# **Docs4NIST**

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This GitHub action uses the Sphinx tool to build documentation in https://github.com/usnistgov projects and then host that documentation on https://pages.nist.gov, as an approximation of ReadTheDocs.

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<sup>&</sup>lt;sup>1</sup> Certain commercial firms and trade names are identified in this document in order to specify the installation and usage procedures adequately, or to provide context. Such identification is not intended to imply recommendation or endorsement by the National Institute of Standards and Technology, nor is it intended to imply that related products are necessarily the best available for the purpose.

2 CONTENTS:

**CHAPTER** 

ONE

## **USAGE**

- Configure your repo for publishing on pages.nist.gov.
- Enable GitHub Actions for your repo and select "Allow all actions and reusable workflows" (you may need to submit a request to devops@nist.gov to enable this for you).
- For each branch of your repository where you want to host documentation, add a workflow, such as .github/workflows/Docs4NIST.yml:

See *Docs4NIST Action* for more information about configuration of this workflow.

## 1.1 Customization

Docs4NIST uses two sets of templates that determine the appearance of the hosted documentation.

## 1.1.1 Assimilation templates

The first set of templates is used by <code>assimilate\_theme()</code> to modify the Sphinx configuration.

These templates can be customized by forking this repository.

## conf.py

This template file overlays the html\_theme you chose for your documentation with the ntd2d theme, described next.

#### ntd2d/

This template directory provides a Sphinx theme that modifies your chosen documentation theme.

## ntd2d/layout.html

This template file inserts standard NIST headers and footers and a dropdown menu that allows selecting different versions of your documentation.

## ntd2d/static/ntd2d.css\_t

This template file controls the appearance of the dropdown menu.

## 1.1.2 Pages templates

The second set of templates is used by *update\_pages()* to create the pages on the hosting site that enable switching between different documentation variants.

You can customize any of these templates by copying them to a \_templates/ directory at the root of your *nist-pages* branch and editing them to suit.

These templates use Python string format syntax (Sphinx and pages.nist.gov already fight over Jekyll templating, so we're not getting fancy, here).

#### downloads.html

A section inserted into menu.html if a documentation variant has any downloadable output, e.g., PDF or ePUB.

Available substitution keywords are:

downloads: A pre-formatted string with each downloadable output formatted by download\_item.html.

## download\_item.html

Formats a link to a single downloadable output.

Available substitution keywords are:

- href: URL of the downloadable output.
- kind: Type of downloadable output, e.g., PDF or ePUB.

## index.html

The default page for your documentation displayed at https://pages.nist.gov/{repository}.

Available substitution keywords are:

- owner: The GitHub user or organization for your repository.
- repository: The name of your repository.
- variants: The result of filling the *variants.html* template.

#### menu.html

The dropdown menu that allows selecting different branches and tags of your documentation.

Available substitution keywords are:

- downloads: The result of filling the downloads.html template.
- tree\_url: The GitHub URL corresponding to the active tag or branch.
- variant: The name of the active tag or branch.
- variants: The result of filling the *variants.html* template.

## ntd2d\_active.css

Style sheet that controls the appearance of the active tag or branch in the dropdown menu.

Available substitution keywords are:

• variant: The name of the active tag or branch.

#### variants.html

Lists tags and branches that are *configured* to serve documentation with this Action.

Available substitution keywords are:

- ullet branches: A pre-formatted string with each git branch formatted by  $variant\_item.html$ .
- latest: A pre-formatted string with the HEAD of the default GitHub branch formatted by variant\_item.html.
- stable: A pre-formatted string with the stable\_version that has the highest version identifier, as formatted by *variant\_item.html*.
- stable\_versions: A pre-formatted string with the tags or branches that satisfy the PEP 440 version specification and aren't pre-releases, each formatted by *variant\_item.html*.
- versions: A pre-formatted string with the tags or branches that satisfy the **PEP 440** version specification, each formatted by *variant\_item.html*.

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## variant\_item.html

Formats a link to a single tag or branch.

Available substitution keywords are:

- href: URL of the downloadable output.
- kind: Type of downloadale output, e.g., PDF or ePUB.

## 1.2 Q & A

## 1.2.1 Can't I just use Read the Docs?

Nope.

## 1.2.2 Is there a reason?

Yep.

## 1.2.3 Is it a good reason?

Nope.

## 1.3 API

ntd2d_action	Workhorse code for modifying and building documenta-
	tion.

## 1.3.1 ntd2d\_action

Workhorse code for modifying and building documentation.

## **Modules**

ntd2d_action.files	Representations of file objects.
ntd2d_action.repository	Interface to a git/GitHub repositories.
ntd2d_action.sphinxdocs	Sphinx configuration directory.
ntd2d_action.variants	Representations of a branches and tags.

## ntd2d action.files

Representations of file objects.

#### **Modules**

```
ntd2d_action.files.borgedconffile

ntd2d_action.files.conffile

ntd2d_action.files.cssfile

ntd2d_action.files.file

ntd2d_action.files.indexfile

ntd2d_action.files.menufile

ntd2d_action.files.nojekyllfile

ntd2d_action.files.pagesfile

ntd2d_action.files.sphinxlog

ntd2d_action.files.template

ntd2d_action.files.template

ntd2d_action.files.templatehierarchy

ntd2d_action.files.variantsfile
```

## ntd2d\_action.files.borgedconffile

## Classes

```
class ntd2d_action.files.borgedconffile.BorgedConfFile(source_dir, config, original_docs)

Bases: ConfFile

Sphinx configuration file that overlays the html theme.

property html_theme

html_theme Sphinx configuration value.

property html_theme_path

html_theme_path Sphinx configuration value.

property language

language Sphinx configuration value.

property project

project Sphinx configuration value.
```

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```
read()
          Evaluate Sphinx configuration values.
          The Sphinx docs says that it reads conf.py with importlib.import_module(). It doesn't.
                  namespace – Configuration values.
              Return type
                  dict
ntd2d_action.files.conffile
Classes
class ntd2d_action.files.conffile.ConfFile(source_dir, config)
     Bases: File
     Sphinx configuration file.
     property html_theme
          html_theme Sphinx configuration value.
     property html_theme_path
          html_theme_path Sphinx configuration value.
     property language
          language Sphinx configuration value.
     property project
          project Sphinx configuration value.
     read()
          Evaluate Sphinx configuration values.
          The Sphinx docs says that it reads conf.py with importlib.import_module(). It doesn't.
              Returns
                  namespace – Configuration values.
              Return type
                  dict
ntd2d action.files.cssfile
Classes
class ntd2d_action.files.cssfile.CSSFile(variant)
     Bases: PagesFile
```

## ntd2d action.files.file

Bases: File

### Classes

```
class ntd2d_action.files.file.File
     Bases: object
     Base file class
ntd2d_action.files.indexfile
Classes
class ntd2d_action.files.indexfile.IndexFile(repo, variants_url)
     Bases: PagesFile
     get_contents()
         build index.html with available documentation variants
ntd2d_action.files.menufile
Classes
class ntd2d_action.files.menufile.MenuFile(variant, variants_url)
     Bases: PagesFile
ntd2d_action.files.nojekyllfile
Classes
class ntd2d_action.files.nojekyllfile.NoJekyllFile(repo)
     Bases: PagesFile
ntd2d_action.files.pagesfile
Classes
class ntd2d_action.files.pagesfile.PagesFile(repo)
```

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## ntd2d\_action.files.sphinxlog

#### **Classes**

```
class ntd2d_action.files.sphinxlog.SphinxLog(docs, path)
    Bases: File
    parse_sphinx_warnings()
```

Parse and emit a sphinx file containing warnings and errors.

## Inputs look like this:

/media/sf\_shared/workspace/sphinx-action/tests/test\_projects/warnings\_and\_errors/index.rst:19: WARNING: Error in "code-block" directive: maximum 1 argument(s) allowed, 2 supplied.

/cpython/Doc/distutils/\_setuptools\_disclaimer.rst: WARNING: document isn't included in any toctree /cpython/Doc/contents.rst:5: WARNING: toctree contains reference to nonexisting document 'ayylmao'

## ntd2d\_action.files.template

#### **Classes**

ntd2d action.files.templatehierarchy

Bases: object

## Classes

Bases: FileTemplate

## ntd2d\_action.files.variantsfile

#### **Classes**

```
class ntd2d_action.files.variantsfile.VariantsFile(repo, variants, pages_url)
    Bases: PagesFile
```

## ntd2d\_action.repository

Interface to a git/GitHub repositories.

#### **Classes**

Bases: object

Interface to a git/GitHub repository.

#### **Parameters**

- **server\_url** (*url*) The URL of the GitHub server (GITHUB\_SERVER\_URL).
- **repository** (*str*) The owner and repository name (GITHUB\_REPOSITORY).
- **branch** (*str*) The branch linked to your documentation server (*pages-branch*).
- **default-branch** (str) The default branch configured in GitHub (*default-branch*).
- **docs** (SphinxDocs) The documentation being built.
- pages\_url (url) URL of the web server for served documentation (pages-url).

update\_pages(branch, sha)

Commit built documentation to pages-branch.

#### **Parameters**

- **branch** (*str*) The sanitized ('/' removed) short ref name of the branch or tag that triggered the workflow (GITHUB\_REF\_NAME).
- **sha** (*str*) The commit SHA that triggered the workflow (GITHUB\_SHA).

## ntd2d\_action.sphinxdocs

Sphinx configuration directory.

#### **Classes**

## class ntd2d\_action.sphinxdocs.BorgedSphinxDocs(original\_docs)

Bases: SphinxDocs

Sphinx configuration directory modified by Docs4NIST

#### **Parameters**

**original\_docs** (SphinxDocs) – The configuration directory stored in the *Repository*.

assimilate\_theme(name, insert\_header\_footer=True)

Replace configuration directory with customized html theme.

build\_docs(build\_command)

**Build Sphinx Documentation** 

Adapted from https://github.com/ammaraskar/sphinx-action/blob/master/sphinx\_action/action.py (Apache-2.0).

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## property inherited\_layout

Find inherited layout.html

Inherited theme may not define its own layout.html, but rely on a theme that it, in turn, derives from. {% extends "!layout.html" %} should work, but doesn't. https://github.com/sphinx-doc/sphinx/issues/12049

## class ntd2d\_action.sphinxdocs.SphinxDocs(docs\_dir)

Bases: object

Sphinx configuration directory.

build\_docs(build\_command)

**Build Sphinx Documentation** 

Adapted from https://github.com/ammaraskar/sphinx-action/blob/master/sphinx\_action/action.py (Apache-2.0).

## ntd2d\_action.variants

Representations of a branches and tags.

## **Classes**

**class** ntd2d\_action.variants.**Variant**(repo, name, rebuild\_menu=False, true\_name=None)

Bases: object

Representation of a branch or tag.

## **Parameters**

- **repo** (Repository) Git repository containing this branch or tag.
- name (str) Ref name of branch or tag.
- **rebuild\_menu** (*bool*) Whether to rebuild variant menu after updating variants (default: False).
- **true\_name** (*str*) Name of actual branch or tag associated with *stable* or *latest* variants.

### property css\_name

Escape ref name to satisfy css class naming requirements

Used to escape characters that are - allowed by *man git-check-ref-format* - disallowed by https://www.w3. org/International/questions/qa-escapes#cssescapes

## class ntd2d\_action.variants.VariantCollection(initlist=None)

Bases: UserList

A collection of Variant objects.

append(item)

S.append(value) – append value to the end of the sequence

 $clear() \rightarrow None -- remove all items from S$ 

## class ntd2d\_action.variants.VariantCollector(repo, current\_variant)

Bases: object

Tool that aggregates branches and versions.

#### **Parameters**

- **repo** (Repository) Git repository to be scanned for branches and tags.
- **current\_variant** (Variant) Branch or tag which triggered the workflow.

## class ntd2d\_action.variants.Version(repo, name, rebuild\_menu=False)

Bases: Variant

A Variant that satisfies the PEP 440 version specification

## Raises

**InvalidVersion** – If the name is not parsable by packaging.version.

#### property css\_name

Escape ref name to satisfy css class naming requirements

Used to escape characters that are - allowed by *man git-check-ref-format* - disallowed by https://www.w3. org/International/questions/qa-escapes#cssescapes

## 1.4 Docs4NIST Action

This GitHub action uses the Sphinx tool to build documentation in https://github.com/usnistgov projects and then host on https://pages.nist.gov as an approximation of ReadTheDocs.

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## 1.4.1 **Usage**

This action is invoked by adding a workflow file to your repository, such as .github/workflows/Docs4NIST.yml:

```
name: "Build Documentation"
on: [push, pull_request, delete]
jobs:
 docs:
   runs-on: ubuntu-latest
   steps:
      - uses: usnistgov/Docs4NIST@0.7
       with:
          docs-folder: docs/
          pages-branch: 'nist-pages'
          pages-url: 'https://pages.nist.gov'
          formats: ''
          build-html-command: make html
          build-epub-command: make epub
          build-pdf-command: make latexpdf
          pre-build-command: ''
          apt-packages: ''
          pip-requirements: ''
          conda-environment: ''
          push-pulls-pages: false
          include-header-footer: true
```

## **1.4.2 Inputs**

## docs-folder

The folder containing your Sphinx configuration.

## pages-branch

The branch linked to your documentation server.

## pages-url

URL of the web server for served documentation.

## **formats**

Type(s) of output desired in addition to html (pdf, and/or epub).

**Note:** GitHub Actions' YAML implementation does not support list or array elements, so use a multiline string to declare formats, e.g.,

```
formats: |-
    epub
    pdf
```

#### build-html-command

The command used by usnistgov/sphinx-action to build your html documentation.

## build-epub-command

The command used by usnistgov/sphinx-action to build your ePUB documentation.

## build-pdf-command

The command used by usnistgov/sphinx-action to build your PDF documentation.

## pre-build-command

Run by usnistgov/sphinx-action before the build command. You can use this to install system level dependencies, for example, with "apt-get update -y && apt-get install -y perl", although those are better installed with apt-packages.

## apt-packages

List of any APT packages that should be installed.

## pip-requirements

The path to the pip requirements file, relative to the root of the project.

#### conda-environment

The path to the Conda environment file, relative to the root of the project.

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#### push-pulls-pages

Whether the results of pull requests should be pushed to *pages-branch*. For security reasons, this is impossible for pull requests from repository forks, but it is generally undesirable in any case (they appear with cryptic names like *merge\_1234* and are redundant to the branch the pull is from). As long as this action is set to run *on: push*, then any build products from branches in the same repository will appear at *pages-url*.

## insert-header-footer

When true, automatically inserts the NIST header and footer. Setting to true conflicts with, e.g., sphinx\_rtd\_theme.

## 1.4.3 Implementation

This action implements a composite workflow with the following major steps:

- 1. actions/checkout
- 2. ntd2d Sub-Action
- 3. ad-m/github-push-action
- 4. actions/upload-artifact

## 1.5 ntd2d Sub-Action

This GitHub action is invoked by the main *Docs4NIST Action* to move built documentation into your designated *pages-branch*.

## 1.5.1 **Usage**

This action is invoked as a step of the composite workflow of the *Docs4NIST Action*. There is no reason to invoke this action yourself.

```
- name: Commit documentation changes
uses: ./../../_actions/current/ntd2d
with:
docs-folder: docs/
default-branch: 'main'
pages-branch: 'nist-pages'
pages-url: 'https://pages.nist.gov'
formats: ''
build-html-command: make html
build-epub-command: make epub
build-pdf-command: make epub
pre-build-command: ''
apt-packages: ''
pip-requirements: ''
conda-environment: ''
include-header-footer: true
```

**Note:** This action must be synchronized with the invoked version of the *Docs4NIST Action*, but "usnistgov/Docs4NIST/borg\_the\_docs@\${{ github.action\_ref }}" doesn't work, hence the clumsy uses: statement.

## **1.5.2 Inputs**

#### docs-folder

The folder containing your Sphinx configuration.

## default-branch

The default branch configured in GitHub.

#### pages-branch

The branch linked to your documentation server.

## pages-url

URL of the web server for served documentation.

#### **formats**

Type(s) of output desired in addition to html (pdf, and/or epub).

**Note:** GitHub Actions' YAML implementation does not support list or array elements, so use a multiline string to declare formats, e.g.,

```
formats: |-
    epub
    pdf
```

## build-html-command

The command used to build your html documentation.

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#### build-epub-command

The command used to build your ePUB documentation.

## build-pdf-command

The command used to build your PDF documentation.

#### pre-build-command

Run before the build command. You can use this to install system level dependencies, for example, with "apt-get update -y && apt-get install -y perl", although those are better installed with apt-packages.

## apt-packages

List of any APT packages that should be installed.

## pip-requirements

The path to the pip requirements file, relative to the root of the project.

## conda-environment

The path to the Conda environment file, relative to the root of the project.

#### include-header-footer

Whether to insert the NIST header and footer. This content conflicts with, e.g., sphinx\_rtd\_theme.

## 1.5.3 Outputs

## borged-build-folder

The folder containing the Sphinx build outputs.

## 1.5.4 Implementation

This action implements a Docker workflow step. The Docker ENTRYPOINT

- installs any specified apt-packages, pip-requirements, and conda-environment,
- wraps the Sphinx configuration directory in a BorgedSphinxDocs object,
- invokes assimilate\_theme()
- executes any pre-build-command,
- invokes build\_docs() for html and any other formats specified in formats,
- wraps the GITHUB\_REPOSITORY in a Repository object,
- invokes update\_pages().

## **CHAPTER**

# TWO

# **INDICES AND TABLES**

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- modindex
- search

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