can be bounded before it starts: the work is refused at once when the budget cannot hold the bound, before any of it is done. Allocations then use the prepaid bytes before charging more; meter_refund returns what they did not use.

```
host.meter_refund :: proc(m: ^Meter)
```

meter_refund returns the prepaid bytes no allocation used to the budget.

```
host.metered_refusal :: proc(l: ^Ledger, what, path: string)
-> (Problem, bool)
```

metered_refusal reports a charge a Meter's ledger could not make: what the step needed, as budget_problem explains it.

```
host.out_of_memory :: proc(what: string) -> Problem
```

out_of_memory is host.memory with what, a static sentence naming the work that could not get memory, as its message; nothing in it is allocated.

```
host.output_text :: proc(s: ^Session) -> string
```

output_text is what the session's last successful run rendered. It borrows the session's output buffer: it is valid until the next run, prepare_session, resize_output, or session_destroy.

```
host.path_type :: proc(path: string) -> (type: os.File_Type,
found: bool, err: os.Error)
```

path_type is what is at path, not following a symbolic link; found is false, with no error, when nothing is. It allocates nothing.

```
host.plan_session :: proc(s: ^Session, input_bytes: int,
second_bank: bool) -> bool
```

plan_session sizes the session for an input of input_bytes; false when the sizes cannot be represented, which counts as the budget reached.

```
host.prepare_session :: proc(s: ^Session) -> bool
```

prepare_session allocates storage of the session's current sizes, releasing any older storage first. It reserves the bytes from the session's budget before allocating, and returns false, allocating nothing, when the budget cannot hold them. run and read call it; callers that load objects call it directly.

```
host.publish :: proc(path: string, data: []u8, force: bool) -
> Problem
```

publish writes bytes through a sibling temporary file, flushes it, and renames it over the destination, making the folders on its way: path holds its old bytes or the new ones, never a part. An existing destination is refused (host.output.exists) unless force is set; any failure leaves the destination unchanged and returns its Problem.

```
host.read :: proc(s: ^Session, reader: gd.Reader, request:
gd.Request, budget := DEFAULT_BUDGET) -> gd.Read_Result
```

read parses without rendering, then runs request.passes (a translation, for example) over the document; storage grows and the whole read retries when a region fills. The document and reports borrow the session, as run's do, and the source text.

```
host.read_file :: proc(path: string, ledger: ^Ledger,
limit := MAX_SOURCE_BYTES, allocator := context.allocator) ->
([]u8, Problem)
```

read_file reads a regular file of at most limit bytes whole, charging its size to ledger before allocating; the caller discharges the bytes when it frees them. A file that grows while it is read is refused. If it shrinks, its original allocation stays charged until freed: fewer bytes read do not mean fewer bytes held.

```
host.read_kept :: proc(s: ^Session, path: string, limit: int)
-> ([]u8, Problem)
```

read_kept reads a file whose bytes the caller keeps while the session's document refers to them. The bytes belong to the caller, allocated in context.allocator; the caller frees them no later than session_destroy, which returns their budget charge. Use read_owned when the session should own and free the bytes itself.

```
host.read_owned :: proc(s: ^Session, path: string, limit:
int) -> ([]u8, Problem)
```

read_owned reads a file the session's document refers to while it lives, such as its cached object. The session owns the returned bytes until session_destroy, which frees them before releasing their charge. Its allocator supplies both the bytes and their ownership record; each allocation is charged before it is made.

```
host.read_source :: proc(path: string, limit :=
MAX_SOURCE_BYTES) -> (text, canonical: string, p: Problem)
```

read_source reads a named input, or standard input for „-“, within limit bytes. It returns the text and the absolute path used as the source's canonical name.

```
host.remove_path :: proc(path: string) -> os.Error
```

Verfügbarkeit: Windows, Darwin, Linux, FreeBSD, OpenBSD, NetBSD.

remove_path removes a file, a link, or an empty folder; see fixed.odin.

```
host.remove_stages :: proc(dir: string)
```

remove_stages removes, in dir and every folder below it, the temporary files that a process stopped (killed, or the machine lost power) left before renaming or removing them: files, never folders or links, whose names is_stage_name accepts. Every other name is left as it is. A folder it cannot list, or has no memory to name, is left as it is: a stage file is clutter that nothing reads. The caller makes sure no stage file below dir is still in use.

```
host.rename_path :: proc(from, to: string) -> os.Error
```

Verfügbarkeit: Windows, Darwin, Linux, FreeBSD, OpenBSD, NetBSD.
 rename_path renames from to to, replacing a file at to; see fixed.odin.

```
host.render_json :: proc(r: Report) -> string
```

render_json is a report as one JSON object (schema DIAGNOSTICS_SCHEMA), without its terminal excerpt and marker; „{}“ when it cannot be encoded. The text is allocated.

```
host.render_problem_json :: proc(p: Problem) -> string
```

render_problem_json is a host problem as a JSON report of severity „error“.

```
host.render_problem_text :: proc(p: Problem, color: bool) -> string
```

render_problem_text lays out a host problem as render_text lays out an error report.

```
host.render_text :: proc(report: Report, consequence: string, color: bool) -> string
```

render_text lays out a report the Elm way: what happened, where, what it means for the result, and what to do next. Color supplements words; it never replaces them.

```
host.resize_output :: proc(s: ^Session, bytes: int) -> bool
```

resize_output replaces the session's output buffer with one of bytes, reserving the whole new buffer while the old one still lives. It returns false, keeping the old buffer, when the budget cannot hold the new one.

```
host.resize_source_map :: proc(s: ^Session, entries: int) -> bool
```

resize_source_map gives the session a source map of entries, reserved as resize_output reserves its buffer.

```
host.run :: proc(s: ^Session, registry: gd.Registry, request: gd.Request, budget := DEFAULT_BUDGET, map_source := false) -> gd.Result
```

run converts with storage sized for the input, growing the exhausted region and retrying until it fits or the budget (bytes; see Session) would be exceeded, which ends it with status Limit and a report that says so (budget_report). With map_source set, the session also collects a source map from the renderer. The session owns everything the result refers to: its reports and output_text are

valid until the next run or read on `s`, or `session_destroy`. request is borrowed for the call, and its source text for as long as the reports are read.

```
host.run_workers :: proc(count: int, data: ^$T, work:
proc(data: ^T))
```

`run_workers` runs `work(data)` on `count` threads at once and returns when every one has ended; work shares data between them, and takes its share of the work itself (an index taken atomically, for one). A thread that cannot start is left out; when none can, work runs once on the calling thread, so the work is always done. It allocates the threads with `context allocator`, which the workers may share (`read_pending` gives them the build's, through a mutex this procedure does not take): so every thread is made before any starts, and freed only once every one has ended, and nothing is allocated while a worker runs. A refusal starts fewer.

```
host.same_contents :: proc(path: string, data: []u8) -> bool
```

`same_contents` reports whether the file at `path` holds exactly data, reading it in chunks and stopping at the first difference.

```
host.session_destroy :: proc(s: ^Session)
```

`session_destroy` frees the session's storage, output, source map, and kept inputs, and releases what it reserved and kept from its budget. Reports, `output_text`, and documents the session returned are invalid after it. The session may be run again.

```
host.settle :: proc(l: ^Ledger)
```

`settle` releases everything `l` holds of its budget; the unit calls it when it frees the memory it charged. A nil ledger or one without a budget is a no-op.

```
host.sizes_for :: proc(input_bytes: int) -> (s: Sizes, ok:
bool) #optional_ok
```

`sizes_for` estimates capacities from the input length. The estimate need not be tight: a capacity result names the region, and the session grows it and retries. `ok` is false when a capacity cannot be represented, which a session reports as its budget reached.

```
host.spill_disk :: proc(b: ^Budget) -> ^Disk
```

`spill_disk` is the Disk that working memory `b` cannot hold goes to, or nil when `b` does not spill.

```
host.stack_budget_limit :: proc(stack: int) -> int
```

`stack_budget_limit` is the largest stack budget a thread with stack bytes can hold: all but `STACK_HEADROOM`, and never more than half the stack. An 8 MiB thread (the main thread's and `core:thread`'s usual stack on Linux and macOS) holds 6 MiB; a 1 MiB one (Windows) holds `core.DEFAULT_STACK_BYTES`, which `stack.odin` sizes to fit it.

```
host.suggest_budget :: proc(used, need, limit, available:
int, available_known := false) -> (budget: int, fits: bool)
```

`suggest_budget` is the budget, in bytes, to suggest for a step that asked for need bytes while the budget held used of its limit, so that one change is enough: what is held, and room for the request `STEP_COPIES` times over (a step that builds a value of that size also holds its output and the copy it writes), or twice the old limit, whichever is larger, in steps of 64 MiB. When the machine has less memory free (available; 0 when unknown), the budget is capped to what fits there (`fitting_budget`), or, when what is needed does not fit, is what is needed, in steps of 16 MiB: then `fits` is false. `available_known` distinguishes measured zero from the default, unknown zero.

```
host.sync_all :: proc(paths: []string) -> Problem
```

`sync_all` flushes files and folders to storage, `SYNC_WORKERS` at a time, and returns the first that failed. A folder is flushed so the names in it are durable. Windows keeps its folders' names durable itself and flushes no folder, so they are skipped there.

```
host.sync_each :: proc(paths: []string) -> Problem
```

`sync_each` flushes each path in turn on the calling thread, as `sync_all` does with threads, and returns the first that failed; it allocates nothing.

```
host.thread_stack_bytes :: proc() -> int
```

Verfügbarkeit: Windows, Darwin, Linux, FreeBSD, OpenBSD, NetBSD.
`thread_stack_bytes` is the stack of a thread `core:thread` starts.

```
host.was_interrupted :: proc() -> bool
```

`was_interrupted` reports whether Ctrl+C was pressed since `catch_interrupts`.

```
host.write_unsynced :: proc(path: string, data: []u8) ->
Problem
```

`write_unsynced` writes bytes as `publish` does, through a sibling temporary file renamed over `path`, so `path` holds either its old bytes or the new ones, but does not flush them: a caller that needs them durable syncs them later (`sync_all`).

Constants

```
host.ARENA_BLOCK_BYTES :: 64 << 10
```

ARENA_BLOCK_BYTES is the size of the blocks an Arena takes from its backing allocator; a request larger than a quarter of it gets a block of its own.

```
host.AVAILABLE_OVERRIDE :: "GUIDEDOG_AVAILABLE_MIB"
```

AVAILABLE_OVERRIDE names the environment variable that states the memory available, in MiB, in place of what the system reports: for machines whose report misleads, and for tests that need the same advice on every machine.

```
host.CRASH_EXIT :: 70
```

CRASH_EXIT is the exit status of a command that crashed: EX_SOFTWARE, an internal software error, which no other failure uses.

```
host.DEFAULT_BUDGET :: 256 << 20
```

DEFAULT_BUDGET is a session's budget in bytes when none is given (256 MiB).

```
host.DIAGNOSTICS_SCHEMA :: 1
```

DIAGNOSTICS_SCHEMA is the version of the JSON form of Report (render_json), which a consumer checks before reading the fields; it changes only when a field does.

```
host.DISK_CHUNK_BYTES :: 64 << 20
```

DISK_CHUNK_BYTES is the size of the temporary files a Disk maps; a larger request gets a file of its own size.

```
host.DISK_MARGIN :: 256 << 20
```

DISK_MARGIN is the free space a Disk leaves on the disk it maps files from, so that spilling working memory never fills the disk the rest of the system writes to.

```
host.ISSUE_TRACKER :: #config(GUIDEDOG_ISSUE_TRACKER, "")
```

ISSUE_TRACKER is where a crash is to be reported: the address of the issue tracker of whoever distributes the build, set when it is built (-define:GUIDEDOG_ISSUE_TRACKER=https://...). Without it, the report asks the user to send the details to whoever provided their build, and names no address.

```
host.MAX_RETRIES :: 64
```

MAX_RETRIES only guards against a bug: the budget is what bounds a session. Each retry at least doubles the region that filled, so growth reaches the budget in a few dozen steps however the regions fill in turn, as a document made of includes fills them.

```
host.MAX_SOURCE_BYTES :: 32 << 20
```

MAX_SOURCE_BYTES is the default size limit of one input file (32 MiB).

```
host.MEMORY_HINT
```

MEMORY_HINT is what to do when the system refuses memory.

```
host.PATH_BYTES :: 4096
```

PATH_BYTES is the longest path, with its terminator, these operations take: the longest that Linux takes (PATH_MAX), and four times macOS's.

```
host.STAGE_PREFIX :: ".guidedog-stage-"
```

STAGE_PREFIX begins the name of every temporary file stage_file makes. It is followed by the STAGE_DIGITS digits os.create_temp_file draws, then the destination's extension.

Foreign imports

```
foreign import host.kernel32 "system:Kernel32.lib"
```

Verfügbarkeit: Windows.

```
foreign import host.system "system:System"
```

Verfügbarkeit: Darwin.

i18n

Package i18n translates Guidedoc documents the way Sphinx does with gettext: it extracts every translatable message of a document into a POT template (Sphinx's gettext builder), and it replaces each message with its translation from a catalog (Sphinx's Locale transform), re-parsing the translation as inline markup of the document's own language. It imports the Guidedoc core and the gettext library only; the reader that parses translations is passed in (gd.Reader.read_inline).

Types

```
il18n.Compact :: struct
```

Compact is gettext_compact: per top-level directory (true, Sphinx's default), per document (false), or one catalog of the given name.

```
mode: enum u8 {Per_Directory, Per_Document, Single}
```

```
name: string
```

for Single.

```
il18n.Extract_Options :: struct
```

Extract_Options are the gettext builder's settings for one document.

```
targets: Targets
```

gettext_additional_targets.

```
location: bool
```

gettext_location: „#: path:line“ for every occurrence.

```
uuid: bool
```

gettext_uuid: a „#: uuid“ line for every occurrence.

```
path: string
```

how locations name the main source, e.g. „../index.rst“.

```
docname: string
```

the document's name, e.g. „guide/usage“; seeds the uuids.

```
base: string
```

included files are named relative to this directory, if set.

```
il18n.Image_Exists :: struct
```

Image_Exists reports whether an image path, as a document would write it, names a file. The host resolves it against the document's directory.

```
procedure: proc(user: rawptr, docname, path: string) -  
> bool
```

user: rawptr

i18n.Image_Localization *:: struct*

Image_Localization is figure_language_filename for the translation pass.

format: string

„“ is DEFAULT_FIGURE_FILENAME.

docname: string

language: string

exists: Image_Exists

i18n.Index_Part *:: struct*

Index_Part is one translatable piece of an index entry line, e.g. „b“ of „single: a; b“. first and length locate it in the line.

text: string

first: int

length: int

i18n.Pot_Header *:: struct*

Pot_Header holds the values of a template’s header, as Sphinx fills them.

project: string

version: string

copyright: string

last_translator: string

gettext_last_translator.

language_team: string

gettext_language_team.

```
creation_date: string
```

e.g. „2026-09-29 12:00+0000“.

```
i18n.Progress :: enum u8
```

Progress is translation_progress_classes: which translatable nodes get the class „translated“ or „untranslated“, so a stylesheet can show what is left to translate.

```
Translated
```

```
Untranslated
```

```
i18n.Progress_Classes :: bit_set[Progress; u8]
```

```
i18n.Target :: enum u8
```

Target names the extra kinds of content gettext_additional_targets makes translatable.

```
Index
```

„index“: index entries.

```
Literal_Block
```

„literal-block“: literal and code blocks, parsed literals.

```
Doctest_Block
```

„doctest-block“

```
Raw
```

„raw“

```
Image
```

„image“: image alt text.

```
i18n.Targets :: bit_set[Target; u8]
```

```
i18n.Template :: struct
```

Template collects the messages of one or more documents into a POT catalog, as Sphinx’s gettext builder does: a message found again gains a

location instead of a second entry, and messages keep the order of their first occurrence.

catalog: gettext.Catalog

seen: map[string]int

msgid -> message index.

uuids: map[string]int

uuids per message, for their positions.

il8n.Translation :: struct

Translation configures the translation pass, Sphinx's Locale transform: every translatable node whose message the catalog translates gets the translation. Inline content is re-parsed with `read_inline`, in the markup the document was written in (read carries the reader's settings, e.g. a `sphinx.Config`), and keeps the original's references; titles keep their anchors. The pass allocates nothing: it takes scratch memory, and registers the catalog's translation pool as one source, so nodes parsed from a translation have exact spans and diagnostics quote the translation.

catalog: ^gettext.Catalog

read_inline: gd.Read_Inline_Proc

read: gd.Read_Options

policy: gd.Policy

limits: gd.Limits

zero: `gd.default_limits()`.

targets: Targets

`gettext_additional_targets`.

source_name: string

names the translations in diagnostics, e.g. „de/index.po“.

progress: Progress_Classes

`translation_progress_classes`.

images: Image_Localization

figure_language_filename; applies without a catalog.

translated: int

Counts of the last run.
messages replaced.

kept: int

translations refused (bad markup or references); warned.

i18n.UI_Problem :: *struct*

UI_Problem is a project catalog that could not be read.

path: string

error: gettext.Error

i18n.Unit :: *enum* u8

Unit says how a node carries a message.

None

Inline

inline content: the source text with its markup; translations re-parse.

Literal

the node's text, verbatim: code, doctest, raw, and math blocks.

Parsed

a parsed literal: inline content, only with the literal-block target.

Alt

an image's Alt attribute.

Graphviz

diagram alt text and, when requested, its literal source.

Index

each part of each index entry.

Caption

a toctree’s caption attribute.

Entry

a toctree entry’s explicit title.

Meta

the values of a meta directive.

Contents

a contents directive’s title.

Procedures

```
i18n.add :: proc(t: ^Template, msgid, location, uuid: string)
```

`add` adds one occurrence of a message: its location („path:line“, or „“) and `uuid`. The template copies what it keeps, with its own allocator, so the arguments are borrowed.

```
i18n.destroy_template :: proc(t: ^Template)
```

`destroy_template` frees a template and everything added to it, and clears it.

```
i18n.domain_for :: proc(docname: string, compact: Compact) -  
> string
```

`domain_for` returns the catalog (text domain) a document’s messages belong to, as Sphinx’s `docname_to_domain` does: „guide/usage“ is „guide“ when `compact`, else „guide/usage“; „index“ is „index“ either way.

```
i18n.embedded_catalog :: proc(language: string) -> (string,  
bool)
```

`embedded_catalog` returns the built-in catalog text for a language, trying it, then its base language (pt_BR, then pt). The text is static, borrowed from the binary; the candidates are made in the temp allocator.


```
i18n.extract :: proc(t: ^Template, v: gd.View, options:
Extract_Options) -> int
```

`extract` adds every translatable message of a document to the template and returns how many occurrences it found. The template copies the messages with its allocator; the view is borrowed, and scratch strings go to the temp allocator.

```
i18n.figure_filename :: proc(format, filename, docname,
language: string, allocator := context.allocator) -> (string,
bool, string)
```

`figure_filename` is `write_figure_filename` into a new string allocated with allocator, which the caller owns; on failure the third result explains the format's problem, in the temp allocator.

```
i18n.figure_for_language :: proc(format, filename, docname,
language: string, exists: Image_Exists, allocator :=
context.allocator) -> string
```

`figure_for_language` returns the localized image when it exists, else the image as written, as Sphinx's `search_image_for_language` does; with no exists.procedure, no localized image exists. Either way the path is a new string allocated with allocator, which the caller owns.

```
i18n.fill_labels :: proc(tr: ^gettext.Translator, labels:
^gd.Labels)
```

`fill_labels` translates every renderer label into labels, for `Render_Options.labels`.

```
i18n.format_date :: proc(format: string, moment:
datetime.DateTime, language: string, allocator :=
context.allocator) -> string
```

`format_date` formats a moment with a strftime format, as Sphinx's `format_date` does, with the month and day names of language. The text is allocated with allocator, and the caller owns it.

```
i18n.index_parts :: proc(line: string, parts: []Index_Part) -
> int
```

`index_parts` splits an index entry line into its translatable pieces, as Sphinx's `split_index_msg` does: the entry type and „!“ main marker are kept out of them.

```
i18n.make_template :: proc(name := "", allocator :=
context.allocator) -> Template
```

`make_template` starts an empty POT catalog named `name`. It and everything added to it are allocated with `allocator`; the caller frees them with `destroy_template`.

```
i18n.parse_target :: proc(name: string) -> (Target, bool)
```

`parse_target` returns the target a `gettext_additional_targets` name stands for.

```
i18n.set_header :: proc(t: ^Template, h: Pot_Header)
```

`set_header` gives the template the header Sphinx's `gettext` builder writes, copied with the template's `allocator`.

```
i18n.translation_pass :: proc(t: ^Translation) -> gd.Pass
```

`translation_pass` returns the pass; `t` must outlive the transform. The workspace keeps views of the catalog's pool and of `source_name` (spans, and reports quoting them), so the catalog and `source_name` must outlive every use of the document and its reports.

```
i18n.ui_text :: proc(tr: ^gettext.Translator, msgid: string)
-> string
```

`ui_text` translates one of Guidedog's words.

```
i18n.ui_translator :: proc(language: string, dirs: []string,
allow_fuzzy := false, allocator := context.allocator) ->
(gettext.Translator, []UI_Problem)
```

`ui_translator` makes the translator of Guidedog's own words for a language. `dirs` are the project's locale directories (absolute). A catalog that fails to parse is left out and reported in problems; the others still apply. The translator and its catalogs are allocated with `allocator`, and the caller owns them (`gettext.destroy_translator`); the problems too.

```
i18n.unit_of :: proc(v: gd.View, id: gd.Node_Id, targets:
Targets) -> Unit
```

`unit_of` classifies a node as Sphinx's `is_translatable` does, with the extra targets. The switch is exhaustive, so a new kind does not compile until it says whether it is translated.

```
i18n.write_figure_filename :: proc(out: ^gd.Buffer, format,
filename, docname, language: string) -> (ok: bool, bad_field:
string)
```

`write_figure_filename` fills a `figure_language_filename` format for an image path as written in a document, as Sphinx's `get_image_filename_for_language` does:

- {root}: the path without its extension („img/logo“ of „img/logo.png“);
- {path}: its directory with a trailing slash, or „“ („img/“);
- {basename}: the file name without directory or extension („logo“);
- {ext}: the extension with its dot („.png“);
- {docpath}: the document's directory with a trailing slash, or „“;
- {language}: the language.

„{“ and „}“ stand for braces. On an unknown field it returns the field's name.

```
i18n.write_message :: proc(v: gd.View, id: gd.Node_Id, out:
^gd.Buffer) -> bool
```

`write_message` writes a node's msgid as Sphinx makes it from the node's source: line breaks and the indentation after them become one space, and the ends are trimmed.

```
i18n.write_template :: proc(t: ^Template, allocator :=
context.allocator) -> string
```

`write_template` writes the template as Sphinx lays out a POT file: every location on its own „#:“ line, sorted, then the uuids, and strings broken only after newlines. The text is allocated with `allocator`, and the caller owns it.

Constants

```
i18n.DEFAULT_FIGURE_FILENAME :: "{root}.{language}{ext}"
```

`DEFAULT_FIGURE_FILENAME` is Sphinx's default `figure_language_filename`.

```
i18n.UI_DOMAIN :: "guidedog"
```

inventory

Types

```
inventory.Error :: enum u8
```

```
None
```

Unknown_Version

the header names no inventory version Sphinx writes.

Truncated

the header ends early.

Bad_Compression

the zlib data does not inflate.

Out_Of_Memory

the allocator refused memory: the inventory may be incomplete.

```
inventory.Inventory :: struct
```

```
project: string
```

```
version: string
```

```
items: [dynamic]Item
```

```
by_type: map[string]map[string]int
```

by_type[type][name] is the index of the item in items.

```
folded: map[string]map[string]string
```

folded[type][lowercase name] is the first name of that spelling, for the types Sphinx matches ignoring case (labels and terms).

```
inventory.Item :: struct
```

```
project: string
```

the inventory's project and version, for „(in Python v3.14)“.

```
version: string
```

```
name: string
```

```
type: string
```

domain:objtype, such as „py:function“.

priority: int

uri: string

absolute, or relative to the inventory's base.

display: string

„-“, when it is the name itself.

Procedures

```
inventory.add :: proc(inv: ^Inventory, item: Item) -> bool
```

add appends an item and indexes it; a later item of the same type and name replaces the earlier one in the index, as a later line overwrites in Sphinx's dictionaries. It allocates with context allocator, the arena the inventory lives in, and keeps item's strings, which must live as long. It is false, and the item may be left out, when the allocator refuses memory.

```
inventory.find :: proc(inv: ^Inventory, type, name: string) -> (Item, bool)
```

find returns the item of a type and name, which borrows the inventory.

```
inventory.find_folded :: proc(inv: ^Inventory, type, name: string) -> (Item, bool)
```

find_folded returns the item of a type whose name matches ignoring case: the first such name listed, as Sphinx matches labels and terms. The item borrows the inventory; the lowercase key is made in the temp allocator.

```
inventory.load :: proc(data: []u8, base: string, allocator := context.allocator) -> (inv: Inventory, err: Error)
```

load reads an inventory. base joins relative locations, as Sphinx joins them with the URL or folder the inventory came from; „“ leaves them as written. It allocates the inventory and its temporary work with allocator, an arena the caller frees; data is only borrowed. A header it does not know, or data that does not inflate, is an Error.

```
inventory.sort_items :: proc(items: []Item)
```

sort_items orders items as Sphinx writes them: by domain, then by the name, display, type, and location of each object.

```
inventory.write :: proc(project, version: string, items:
[]Item, allocator := context.allocator) -> []u8
```

write returns an inventory in version 2 format, lines in the order given, as Sphinx writes them sorted. Locations ending in the name are shortened with \$, and a display equal to the name is written as -. It allocates the bytes, and its temporary work, with allocator, an arena the caller frees.

jinja

Types

```
jinja.Call :: struct
```

Call is what a native procedure receives: the positional and keyword arguments (for a filter or test, args[o] is the value being filtered or tested), the user pointer given at registration, and the receiver of a bound method.

```
args: []Value
```

```
kwargs: []Keyword
```

```
user: rawptr
```

```
self: Value
```

```
name: string
```

```
state: ^State
```

```
jinja.Callable :: struct
```

Callable is a function value: a native procedure (optionally bound to self) or a macro.

```
name: string
```

```
procedure: Native
```

```
user: rawptr
```

```
self: Value
```

```
macro: ^Macro
```

```
jinja.Cycler :: struct
```

Cycler is the object made by the `cycler()` global.

```
items: []Value
```

```
pos: int
```

```
jinja.Dict :: struct
```

Dict is an insertion-ordered dictionary. String keys are indexed; other keys are compared with Python equality (`1 == 1.0 == True`). allocator owns the dict as it owns a List.

```
keys: [dynamic]Value
```

```
values: [dynamic]Value
```

```
index: map[string]int
```

```
kind: Dict_Kind
```

```
name: string
```

the template name of a module

```
allocator: mem.Allocator
```

```
jinja.Dict_Kind :: enum u8
```

```
Dict
```

a plain dict

```
Namespace
```

`namespace()`: the only object whose attributes templates may assign

```
Module
```

the result of `{% import %}`: exported macros and variables

```
jinja.Environment :: struct
```

Environment holds options, filters, tests, globals and the template cache. Its own memory (parsed templates, tables) comes from an arena freed by `destroy_environment`.

```
options: Options
```

```
filters: map[string]Registered
```

```
tests: map[string]Registered
```

```
globals: map[string]Value
```

```
cache: map[string]^Compiled
```

```
arena: ^Arena
```

```
allocator: mem.Allocator
```

```
backing: mem.Allocator
```

```
stack: Stack_Guard
```

started by the outermost call on the environment

```
out_of_memory: bool
```

Set when the environment's memory could not hold its tables: every template it parses then fails with a Memory error.

```
jinja.Error :: struct
```

Error describes a failure. `kind == .None` means success. `excerpt` is the template line the error points at; `hint`, when set, suggests a fix.

```
kind: Error_Kind
```

```
template: string
```

```
line: int
```

```
message: string
```


excerpt: string

hint: string

`jinja.Error_Kind :: enum u8`

None

Syntax

the template does not parse (`TemplateSyntaxError`)

Undefined

an undefined value was used (`UndefinedError`)

Type

an operation got the wrong kind of value (`TypeError`)

Not_Found

a template could not be loaded (`TemplateNotFound`)

Limit

a recursion, iteration or output limit was reached

Memory

the memory the parse or render may use could not hold it (`MemoryError`)

Runtime

any other failure while rendering

`jinja.Keyword :: struct`

Keyword is one keyword argument of a call.

name: string

value: Value

jinja.List :: struct

List is a list, or a tuple when tuple is set. fields names the items of a named tuple (the groups made by groupby), which can then also be read as attributes. allocator owns the list: its items grow there, and what a template stores in the list is copied there when the render ends (see Memory in the README).

items: [dynamic]Value

tuple: bool

fields: []string

allocator: mem.Allocator

jinja.Loader :: struct

Loader is a procedure plus its data. destroy, when set, is called by destroy_environment.

procedure: Loader_Proc

user: rawptr

destroy: proc(user: rawptr)

jinja.Loader_Proc :: #type proc(user: rawptr, name: string, allocator: mem.Allocator) -> (source: string, found: bool)

Loader_Proc returns the source of a template, allocated with allocator.

jinja.Loop :: struct

Loop is the special loop variable of a for loop.

items: []Value

index0: int

depth0: int

last_seen: Value

for loop.changed()

changed: bool

whether `changed()` was called before

recurse: ^Recursion

set in a recursive loop

jinja.Markup :: *distinct* string

Markup is a string that is already safe HTML: autoescaping leaves it alone.

jinja.Native :: #type *proc*(call: ^Call) -> Value

Native is the one signature of every filter, test, global function and method written in Odin. Report errors with `fail(call, ...)` and return anything.

jinja.None :: struct

None is Jinja's none / None.

jinja.Options :: struct

autoescape: bool

autoescape_extensions: []string

When set, templates whose names end with one of these („.html“) autoescape and others do not, like `select_autoescape()`; `autoescape` is then ignored.

trim_blocks: bool

lstrip_blocks: bool

keep_trailing_newline: bool

undefined: Undefined_Mode

loader: Loader

max_recursion: int

nested macros, includes and recursive loops; 0 means 200

max_iterations: int

loop iterations per render; 0 means 10,000,000

max_output: int

Bytes per render, and per value a render builds (a repetition, padding, a join), checked before the value is allocated; 0 means unlimited.

max_nesting: int

how deep template syntax nests; 0 means 100

stack_bytes: int

machine stack parsing and rendering may use; 0 means 512 KiB

random_seed: u64

seeds |random and lipsum(); renders are deterministic

jinja.State :: struct

State is one render in progress. Natives reach it through Call.state.

env: ^Environment**out:** ^strings.Builder**err:** Error**failed:** bool**autoescape:** bool**depth:** int**iterations:** int**ctx:** ^Context**current:** ^Compiled**line:** int

rng: u64

guard: ^Guard

the render's allocator; see `memory.odin`.

scratch: ^Arena

the render's own memory, or nil; see `ownership.odin`.

caller: mem.Allocator

`context.allocator` of the call that renders.

stored: map[rawptr]Value

containers not the render's own it stored values in.

jinja.Template :: struct

Template is a handle to a parsed template.

env: ^Environment

compiled: ^Compiled

name: string

jinja.Undefined :: struct

Undefined is what a missing variable, attribute or item evaluates to. The fields only feed the error message produced when the value is used in a way Jinja forbids.

name: string

the missing variable or attribute

owner: string

„dict object“ when an attribute or item was missing

hint: string

a complete message that replaces the generated one

```
jinja.Undefined_Mode :: enum u8
```

Default

renders as „, fails on attribute access, calls and arithmetic

Strict

fails on every use except `is defined` and `|default`

Chainable

like Default, but attributes of undefined are undefined too

Debug

like Default, but renders as `{{ name }}`

```
jinja.Value :: union #no_nil {Undefined, None, bool, i64, f64, string, Markup, ^List, ^Dict, ^Callable, ^Loop, ^Cycler}
```

Value is every value a template can see. The zero value is Undefined.

Procedures

```
jinja.add_filter :: proc(env: ^Environment, name: string,
procedure: Native, user: rawptr = nil)
```

`add_filter` registers a filter: `call.args[0]` is the filtered value. The environment copies name into its arena; user is borrowed until `destroy_environment`.

```
jinja.add_function :: proc(env: ^Environment, name: string,
procedure: Native, user: rawptr = nil)
```

`add_function` registers a native procedure as a global function, allocated in the environment's arena; user is borrowed until `destroy_environment`.

```
jinja.add_global :: proc(env: ^Environment, name: string,
value: Value)
```

`add_global` makes a value visible to every template. The environment copies name into its arena; the value is borrowed and must outlive renders.

```
jinja.add_template :: proc(env: ^Environment, name, source:
string) -> Error
```

`add_template` parses source and caches it under name, so that extends, include and import find it without a loader. An error is allocated with `context allocator` (`destroy_error`).

```
jinja.add_test :: proc(env: ^Environment, name: string,
  procedure: Native, user: rawptr = nil)
```

add_test registers a test: call.args[o] is the tested value; return a bool. The environment copies name into its arena; user is borrowed until destroy_environment.

```
jinja.append_value :: proc(l: Value, items: ..Value)
```

append_value adds values to the end of a list value, growing it with the list's own allocator; nothing happens when l is not a list or that allocator refuses.

```
jinja.arg :: proc(c: ^Call, index: int, name: string,
  default: Value = Undefined{}) -> Value
```

arg returns positional argument index, else the keyword argument name, else default.

```
jinja.arg_int :: proc(c: ^Call, index: int, name: string,
  default: i64) -> (i64, bool)
```

arg_int reads an integer argument (booleans and integral floats accepted).

```
jinja.autoescaping :: proc(c: ^Call) -> bool
```

autoescaping reports whether the call happens while autoescape is on.

```
jinja.boolean :: proc(b: bool) -> Value
```

boolean makes a boolean value.

```
jinja.call_filter :: proc(s: ^State, name: string, args:
  []Value, kwargs: []Keyword) -> Value
```

call_filter runs a registered filter by name (used by map, and by hosts).

```
jinja.call_test :: proc(s: ^State, name: string, args:
  []Value, kwargs: []Keyword) -> bool
```

call_test runs a registered test by name (used by select and reject).

```
jinja.check_args :: proc(c: ^Call, who: string, names:
  []string, required := 0) -> bool
```

check_args enforces a Python signature: at most len(names) positional arguments and only the named keywords, each at most once. who names the callable in errors.

```
jinja.clear_cache :: proc(env: ^Environment)
```

clear_cache forgets parsed templates so the next load reads them again.

```
jinja.create_environment :: proc(options: Options = {}) -  
> Environment
```

create_environment makes an environment with options, zero fields taking their defaults. It keeps its own arena, backed by context allocator, for parsed templates and registrations; destroy_environment frees it. When that memory cannot hold the environment's tables, out_of_memory is set and every parse fails with a Memory error.

```
jinja.destroy_environment :: proc(env: ^Environment)
```

destroy_environment frees the environment's arena, with every template parsed in it, and its loader's state (Loader.destroy).

```
jinja.destroy_error :: proc(err: Error, allocator :=  
context.allocator)
```

destroy_error frees an error returned by this package.

```
jinja.dict :: proc() -> Value
```

dict makes an empty dict, allocated with context.allocator (Undefined when it refuses the memory); fill it with set().

```
jinja.escape :: proc(v: Value, allocator :=  
context.allocator) -> Markup
```

escape converts a value to Markup: Markup stays as it is, everything else is converted to a string and escaped (MarkupSafe's escape()), allocating with allocator when it must; the result may borrow v, so it belongs in an arena, as values do.

```
jinja.escape_string :: proc(s: string, allocator :=  
context.allocator) -> string
```

escape_string replaces the five HTML special characters as MarkupSafe does. When s has none it is returned as it is, borrowed; otherwise the result is allocated with allocator, which the caller owns (or, as usual, an arena holds).

```
jinja.evaluate :: proc(env: ^Environment, expression: string,  
ctx: Value = {}) -> (Value, Error)
```

evaluate evaluates one expression against ctx (Jinja's compile_expression). The value and an error's message are allocated with context.allocator, the caller's; the lists and dicts of the value grow through a small allocator record

kept there too. When that allocator refuses memory the error is a Memory error.

```
jinja.fail :: proc(c: ^Call, format: string, args: ..any) -> Value
```

fail records a runtime error from a native procedure; return its result. The message is formatted with context.allocator, the render's arena.

```
jinja.filesystem_loader :: proc(directories: []string) -> Loader
```

filesystem_loader serves templates from directories, searched in order; the first match wins. Names use „/“ and may not climb out of a directory with „..“. The loader copies directories with context.allocator and frees them when its environment is destroyed (Loader.destroy). When that allocator refuses the copy, the loader finds nothing.

```
jinja.float :: proc(f: f64) -> Value
```

float makes a floating-point value.

```
jinja.format_error :: proc(err: Error, allocator := context.allocator) -> string
```

format_error renders an error as a friendly report in the style of Elm's compiler, in a string allocated with allocator that the caller owns („ for no error):

```
-- UNDEFINED VALUE ----- page.html:3
'user' is undefined
3| <h1>{{ user.name }}</h1>
Hint: Pass it in the render context, or test it with `is defined`.
```

```
jinja.function :: proc(name: string, procedure: Native, user: rawptr = nil) -> Value
```

function wraps a native procedure as a callable value for globals or context data, allocated with context.allocator (Undefined when it refuses the memory); name and user are borrowed.

```
jinja.get :: proc(d: Value, key: string) -> Value
```

get reads a string key from a dict value; missing keys give Undefined.

```
jinja.has_arg :: proc(c: ^Call, index: int, name: string) -> bool
```

has_arg reports whether the argument was passed at all.

```
jinja.integer :: proc(i: i64) -> Value
```

integer makes an integer value (int would shadow Odin's type).

```
jinja.is_markup :: proc(v: Value) -> bool
```

is_markup reports a safe-HTML string.

```
jinja.is_none :: proc(v: Value) -> bool
```

is_none reports None.

```
jinja.is_undefined :: proc(v: Value) -> bool
```

is_undefined reports an undefined value.

```
jinja.keys :: proc(d: Value, allocator := context.allocator)
-> []string
```

keys returns the string keys of a dict value, in insertion order, in a slice allocated with allocator that the caller owns; the keys borrow the dict.

```
jinja.length :: proc(v: Value) -> int
```

length is the number of items of a list or dict, or of runes of a string.

```
jinja.list :: proc(items: ..Value) -> Value
```

list makes a list holding the given values, allocated with context.allocator; when it refuses the memory, the result is Undefined.

```
jinja.load_template :: proc(env: ^Environment, name: string)
-> (Template, Error)
```

load_template loads a template through the environment's loader, cached in the environment's arena until destroy_environment (or clear_cache). An error is allocated with context.allocator; the caller frees it with destroy_error.

```
jinja.markup :: proc(s: string) -> Value
```

markup makes a string value that is safe HTML, which autoescaping leaves alone; the value borrows s.

```
jinja.memory_loader :: proc(sources: ^map[string]string) -
> Loader
```

memory_loader serves templates from a map the host owns (name -> source).

```
jinja.none :: proc() -> Value
```

none makes Python's None.

```
jinja.parse_template :: proc(env: ^Environment, name, source:
string) -> (Template, Error)
```

parse_template parses source directly (not cached; not visible to includes). The template lives in the environment's arena, which copies source; an error is allocated with context allocator (destroy_error).

```
jinja.render :: proc(t: ^Template, ctx: Value = {}) ->
(string, Error)
```

render renders a template with ctx (a dict value, or Undefined for none). The result and any error message are allocated with context allocator; everything else lives in a scratch arena freed before returning. When that allocator refuses memory the render stops with a Memory error at the line it was rendering.

```
jinja.render_position :: proc() -> (template: string, line:
int, excerpt: string, ok: bool)
```

render_position is where the render running on this thread is: its template's name, the line being rendered, and that line's text; false when none runs. A host asked about a render while it runs, as when the render's allocator asks what to do about memory, names the place with it. The strings borrow the template.

```
jinja.render_source :: proc(env: ^Environment, source:
string, ctx: Value = {}, name := "<template>") -> (string,
Error)
```

render_source parses and renders source in one call (nothing is cached), in a scratch arena it frees before returning. The output, and an error, are allocated with context allocator; the caller owns them.

```
jinja.repr :: proc(v: Value, allocator := context.allocator)
-> string
```

repr converts a value as Python's repr() does, in a string allocated with allocator, which the caller owns.

```
jinja.set :: proc(d: Value, key: string, value: Value)
```

set stores value under the string key in a dict value, growing it with the dict's own allocator; nothing happens when d is not a dict or that allocator refuses.

```
jinja.set_key :: proc(d: Value, key: Value, value: Value)
```

set_key stores value under any key in a dict value.

```
jinja.str :: proc(s: string) -> Value
```

str makes a string value; the value borrows s.

```
jinja.to_string :: proc(v: Value, allocator :=
context.allocator) -> string
```

to_string converts a value as Python's str() does (Undefined gives „"). A string or Markup value is returned as it is, borrowed; anything else is written into a string allocated with allocator, so the result belongs in an arena, as values do.

```
jinja.truthy :: proc(v: Value) -> bool
```

truthy is Python truthiness (Undefined is false).

```
jinja.tuple :: proc(items: ..Value) -> Value
```

tuple makes a tuple holding the given values, allocated as list allocates.

```
jinja.type_name :: proc(v: Value) -> string
```

type_name is the Python type name used in Jinja's error messages.

```
jinja.undefined :: proc(name := "") -> Value
```

undefined makes an undefined value; name, borrowed, is what error messages call it.

```
jinja.values_equal :: proc(a, b: Value) -> bool
```

values_equal compares as Python's == does: lists and dicts by content, 200 levels deep.

odindoc

Package odindoc reads Odin packages by static analysis, with Odin's own parser (core:odin/parser), and writes the reStructuredText of the Guidedoc `odin` domain that documents them, as sphinx.ext.autodoc writes the Python domain's: packages, procedures, procedure groups, types and their fields or enumerators, constants, variables, and foreign imports, each with its doc comment turned into reST.

It never runs the compiler: types are shown as written. A package's files are read the way Odin builds them for every target at once: file-name suffixes (`_windows`, `_linux_arm64`) and `#+build` tags choose the targets a file builds for, and file-scope `when ODIN_OS == ...` blocks are evaluated when their conditions

are that simple. A declaration made for every target the package builds for is documented once; one made for some targets only says which (see platform.odin).

It is a host library: it reads files through a `File_Reader` and allocates with the context allocator, freeing nothing itself, so a host runs it in an arena: a `Project`, the packages it loads, and the lines document returns live until the arena is freed.

Types

```
odindoc.Arch :: runtime.Odin_Arch_Type
```

```
odindoc.Archs :: runtime.Odin_Arch_Types
```

```
odindoc.Config :: struct
```

```
default_options: []Option
```

```
member_order: string
```

„source“ (the default), „alphabetical“, „groupwise“.

```
odindoc.Decl :: struct
```

`Decl` is a package-level declaration. signature is one line, without attributes, as the `odin` domain's directive takes it („clone :: proc(s: string) -> string“).

```
name: string
```

```
kind: Kind
```

```
signature: string
```

```
attributes: []string
```

as written, in order: „@(require_results)“.

```
docs: string
```

```
private: Private
```

```
members: []Member
```

```
foreign_lib: string
```

the library of a foreign block it is declared in.

targets: Targets

availability: string

its targets for people, when not the package's all.

variant: int

0; 1, 2, ... for later declarations of the name that differ.

file: string

base name.

line: int

order: int

in the package: files by name, then position.

`odindoc.File_Read :: struct`

path: string

text: string

`odindoc.File_Reader :: struct`

`File_Reader` reads the files the analysis needs. `procedure` reads a file; `list` names the entries of a folder (folders end with „/“). Either may be nil, which uses the file system; a host confines both to its readable roots.

`reserve`, when set, is asked for the memory parsing a file may take (`parse_bound`) before the file is parsed; a file it refuses is not parsed (`Package.too_large`). Odin's parser does not survive a failed allocation, so a host whose allocator can refuse reserves the bound ahead, and its allocator then serves the parse from what was reserved.

procedure: `proc(user: rawptr, path: string) -> (string, bool)`

list: `proc(user: rawptr, dir: string) -> ([]string, bool)`

reserve: `proc(user: rawptr, bytes: int) -> bool`

user: rawptr

```
odindoc.Import :: struct
```

Import is a package another package imports: the name it is used by in the source (its alias) and the id of the package it names.

```
alias: string
```

```
id: string
```

```
odindoc.Kind :: enum u8
```

```
Proc
```

```
Proc_Group
```

```
Struct
```

```
Union
```

```
Enum
```

```
Bit_Set
```

```
Bit_Field
```

```
Type
```

```
Const
```

```
Var
```

```
Foreign_Import
```

```
odindoc.Member :: struct
```

```
name: string
```

```
kind: Member_Kind
```

```
signature: string
```

```
docs: string
```

the comment above it and the one after it on its line.

```
odindoc.Member_Kind :: enum u8
```

```
Field
```

of a struct: „[using]name: T[tag]“.

```
Enumerator
```

of an enum: „Name[= value]“.

```
Bit_Field
```

of a bit_field: „name: T | bits“.

```
odindoc.Message :: struct
```

```
severity: Severity
```

```
code: string
```

```
title: string
```

```
text: string
```

```
hint: string
```

```
odindoc.OS :: runtime.Odin_OS_Type
```

```
odindoc.Option :: struct
```

```
name: string
```

```
value: string
```

```
odindoc.Package :: struct
```

Package is an analysed package. doc is its package comment (from doc.odin first, then the first file by name that has one) with comment markers stripped; synopsis is that comment's first sentence.

id: string

name: string

dir: string

doc: string

synopsis: string

decls: []Decl

imports: []Import

targets: Targets

every target some file of the package builds for.

platform: string

targets shown for people; „ when it builds for all.

files: []string

the package’s files that were read, sorted.

errors: int

syntax errors the parser reported.

too_deep: [dynamic]string

files nested too deeply to parse (nesting.odin).

too_large: [dynamic]string

files whose parse_bound the reader refused.

odindoc.**Package_Ref** :: struct

id: string

dir: string

```
odindoc.Private :: enum u8
```

```
Public
```

```
Package
```

@(private), or a #+private file.

```
File
```

@(private="file"), or a #+private file file.

```
odindoc.Project :: struct
```

```
roots: []Root
```

```
reader: File_Reader
```

```
files: [dynamic]File_Read
```

every file read, for the host's dependencies.

```
packages: map[string]^Package
```

loaded packages by id; nil for one that failed.

```
odindoc.Request :: struct
```

```
directive: string
```

„odin:autopackage“, „odin:autoproc“, ...

```
argument: string
```

```
options: []Option
```

```
current: string
```

the reader's current odin package, or „“.

```
odindoc.Result :: struct
```

```
lines: [dynamic]string
```

```
messages: [dynamic]Message
```

```
odindoc.Root :: struct
```

Root is a folder holding packages. Without a collection, a package's id is its path relative to dir („readers/sphinx“), and dir's own package is named by dir's base name; with one, ids are import paths in that collection („core:fmt“).

```
dir: string
```

```
collection: string
```

```
odindoc.Severity :: enum u8
```

```
Note
```

```
Warning
```

```
Error
```

```
odindoc.Targets :: [OS]Archs
```

Targets is a set of (os, arch) pairs: per system, its architectures.

Procedures

```
odindoc.document :: proc(p: ^Project, config: ^Config,  
request: Request) -> Result
```

document runs one autodoc directive (request.directive, „odin:autopackage“ and the others, with its argument and options over config's defaults) and returns the reStructuredText lines it generates, with any messages: an unknown directive, option, package, or name is an Error message and no lines, never a panic. Packages are loaded through p as needed. The result lives in the context arena.

```
odindoc.init :: proc(p: ^Project, roots: []Root, reader :=  
File_Reader{})
```

init starts a project over roots, reading through reader (the file system when it is zero). The project and everything it loads live in the context arena.

```
odindoc.list_packages :: proc(p: ^Project) -> []Package_Ref
```

list_packages lists every folder below the roots that holds a package, by id.

```
odindoc.load :: proc(p: ^Project, id: string) -> (^Package,
bool)
```

load analyses the package with an id, once; later calls return the same package, which the project keeps. It is false when no root holds a package with that id.

```
odindoc.parse_bound :: proc(n: int) -> int
```

parse_bound is the memory parsing a file of n bytes may take.

Constants

```
odindoc.PARSE_BASE_BYTES :: 256 << 10
```

PARSE_BASE_BYTES is what the parser allocates for any file, and an arena block's room.

```
odindoc.PARSE_BYTES_PER_BYTE :: 256
```

PARSE_BYTES_PER_BYTE bounds what Odin's parser allocates, with the build tags read after it, for each byte of a file it parses. Its tree takes 20 to 30 bytes for each byte of ordinary code, and up to about 170 for the densest input measured: long operator chains, runs of semicolons, and one-character list items (parse_bounds_hold). The bound counts every growth of a list as a new allocation, as an arena that cannot grow it in place makes it.

project

Package project builds a documentation project the way Sphinx does: a source directory with conf.toml, builders writing _build/<builder>, and incremental builds. It is host code and may allocate; documents are read and rendered by the Guidedoc engine.

Its surface is the verbs on a Project (project.odin says who owns what they allocate) and the types they take and return; every other file is #+private. lib/project/README.md lists the surface.

Types

```
project.Build_Options :: struct
```

Build_Options are one build's command-line options; build copies them.

```
all: bool
```

-a: write every output, not only outdated ones.

```
fresh: bool
```

-E: ignore the saved environment.

nitpicky: bool`-n`**warnings_as_errors:** bool`-W`**keep_going:** bool`--keep-going`**untrusted:** bool`--untrusted:` see `untrusted_policy`.**jobs:** int`-j:` reading threads; 0 or 1 is one, -1 one per core.**budget:** int`--budget:` bytes; 0 is `BUILD_BUDGET`.**memory:** `host.Budget_Policy`when the budget is reached: `-memory`, or `ask`.**heap:** `mem.Allocator`

Where steps' scratch memory comes from (a document read, a page rendered); zero: the heap. Reading threads use it at once, so it must be thread-safe.

max_depth: int`--max-depth:` how deep content may nest; 0 is the default.**max_nodes:** int`--max-nodes:` nodes per document; 0 is the default.**stack_bytes:** int`--stack-kib:` stack budget; 0 is the default. See `build_limits`.**tags:** `[]string``-t`

output_dir: string

sphinx-build form; otherwise build_dir/<builder>.

arena_block: int

bytes the build's arenas ask for at a time; 0 is 64 KiB.

now: datetime.DateTime

the build's moment; zero is now, in UTC.

year: string

project.**Build_Result** :: struct

Build_Result is what a build did: exit 0, or exit != 0 with a problem; the reports of the whole build either way, and its counters. It owns everything it refers to, in its arena, until release.

exit: int

problem: host.Problem

reports: []host.Report

read: int

documents parsed.

unread: int

documents that could not be read.

reused: int

documents taken from the environment.

written: int

outputs written: published, or only prepared when not published.

unchanged: int

outputs already up to date.

output: string

reached: `Build_Stage`

how far the build got.

published: `bool`

the outputs are in place; otherwise the previous ones stay,

unsettled: `bool`

unless this is set: a publication neither finished nor undone.

peak: `int`

the most memory the budget held at once, in bytes.

budget: `int`

the budget at the end, in bytes: `Budget_Policy` may raise it.

memory: `^Memory`

everything the build allocated; see `release`.

owner: `mem.Allocator`

the allocator memory came from.

`project.Build_Stage :: enum`

`Build_Stage` is how far a build got, so its summary says what it did and no more.

Preparing

settings, the documents to read, the readers: no document read yet.

Reading

reading the documents and resolving their references.

Writing

writing the outputs beside the output folder.

Written

every output written; publishing them is what is left.

```
project.Builder_Kind :: enum u8
```

Builder_Kind is the output a build writes; BUILDER_NAMES are the names the command line gives them, and builder_named reads a name.

Html

Dirhtml

Singlehtml

Pdf

Text

Gettext

Dummy

```
project.Config :: struct
```

Config holds conf.toml. Names follow conf.py so a Sphinx user recognizes them.

source_dir: string

the directory holding conf.toml (absolute).

build_dir: string

_build beside it, or build/ in the separated layout.

project: string

Project.

author: string

Project.

copyright: string

Project.

version: string

Project.

release: string

Project.

today: string

Project.

today_fmt: string

Project.

language: string**root_doc:** string

General.

source_suffix: []string**exclude_patterns:** []string**include_roots:** []string

folders beyond the source folder files may come from.

include_patterns: []string**templates_path:** []string**extensions:** []string**rst_prolog:** string**rst_epilog:** string**default_role:** string**primary_domain:** string

highlight_language: string

pygments_style: string

Pygments style for code; „ is the theme’s.

pygments_dark_style: string

for dark pages; „ is github-dark.

numfig: bool

numfig_format: map[string]string

numfig_secnum_depth: int

math_number_all: bool

math_eqref_format: string

math_numfig: bool

nitpicky: bool

nitpick_ignore: [][]string

nitpick_ignore_regex: [][]string

nitpick_patterns: [][]regex.Regular_Expression

nitpick_ignore_regex, compiled.

show_authors: bool

add_function_parentheses: bool

add_module_names: bool

toc_object_entries: bool

toc_object_entries_show_parents: string

„domain“, „hide“, or „all“.

trim_footnote_reference_space: bool

smartquotes: bool

keep_warnings: bool

suppress_warnings: []string

todo_include_todos: bool

autosectionlabel_prefix_document: bool

labels are „docname:Title“.

autosectionlabel_maxdepth: int

sections this deep or deeper get no label; 0: all.

trim_doctest_flags: bool

doctest flags and <BLANKLINE> hidden in sessions.

manpages_url: string

option_emphasise_placeholders: bool

extlinks: map[string][2]string

extlinks_detect_hardcoded_links: bool

object_types: [dynamic]sphinx.Object_Type

see object_types.odin.

directive_aliases: []sphinx.Directive_Alias

mathjax_path: string

sphinx.ext.mathjax, Sphinx’s HTML math; see mathjax.odin.

mathjax_options: map[string]string

mathjax_inline: []string

each an opening and a closing delimiter.

mathjax_display: []string

each an opening and a closing delimiter.

mathjax3_config: string

JSON, as json.dumps writes the table.

mathjax4_config: string

JSON, as json.dumps writes the table.

mathjax_config_path: string

intersphinx_mapping: []Intersphinx_Project

sphinx.ext.intersphinx; see intersphinx.odin.

intersphinx_cache_limit: int

days an inventory is reused; below 0: always.

intersphinx_timeout: int

seconds; 0: no limit, as None in conf.py.

intersphinx_disabled_reftypes: []string

intersphinx_resolve_self: string

autodoc_source_paths: []string

sphinx.ext.autodoc, which reads Python source without running it;
see autodoc.odin.

folders holding the packages, like sys.path.

autoclass_content: string

autodoc_class_signature: string

autodoc_default_options: []ad.Default_Option

autodoc_docstring_signature: bool

autodoc_inherit_docstrings: bool

autodoc_member_order: string

autodoc_mock_imports: []string

accepted: nothing is imported, so nothing is mocked.

autodoc_preserve_defaults: bool

autodoc_typehints: string

autodoc_typehints_description_target: string

autodoc_typehints_format: string

autodoc_type_aliases: map[string]string

autodoc_use_type_comments: bool

autodoc_warningiserror: bool

python_display_short_literal_types: bool

strip_signature_backslash: bool

odin_autoapi_dirs: []string

The odin domain's generating directives and API pages; see `odin.odin`.
folders whose packages get API pages.

odin_collections: map[string]string

collection name to folder („core“).

odin_autoapi_root: string

the folder of the generated pages: „api“.

odin_autoapi_options: []string

members, undoc-members, private-members.

odin_autoapi_member_order: string

source, alphabetical, groupwise.

odin_autoapi_add_tocentry: bool

the API index joins the root's toctree.

odin_autoapi_generate_api_docs: bool

false: only the directives read the dirs.

html_theme: string

HTML.

html_theme_options: map[string]string

html_title: string

html_short_title: string

html_logo: string

html_favicon: string

html_static_path: []string

html_extra_path: []string

html_css_files: []string

html_js_files: []string

html_last_updated_fmt: Maybe(string)

unset: no date; „: the default format.

html_permaLinks: bool

```
html_permlinks_icon: string
```

```
html_use_index: bool
```

```
html_domain_indices: bool
```

the Python module index, `py-modindex.html`.

```
modindex_common_prefix: []string
```

prefixes the module index leaves out.

```
html_split_index: bool
```

```
html_copy_source: bool
```

```
html_show_sourcelink: bool
```

```
html_sourcelink_suffix: string
```

```
html_show_copyright: bool
```

```
html_show_sphinx: bool
```

```
html_baseurl: string
```

```
html_file_suffix: string
```

```
html_link_suffix: string
```

```
html_secnumber_suffix: string
```

```
html_context: Toml_Value
```

a table, as written: the pages' variables.

```
html_additional_pages: map[string]string
```

page name: the template it is made from.

```
pdf_documents: []Pdf_Document
```

PDF.

pdf_paper_size: string

pdf_logo: string

pdf_toplevel_sectioning: string

pdf_show_urls: string

pdf_preamble: string

pdf_packages: string

pdf_fonts: string

pdf_font_paths: []string

typst: string

graphviz_output_format: string

Graphviz, linked in through graphdog.
svg; png is read as svg.

graphviz_dot_args: []string

-Gname=value, -Nname=value, -Ename=value.

graphviz_dot: string

accepted from conf.py; Graphviz is built in.

myst_enable_extensions: []string

Markdown, with myst-parser 0.16.1's names; the reader has the support built in.
optional syntax, such as colon_fence.

myst_heading_anchors: int

heading depth that gets slug anchors; 0: none.

myst_dmath_allow_labels: bool

myst_dmath_allow_space: bool

myst_dmath_allow_digits: bool

myst_dmath_double_inline: bool

myst_linkify_fuzzy_links: bool

myst_substitutions: map[string]string

myst_sub_delimiters: []string

two characters, each doubled: {{ name }}.

myst_url_schemes: []string

schemes that make external links; empty: all.

myst_footnote_transition: bool

myst_html_meta: map[string]string

myst_commonmark_only: bool

CommonMark syntax only; headings still make sections.

myst_disable_syntax: []string

markdown-it rule names not parsed.

myst_words_per_minute: int

myst_dmath_enable: bool

deprecated spellings of the extensions.

myst_amsmath_enable: bool

deprecated spellings of the extensions.

locale_dirs: []string

Internationalization, with Sphinx's names (see lib/i18n).
relative to the source directory.

gettext_compact: Flag_Or_Name

true, false, or one catalog's name.

gettext_uuid: bool

gettext_location: bool

gettext_auto_build: bool

compile .po files to .mo beside them.

gettext_additional_targets: []string

gettext_exclude_patterns: []string

document paths excluded from extraction only.

gettext_allow_fuzzy_translations: bool

gettext_last_translator: string

gettext_language_team: string

figure_language_filename: string

translation_progress_classes: Flag_Or_Name

true, false, translated, untranslated.

html_title_derived: bool

html_title was made from the project name.

html_short_title_derived: bool

project.Flag_Or_Name *:: struct*

Flag_Or_Name is a setting that is true, false, or a name, as gettext_compact is.

on: bool

name: string

the name, when one was given; on is then true.

```
project.Intersphinx_Project :: struct
```

Intersphinx_Project is one intersphinx_mapping entry: the name references use as a prefix, the base URL of the other project's pages, and where its inventory is, tried in order; „ stands for None, the base URL's objects.inv.

```
name: string
```

```
uri: string
```

```
locations: []string
```

```
project.Intl_Action :: enum u8
```

Intl_Action is what intl_update did to one catalog.

```
Create
```

```
Update
```

```
Not_Changed
```

```
project.Intl_File :: struct
```

Intl_File is one catalog intl_update or intl_stat looked at, with its statistics.

```
action: Intl_Action
```

```
path: string
```

```
stats: gettext.Stats
```

```
project.Intl_Options :: struct
```

Intl_Options are sphinx-intl's options for update and stat.

```
pot_dir: string
```

-p: the templates; default: the gettext builder's output.

```
locale_dir: string
```

-d: default: the first of locale_dirs.

languages: []string

-l, repeatable; default: the project's language.

width: int

-w: line width; 0 means 76.

obsolete: bool

keep obsolete messages (sphinx-intl's default).

project.Load_Options :: struct

Load_Options are the command line's say in where a project is and how it is set; load borrows them for the call.

conf_dir: string

-c: where conf.toml is, when not in the source directory.

no_config: bool

-C: build with defaults only.

overrides: []string

-D name=value, applied after conf.toml.

source: string

sphinx-build form: explicit source directory.

output: string

sphinx-build form: explicit output directory.

project.Migrate_Options :: struct

input: string

conf.py, guidedog.toml, or a folder holding one.

output: string

where conf.toml goes; „ is beside the input, „-„ writes nothing.

force: bool

replace an existing conf.toml.

```
year: string
```

what datetime's current year evaluates to.

```
project.Migrate_Result :: struct
```

Migrate_Result is what migrate wrote (toml, and output unless that was „-“), with notes on what it could not convert as written, and how many settings it converted.

```
input: string
```

```
output: string
```

```
toml: string
```

```
notes: []host.Report
```

```
converted: int
```

settings written to conf.toml.

```
attention: int
```

settings left out that may matter.

```
project.Pdf_Document :: struct
```

Pdf_Document is one book of pdf_documents: which document it starts from, and the file, title, and author it gets.

```
root: string
```

the root document of the book.

```
file: string
```

the PDF name in _build/pdf.

```
title: string
```

```
author: string
```

project.Project :: struct

Project is a loaded documentation project. The API is a handful of verbs over it:

```
p, problem := project.load("docs", {}, defaults.registry())
defer project.unload(&p)
if problem.exit != 0 do return problem.exit
result := project.build(&p, .Html, {})
defer project.release(&result)
project.clean(&p)
```

Who owns what each entry point allocates, all of it taken from context.allocator:

- **load**: the project owns everything, in an arena of its own; **unload** releases it, including the text of a problem load returned, so it is called whether load succeeded or not.
- **build**: the result owns everything the build allocated, in an arena of its own; **release** frees it. The project is never changed by a build (see **build**), so it may be built any number of times, and must outlive every result of its builds only while their reports are used. **load**, **build**, **release**, **unload** leaves nothing live.
- **serve**: each request works in an arena it frees; the rebuild callback owns (and releases) the results of the builds it runs.
- **clean**, **intl_update**, **intl_stat**, **migrate**, **quickstart**: their results and problems are allocated in context.allocator and not freed one by one; a caller on the heap runs them with an arena (or the temporary allocator) as context.allocator and frees it once it has used them.
- **builder_named**, **absolute**, **join**: plain values; **absolute** and **join** allocate the path.

config: Config

warnings: [dynamic]host.Report

from configuration; builds add their own.

registry: gd.Registry

settings: string

digest of conf.toml and the -D overrides: what every output uses.

memory: ^Memory

everything load allocated; see **unload**.

owner: mem.Allocator

the allocator memory came from.

```
project.Quickstart_Options :: struct
```

Quickstart_Options are guidedog quickstart's answers; „“ takes each default.

```
dir: string
```

```
project: string
```

```
author: string
```

```
version: string
```

```
release: string
```

```
language: string
```

```
suffix: string
```

„rst“ by default.

```
root_doc: string
```

„index“ by default.

```
separate: bool
```

source/ and build/ instead of one folder with _build.

```
year: string
```

for the copyright line.

```
date: string
```

for the root document's comment.

```
project.Server :: struct
```

Server previews the built html output on the loopback interface. Before serving a page it checks whether any source changed and rebuilds incrementally if so.

```
project: ^Project
```

```
rebuild: proc(s: ^Server) -> bool
```

returns false when the rebuild failed.

```
user: rawptr
```

```
stamp: i64
```

fingerprint of watched paths, sizes, and modification times.

```
project.Toml_Kind :: enum u8
```

TOML 1.0: tables, arrays of tables, dotted and quoted keys, inline tables, arrays, every string form, integers in all bases, floats, booleans, and date-times (kept as text). Errors carry the line, so a mistake in `conf.toml` points at itself.

```
String
```

```
Integer
```

```
Float
```

```
Boolean
```

```
Datetime
```

```
Array
```

```
Table
```

```
project.Toml_Value :: struct
```

`Toml_Value` is one parsed TOML value; `Config.html_context` keeps a table of them as written. Its strings and lists belong to the project that loaded it.

```
kind: Toml_Kind
```

```
text: string
```

String and Datetime.

```
integer: i64
```


float: f64

boolean: bool

items: [dynamic]Toml_Value

Array.

keys: [dynamic]string

Table, in definition order.

values: [dynamic]Toml_Value

Table, parallel to keys.

line: int

defined: bool

Table: defined by a header or as a value, not only implied.

inline: bool

written inline, so it may not be extended later.

Procedures

project.absolute :: *proc(path: string) -> string*

absolute makes a path absolute against the working directory without resolving it, so it works for folders a build has not created yet. The path is allocated in the context allocator and owned by the caller.

project.build :: *proc(p: ^Project, kind: Builder_Kind, o: Build_Options) -> Build_Result*

build reads, resolves, and writes the project with one builder. Outputs are written only for documents whose inputs changed, unless o.all is set.

Ownership: the build allocates everything, its result included, in an arena of its own taken from context.allocator, and release frees it: a caller releases each result once it is done with its reports. The build never changes the project: it works on its own copy of the configuration (build_config), so an –untrusted build confines only itself, and any number of builds may follow on the same project.

The memory of each step (a document read, a page rendered) comes from o.heap, the heap by default, and is freed when the step ends. When

context.allocator or o.heap refuses memory, the build stops with host.memory (exit 3) and publishes nothing.

```
project.build_limits :: proc(o: Build_Options) -> (gd.Limits,
host.Problem)
```

build_limits are the limits every session of a build reads and renders with: the documented defaults, with `-max-depth`, `-max-nodes`, and `-stack-kib`. Reading runs on the main thread, or on core:thread's threads with `-j`, and pages render on the main thread, so the stack budget may be at most what the smaller of those stacks holds (host.stack_budget_limit); without `-stack-kib` it is the default, or less on a thread too small for it. A `-stack-kib` above that is the problem build.stack (exit 2); a caller may call it before build to refuse the options early. Only the problem's message is allocated.

```
project.builder_named :: proc(name: string) -> (Builder_Kind,
bool)
```

builder_named accepts Guidedog's builder names and the Sphinx names that map onto them: the LaTeX builders become pdf, because Guidedog typesets PDF with Typst.

```
project.clean :: proc(p: ^Project) -> host.Problem
```

clean removes everything in the project's build directory, as `make clean` does for Sphinx, and leaves the directory itself; a missing one is nothing to clean. It stops at the first file it cannot remove and returns its problem (host.io), whose text is allocated in the caller's context allocator and owned by the caller.

```
project.intl_stat :: proc(p: ^Project, options: Intl_Options)
-> ([Intl_File, host.Problem)
```

intl_stat is sphinx-intl stat: the translated, fuzzy, and untranslated messages of every catalog of the languages. It writes nothing; the files are allocated in context.allocator (see Project).

```
project.intl_update :: proc(p: ^Project, options:
Intl_Options) -> ([Intl_File, host.Problem)
```

intl_update is sphinx-intl update: for each template of pot_dir and each language, it creates the translation catalog, or merges the template into the existing one (gettext.merge: kept, fuzzy, and obsolete messages, as msgmerge does). It returns what it did to each catalog, allocated in context.allocator (see Project), or the first problem, with the catalogs written before it kept.

```
project.join :: proc(parts: ..string) -> string
```

join joins path parts with the system's separator and cleans the result, as filepath.join does; the path is allocated in context allocator.

```
project.load :: proc(dir: string, options: Load_Options,
registry: gd.Registry) -> (p: Project, problem: host.Problem)
```

load finds the project from dir (see find_project) or the explicit directories in options, and reads its configuration. The registry is checked first: an adapter with no ID, version, or procedure, or an ID registered twice, is a problem, as it is for gd.convert. Whether it has the readers the documents need is known once a build has found them (find_readers). The project owns everything load allocates, in an arena taken from context.allocator, which unload frees; a problem's text lives in that arena too. When that allocator refuses memory, load stops with host.memory (exit 3), and unload is still what frees the rest.

```
project.migrate :: proc(o: Migrate_Options) -> (r:
Migrate_Result, problem: host.Problem)
```

migrate turns the Sphinx conf.py (or a guidedog.toml) that o.input names into conf.toml, and writes it unless o.output is „-„: literal assignments become settings, and what Python would have computed is reported in r.notes. The written conf.toml is loaded first, so it always builds; an existing one is refused unless o.force is set. Everything is allocated in context.allocator (see Project); a failure is the problem, with nothing written.

```
project.quickstart :: proc(o: Quickstart_Options) ->
(created: []string, p: host.Problem)
```

quickstart creates a documentation project in o.dir laid out as Sphinx lays one out, with conf.toml, a root document, and the default templates copied in so they can be edited, and returns the paths it created. It refuses to overwrite a project. The paths and the problem are allocated in context.allocator (see Project).

```
project.release :: proc(r: ^Build_Result)
```

release frees everything a build allocated, its result included, which is empty after.

```
project.serve :: proc(s: ^Server, port: int) -> host.Problem
```

serve previews the project's built html output on 127.0.0.1:port, rebuilding through s.rebuild before a page is served when a source changed since the last build. It borrows s and the project for as long as it runs, which is until the process ends: it returns only the problem of a port it cannot listen on. Each request works in an arena of its own on the heap, freed when it is answered.

```
project.unload :: proc(p: ^Project)
```

unload releases everything load allocated.

Constants

```
project.BUILD_BUDGET :: 1 <= 30
```

BUILD_BUDGET bounds what the build holds at once: its sessions, and the files it reads: reading threads wait rather than exceed it (see host.Budget). – budget sets another.

```
project.CONFIG_FILE :: "conf.toml"
```

CONFIG_FILE is the name of a project's configuration, in its source directory.

Variables

```
@(rodata) project.BUILDER_NAMES
```

pyscan

Package pyscan analyses Python source statically, through tree-sitter: modules and their docstrings, `__all__`, and imports; classes with their bases, decorators, and members in source order; functions with their parameters as written; and the attribute documentation Sphinx's ModuleAnalyzer finds (#: comments and docstrings after assignments). Names resolve across the modules of the configured source roots, so a class re-exported by a package is found where it is defined. Nothing is executed.

It is a host library: it reads files (through a reader the host may confine) and allocates with the context allocator, freeing none of it, so a host runs it in an arena: the project and every module, class, and string it returns live until the arena is freed. destroy frees what tree-sitter holds, which no arena can.

Types

```
pyscan.All :: struct
```

All is a module's `__all__` when it can be read without running code.

```
names: [dynamic]string
```

```
defined: bool
```

the module assigns `__all__`.

```
known: bool
```

and its value was read: literal lists, +=, append, extend.

pyscan.Analysis :: struct

Analysis is what Sphinx's ModuleAnalyzer (sphinx.pycode.parser.Parser) finds in a module, keyed as it keys them: attribute documentation from #: comments and from string literals after assignments, annotations, definition order, @final, @overload.

attr_docs: map[Attr_Key][dynamic]string

lines, ending with „.

attr_order: [dynamic]Attr_Key

first-insertion order of attr_docs.

annotations: map[Attr_Key]string

annotation_order: [dynamic]Attr_Key

first-insertion order of annotations.

tagorder: map[string]int

dotted qualname -> order of its last definition.

counter: int

finals: map[string]bool

overloads: map[string][dynamic]^Function

pyscan.Attr_Key :: struct

Attr_Key is (scope, name): scope is „ at module level, else the class's qualname.

scope: string

name: string

pyscan.Class :: struct

module: ^Module

name: string

qualname: string

node: ts.Node

bases: [dynamic]ts.Node

positional arguments of the class statement.

keywords: [dynamic]Keyword

metaclass=..., and others.

decorators: [dynamic]ts.Node

the decorator expressions.

doc: Doc

scope: Scope

outer: ^Class

the class it is nested in, or nil.

mro_done: bool

mro_complete: bool

mro_order: [dynamic]Mro_Entry

pyscan.**Def** :: struct

Def is one binding of a name in a module or class body, in source order.

name: string

kind: Def_Kind

node: ts.Node

the statement, or the definition.

runtime: bool

false under if TYPE_CHECKING:.

class: ^Class

function: ^Function

value: ts.Node

right-hand side; null when there is none.

annotation: ts.Node

the type node of an annotated assignment.

target: string

imports: the absolute module imported from, or imported.

member: string

Import_From: the name imported; „*“ for a wildcard.

tuple: bool

bound by unpacking: its value is one part of value.

line: int

1-based line of the statement.

pyscan.**Def_Kind** :: *enum* u8

Class

Function

Assign

name = value, name: type = value.

Annotation

name: type, with no value.

Import

import a.b [as c].

Import_From

from m import name [as alias].

Type_Alias

type Name = value (PEP 695).

pyscan.**Doc** :: struct

Doc is a docstring as Python evaluates it (escapes processed), or none.

text: string

ok: bool

pyscan.**File_Read** :: struct

path: string

text: string

pyscan.**File_Reader** :: struct

File_Reader reads a file for the analyser. The host confines reads to what it may read; ok is false for a file that is missing or refused.

procedure: proc(user: rawptr, path: string) -> (text: string, ok: bool)

user: rawptr

pyscan.**Function** :: struct

module: ^Module

name: string

qualname: string

node: ts.Node

the function_definition, or the lambda.

is_async: bool

is_lambda: bool

decorators: [dynamic]ts.Node

params: [dynamic]Param

returns: ts.Node

the return type node, or null.

doc: Doc

class: ^Class

the class whose body defines it, or nil.

type_comment: bool

A PEP 484 type comment after the header, „# type: (int, str) -> bool“: the parameter types as written („...“ alone when elided) and the return type.

type_args: [dynamic]string

type_returns: string

pyscan.**Keyword** :: struct

name: string

value: ts.Node

pyscan.**Module** :: struct

project: ^Project

name: string

dotted.

kind: Module_Kind

path: string

the file read; the folder of a namespace package.

source: string

with line breaks normalised to \n.

tree: ^ts.Tree

root: ts.Node

doc: Doc

scope: Scope

all: All

info: Analysis

what Sphinx's ModuleAnalyzer finds.

broken: bool

tree-sitter found syntax errors.

too_deep: bool

it nests past MAX_SYNTAX_DEPTH, so it is not analysed (kind .Native).

origin: ^Module

A parsed snippet (parse_expression) names things in the namespace of origin.

pyscan.**Module_Kind** :: enum u8

Source

a .py file.

Package

a folder with __init__.py.

Namespace

a folder without `__init__.py` (PEP 420).

Native

a compiled extension (`.so`, `.pyd`): it cannot be read.

`pyscan.Mro_Entry` *:: struct*

`Mro_Entry` is one class of a method resolution order: a class in the roots, or one outside them known by path.

class: `^Class`

path: `string`

for a class outside the roots: „`builtins.object`“, „`werkzeug.X`“.

`pyscan.Object` *:: struct*

kind: `Object_Kind`

module: `^Module`

.Module: the module itself; else the module that defines it.

class: `^Class`

function: `^Function`

value: `ts.Node`

.Value: the expression assigned.

tuple: `bool`

.Value: bound by unpacking, so value is only its source.

path: `string`

.External, .Builtin: the dotted name.

wrapper: `Wrapper`

abstract: booldecorated with `abstractmethod`.**owner:** ^Class

the class whose body defines it, when found in one.

def: ^Def

the binding it was found through.

decorator: string

.Unknown wrapper: the decorator as written.

doc: Doca docstring given explicitly: `property(fget, doc="...")`.**class_property:** boola property under `classmethod`: a property of the class.**partial_args:** int`functools.partial` and `partialmethod`: how many leading parameters (after `self`, for `partialmethod`) the call already gave, which the signature leaves out.**partial:** bool**partial_method:** bool`partialmethod`: as got from the class, a function with no docstring.`pyscan.Object_Kind :: enum u8`**None**

not found.

Module**Class****Function**

Value

anything an assignment made: value is its expression.

External

from a module outside the source roots: only path is known.

Builtin

a builtin such as str or Exception: path is „builtins.<name>“.

`pyscan.Param :: struct`

name: string

kind: Param_Kind

annotation: ts.Node

the type node, or null.

default: ts.Node

the default expression, or null.

type_comment: string

„a, # type: str“: a per-parameter type comment, or „“.

`pyscan.Param_Kind :: enum u8`

Positional_Only

Positional_Or_Keyword

Var_Positional

Keyword_Only

Var_Keyword

`pyscan.Project :: struct`

Project finds and analyses modules below its source roots, each once.

roots: []string

reader: File_Reader

a nil procedure reads with core:os.

parser: ^ts.Parser

modules: map[string]^Module

by dotted name; nil records a module not found.

files: [dynamic]File_Read

every source read, in order: a build's dependencies.

trees: [dynamic]^ts.Tree

steps: int

The lookup in progress: its steps (MAX_STEPS), where its stack starts (LOOKUP_STACK_BYTES), and how deep lookups and MRO computations are nested.

stack_base: uintptr

resolving: int

mro_depth: int

pyscan.**Scope** :: struct

defs: [dynamic]Def

pyscan.**Slot** :: struct

Slot is one entry of a class's `__slots__`, with the docstring a dictionary gives it.

name: string

doc: Doc

pyscan.String_Kind :: *enum* u8

Str

Bytes

Formatted

an f-string or t-string: not a constant.

pyscan.Unparse_Mode :: *enum* u8

Unparse_Mode chooses whose unparser to follow.

Sphinx

Sphinx's sphinx.pycode.ast.unparse, which preserve_defaults and @overload signatures use: numbers as written when source is given, lambda bodies as „...“, and no parentheses added for precedence.

Sphinx_Repr

Sphinx's unparser without the source, as for overload signatures: numbers as repr.

Python

Python's own ast.unparse, which makes the annotation strings of from __future__ import annotations: parentheses kept, every expression.

pyscan Wrapper :: *enum* u8

Wrapper is what the decorators of a function made of it.

None

Staticmethod

Classmethod

Property

Cached_Property

Unknown

a decorator from outside the source roots that is not known to keep functions.

Procedures

```
pyscan.base_objects :: proc(c: ^Class) -> [dynamic]Object
```

base_objects resolves the bases a class statement lists; subscripted generics give their origin.

```
pyscan.class_attr :: proc(c: ^Class, name: string, depth := 0) -> Object
```

class_attr is getattr(cls, name): the first class along the MRO whose body binds name.

```
pyscan.def_object :: proc(m: ^Module, owner: ^Class, d: ^Def, depth: int) -> Object
```

def_object turns a binding into the object it holds.

```
pyscan.destroy :: proc(p: ^Project)
```

destroy frees the trees and the parser. Everything else is in the caller's allocator.

```
pyscan.exported :: proc(m: ^Module, name: string) -> bool
```

exported is whether `from m import *` binds name: `__all__` when m has one, else the public names.

```
pyscan.find_def :: proc(s: ^Scope, name: string) -> ^Def
```

find_def returns the binding of name that is in force when the body has run: the last runtime one; nil when there is none.

```
pyscan.get_attr :: proc(obj: Object, name: string, depth := 0) -> Object
```

get_attr is getattr(obj, name) as far as the source tells.

```
pyscan.init :: proc(p: ^Project, roots: []string, reader := File_Reader{}) -> bool
```

init prepares a project over roots (folders, absolute or relative to the working directory). It returns false when tree-sitter cannot read the Python grammar.

```
pyscan.is_builtin :: proc(name: string) -> bool
```

is_builtin lists the names of Python's builtins module that matter to documentation.

```
pyscan.is_builtin_exception :: proc(name: string) -> bool
```

is_builtin_exception lists the builtin exception classes.

```
pyscan.is_exception :: proc(c: ^Class) -> bool
```

is_exception is whether a class derives from BaseException, as far as its MRO is known.

```
pyscan.lookup_name :: proc(code: ^Module, scope: ^Class,
name: string, depth := 0) -> Object
```

lookup_name resolves a name where a class body (scope) or the module runs: the class body first, then the module, then builtins.

```
pyscan.module :: proc(p: ^Project, name: string) -> ^Module
```

module finds, reads, and analyses a module by dotted name, once; nil when no root has it.

```
pyscan.module_attr :: proc(m: ^Module, name: string, depth :=
0) -> Object
```

module_attr looks a name up in a module's namespace, then among its submodules.

```
pyscan.module_object :: proc(m: ^Module) -> Object
```

module_object is the object of a module.

```
pyscan.mro :: proc(c: ^Class) -> (order: [dynamic]Mro_Entry,
complete: bool)
```

mro is the class's method resolution order, by C3 linearisation, ending with object. complete is false when a base could not be resolved or lies outside the roots (it then appears by path, and what it defines is unknown).

```
pyscan.number_repr :: proc(literal: string) -> string
```

number_repr is Python's repr of a numeric literal: integers in decimal, floats in their shortest round-trip form, imaginary numbers with j.

```
pyscan.parse_expression :: proc(m: ^Module, s: string) ->
(^Module, ts.Node, bool)
```

parse_expression parses text, such as a string annotation, as an expression whose names resolve in m. The module returned holds the snippet's source.

```
pyscan.prepare_docstring :: proc(s: string, tab_width := 8) -
> [dynamic]string
```

prepare_docstring is Sphinx's sphinx.util.docstrings.prepare_docstring: lines of reST with the common indentation of the lines after the first removed, the first line stripped, leading blank lines dropped, and a blank line at the end.

```
pyscan.reference :: proc(m: ^Module, scope: ^Class, n:
ts.Node, depth := 0) -> Object
```

reference evaluates an expression that names an object: a name, or attributes of one, or a subscripted generic (its origin). Other expressions give None.

```
pyscan.repr_bytes :: proc(s: string) -> string
```

repr_bytes is Python's repr of bytes.

```
pyscan.repr_str :: proc(s: string) -> string
```

repr_str is Python's repr of a str: single quotes unless the text has one and no double quote, and escapes for what is not printable.

```
pyscan.slots :: proc(c: ^Class) -> (out: [dynamic]Slot, ok:
bool)
```

slots is inspect's getslots: the __slots__ the class has (its own, or the nearest base's), as a list, tuple, dictionary, or single string of names. ok is false when there are none, or they are computed.

```
pyscan.split_lines :: proc(s: string) -> [dynamic]string
```

split_lines is str.splitlines for \n, \r\n, \r and the other line boundaries Python knows; a final line break does not start another line.

```
pyscan.str_value :: proc(m: ^Module, n: ts.Node) -> (string,
bool)
```

str_value is string_value for str constants only.

```
pyscan.string_value :: proc(m: ^Module, n: ts.Node) ->
(value: string, kind: String_Kind, ok: bool)
```

string_value evaluates a string or concatenated_string node as Python does: prefixes, escape sequences, and adjacent literals joined. ok is false for other nodes.

```
pyscan.text :: proc(m: ^Module, n: ts.Node) -> string
```

text is the source a node spans.

```
pyscan.try_unparse :: proc(m: ^Module, n: ts.Node, mode :=
Unparse_Mode.Sphinx) -> (string, bool)
```

try_unparse is unparse that reports expressions Sphinx's unparser refuses (comparisons, comprehensions, f-strings, conditional expressions...).

```
pyscan.unparse :: proc(m: ^Module, n: ts.Node, mode :=
Unparse_Mode.Sphinx) -> string
```

unparse writes an expression back as Sphinx's unparser does (Sphinx mode).

readers/commonmark

Package commonmark reads Markdown into a Guidedoc document without calling an allocator, as two readers with distinct ids: „commonmark“ (reader, read, read_inline) is pure CommonMark 0.31.2 and takes no settings; „myst“ (myst_reader, read_myst, read_myst_inline) is the MyST Markdown that Sphinx projects write (myst-parser 0.16.1): directives, roles, targets, comments, front matter, footnotes, GFM tables, and the optional syntax that Settings.enable_extensions turns on.

Block structure is parsed line by line into a skeleton in scratch; link reference definitions are collected over the whole document; then the skeleton is emitted in preorder, with inline content parsed per paragraph and heading. Directive content is parsed the same way when the directive asks for it (see extension.odin), so a parse works on line views of any source.

Types

```
commonmark.Directive :: struct
```

Directive is a directive the reader has split into its parts. Lines are views of source.

```
name: string
```

```
name_span: gd.Source_Span
```

span: `gd.Source_Span`

source: `gd.Source_Id`

arg: `[]Line`

the argument; empty when there is none.

options: `[]Option`

content: `[]Line`

sections: `bool`

the directive stands where sections are allowed.

classes: `gd.Text`

classes a handler leaves for the next element (Docutils' class directive without content); the reader gives them to the next block it emits.

`commonmark.Directive_Handler` *:: struct*

name: `string`

compared case-insensitively.

run: `Directive_Proc`

`commonmark.Directive_Proc` *:: #type proc(h: ^Host, d: ^Directive, user: rawptr) -> Directive_Result*

`Directive_Proc` runs a parsed directive; `user` is `Extension.user`. The directive and its lines are borrowed for the call.

`commonmark.Directive_Result` *:: enum u8*

Ran

Unknown

the handler does not know the name; the reader reports it.

Failed

the handler refused the directive and reported why.

```
commonmark.Directive_Shape :: struct
```

Directive_Shape tells the reader how a directive takes its first line: as an argument, or, for a directive without arguments, as the first line of content; and whether it takes options at all.

```
argument: bool
```

```
options: bool
```

it has options; without, an option block stays content.

```
commonmark.Extension :: struct
```

```
directives: []Directive_Handler
```

```
directive: Directive_Proc
```

directive is offered every directive the table does not list.

```
shape: proc(h: ^Host, name: string, user: rawptr) ->
(Directive_Shape, bool)
```

shape describes a directive by name; found is false for an unknown directive.

```
roles: []Role_Handler
```

```
role: Role_Proc
```

role is offered every role the table does not list.

```
table: proc(h: ^Host, id: gd.Node_Id, span:
gd.Source_Span, columns: int, user: rawptr) -> bool
```

table runs after the reader opens a Table node, before its rows, so a table directive around it can add its title and attributes; it returns true when it did, and the reader then adds no attributes of its own.

```
begin: proc(h: ^Host, user: rawptr)
```

before the document's blocks.

```
end: proc(h: ^Host, user: rawptr)
```

after them.

```
resolve: proc(h: ^Host, user: rawptr) -> gd.Status
```

resolve, when set, links references, targets, and footnotes instead of the reader's own resolution (resolve.odin); the Sphinx layer resolves as for reStructuredText.

```
user: rawptr
```

```
commonmark.Host :: struct
```

Host is the reader's document-wide state, shared by the parse of the document and the parses of nested content. Directive and role handlers receive it and treat it as opaque: they reach the read through context_of and the procedures below.

```
ctx: ^gd.Read_Context
```

```
b: ^gd.Builder
```

```
settings: Settings
```

```
ext: ^Extension
```

```
myst: bool
```

the MyST syntax is on: the „myst“ reader, not „commonmark“.

```
disabled: Rules
```

myst_disable_syntax.

```
syntax: Syntax_Extensions
```

myst_enable_extensions in force.

```
refs: []Ref
```

Link reference definitions, collected over the whole document.

```
nrefs: int
```

```
names: gd.Symbol_Table
```

```
labels: gd.Buffer
```

```
label_tmp: []u8
```

```
html_format: gd.Text
```

```
rel_images: bool
```

MyST include options in force: rewrite image paths, and link paths starting with `rel_docs`, of included sources to be relative to the main source.

```
rel_docs: string
```

```
using state: Myst_State
```

```
commonmark.Line :: gd.Line_View
```

Line is a view of one input line: its text without the line break, and the source offset of `text[o]`. Directive handlers pass nested content as lines.

```
commonmark.Meta :: struct
```

Meta is one HTML meta tag: key as MyST writes it („description lang=en“, „http-equiv=Content-Type“, „keywords“) and its content.

```
key: string
```

```
content: string
```

```
commonmark.Option :: struct
```

Option is one directive option: its name and value lines. A value written as a YAML scalar has its quoting and folding processed; its lines may then be copies in scratch, whose offset is where the value starts in the source.

```
name: string
```

```
value: []Line
```

```
span: gd.Source_Span
```

```
commonmark.Role :: struct
```

Role is one role, `{name}`content``. lines hold the whole construct, split at line breaks; content is the range of the content in the lines joined by „\n“.

```
name: string
```

```
lines: []Line
```

```
content: [2]int
```

```
span: gd.Source_Span
```

```
source: gd.Source_Id
```

```
commonmark.Role_Handler :: struct
```

```
name: string
```

compared case-insensitively.

```
run: Role_Proc
```

```
commonmark.Role_Proc :: #type proc(h: ^Host, r: ^Role, user: rawptr) -> bool
```

Role_Proc handles a role; it returns false for a role it does not know.

```
commonmark.Rule :: enum u8
```

Rule names a syntax element that `myst_disable_syntax` can turn off, by markdown-it's rule name.

```
Table
```

```
Code
```

```
Fence
```

```
Blockquote
```

```
Hr
```

```
List
```

```
Reference
```

Html_Block

Heading

Lheading

Emphasis

Backticks

Link

Image

Autolink

Html_Inline

Entity

Escape

Newline

Front_Matter

Myst_Target

Myst_Line_Comment

Myst_Block_Break

Myst_Role

Math_Block

Math_Inline

Footnote_Def**Footnote_Ref****Myst_Directive**

not a markdown-it rule: {name} fences (off with `commonmark_only`).

```
commonmark.Settings :: struct
```

Settings are the „myst“ reader’s settings: myst-parser 0.16.1’s `myst_*` configuration values, named without the prefix. They reach the reader through `gd.Read_Options.extension`, made with `gd.read_extension(&settings)`; an empty extension means `default_settings()`. The „commonmark“ reader (pure CommonMark) takes none. A caller that supplies Settings starts from `default_settings()`, because several defaults are not zero.

```
extension: ^Extension
```

Directive and role handlers (the Sphinx layer provides them); nil means none, and directives and roles are then reported as unknown.

```
commonmark_only: bool
```

`myst_commonmark_only`: CommonMark syntax only (no directives, roles, or other MyST syntax), but a document’s tree as for MyST: headings make sections.

```
enable_extensions: Syntax_Extensions
```

`myst_enable_extensions`: the optional syntax. Default `{.Dollarmath}`.

```
disable_syntax: []string
```

`myst_disable_syntax`: markdown-it rule names whose syntax is not parsed, e.g. „emphasis“, „table“, „html_block“ (see `syntax_rule`).

```
url_schemes: []string
```

`myst_url_schemes`: schemes of `[text](scheme:...)` links that are external; other destinations are cross-references. nil recognizes every scheme. Default `http, https, mailto, and ftp`.

```
linkify_fuzzy_links: bool
```

`myst_linkify_fuzzy_links`: linkify recognizes URLs without a scheme. Default `true`.

heading_anchors: int

myst_heading_anchors: headings up to this level get a GitHub-style slug anchor that `[](#slug)` and `[](file.md#slug)` reach. 0 means none.

heading_slug_func: string

myst_heading_slug_func is a Python callable and cannot be supported; a non-empty value is reported and the built-in slugs are used.

substitutions: []Substitution

myst_substitutions: global substitutions; front matter overrides them.

sub_delimiters: [2]u8

myst_sub_delimiters: the characters doubled around substitution references. Default `{, , }`, giving `{{ name }}`.

html_meta: []Meta

myst_html_meta: HTML meta tags for every document; front matter html_meta overrides entries with the same key.

footnote_transition: bool

myst_footnote_transition: a transition of class „footnotes“ precedes the footnotes at the end of the document. Default true.

dmath_allow_labels: bool

myst_dmath_allow_labels: `$$...$$ (label)`. Default true.

dmath_allow_space: bool

myst_dmath_allow_space: inline math may start or end with a space. Default true.

dmath_allow_digits: bool

myst_dmath_allow_digits: inline math may follow or precede a digit. Default true.

dmath_double_inline: bool

myst_dmath_double_inline: `$$...$$` inside a paragraph. Default false.

words_per_minute: int

myst_words_per_minute: for the wordcount-minutes substitution. Default 200.

docname: string

The document's name („usage/intro“) and configuration values, which substitutions reach as env.docname and env.config.<name>.

env_config: []Substitution

today: string

The {sub-ref} today: the project's formatted date; empty is Read_Options.today.

commonmark.**Substitution** :: struct

A substitution's value is Markdown, or a mapping written as nested YAML that dotted names reach („key.sub“).

name: string

value: string

commonmark.**Syntax_Extension** :: enum u8

Syntax_Extension names an entry of myst_enable_extensions.

Amsmath

Colon_Fence

Deflist

Dollarmath

Fieldlist

Html_Admonition

Html_Image

Linkify**Replacements****Smartquotes****Substitution****Tasklist**

```
commonmark.Syntax_Extensions :: bit_set[Syntax_Extension;
u16]
```

Procedures

```
commonmark.context_of :: proc(h: ^Host) -> ^gd.Read_Context
```

context_of returns the read context, for handlers that build nodes.

```
commonmark.default_settings :: proc() -> Settings
```

default_settings returns myst-parser 0.16.1's defaults. The value borrows only static data (the default URL schemes); fields a caller sets must outlive the read.

```
commonmark.include_paths :: proc(h: ^Host, images: bool,
docs: string) -> (bool, string)
```

include_paths sets MyST's include options :relative-images: and :relative-docs: for the content of the include directive being run; it returns the previous values.

```
commonmark.list_items :: proc(h: ^Host, lines: []Line,
source: gd.Source_Id) -> (items: [][]Line, starts: []int,
ok: bool)
```

list_items splits lines that hold one bullet list into the content lines of its items, and where each item starts in lines (for list-table). ok is false when the lines are anything but one bullet list. The results live in scratch.

```
commonmark.myst_reader :: proc() -> gd.Reader
```

myst_reader returns the „myst“ reader by value: MyST Markdown with ^Settings.

```
commonmark.parse_body :: proc(h: ^Host, lines: []Line,  
source: gd.Source_Id, sections := false, classes :=  
gd.Text{})
```

`parse_body` parses lines of a source as Markdown body content of the builder's open node. `sections` lets headings open sections, as at the top of a document; `classes`, when set, go to every top-level element.

```
commonmark.parse_inline :: proc(h: ^Host, lines: []Line,  
source: gd.Source_Id)
```

`parse_inline` parses lines of a source as Markdown inline content of the builder's open node.

```
commonmark.read :: proc(ctx: ^gd.Read_Context) -> gd.Status
```

`read` reads `ctx.source` as pure CommonMark 0.31.2 (`gd.Read_Proc`): headings, no sections. Any settings in the read options are refused with `Invalid_Input`. It borrows `ctx` for the call; its skeleton lives in scratch, released before it returns. Problems go to `ctx.reports`; the result is the builder's status (`.Capacity` when a table is full).

```
commonmark.read_inline :: proc(ctx: ^gd.Read_Context, span:  
gd.Source_Span) -> gd.Status
```

`read_inline` parses a span of `ctx.source` as CommonMark inline content of the builder's open node, for a translated message (`gd.Read_Inline_Proc`). Link reference definitions and footnote definitions of the surrounding document are not known to it.

```
commonmark.read_myst :: proc(ctx: ^gd.Read_Context) ->  
gd.Status
```

`read_myst` reads `ctx.source` as MyST Markdown (`gd.Read_Proc`), with the `^Settings` the read options carry (`gd.read_extension`), or `default_settings` when they carry none. Settings of another type are refused with `Invalid_Input`. Ownership and failures are read's; the settings are borrowed for the call.

```
commonmark.read_myst_inline :: proc(ctx: ^gd.Read_Context,  
span: gd.Source_Span) -> gd.Status
```

`read_myst_inline` is `read_inline` for MyST, with the settings of `ctx.options.extension` (roles included), as `read_myst` takes them.

```
commonmark.reader :: proc() -> gd.Reader
```

`reader` returns the „commonmark“ reader by value: pure CommonMark 0.31.2, no settings.

```
commonmark.syntax_extension_named :: proc(name: string) ->
(Syntax_Extension, bool)
```

syntax_extension_named finds a myst_enable_extensions entry by its name.

```
commonmark.syntax_rule :: proc(name: string) -> (Rule, bool)
```

syntax_rule finds a myst_disable_syntax entry by its markdown-it rule name.

Constants

```
commonmark.CONFORMANCE :: gd.Conformance.Conformant
```

```
commonmark.MYST_CONFORMANCE :: gd.Conformance.Partial
```

```
commonmark.MYST_VERSION :: "0.16.1"
```

MyST follows myst-parser 0.16.1, with the differences CONFORMANCE.md documents.

```
commonmark.VERSION :: "0.31.2"
```

readers/rst

Package rst reads reStructuredText as the Docutils markup specification defines it, implemented independently. It owns lines, block structure, and directives; inline markup and reference resolution live in the inline subpackage.

Types

```
rst.Arg_Rule :: enum u8
```

None

Optional

Required

```
rst.Content_Rule :: enum u8
```

None

Optional

Required

```
rst.Dir_Opt :: struct
```

```
spec: Opt_Spec
```

```
lines: []Line
```

the value: the rest of the marker line, then continuation lines.

```
span: gd.Source_Span
```

```
rst.Dir_Spec :: struct
```

```
name: string
```

```
kind: Dir_Kind
```

```
arg: Arg_Rule
```

```
final_ws: bool
```

```
content: Content_Rule
```

```
opts: Opt_Set
```

```
value: gd.Admonition_Kind
```

```
rst.Directive :: struct
```

```
spec: ^Dir_Spec
```

```
span: gd.Source_Span
```

```
name_span: gd.Source_Span
```

```
arg: []Line
```

argument lines, trimmed; empty when there is no argument.

```
opts: [MAX_OPTIONS]Dir_Opt
```

```
nopts: int
```


content: []Line

sections: bool

subst: bool

inside a substitution definition.

ext: ^Directive_Handler

a dialect's handler, or nil for a standard directive.

arg_block: []Line

the argument lines with their relative indentation.

subst_name: string

the name of the substitution definition it is in, as written.

rst.Directive_Handler :: struct

name: string

compared case-insensitively, as directive names are.

arg: Arg_Rule

final_ws: bool

the last argument may contain white space.

content: Content_Rule

options: []Opt_Spec

run: Directive_Proc

rst.Directive_Proc :: #type proc(p: ^Parser, d: ^Directive, user: rawptr)

Directive_Proc runs a parsed directive. user is Extension.user.

rst.Directive_Shape :: struct

Directive_Shape tells a host how a directive takes its parts.

arg: Arg_Rule

final_ws: bool

the last argument may contain white space.

content: Content_Rule

options: []Opt_Spec

rst.Extension :: struct

directives: []Directive_Handler

lookup: proc(name: string, user: rawptr) ->
^Directive_Handler

lookup, when set, finds handlers the table does not list, such as names that depend on reader state (a default domain). It returns nil for unknown names.

roles: []Role_Handler

role: Role_Proc

role, when set, is offered every role the table does not list.

begin: Hook_Proc

before the main source's blocks (reader state).

prologue: Hook_Proc

prologue runs after the main source's leading field lines, where Sphinx inserts rst_prolog: after a document's bibliographic fields, else before everything.

end: Hook_Proc

after them, before sections close (e.g. an epilogue).

substitution: proc(name: string, user: rawptr) -> (text:
string, ok: bool)

substitution, when set, supplies default substitutions: resolution offers it each reference whose name no definition in the document has (see

`rst_inline.Substitution_Hook`). It runs after parsing, with the extension's user.

```
user: rawptr
```

```
rst.Frame :: struct
```

```
src: gd.Source_Id
```

```
text: string
```

```
tab: int
```

```
rst.Hook_Proc :: #type proc(p: ^Parser, user: rawptr)
```

`Hook_Proc` runs at a fixed point of the read, with the reader's state.

```
rst.Host :: struct
```

Host procedures receive `Host.user`. Lines are views of the current source (`p.src`), as the block parser's are, so every node keeps exact spans.

```
body: proc(p: ^Parser, lines: []Line, sections: bool,  
each: gd.Text, user: rawptr)
```

`body` parses nested body content of the open node; `sections` allows headings to make sections, and `each`, when set, gives these classes to every top-level element (the class directive).

```
inline: proc(p: ^Parser, lines: []Line, user: rawptr)
```

`inline` parses inline content of the open node.

```
items: proc(p: ^Parser, lines: []Line, user: rawptr) ->  
(items: [][]Line, starts: []int, ok: bool)
```

`items` splits lines that hold one bullet list into its items' content, with where each item starts in lines (list-table, with the host's list syntax); `ok` is false when the lines are not one bullet list.

```
user: rawptr
```

```
rst.Host_Directive :: struct
```

`Host_Directive` is a directive the host has split into its parts.

name: string

name_span: gd.Source_Span

span: gd.Source_Span

arg: []Line

the argument lines; empty when there is none.

options: []Host_Option

content: []Line

sections: bool

the directive stands where sections are allowed.

rst.Host_Option :: struct

Host_Option is a directive option as the host wrote it: its name and value lines.

name: string

value: []Line

span: gd.Source_Span

rst.Hosted_Result :: enum u8

Ran

Unknown

no directive of that name; nothing was reported.

Failed

the arguments, options, or content were refused and reported.

rst.Line :: struct

Line is a view of one input line in columns: tabs are expanded to tab stops and trailing white space is stripped. A line that held a tab, form feed, or vertical

tab is a copy in scratch; raw then keeps the source line so columns map back to source bytes. Nested blocks use cut views of their parent's lines, so every node keeps exact spans.

text: string

raw: string

the source line of an expanded copy, else „.

offset: u32

source offset of text[o]; of raw[o] when raw is set.

col: i32

column of text[o] in the expanded line when raw is set.

rst.Opt_Spec :: struct

name: string

type: Opt_Type

choices: string

space-separated, for Choice.

rst.Opt_Type :: enum u8

Flag

Text

Text_Required

Int

Nonneg_Int

Pos_Int

Opt_Int

Length**Length_Percent****Figwidth****Percentage****Class****Name****Choice****Encoding****Char****Widths****Path****rst.Parser** *:: struct***ctx:** ^gd.Read_Context**b:** ^gd.Builder**inl:** rst_inline.Inline_State**src:** gd.Source_Id

the source the current lines come from.

text: string**tab:** int**depth:** int

stack: `gd.Stack_Guard`

bounds the machine stack of the recursion (enter).

styles: `[MAX_LEVELS]Style`

styles_used: `int`

sections: `[MAX_LEVELS]Section_Entry`

sections_used: `int`

section_base: `int`

sections open before titled content (`parse_titled`) began.

level_base: `int`

the level of the last of them: titled content's sections nest in it.

top_count: `int`

top-level elements since the current section began.

top_transition: `bool`

the last top-level element was a transition.

transition_span: `gd.Source_Span`

pending: `gd.Text`

classes from a class directive, for the next element.

pending_span: `gd.Source_Span`

has_pending: `bool`

in_sidebar: `int`

ext: `^Extension`

a dialect's directives and roles; see `extension.odin`.

host: `^Host`

another markup that uses the directives; see `host.odin`.

hosted: `bool`

the running directive was written in the host markup.

table_extra: `^Table_Extra`

a table directive's title and options for the host.

`rst.Role_Handler` `:: struct`

name: `string`

compared case-insensitively.

run: `Role_Proc`

`rst.Role_Proc` `:: #type proc(p: ^Parser, call: ^rst_inline.Role_Call, user: rawptr) -> bool`

`Role_Proc` handles interpreted text; it returns false for a role it does not know.

`rst.Settings` `:: struct`

Settings are the reader's dialect settings. They reach the reader through `gd.Read_Options.extension`, made with `gd.read_extension(&settings)`; settings of another type are refused. A dialect's own configuration embeds `Settings` and passes a pointer to that embedded field when it runs this reader. An empty extension means defaults (`default_settings`); a caller that supplies `Settings` starts from `default_settings`, because the zero value turns bibliographic fields off.

extension: `^Extension`

Directive and role handlers consulted before the standard ones.

host: `^Host`

Another markup (MyST Markdown) that reads the main source and nested directive content with these directives and roles; see `host.odin`.

pep_references: `bool`

Implicit „PEP nnn“ and „RFC nnn“ references in running text become links.

rfc_references: bool

pep_base_url: string

„“ means <https://peps.python.org/>

rfc_base_url: string

„“ means <https://datatracker.ietf.org/doc/html/>

trim_footnote_reference_space: bool

White space before a footnote reference is removed.

smart_quotes: Smart_Quotes

Typographic quotation marks, apostrophes, dashes, and ellipses in text.

smart_quotes_locales: string

Quotation marks per language, overriding the built-in ones, as „tag:“”“,tag2:«»<>“: primary open and close, then secondary open and close.

language: string

BCP 47 tag of the document language: bibliographic field names, generated titles, and quotation marks. „“ means „en“.

docinfo: bool

A field list first in the document becomes bibliographic data (docinfo).

sectsubtitle: bool

A lone subsection title becomes the section’s subtitle.

tab_width: int

Tab stops; zero means `gd.Read_Options.tab_width`, which zero makes 8.

character_level_inline_markup: bool

Inline markup is recognized inside words (Docutils’ `character_level_inline_markup`).

`rst.Smart_Quotes :: rst_inline.Smart_Quotes`

```
rst.Table_Extra :: struct
```

Table_Extra carries what table directives add to a table: a title and attributes.

```
title: []Line
```

```
classes: gd.Text
```

```
name: gd.Text
```

```
align: string
```

```
width: string
```

```
widths: []int
```

from :widths:: nil keeps the table's own widths.

```
auto_widths: bool
```

:widths: auto leaves widths to the renderer.

```
width_class: string
```

„colwidths-auto“ or „colwidths-given“ from :widths:.

```
found: bool
```

set by the table parser when it emits a table.

Procedures

```
rst.add_common :: proc(p: ^Parser, id: gd.Node_Id, d:  
^Directive, class_opt := "class")
```

add_common adds the :class: and :name: options as attributes. Directive nodes keep their Name attribute for the directive name, so :name: becomes Custom „name“.

```
rst.blank :: proc(l: Line) -> bool
```

blank tells whether l has no text (white space is stripped when lines are split).

```
rst.bullet_width :: proc(t: string) -> int
```

bullet_width returns the byte length of a bullet that starts t, or 0.

```
rst.class_directive :: proc(p: ^Parser, d: ^Directive)
```

class_directive runs the class directive: its classes go to the content's elements, or, without content, to the next element; invalid names are reported.

```
rst.close :: proc(p: ^Parser, id: gd.Node_Id)
```

close ends the element open returned id for.

```
rst.code_text :: proc(p: ^Parser, lines: []Line) -> gd.Text
```

code_text writes lines to the text pool, each ending in „\n“.

```
rst.custom :: proc(p: ^Parser, id: gd.Node_Id, name, value: string)
```

custom adds a Custom attribute name=value to node id; both strings are copied to the text pool. A full pool poisons the builder, as every builder write does.

```
rst.cut :: proc(l: Line, k: int) -> Line
```

cut drops the first k columns.

```
rst.dedent :: proc(lines: []Line)
```

dedent strips the least indentation of the non-blank lines, in place.

```
rst.default_settings :: proc() -> Settings
```

default_settings returns Docutils' defaults: bibliographic fields on, everything else off or empty. The value owns nothing.

```
rst.directive_node :: proc(p: ^Parser, d: ^Directive, name: string) -> gd.Node_Id
```

directive_node opens a generic Directive node named after the directive.

```
rst.directive_shape :: proc(p: ^Parser, name: string) -> (shape: Directive_Shape, found: bool)
```

directive_shape looks a directive up as the reader would, a dialect's handlers first.

```
rst.embed_begin :: proc(p: ^Parser, ctx: ^gd.Read_Context)
```

embed_begin prepares p for a host that reads the main source itself: the settings of ctx.options.extension apply as for read, and the dialect's begin hook runs.

```
rst.embed_end :: proc(p: ^Parser) -> gd.Status
```

embed_end runs the dialect's end hook and resolves the document as read does.

```
rst.enter_source :: proc(p: ^Parser, id: gd.Source_Id, tab: int) -> Frame
```

enter_source makes lines of another source current, for spans and inline parsing.

```
rst.find_role :: proc(p: ^Parser, name: string) -> int
```

find_role returns the index of the role the document defined with the role directive under name, in p.inl.roles, or -1. The search spends work budget.

```
rst.get_opt :: proc(d: ^Directive, name: string) -> ^Dir_Opt
```

get_opt returns the option called name that the directive was given, or nil. The result points into d and lives as long as it.

```
rst.has_option :: proc(d: ^Directive, name: string) -> bool
```

has_option reports whether a directive was given an option, flags included.

```
rst.head :: proc(l: Line, n: int) -> Line
```

head keeps the first n columns, without trailing spaces.

```
rst.host_lines :: proc(p: ^Parser, views: []rst_inline.Line) -> ([]Line, bool)
```

host_lines makes lines of views of source text (a host's lines): tabs are expanded to the parser's tab stops, as split_lines does.

```
rst.host_views :: proc(p: ^Parser, lines: []Line) -> ([]rst_inline.Line, bool)
```

host_views gives the host the source text of lines, tabs unexpanded (inline_view).

```
rst.indent_of :: proc(s: string) -> int
```

indent_of counts the spaces s starts with.

```
rst.inline :: proc(p: ^Parser, lines: []Line)
```

inline parses lines as inline content of the currently open node.

```
rst.inline_node :: proc(p: ^Parser, kind: gd.Node_Kind,
lines: []Line)
```

`inline_node` adds a node of kind holding lines parsed as inline content (`inline`); nothing for no lines.

```
rst.is_indented :: proc(l: Line) -> bool
```

`is_indented` tells whether `l` starts with a space.

```
rst.join_lines :: proc(p: ^Parser, lines: []Line, sep:
string) -> string
```

`join_lines` joins lines into a scratch copy, or returns the single line's text.

```
rst.leave_source :: proc(p: ^Parser, f: Frame)
```

`leave_source` makes the source that `enter_source` returned `f` for current again.

```
rst.line_span :: proc(p: ^Parser, l: Line) -> gd.Source_Span
```

`line_span` is the source span of one line (`span_of`).

```
rst.lines_span :: proc(p: ^Parser, lines: []Line) ->
gd.Source_Span
```

`lines_span` is the source span of lines without trailing blank lines; empty lines give an empty span at the start of the source.

```
rst.mark :: proc(p: ^Parser) -> gd.Scratch_Mark
```

`mark` records the scratch position; `release` returns scratch to it. Pair them with `defer` around work that takes scratch.

```
rst.open :: proc(p: ^Parser, kind: gd.Node_Kind, span:
gd.Source_Span) -> gd.Node_Id
```

`open` begins an element and gives it the classes of a preceding class directive.

```
rst.opt_value :: proc(p: ^Parser, d: ^Directive, name:
string) -> (string, bool)
```

`opt_value` returns an option's value lines joined by spaces and trimmed; `ok` is false when the option was not given. The text is a view of the source or a scratch copy, valid until the caller's scratch mark is released.

```
rst.option_lines :: proc(d: ^Directive, name: string) ->
([]Line, bool)
```

`option_lines` returns the value lines of a directive option, or `nil`.

```
rst.parse_blocks :: proc(p: ^Parser, lines: []Line,
sections := false, each := gd.Text{})
```

`parse_blocks` parses body elements. `sections` allows titles and transitions; each gives classes to every element parsed at this level (class directive content).

```
rst.parse_body :: proc(p: ^Parser, lines: []Line, sections :=
false, each := gd.Text{})
```

`parse_body` parses nested body content of the open node in the markup of the running directive (see `Host`). Outside hosted directives it is `parse_blocks`.

```
rst.parse_source :: proc(p: ^Parser, id: gd.Source_Id,
sections: bool)
```

`parse_source` parses a whole registered source (`gd.add_source`) as body content at the current position, as if its lines stood there. `sections` allows titles.

```
rst.parse_titled :: proc(p: ^Parser, lines: []Line)
```

`parse_titled` parses content in which titles begin sections, in a title context of its own (Sphinx's nested parse with titles): adornments take levels afresh, the first nesting in the innermost open section, and the sections close when the content ends. The surrounding adornments are kept for what follows.

```
rst.path_of :: proc(p: ^Parser, lines: []Line) -> string
```

`path_of` joins path lines without white space, as the specification treats paths.

```
rst.place_titled :: proc(p: ^Parser, lines: []Line)
```

`place_titled` prepares for titled content (`parse_titled`) as Sphinx's only directive does: when the content's first title has an adornment the document already uses, the content stands where a title of that level would, so deeper sections close first.

```
rst.pool_classes :: proc(p: ^Parser, s: string) -> (gd.Text,
bool)
```

`pool_classes` writes white-space separated class names as identifiers, one space apart. It fails when a name has no letters.

```
rst.pool_lines :: proc(p: ^Parser, lines: []Line, sep:
string) -> gd.Text
```

`pool_lines` writes the lines joined by `sep` into the text pool and returns the text, which lives as long as the document; a full pool poisons the builder.

```
rst.pool_lower :: proc(p: ^Parser, s: string) -> string
```

pool_lower writes s in lower case to the text pool and returns the pooled string.

```
rst.push_lines :: proc(p: ^Parser, lines: []Line, sep: string)
```

push_lines writes the lines joined by sep into the text pool.

```
rst.read :: proc(ctx: ^gd.Read_Context) -> gd.Status
```

read reads ctx.source as reStructuredText into ctx.b (gd.Read_Proc). Settings of another type than ^Settings are refused with Invalid_Input before anything is read. It borrows ctx for the call and keeps nothing; its tables live in scratch, released before it returns. Problems go to ctx.reports; the result is the builder's status (.Capacity when a table is full, .Limit past the nesting or stack limits), or that of reference resolution.

```
rst.read_inline :: proc(ctx: ^gd.Read_Context, span: gd.Source_Span) -> gd.Status
```

read_inline parses a span of ctx.source as inline content of the builder's open node, with the settings of ctx.options.extension, as Sphinx parses a translated message (gd.Read_Inline_Proc). Each line's leading white space is dropped, as the lines of a paragraph lose their indentation. References are left for the caller to resolve.

```
rst.reader :: proc() -> gd.Reader
```

reader returns the „rst“ reader descriptor, for a gd.Registry. It is a value with no state: registering it twice or copying it is harmless.

```
rst.release :: proc(p: ^Parser, m: gd.Scratch_Mark)
```

release frees the scratch taken since mark m; views into it become invalid.

```
rst.report :: proc(p: ^Parser, m: gd.Message, span: gd.Source_Span, a := gd.Diagnostic_Arg{}, b := gd.Diagnostic_Arg{})
```

report adds diagnostic m at span, with its arguments, to the read's reports; a full reports region counts it as suppressed (gd.report) rather than failing the read.

```
rst.run_hosted :: proc(p: ^Parser, h: Host_Directive) ->
Hosted_Result
```

run_hosted checks and runs a directive written in the host markup. Options are checked as in reStructuredText; a host with other rules checks them first (directive_shape, option_problem) and passes only the ones it keeps.

```
rst.span_of :: proc(p: ^Parser, first, last: Line) ->
gd.Source_Span
```

span_of is the source span from the start of first to the end of last, in the current source, clamped to its text.

```
rst.standard_role :: proc(name: string) ->
(rst_inline.Role_Base, bool)
```

standard_role finds a standard role or alias by name, compared case-insensitively; ok is false (base.Custom) for another name.

```
rst.table_decorate :: proc(p: ^Parser, id: gd.Node_Id,
span: gd.Source_Span, cols: int, widths: []int, extra:
^Table_Extra)
```

table_decorate gives an open Table, before its rows, its widths and a table directive's attributes and title. A host calls it for the table it emits inside a table directive (Parser.table_extra).

```
rst.take :: proc(p: ^Parser, $T: typeid, n: int) -> ([]T,
bool)
```

take returns n zeroed items of T from scratch, valid until the enclosing mark is released. When scratch is short it records the capacity need on the builder (poisoning it) and returns false.

```
rst.trim_blank_end :: proc(lines: []Line) -> []Line
```

trim_blank_end returns lines without its trailing blank lines (a subslice).

Constants

```
rst.CONFORMANCE :: gd.Conformance.Partial
```

```
rst.DIRECTIVE_UNKNOWN
```

DIRECTIVE_UNKNOWN is what the reader reports for a directive no handler knows; a handler that finds it cannot serve a directive it was given reports it too.

```
rst.VERSION :: "0.1.0"
```


readers/rst/inline

Package `rst_inline` parses reStructuredText inline markup and resolves references. The block reader in `lib/readers/rst` owns lines, directives, and document structure; it calls `parse_inline` for every inline context and resolve once parsing ends.

Types

```
inline.Inline_State :: struct
```

`Inline_State` is shared, long-lived reader state for inline parsing.

```
ctx: ^gd.Read_Context
```

```
source: gd.Source_Id
```

the source the current lines come from.

```
roles: []Role
```

custom roles; storage owned by the block reader.

```
roles_used: int
```

```
default_role: string
```

„“ means title-reference.

```
hook: Role_Hook
```

a dialect's roles, consulted first; see `extension.odin`.

```
options: Options
```

settings of the block reader; see `options.odin`.

```
inline.Line :: gd.Line_View
```

`Line` is a view of one line of text. `offset` is the source byte offset of `text[o]`; for a line copied during tab expansion it is the offset of the original line start.

```
inline.Options :: struct
```

`Options` are the settings of the block reader (`rst.Settings`) that inline parsing and resolution need.

```
pep_references: bool
```

rfc_references: bool

pep_base_url: string

rfc_base_url: string

trim_footnote_reference_space: bool

smart_quotes: Smart_Quotes

smart_quotes_locales: string

language: string

docinfo: bool

sectsubtitle: bool

character_level: bool

tab_width: int

tab stops of the main source; 0 means 8.

default_substitution: Substitution_Hook

inline.Role :: struct

Role is a role defined by the role directive, or a standard role.

name: string

normalized (lowercase) role name.

base: Role_Base

classes: string

space-separated, from :class:.

format: string

raw roles: the output format, e.g. „html“.

language: string

code-derived roles.

`inline.Role_Base :: enum u8`

Emphasis

Strong

Literal

Code

Math

Subscript

Superscript

Title_Reference

Pep_Reference

Rfc_Reference

Abbreviation

Acronym

Raw

Custom

a Role node carrying the role name and classes.

`inline.Role_Call :: struct`

Role_Call describes one interpreted text for an extension’s role handler. The strings live in scratch and are valid only during the call.

state: ^Inline_State

b: `^gd.Builder`

name: `string`

the role name as written, or the default role's name.

marked: `string`

the content with every escaping backslash as NUL; breaks as „\n“.

text: `string`

the content with escapes processed; line breaks become spaces.

span: `gd.Source_Span`

the whole interpreted text, role included.

content: `gd.Source_Span`

the content between the backquotes.

inline.Role_Hook *:: struct*

Role_Hook lets a dialect handle interpreted text before the document's and the standard roles are consulted. The procedure returns false for a role it does not know, and the standard lookup continues.

procedure: `proc(user: rawptr, call: ^Role_Call) -> bool`

user: `rawptr`

inline.Smart_Quotes *:: enum u8*

Smart_Quotes selects typographic quotation marks, apostrophes, dashes, and ellipses.

Off

On

the language's primary quotation marks outside, secondary inside.

Alt

the language's alternative marks, where it has them.

```
inline.Substitution_Hook :: struct
```

Substitution_Hook supplies substitutions a dialect defines by default, such as Sphinx’s `|version|`, `|release|`, and `|today|`. Resolution offers it every reference whose name no definition in the document has exactly (the case-insensitive match comes after it); a procedure returning true replaces the reference with that text.

```
procedure: proc(user: rawptr, name: string) -> (text:
string, ok: bool)
```

```
user: rawptr
```

Procedures

```
inline.apply_host_role :: proc(s: ^Inline_State, name:
string, lines: []Line, q, j: int) -> gd.Status
```

`apply_host_role` runs the role called `name` on interpreted text written in another markup, such as MyST’s `{name}`content``, as the dialect’s hook and the standard roles would for `reStructuredText`. `lines` hold the whole construct; the content is the joined text’s range `[q, j)` (lines joined by „\n“) and is taken literally: a backslash is an ordinary character. An unknown role is reported, and the construct stays as text.

```
inline.footnote_symbol :: proc(n: int, out: ^gd.Buffer)
```

`footnote_symbol` writes the label of symbol footnote `n` (1-based) into `out`; nothing for `n < 1`. A label that does not fit sets `out`’s overflow, as every `Buffer` write does.

```
inline.parse_inline :: proc(s: ^Inline_State, lines: []Line)
-> gd.Status
```

`parse_inline` emits inline nodes for the lines as children of the builder’s currently open node. Markup may span lines; a line break outside inline literals and roles becomes a `Soft_Break` node, as in `CommonMark`. Markup that cannot be completed is kept as text with a warning; unknown or misused roles are errors. It borrows `s` and `lines` for the call; its working memory is scratch it releases. Problems go to the reports; the result is the builder’s status, which a full table or spent work budget sets.

```
inline.python_space :: proc(r: rune) -> bool
```

`python_space` reports whether `r` is white space as Python’s `str.isspace` and the `\s` of Python’s regular expressions define it, for readers that follow Python patterns.

```
inline.resolve :: proc(ctx: ^gd.Read_Context, options :=
Options{docinfo = true}) -> gd.Status
```

resolve links references to targets, numbers footnotes, checks substitutions, and promotes the document title when ctx.options.promote_title is set. It edits the builder's nodes in place, with scratch it releases; problems go to ctx.reports; the result is the builder's status.

```
inline.unescape :: proc(out: ^gd.Buffer, marked: string)
```

unescape writes marked text (escapes as NUL, see Role_Call.marked) with escapes processed: an escaped space or line break disappears, any other escaped character stays, and an unescaped line break becomes a space.

readers/sphinx

Package sphinx reads reStructuredText with the Sphinx layer: Sphinx's directives, roles, and domains (GDS „Guidedog: everything Sphinx does, the Odin way“), implemented independently on the base reader's extension interface. It produces the shapes of lib/core/AST.md, „Sphinx layer“; cross-document work (toctrees, cross-references, numbering) is left to the project host. The same handlers serve Markdown (MyST) read by the commonmark reader: see markdown.odin.

Types

```
sphinx.Autodoc_Message :: struct
```

Autodoc_Message is a problem the host found, reported at the directive.

```
severity: gd.Severity
```

```
code: string
```

```
title: string
```

```
message: string
```

```
hint: string
```

```
sphinx.Autodoc_Option :: struct
```

```
name: string
```

```
value: string
```

„“ for a flag.

```
sphinx.Autodoc_Provider :: struct
```

Autodoc_Provider belongs to the caller's trust boundary and may allocate.

```
procedure: proc(user: rawptr, request: ^Autodoc_Request) -
> Autodoc_Result
```

```
user: rawptr
```

```
sphinx.Autodoc_Request :: struct
```

Autodoc_Request is one autodoc directive and the context it needs: the current py:module and py:class (ref_context) and the document.

```
directive: string
```

„autoclass“

```
argument: string
```

```
options: []Autodoc_Option
```

```
content: string
```

the directive's content, lines joined with „\n“.

```
module: string
```

```
class: string
```

```
docname: string
```

```
sphinx.Autodoc_Result :: struct
```

Autodoc_Result borrows host memory valid for the whole conversion. name names the generated text as a source (for diagnostics), such as „<autodoc flask.Flask>“.

```
name: string
```

```
text: string
```

```
messages: []Autodoc_Message
```

```
sphinx.Config :: struct
```

Config holds the `conf.toml` settings that reading needs, with Sphinx's names. It reaches the reader through `gd.Read_Options.extension`. Start from `default_config`: several defaults are true. Settings that the base reader owns (smart quotes, PEP and RFC base URLs, trimmed footnote reference space, language) live in settings.

```
using settings: rst.Settings
```

```
docname: string
```

the document's name, e.g. „usage/intro“.

```
default_role: string
```

„“ means Docutils' title-reference.

```
primary_domain: string
```

„py“; „“ means none.

```
highlight_language: string
```

„default“.

```
extlinks: []Extlink
```

```
rst_prolog: string
```

parsed before every document.

```
rst_epilog: string
```

parsed after every document.

```
numfig: bool
```

```
math_number_all: bool
```

```
todo_include_todos: bool
```

```
show_authors: bool
```


add_function_parentheses: bool

true.

add_module_names: bool

true.

toc_object_entries: bool

true: objects have table of contents entries.

toc_object_entries_show_parents: Toc_Parents

manpages_url: string

„{page}“, „{section}“, „{path}“ substituted.

option_emphasise_placeholders: bool

trim_doctest_flags: bool

true: doctest flags and <BLANKLINE> are hidden.

version: string

The default substitutions |version|, |release|, and |today|, for documents that do not define them: the short version, the full release, and today’s date already formatted (Sphinx’s today, or today_fmt applied).

release: string

today: string

intersphinx: bool

sphinx.ext.intersphinx: the :external: roles are read when it is on, and an external role naming intersphinx_resolve_self is an ordinary reference.

intersphinx_resolve_self: string

labels: ^gd.Labels

The group names of info fields („Parameters“, „Returns“) in the document’s language, as a host translates its labels; nil for English.

object_types: []Object_Type

Directives and roles the project declares (see `object_types.odin`), and other names for directives.

directive_aliases: []Directive_Alias

autodoc: Autodoc_Provider

`sphinx.ext.autodoc`: the host that generates what autodoc directives stand for; nil when the extension is off. See `autodoc.odin`.

odin_autodoc: Autodoc_Provider

The `odin` domain's generating directives (`odin:autopackage`, ...): the host that reads the `Odin` source; nil leaves them unknown.

sphinx.Directive_Alias :: struct

name: string

„django-admin-option“ names „option“; a target may name

target: string

„django-admin-option“ names „option“; a target may name

sphinx.Extlink :: struct

`Extlink` is one `sphinx.ext.extlinks` entry: `:name:part` links to url with %s replaced by part; caption, when set, is the link text with %s replaced likewise.

name: string

url: string

caption: string

sphinx.Markdown :: struct

`Markdown` serves the `commonmark` reader with this layer's directives and roles, the same handlers that serve `reStructuredText`: the reader parses `MyST Markdown` and hands each directive and role here (`commonmark.Extension`); they run on an embedded `reStructuredText` parser whose host is the `Markdown` reader (`rst.Host`), so their nested content is parsed as `Markdown` again. `eval-rst` parses its content as `reStructuredText`. The document is resolved as

reStructuredText is (references, footnotes, targets, bibliographic fields, smart quotes).

Use: `markdown_settings(&m, config, myst)` gives the reader settings to pass as `gd.Read_Options.extension` to the „commonmark“ reader; `m` must outlive the read.

config: Config

settings: cm.Settings

ext: cm.Extension

state: State

parser: rst.Parser

host: rst.Host

reader: ^cm.Host

sphinx. Object_Type :: struct

directive: string

„setting“

role: string

„setting“; „“ for none.

index: string

Sphinx’s `indextemplate`, „pair: %s; setting“; „“ for none.

target: bool

`add_crossref_type`: a target and an index entry, no description.

first_word: bool

the object’s name is the signature up to its first space.

display: string

how the signature is shown, „%s“ for it; „“ shows it as written.

program: bool

the name becomes the program options that follow belong to.

sphinx.Toc_Parents :: enum u8

Toc_Parents is toc_object_entries_show_parents: how much of an object's hierarchy its table of contents entry shows.

Domain

as the domain names it: Python's Class.method, C++'s enclosing objects.

Hide

the object's own name.

All

every part: module.Class.method, ns::Class::f.

Procedures

sphinx.default_config :: proc() -> Config

default_config returns Sphinx's defaults, with the base reader's default_settings and smart quotes on. The value owns nothing; fields a caller sets must outlive the read.

sphinx.markdown_settings :: proc(m: ^Markdown, config: Config, myst: cm.Settings) -> ^cm.Settings

markdown_settings prepares m for one read of a Markdown document with the Sphinx configuration config and the MyST settings myst, and returns the reader settings. It copies both into m; the result points into m, so m must outlive the read and serves one read at a time. It cannot fail.

sphinx.read :: proc(ctx: ^gd.Read_Context) -> gd.Status

read reads reStructuredText with the Sphinx layer. ctx.options.extension is a ^Config (gd.read_extension), or empty for default_config; another type is refused with Invalid_Input. The read copies the Config and keeps nothing of it afterwards; its tables live in scratch, released before it returns. Otherwise it fails as rst.read.

sphinx.read_inline :: proc(ctx: ^gd.Read_Context, span: gd.Source_Span) -> gd.Status

read_inline parses a span of ctx.source as reStructuredText inline content with Sphinx's roles, for a translated message (gd.Read_Inline_Proc). rst_prolog

and `rst_epilog` do not apply to a message. Settings, ownership, and failures are read's.

```
sphinx.reader :: proc() -> gd.Reader
```

`reader` returns the „sphinx“ reader descriptor, for a `gd.Registry`. It is a value with no state: registering it twice or copying it is harmless.

Constants

```
sphinx.CONFORMANCE :: gd.Conformance.Partial
```

```
sphinx.MAX_OBJECT_TYPES :: 64
```

```
sphinx.VERSION :: "0.1.0"
```

render/html

Package `html` renders a Guidedoc document as HTML without calling an allocator. The default output is semantic HTML with anchors, notes, and tables; the reference profile reproduces the CommonMark reference renderer byte for byte for conformance tests. Raw content and unsafe URLs are governed by the conversion policy.

Procedures

```
html.render :: proc(ctx: ^gd.Render_Context) -> gd.Status
```

`render` writes `ctx.view` as HTML through `ctx.out`: a whole page when `ctx.options.standalone`, else a fragment, and the CommonMark reference renderer's bytes when `ctx.options.reference_profile`. It borrows the context for the call and keeps nothing; its scratch is released before it returns. Problems go to `ctx.reports`; the result is `.Ok`, the status of the first error (a raw block or URL the policy refuses, an unresolved reference, nesting past the limits), or `.Capacity` when scratch runs out.

```
html.renderer :: proc() -> gd.Renderer
```

`renderer` returns the „html“ renderer descriptor, for a `gd.Registry`. It is a value with no state: registering it twice or copying it is harmless.

Constants

```
html.CONFORMANCE :: gd.Conformance.Partial
```

```
html.VERSION :: "0.1.0"
```

render/text

Package `text_render` renders a Guidedoc document as plain text without calling an allocator, following the conventions of Sphinx's text builder: paragraphs wrapped at 70 columns, titles underlined with `= - ~` and the other section characters, `„`, `*`, and `„1. „` list markers with hanging indents, definitions and literal blocks indented by three spaces, grid tables drawn with `+--+` borders, and `„Note:“` admonitions.

Inline content is laid out twice, once to measure and once into scratch, and then wrapped; table cells are laid out into scratch at trial widths before the table is drawn. Output goes only through the emitter, so the engine's measure and write runs produce identical bytes.

Procedures

```
text.render :: proc(ctx: ^gd.Render_Context) -> gd.Status
```

`render` writes `ctx.view` as plain text through `ctx.out`. It borrows the context for the call and keeps nothing; its scratch is released before it returns. Problems go to `ctx.reports`; the result is `.Ok`, the status of the first error (raw content the policy refuses, an unresolved reference, nesting past the limits), or `.Capacity` when scratch cannot hold the indentation frames or a laid-out paragraph.

```
text.renderer :: proc() -> gd.Renderer
```

`renderer` returns the `„text“` renderer descriptor, for a `gd.Registry`. It is a value with no state: registering it twice or copying it is harmless.

Constants

```
text.CONFORMANCE :: gd.Conformance.Partial
```

```
text.VERSION :: "0.1.0"
```

render/typst

Package `typst_render` encodes a validated Guidedoc document as one Typst source file.

The output is a fixed, trusted preamble of `gd-` helper definitions followed by the body. Source text never becomes executable Typst: markup text escapes every ASCII punctuation character, and code, URLs, labels, and paths are string literals. Working memory comes only from the render context's scratch; output goes only through the emitter, so the Measure and Write runs produce identical bytes.

Procedures

```
typst.emit_preamble :: proc(e: ^gd.Emitter)
```

emit_preamble writes the helper definitions every body relies on. A host composing a book from body-only chapters writes it once, before the chapters. The text is a constant: it cannot fail, and the emitter counts what does not fit.

```
typst.render :: proc(ctx: ^gd.Render_Context) -> gd.Status
```

render writes ctx.view as Typst source through ctx.out: the preamble, page settings, and body when ctx.options.standalone, else the body alone (see emit_preamble). It borrows the context for the call and keeps nothing but scratch taken from ctx, which the caller's scratch mark releases. Problems go to ctx.reports; the result is .Ok, the status of the first error (raw content the policy refuses, nesting past the limits), or .Capacity when scratch cannot hold the per-node marks.

```
typst.renderer :: proc() -> gd.Renderer
```

renderer returns the „typst“ renderer descriptor, for a gd.Registry. It is a value with no state: registering it twice or copying it is harmless.

Constants

```
typst.CONFORMANCE :: gd.Conformance.Partial
```

```
typst.VERSION :: "0.1.1"
```

treesitter

Package treesitter is a thin binding of the tree-sitter C library and its Python grammar: parsers, trees, nodes, and cursors, and nothing more. It imports only Odin's own packages, so any Odin program can use it; Guidedog's autodoc reads Python source through it.

Types

```
treesitter.Cursor :: struct
```

Cursor is TSTreeCursor; cursor_delete frees it.

```
tree: rawptr
```

```
id: rawptr
```

```
ctx: [3]u32
```

```
tree sitter.Field_Id :: u16
```

```
tree sitter.Iterator :: struct
```

Iterator visits a node's children in order, named or all, for for child in

```
node: Node
```

```
index: int
```

```
count: int
```

```
named: bool
```

```
tree sitter.Language :: struct
```

```
tree sitter.Node :: struct
```

Node is TSNODE, a value that is valid while its tree lives.

```
ctx: [4]u32
```

```
id: rawptr
```

```
tree: ^Tree
```

```
tree sitter.Parser :: struct
```

Opaque handles.

```
tree sitter.Point :: struct
```

```
row: u32
```

```
column: u32
```

in bytes

```
tree sitter.Symbol :: u16
```

```
tree sitter.Tree :: struct
```


Procedures

```
tree-sitter.abi_version :: proc(l: ^Language) -> int
```

abi_version is the grammar's ABI, which the runtime must support.

```
tree-sitter.child :: proc(n: Node, i: int) -> Node
```

child is the node's child i of child_count, or a null node.

```
tree-sitter.child_count :: proc(n: Node) -> int
```

child_count counts the node's children, named and anonymous.

```
tree-sitter.children :: proc(n: Node, named := true) ->
Iterator
```

children iterates n's children, named ones only unless named is false, with next_child.

```
tree-sitter.cursor_delete :: proc(c: ^Cursor)
```

cursor_delete frees what cursor_new allocated.

```
tree-sitter.cursor_field_name :: proc(c: ^Cursor) -> string
```

cursor_field_name names the field the cursor's node fills in its parent, or „“.

```
tree-sitter.cursor_first_child :: proc(c: ^Cursor) -> bool
```

cursor_first_child moves to the first child; false, and no move, when there is none.

```
tree-sitter.cursor_new :: proc(n: Node) -> Cursor
```

cursor_new starts a cursor at n, for walks that allocate nothing per step. tree-sitter allocates the cursor's stack; the caller frees it with cursor_delete.

```
tree-sitter.cursor_next_sibling :: proc(c: ^Cursor) -> bool
```

cursor_next_sibling moves to the next sibling; false, and no move, when there is none.

```
tree-sitter.cursor_node :: proc(c: ^Cursor) -> Node
```

cursor_node is the node the cursor is at.

```
treesitter.cursor_parent :: proc(c: ^Cursor) -> bool
```

`cursor_parent` moves to the parent; false, and no move, at the node the cursor started at.

```
treesitter.deeper_than :: proc(n: Node, limit: int) -> bool
```

`deeper_than` reports whether the tree below `n` nests more than `limit` levels (`n`'s children are level 1). Parsing needs no recursion however deep the source nests, but recursive walks over the tree do: a program checks first, and refuses trees deeper than its walks can hold. It walks with a cursor, so it needs no recursion itself.

```
treesitter.end_byte :: proc(n: Node) -> int
```

`end_byte` is the byte offset just past the node in the parsed text.

```
treesitter.end_point :: proc(n: Node) -> Point
```

`end_point` is the 0-based row and byte column where the node ends; see `start_point`.

```
treesitter.equal :: proc(a, b: Node) -> bool
```

`equal` reports whether `a` and `b` are the same node of the same tree.

```
treesitter.field :: proc(n: Node, name: string) -> Node
```

`field` is the child the grammar names, such as „name“ or „body“; a null node when absent.

```
treesitter.field_name_for_child :: proc(n: Node, i: int) -> string
```

`field_name_for_child` names the field child `i` fills, or „“.

```
treesitter.has_error :: proc(n: Node) -> bool
```

`has_error` reports whether the node or any node below it is an error or missing node.

```
treesitter.is_error :: proc(n: Node) -> bool
```

`is_error` reports a node the parser could not fit into the grammar.

```
treesitter.is_extra :: proc(n: Node) -> bool
```

`is_extra`: comments and other tokens that may appear anywhere.

```
tree sitter.is_missing :: proc(n: Node) -> bool
```

is_missing reports a node the parser inserted to recover from a syntax error.

```
tree sitter.is_named :: proc(n: Node) -> bool
```

is_named reports a node the grammar names, rather than an anonymous token such as „(„.

```
tree sitter.is_null :: proc(n: Node) -> bool
```

is_null reports a null node: an absent field, child, sibling, or parent.

```
tree sitter.kind :: proc(n: Node) -> string
```

kind is the node's type name, such as „function_definition“, or the token itself for anonymous nodes such as „(„ or „def“.

```
tree sitter.named_child :: proc(n: Node, i: int) -> Node
```

named_child is the node's named child i of named_child_count, or a null node.

```
tree sitter.named_child_count :: proc(n: Node) -> int
```

named_child_count counts the node's named children.

```
tree sitter.next_child :: proc(it: ^Iterator) -> (n: Node, i: int, ok: bool)
```

next_child returns the next child and its index, for
for child, i in next_child(&it).

```
tree sitter.next_named_sibling :: proc(n: Node) -> Node
```

next_named_sibling is the next named node under n's parent, or a null node.

```
tree sitter.next_sibling :: proc(n: Node) -> Node
```

next_sibling is the node after n under its parent, or a null node.

```
tree sitter.parent :: proc(n: Node) -> Node
```

parent is the node's parent, or a null node for the root.

```
tree sitter.parse :: proc(p: ^Parser, text: string) -> ^Tree
```

parse parses UTF-8 text into a tree, which tree-sitter allocates and the caller frees with tree_delete. The tree refers to text by byte offsets only, so text need not outlive it, but text slices whatever text it is given. Nil when parsing was

impossible (text over 4 GiB, or no language set); syntax errors give a tree with error nodes instead (`has_error`).

```
tree sitter.parser_delete :: proc(p: ^Parser)
```

`parser_delete` frees a parser from `parser_new`; nil is ignored. Trees it parsed stay valid.

```
tree sitter.parser_new :: proc(language: ^Language) -> ^Parser
```

`parser_new` returns a parser for `language`, which tree-sitter allocates and the caller frees with `parser_delete`, or nil when this runtime cannot read the grammar (a shared runtime older than the grammar's ABI).

```
tree sitter.prev_named_sibling :: proc(n: Node) -> Node
```

`prev_named_sibling` is the previous named node under `n`'s parent, or a null node.

```
tree sitter.prev_sibling :: proc(n: Node) -> Node
```

`prev_sibling` is the node before `n` under its parent, or a null node.

```
tree sitter.python :: proc() -> ^Language
```

`python` returns the Python grammar, static data that is never freed.

```
tree sitter.root :: proc(t: ^Tree) -> Node
```

`root` is the tree's root node, valid while the tree lives.

```
tree sitter.start_byte :: proc(n: Node) -> int
```

`start_byte` is the byte offset where the node starts in the parsed text.

```
tree sitter.start_point :: proc(n: Node) -> Point
```

`start_point` and `end_point` are 0-based rows and byte columns.

```
tree sitter.symbol :: proc(n: Node) -> Symbol
```

`symbol` is the grammar's number for the node's type.

```
tree sitter.text :: proc(n: Node, source: string) -> string
```

`text` is the source the node spans, a slice of the parsed text.

```
tree_sitter.tree_delete :: proc(t: ^Tree)
```

`tree_delete` frees a tree from parse, and with it every node of the tree; nil is ignored.

Constants

```
tree_sitter.NOTICES :: #load("licenses/tree-sitter.txt",
string) + "\n" + #load("licenses/tree-sitter-python.txt",
string)
```

The MIT licence notices of the two libraries, which a program that links them ships.

```
tree_sitter.PYTHON_VERSION :: "0.25.0"
```

```
tree_sitter.RUNTIME_VERSION :: "0.26.13"
```

The versions native/tree-sitter/build.sh pins; a shared build links whatever is installed.

```
tree_sitter.STATIC :: #config(TREESITTER_STATIC, BUILT)
```

Foreign imports

```
@(extra_linker_flags = #config(TREESITTER_LINK_FLAGS, ""))
foreign import tree_sitter.ts {"../..../native/tree-sitter/out/
lib/tree-sitter-python.lib", "../..../native/tree-sitter/out/
lib/tree-sitter.lib"}
```

```
@(extra_linker_flags = #config(TREESITTER_LINK_FLAGS, ""))
foreign import tree_sitter.ts {"../..../native/tree-sitter/out/
lib/libtree-sitter-python.a", "../..../native/tree-sitter/out/
lib/libtree-sitter.a"}
```

```
@(extra_linker_flags = #config(TREESITTER_LINK_FLAGS, ""))
foreign import tree_sitter.ts {"system:tree-sitter-python",
"system:tree-sitter"}
```

typst

Package `typst` adapts the Typst toolchain for the host. The development backend runs an installed, pinned `typst` executable with an argument vector, never a shell; the embedded backend links the compiler in (bridge.odin). It is outside Guidedoc's allocation-free core.

Typst is not a sandbox of its own; what it may do is what the caller gives it:

- Files: Typst reads only paths below the root it is given, and refuses a path that leaves it; a link below the root is followed. Fonts come from `font_paths` and, unless `embedded_fonts_only` is set, from the system.
- Packages: an `@preview` import downloads the package, unless `offline` is set (the embedded backend only; the typst program has no such switch).
- Memory and time: Typst's own, in the process (embedded) or in the typst program; no budget of the host bounds them. Only the output the embedded backend copies back is counted, through `reserve`.

So Typst code reaches everything below its root: a caller that compiles Typst it does not trust gives a root holding only what that code may read. Guidedog's builds do (project/typst_root.odin), and an `-untrusted` build compiles only Typst it generated.

Types

`typst.Backend` *:: struct*

Backend is the compiler a compile runs: an installed typst program, or the embedded one. `locate` makes it; its strings are the caller's.

program: string

version: string

embedded: bool

the statically linked compiler; no external program runs.

`typst.Diagnostic` *:: struct*

Diagnostic is one problem Typst reported.

file: string

line: int

1-based; 0 when the compiler gave no position.

column: int

severity: string

message: string

stdin: bool

the position is in the generated source fed on `stdin`.

```
typst.Options :: struct
```

Options mirror the typst CLI. Zero values mean: download missing packages into the system cache, and use system fonts before the embedded ones.

```
offline: bool
```

use only packages already on disk.

```
package_cache: string
```

package cache directory; „“ is the system cache.

```
embedded_fonts_only: bool
```

ignore system fonts, for reproducible output.

```
font_paths: []string
```

extra font directories, searched first.

```
reserve: Reserve
```

When set, the embedded compiler’s output is counted before it is copied into host memory; a refusal fails the compile. The typst program writes its output itself.

```
typst.Outcome :: struct
```

Outcome is what a compile did. Its diagnostics and text are allocated in context allocator and owned by the caller; launch_error is set when Typst could not run.

```
ok: bool
```

```
exit_code: int
```

```
diagnostics: []Diagnostic
```

```
detail: string
```

unparsed compiler output, bounded.

```
launch_error: string
```

```
typst.Reserve :: struct
```

Reserve asks the caller whether bytes may be allocated, before the embedded compiler's output is copied into host memory; false refuses the compile.

```
procedure: proc(user: rawptr, bytes: int) -> bool
```

```
user: rawptr
```

```
typst.Target :: enum u8
```

Target is the artifact a compile writes.

```
Pdf
```

```
Html
```

Procedures

```
typst.compile_file :: proc(b: Backend, source, root, output: string, target: Target, options := Options{}) -> Outcome
```

compile_file compiles a native Typst source file into output; paths resolve against root, and Typst reads nothing outside it. The Outcome is allocated in context.allocator and owned by the caller. Write to a staged path and rename it on success when a failed compile must not disturb an earlier artifact.

```
typst.compile_text :: proc(b: Backend, text, root, output: string, target: Target, options := Options{}) -> Outcome
```

compile_text compiles generated Typst fed on stdin, so no file is written beside the user's sources. Relative paths in the text resolve against root. The Outcome is allocated in context.allocator and owned by the caller.

```
typst.find_program :: proc(name: string) -> (string, bool)
```

find_program looks a program up on PATH, handling Windows' „;" and „.exe". The path is allocated in context.allocator and owned by the caller; false when none is found.

```
typst.locate :: proc(program: string) -> (Backend, bool)
```

locate returns the embedded compiler when this build links one and the caller did not name another program; otherwise it finds the program and asks for its version. The backend's strings are allocated in context.allocator and owned by the caller; false when no program is found. A program that cannot tell its version has version „".


```
typst.offset_of :: proc(text: string, line, column: int) -> int
```

offset_of converts a 1-based line and column (in characters) into a byte offset of text, clamped to its end; it allocates nothing.

```
typst.pinned :: proc(b: Backend) -> bool
```

pinned reports whether the backend is the Typst release Guidedog is tested with.

Constants

```
typst.EMBEDDED :: #config(GUIDEDOG_TYPST_BRIDGE, false)
```

EMBEDDED selects the statically linked Typst compiler. Build the bridge first:

```
cargo build --release --offline --manifest-path native/typst_bridge/
Cargo.toml
odin build cmd/guidedog -define:GUIDEDOG_TYPST_BRIDGE=true -out:build/
guidedog
```

Without it, Guidedog uses the development backend: an installed typst program.

```
typst.PINNED_VERSION :: "0.15.1"
```

PINNED_VERSION is the Typst release Guidedog is built and tested with.

Foreign imports

```
foreign import typst.bridge {"../..../native/typst_bridge/
typst_bridge/target/release/guidedog_typst_bridge.lib",
"system:ws2_32.lib", "system:userenv.lib",
"system:ntdll.lib", "system:bcrypt.lib",
"system:advapi32.lib", "system:kernel32.lib"}
```

Verfügbarkeit: Windows.

```
foreign import typst.bridge {"../..../native/typst_bridge/
target/release/
libguidedog_typst_bridge.a", "system:Security.framework",
"system:CoreFoundation.framework",
"system:System", "system:iconv"}
```

Verfügbarkeit: Darwin.

```
foreign import typst.bridge {"../../native/typst_bridge/  
target/release/libguidedog_typst_bridge.a", "system:gcc_s",  
"system:util", "system:rt", "system:pthread", "system:m",  
"system:dl", "system:c"}
```

Verfügbarkeit: Linux, FreeBSD, OpenBSD, NetBSD, WASI, JS, Orca, Free-standing.

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