ROCm Docs Core

Release 1.33.1

Advanced Micro Devices, Inc.

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ROCm Docs Core is a collection of utilities, styling, scripts and additional HTML content common to all ROCm projects' documentation.

ROCm Docs Core is distributed as a pip package available from PyPi as rocm-docs-core

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Demo Doxygen Documentation Integration

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CHAPTER

TWO

USER GUIDE

The User Guide describes how users can make use of functionality in `rocm-docs-core`

2.1 Spell Check

`rocm-docs-core` has spell checks run on every pull request (PR) via GitHub Actions.

If a PR fails spell check, the errors must be addressed before it can be merged.

The results of a spell check is viewable in the "Checks" tab for a PR.

2.1.1 Types of Errors

2.1.1.1 Spelling Mistake

View the "Details" for a spell check and fix the misspelled words.

2.1.1.2 New words or Acronyms

Spell check may flag errors if it does not recognize a word.

The reason could be that the word is not familiar to the dictionary used or an unfamiliar acronym.

To get spell check to recognize this word, add it to the `.wordlist.txt` file, located at the root of the project (for this project, `rocm-docs-core`, that would be the `rocm-docs-core` folder).

2.1.1.3 Special keywords

If the word is not meant to be a dictionary word, but is still valid technical terminology, wrap the word with the backtick (`) key.

2.1.1.3.1 Keyword examples

- File or folder names
- Commands or arguments
- Code blocks
- Names of executables or binaries

2.1.2 More Information

For more information, see the GitHub Action spellcheck-github-actions

2.2 Linting

`rocm-docs-core` has linting to ensure correct Markdown and ReStructuredText formatting on every pull request (PR) via GitHub Actions.

If a PR fails linting, the errors must be addressed before it can be merged.

The results of linting is viewable in the "Checks" tab for a PR.

2.2.1 Markdown Linting

The current linter used for Markdown is `markdownlint`, which uses the following rules.

2.2.1.1 Optional

`markdownlint` can also be installed and run locally using the `markdownlint` extension on Visual Studio Code.

2.3 Linking

Markdown

reStructuredText (RST)

2.3.1 Linking in Markdown

2.3.1.1 Markdown

2.3.1.1.1 Cross References to Other Projects

The `projects.yaml` configuration file contains the names of projects that should be used when making links that cross-reference documentation sites.

When making links that cross-reference documentation sites, the following format should be used:

```
{doc}`Text here<project_name:path/to/page_name>`
```

Cross-references are achieved via Intersphinx. For more information, refer to the Sphinx documentation or Read the Docs documentation on Intersphinx.

2.3.1.1.1.1 Example

The following Markdown:

```
{doc}`ROCm Documentation<rocm:about/license>`
```

will be rendered as the following link:

ROCm Documentation

2.3.1.1.2 Relative Links to Current Project

2.3.1.1.2.1 Example

The following Markdown:

```
[Link Text](../index)
```

will be rendered as the following link:

Link Text

2.3.1.1.3 Absolute Links to External Sites

For other links, usual Markdown conventions should be used.

2.3.1.1.3.1 Example

The following Markdown:

```
[Link Text](https://github.com/ROCm/ROCm)
```

will be rendered as the following link:

Link Text

2.3.2 Linking in RST

2.3.2.1 reStructuredText (RST)

2.3.2.1.1 Cross References to Arbitrary Locations in Other Projects

The projects.yaml configuration file contains the names of projects that should be used when making links that cross-reference documentation sites.

Cross references to anchors or arbitrary locations in documentation can be done using labels.

See the Sphinx documentation on cross-referencing arbitrary locations for information on labels.

The format using a label would appear as follows:

```
:ref:`Text here<project_name:label_name>`
```

Cross-references are achieved via Intersphinx. For more information, refer to the Sphinx documentation or Read the Docs documentation on Intersphinx.

2.3.2.1.1.1 Example

The following RST:

```
:ref:`ROCm for AI Install<rocm:rocm-for-ai-install>`
```

will be rendered as the following link:

ROCm for AI Install

2.3.3 Linking in the Table of Contents

2.3.3.1 Syntax

Variables of the form `${<variable>}` are substituted, currently the following list is supported:

- `${branch}` or `{branch}`: the name of the current branch
- `${url}` or `{url}`: GitHub URL of the current project
- `${project:<project_name>}`: base URL of the documentation of `<project_name>` based on Intersphinx mapping

2.3.3.1.1 Example

```
- url: "{url}/tree/{branch}"
- url: ${project:python}
- url: ${project:rocm-docs-core}
- url: ${project:hipify}
```

2.4 Doxygen Integration

2.4.1 What

`doxysphinx` is a package that handles integration of Doxygen and Sphinx documentation.

`doxysphinx` allows displaying Doxygen documentation in the Sphinx documentation.

`rocm-docs-core` applies some additional formatting and styling on top of this to stay in line with our themes.

Since `doxysphinx` automatically integrates the Doxygen documentation, developers only have to update the documentation strings in the source code if they are formatted for Doxygen.

For more information on `doxysphinx`, see the GitHub repository or the doxysphinx documentation.

2.4.2 How

Some examples of how to use `doxysphinx` with `rocm-docs-core` are included below.

Assuming Doxygen documentation is already configured correctly, several changes must be made to the configuration file (`conf.py`) located in the `docs` folder and the requirements files (`requirements.in` and `requirements.txt`) located in the `sphinx` folder.

For the configuration file:

- Include the `rocm_docs.doxygen` extension in the `extensions` list.
- Include the path to the Doxygen configuration in `doxygen_root`. For ROCm projects, this value is usually `doxygen`.
- Set `doxysphinx_enabled` to True.
- Define a `doxygen_project` dictionary and set a `name` and `path`. For ROCm projects, the value of path is usually `doxygen/xml`.

For the requirements files:

- Specify the `api_reference` in the `requirements.in` (example: `rocm-docs-core[api_reference]==0.36.0`)
- Use `pip-tools` to compile the `requirements.in`
  - `pip install pip-tools`
  - `pip-compile requirements.in --resolver=backtracking`

Then add the Doxygen output to the table of contents (`_toc.yml.in`).

Optionally, specify custom style sheets to use in the Doxygen configuration (`Doxyfile`). These style sheets are a part of `rocm-docs-core`.

- `HTML_HEADER`
- `HTML_FOOTER`
- `HTML_STYLESHEET`

- `HTML_EXTRA_STYLESHEET`

When building the documentation with the API reference enabled, the console output will also make configuration recommendations to make documentation builds succeed. If documentation builds are still failing, please follow the recommendations.

This project has *Demo Doxygen Docs here*. See the source code for details.

The `tests` folder in the `rocm-docs-core` project on GitHub also has example configuration files.

See this PR for a simple example of adding a Doxygen code snippet.

2.5 Article Info

Article info is disabled by default and must be enabled in `conf.py`.

2.5.1 Settings

Legend: `setting name (setting data type):` *explanation*

- `setting_all_article_info (bool)`: Setting this value to true will enable article info for all pages and use default values. See possible settings for default values.
- `all_article_info_os (list[str])`: Determines which supported OS appear in the article info. Possible strings are `"linux"` and `"windows"`. Default value is `["linux"]`.
- `all_article_info_author (str)`: Determines the author. Default is empty string.
- `all_article_info_date (str)`: Determines date of publication. Default is the date the file was last modified in git.
- `all_article_info_read_time (str)`: Determines the read time. Default is calculated based on the number of words in the file.
- `article_pages (list[dict])`: Used for specific settings for a page. These override any of the general settings above (eg: `all_article_info_<field>`).

Example:

```
article_pages = [
    {
        "file":"index",
        "os":["linux", "windows"],
        "author":"Author: AMD",
        "date":"2023-05-01",
        "read-time":"2 min read"
    },
    {"file":"developer_guide/commitizen"}
]
```

CHAPTER

THREE

DEVELOPER GUIDE

The Developer Guide provides additional information on the processes and toolchains in `rocm-docs-core`

3.1 Just

`just` is a command runner used to quickly setup an environment for documentation development.

The aim is to make contributing to `rocm-docs-core` more approachable by providing ready-to-use environments for development.

3.1.1 Usage

3.1.1.1 Setting up a development environment

```
just devenv
```

This creates a Python virtual environment, installs the dependencies, and sets up the pre-commit hooks.

3.1.1.2 Running linting commands

These commands work on both Linux and Windows

```
just check-codestyle
```

Check files for formatting errors and report them.

```
just fix-codestyle
```

Automatically fix errors that have suggested fixes.

3.1.2 GitHub

GitHub Actions CI is extended to run these tools on PRs (using the `just`-based entry-points).

Development container setup and settings are added for Visual Studio Development containers (and GitHub Codespaces) and Gitpod.

- VS Code Dev Containers Guide
  - Dev Container Dockerfile and Configuration
- Ona (Gitpod) Guide
  - Gitpod Configuration

3.2 Python Linting

The following list of tools is used for checking correctness in Python code. These tools are set up to run as git pre-commit hooks via pre-commit.

- `Ruff` for linting
  - Usage
- `Mypy` for static type checking
  - Usage
- `Black` for code formatting
  - Usage
- `isort` for import sorting
  - Usage

Some non-Python-specific hooks are also enabled:

- Check `yaml`, `toml`, and `json` validity
- Check for no trailing whitespaces and additional newline at the end of files

3.3 Commitizen

The ROCm Docs Core repository uses Commitizen to enforce Conventional Commits and implement automatic release tagging based on commit messages.

3.3.1 Commit message rules

A commit message should like like this:

```
<type>[optional scope]: <subject>

[optional body]

[optional footer(s)]
```

Commit messages start with a header line that notes the type of change, followed by an optional list of scopes, then the description of the change.

Type must be one of:

- **`build`**: Changes that affect the build system or external dependencies (example scopes: `gulp`, `broccoli`, `npm`)
- **`ci`**: Changes to our CI configuration files and scripts
- **`docs`**: Documentation only changes
- **`feat`**: A new feature, *corresponds to a minor version bump*
- **`fix`**: A bug fix, *correspond to a patch version bump*
- **`perf`**: A code change that improves performance
- **`refactor`**: A code change that neither fixes a bug nor adds a feature
- **`style`**: Changes that do not affect the meaning of the code (white-space, formatting, missing semi-colons, etc)
- **`test`**: Adding missing tests or correcting existing tests

- **chore**: Other changes that don't modify source code, test or build files (e.g changing `.gitignore`)

The **scope** if included should be the area the change affects in parentheses i.e. `(theme)` for theming changes or `(deps)` for changes to the list of dependencies. Multiple scopes can be given and `(all)` may be used if change affects the entire project.

The **subject** should be a succinct description of the change in present imperative tense (i.e. *update wording* not *updated wording*)

A longer description can be included in the **body**, including the motivation of the change and comparison with the previous version. Comparisons with the prior state if shouldn't detail literal changes, those are recorded by the git history, but the semantic or higher level effect of the modifications.

The footer contains information about **Breaking Changes** and references to GitHub issues that the change closes or relates to. Breaking changes should be noted with the words `BREAKING CHANGE:` followed by a space and the description of the change. Including a breaking change in a commit will result in a major version bump of the next release including such commit.

For a more detailed description of conventional commits please refer to the specification linked above.

3.3.2 Committing with Commitizen

Commitizen contains a utility to walk through making a commit following the rules above.

3.3.2.1 Installation

Commitizen is marked as a "development" dependency of `rocm-docs-core`, installable via `pip install .[development]` from the root of the repository.

3.3.2.2 Usage

Run `cz commit` or `cz c` to start making a commit after staging the files to be added. Commitizen will ask for each part of the commit message in turn.

Refer to the documentation of Commitizen (linked above) on other options, and other features of Commitizen.

3.4 External Intersphinx Project Mapping

Projects should be defined in `projects.yaml` and should set which key they correspond to by setting external_projects_current_project to this key.

3.4.1 Example

Given the following `projects.yaml` file:

```
projects:
  python: https://docs.python.org/3/
  rtd: https://docs.readthedocs.io/en/stable/
  sphinx: https://www.sphinx-doc.org/en/master/
  rocm-docs-core: https://rocm.docs.amd.com/projects/rocm-docs-core/en/${version}
```

The `conf.py` from `rocm-docs-core` should contain:

```
external_projects_current_project = "rocm-docs-core"
```

Adds support for specifying the "development" branch for each project defined in `projects.yaml`. This is achieved by setting the `development_branch` key for the project:

```
projects:
  ...
  project:
    target: <target-url>
    development_branch: master
```

With this the mapping between projects is changed to the following:

Development branches map between each other. Essentially, links on project A's `develop` branch point to the project B's `master` branch. Vice-versa if A has set its `development_branch` to `develop` and B sets it to `master`.

Symbolic versions "latest" and "stable" map to themselves in other projects.

Any other branch maps to "latest".

3.4.2 Explicitly list external projects

By default the inventories of all external projects defined in `projects.yaml` will be downloaded. This can take a long time as it requires a network request for each external project.

The `external_projects` configuration option can be set to a list with the names of remote projects to fetch inventories from & enable links to. The list must be a subset of the project names defined in `projects.yaml`. The default value of `"all"` means to fetch all projects.

Intersphinx references to projects that are not in `external_projects` will not be resolved. References in the the TOC like `${project:project_name}` will continue to be resolved to the URL of `project_name`, even if `project_name` is not set in `external_projects` (but it's defined in `projects.yaml`).

3.5 Dependabot

Dependabot is automated dependency management tool. It is used to keep ROCm documentation dependencies up to date.

Here is an example PR that dependabot made on the ROCm repository

Dependabot Configuration used by this project

GitHub Dependabot Configuration Guide

CHAPTER

FOUR

ROCM DOCS CORE DEMO DOXYGEN DOCS

4.1 Modules

4.2 Namespaces

4.2.1 Namespace List

4.2.2 Namespace Members

4.2.2.1 Namespace Members

4.2.2.2 Namespace Members

4.3 Classes

4.3.1 Class List

4.3.2 Class Index

4.3.3 Class Hierarchy

4.3.4 Class Members

4.3.4.1 Class Members

4.3.4.2 Class Members - Functions

4.3.4.3 Class Members - Variables

4.4 Files

4.4.1 File List

4.4.2 File Members

4.4.2.1 File Members

4.4.2.2 File Members

4.4.2.3 File Members

4.4.2.4 File Members

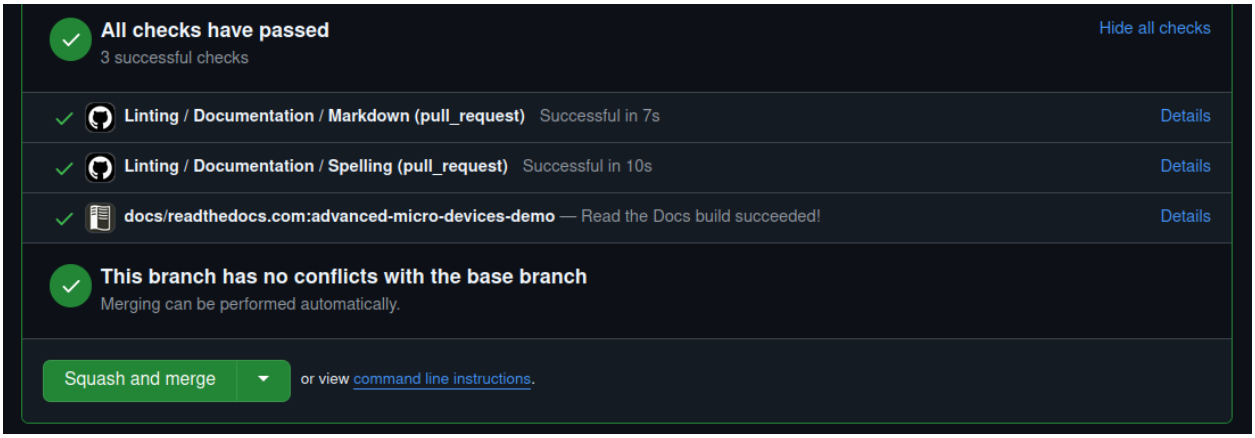
CHAPTER

FIVE

BUILDING DOCUMENTATION

5.1 GitHub

If you open a pull request and scroll down to the summary panel, there is a commit status section. Next to the line `docs/readthedocs.com:advanced-micro-devices-demo`, there is a `Details` link. If you click this, it takes you to the Read the Docs build for your pull request.



If you don't see this line, click `Show all checks` to get an itemized view.

5.2 Command line

You can build our documentation via the command line using Python.

See the `build.tools.python` setting in the Read the Docs configuration file for the Python version used by Read the Docs to build documentation.

See the Python requirements file for Python packages needed to build the documentation.

Use the Python Virtual Environment (`venv`) and run the following commands from the project root:

```
python3 -mvenv .venv

.venv/bin/python     -m pip install -r docs/sphinx/requirements.txt
.venv/bin/python     -m sphinx -T -E -b html -d _build/doctrees -D language=en docs _
↪build/html
```

Navigate to `_build/html/index.html` and open this file in a web browser.

5.3 Visual Studio Code

With the help of a few extensions, you can create a productive environment to author and test documentation locally using Visual Studio (VS) Code. Follow these steps to configure VS Code:

1. Install the required extensions:
   - Python: `(ms-python.python)`
   - Live Server: `(ritwickdey.LiveServer)`
2. Add the following entries to `.vscode/settings.json`.

```
{
  "liveServer.settings.root": "/.vscode/build/html",
  "liveServer.settings.wait": 1000,
  "python.terminal.activateEnvInCurrentTerminal": true
}
```

   - `liveServer.settings.root`: Sets the root of the output website for live previews. Must be changed alongside the `tasks.json` command.
   - `liveServer.settings.wait`: Tells the live server to wait with the update in order to give Sphinx time to regenerate the site contents and not refresh before the build is complete.
   - `python.terminal.activateEnvInCurrentTerminal`: Activates the automatic virtual environment, so you can build the site from the integrated terminal.
3. Add the following tasks to `.vscode/tasks.json`.

```
{
  "version": "2.0.0",
  "tasks": [
    {
      "label": "Build Docs",
      "type": "process",
      "windows": {
        "command": "${workspaceFolder}/.venv/Scripts/python.exe"
      },
      "command": "${workspaceFolder}/.venv/bin/python3",
      "args": [
        "-m",
        "sphinx",
        "-j",
        "auto",
        "-T",
        "-b",
        "html",
        "-d",
        "${workspaceFolder}/.vscode/build/doctrees",
        "-D",
        "language=en",
        "${workspaceFolder}/docs",
        "${workspaceFolder}/.vscode/build/html"
      ],
      "problemMatcher": [
        {
```

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```
            "owner": "sphinx",
            "fileLocation": "absolute",
            "pattern": {
              "regexp": "^(?:.*\\.{3}\\s+)?(\\/[^:]*|[a-zA-Z]:\\\\[^:]*):(\\d+):\\
↪s+(WARNING|ERROR):\\s+(.*)$",
              "file": 1,
              "line": 2,
              "severity": 3,
              "message": 4
            }
          },
          {
          "owner": "sphinx",
            "fileLocation": "absolute",
            "pattern": {
              "regexp": "^(?:.*\\.{3}\\s+)?(\\/[^:]*|[a-zA-Z]:\\\\[^:]*):{1,2}\\
↪s+(WARNING|ERROR):\\s+(.*)$",
              "file": 1,
              "severity": 2,
              "message": 3
            }
          }
        ],
        "group": {
          "kind": "build",
          "isDefault": true
        }
      }
    ]
  }
```

Implementation detail: two problem matchers were needed to be defined, because VS Code doesn't tolerate some problem information being potentially absent. While a single regex could match all types of errors, if a capture group remains empty (the line number doesn't show up in all warning/error messages) but the `pattern` references said empty capture group, VS Code discards the message completely.

4. Configure the Python virtual environment (`venv`).

   From the Command Palette, run `Python: Create Environment`. Select `venv` environment and `docs/sphinx/requirements.txt`.

5. Build the docs.

   Launch the default build task using one of the following options:

   - A hotkey (the default is `Ctrl+Shift+B`)
   - Issuing the `Tasks: Run Build Task` from the Command Palette

6. Open the live preview.

   Navigate to the site output within VS Code: right-click on `.vscode/build/html/index.html` and select `Open with Live Server`. The contents should update on every rebuild without having to refresh the browser.

CHAPTER

SIX

ROCM DOCUMENTATION TOOLCHAIN

ROCm documentation relies on several open source toolchains and sites. Here is a list of a few important ones.

6.1 rocm-docs-core

rocm-docs-core is an AMD-maintained project that applies customizations for the ROCm documentation. This project is the tool most ROCm repositories use as part of their documentation build pipeline. It is available as a pip package on PyPI.

6.2 Sphinx

Sphinx is a documentation generator originally used for Python. It is now widely used in the open source community.

6.2.1 Sphinx External ToC

Sphinx External ToC is a Sphinx extension used for ROCm documentation navigation. This tool generates a navigation menu on the left based on a YAML file (`_toc.yml.in`) that contains the table of contents.

6.2.2 Sphinx-book-theme

Sphinx-book-theme is a Sphinx theme that defines the base appearance for ROCm documentation. ROCm documentation applies some customization, such as a custom header and footer, on top of the Sphinx Book Theme.

6.2.3 Sphinx Design

Sphinx design is a Sphinx extension that adds design functionality. ROCm documentation uses Sphinx Design for grids, cards, and synchronized tabs.

6.3 Doxygen

Doxygen is a documentation generator that extracts information from in-code comments. It is used for API documentation.

6.4 Breathe

Breathe is a Sphinx plugin for integrating Doxygen content.

6.5 MyST

Markedly Structured Text (MyST) is an extended flavor of Markdown (CommonMark) influenced by reStructuredText (RST) and Sphinx. It is integrated into the ROCm documentation with the `myst-parser` Sphinx extension.

See the MyST syntax cheat sheet at the Jupyter Book site.

6.6 Read the Docs

Read the Docs is the service that builds and hosts the HTML version of the ROCm documentation.

CHAPTER

SEVEN

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