



SWHID specification kickoff meeting

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SWHID specification

kickoff meeting

Roberto Di Cosmo

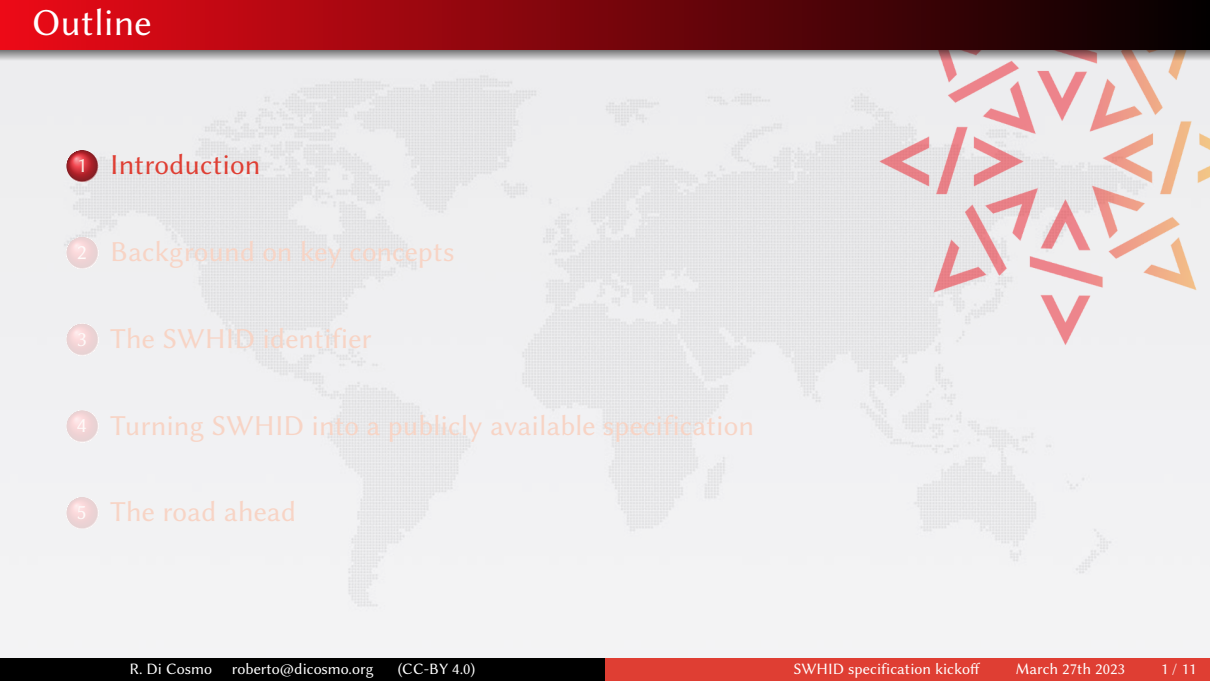
Director, Software Heritage
Inria and Université de Paris Cité

March 27th 2023



Software Heritage

THE GREAT LIBRARY OF SOURCE CODE

- 
- 1 Introduction
 - 2 Background on key concepts
 - 3 The SWHID identifier
 - 4 Turning SWHID into a publicly available specification
 - 5 The road ahead

What and how

Objective

bring you all up to speed on the SWHID specification effort, and kickstart the work

Organization

- duration: 1 hour (45m plus 15m Q&A); **write questions in the chat**
- session will be recorded
- set your Zoom id to your full name

Agenda

- recall basic notions of identifiers, then focus on the SWHID
- review of the way SWHIDs are composed and computed
- focus on the key parts of the specification that need work
- guided tour of the contribution and editorial process
- governance and licensing

- 
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Identification of a book



Goal: identify a book

- one ISBN number per published book
- ISO 2108 standard specification

Location of (a copy of) a book



Goal: find (a copy of) a book

- many locations (locations can change!)
- many approaches for call numbers

we are interested in **identification**, not in location

Extrinsic vs Intrinsic identifiers

In a nutshell

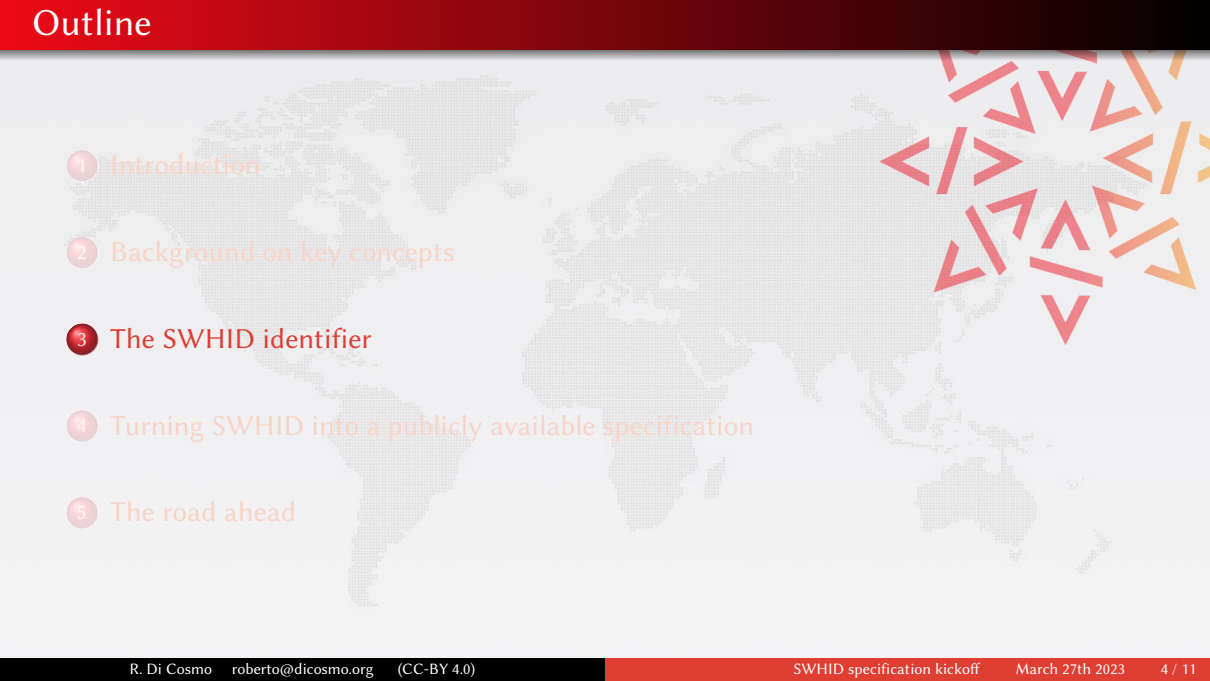
(for more info see [this dedicated blog post](#))

Main difference: how the *relation* between *identifier* and *designated object* is created and maintained. *Persistence* is a key desired property.

	Extrinsic	Intrinsic
relation	register	convention
persistence	external ^a	internal
pre-internet	passport number, ISBN, SSN, etc.	Music/Chemistry notations <i>e.g. NaCl is table salt</i>
internet era	DOI, Handle, Ark, etc.	cryptographic hashes <i>e.g.: git, bitcoin, SWHID</i>

^a"persistence... is a function of *administrative care*" [RFC 3650 \(Handle System Overview, 2003\)](#)

Here we are interested in normalising the SWHID *intrinsic identifier*

- 
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Bird's eye view of the SWHID *Intrinsic* Identifier

Structure of a SWHID identifier

[link to full docs](#)

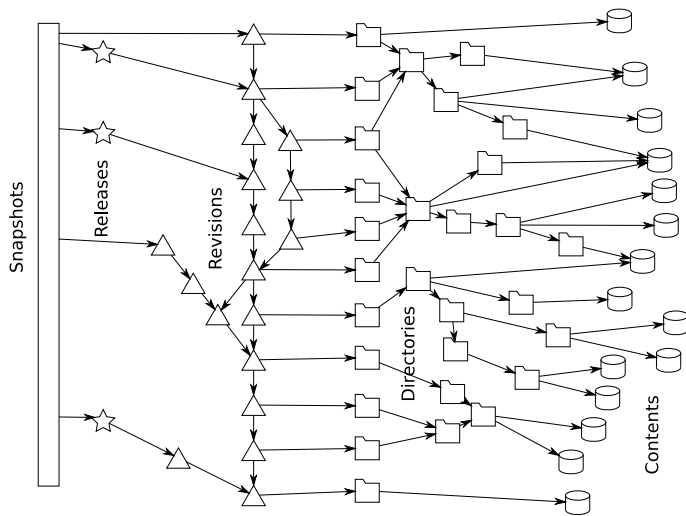


Current status

30+B [SWHIDs](#) in the Software Heritage archive

Mention in Linux Foundation's [SPDX 2.2](#); IANA registered; WikiData [P6138](#)

SWHID computation: a worked example



Contents

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Version 3, 29 June 2007

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Preamble

The GNU General Public License is a free, copyleft license for
software and other kinds of works.

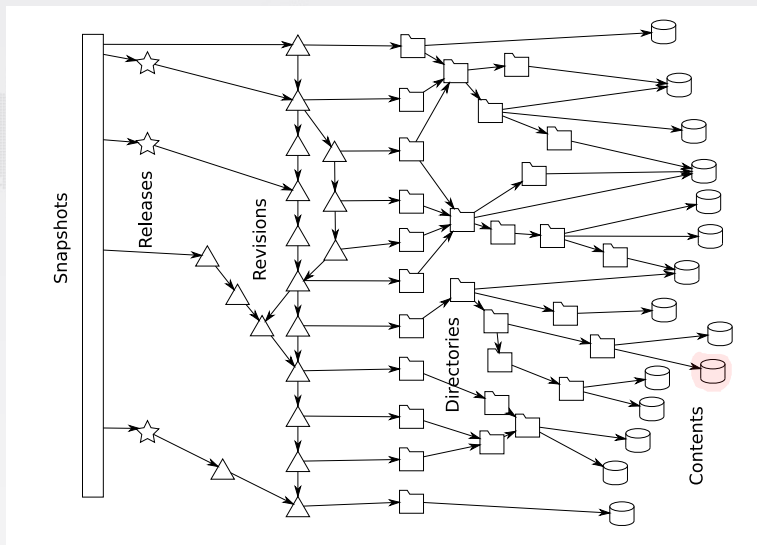
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to take away your freedom to share and change the works. By contrast,
the GNU General Public License is intended to guarantee your freedom to
share and change all versions of a program--to make sure it remains free
software for all its users. We, the Free Software Foundation, use the
GNU General Public License for most of our software; it applies also to
any other work released this way by its authors. You can apply it to
your programs, too.

When we speak of free software, we are referring to freedom, not
price. Our General Public Licenses are designed to make sure that you
have the freedom to distribute copies of free software (and charge for
them if you wish), that you receive source code or can get it if you
want it, that you can change the software or use pieces of it in new
free programs, and that you know you can do these things.

... To protect your rights, we need to pro...

sha1: 8624bcdae55baeef...
sha256: 8ceb4b9ee5aded...
sha1_git: 94a9ed024d385...
length: 35147

SWHID computation: a worked example



SWHID computation: a worked example



Directories

?

SWHID computation: a worked example

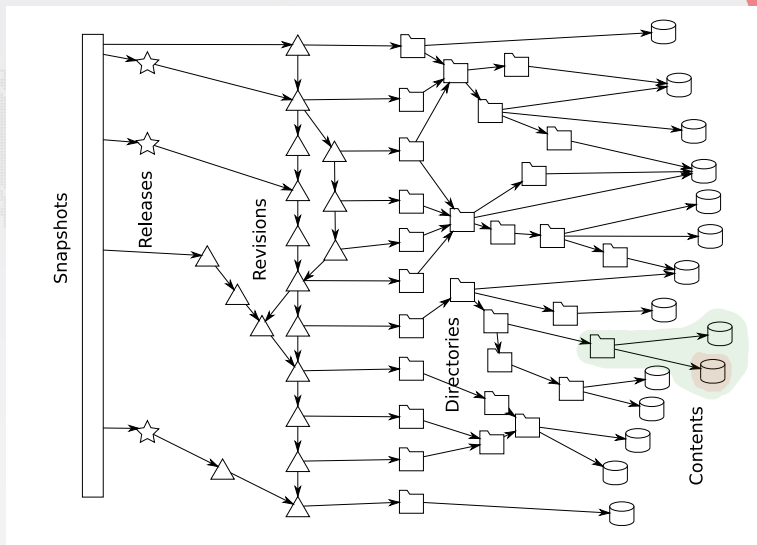


Directories

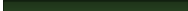
```
100644 blob c5baade4c44766042186ef858c0fd63d587ebf09 .gitignore
100644 blob 2d0a34af6f52cf3cf6b0c2f7bd0648fbd255e77f AUTHORS
100644 blob 94a9ed024d3859793618152ea559a168bbcbb5e2 LICENSE
100644 blob d9b2665a435a43f8a79a84e0867751dfb095c7bb MANIFEST.in
100644 blob 524175c2bad0b35b975f79284c2f5a6d5eaf2eb4 Makefile
100644 blob 5c7e3a5bbddb038682ba7793f440492ed9678bb3 Makefile.local
100644 blob 8617980629cd24e6080404f09aa749b085b3e07b README.db_testing
100644 blob 76b29f94cf815e0869c414d38d78d7ce08ec514e README.dev
040000 tree e1e10cecf948af0b93adb0372afc89f12e92618a bin
040000 tree 83e56d0beaf7793c77a45a345c80fcb8af503013 debian
040000 tree a34c9c4ba213f0cedc67f9816348d27955577af5 docs
100644 blob f2a6d32c6135aa7287bbd76167b01df2ae4f1539 requirements.txt
100755 blob eee147c36caf1bbc2d820da8dc026cb5b68180bc setup.py
040000 tree 224bb4c1f4c67fca1d160bfd2d06094e7e1abf3 sql
040000 tree 8631c9cd77bbe993168107ab5baf51f40c6300be swh
040000 tree 8fb905b56ba8ed692f1209b2773b474c6c1d66c1 utils
```

id: 515f00d44e92c65322aaa9bf3fa097c00ddb9c7d

SWHID computation: a worked example



Revisions

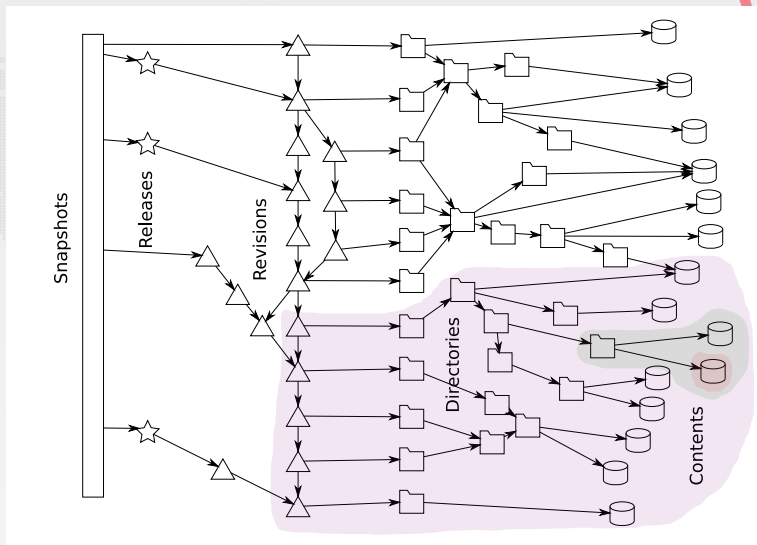
Details	Changes	Files
SHA: 963634dca6ba5dc37e3ee426ba091092c267f9f6		
Author: Nicolas Dandrimont <nicolas@dandrimont.eu> (Thu Sep 1 14:26:13 2016)		
Committer: Nicolas Dandrimont <nicolas@dandrimont.eu> (Thu Sep 1 14:26:13 2016)		
Subject: provenance.tasks: add the revision -> origin cache task		
Parent: fc3a8b59ca1df424d860f2c29ab07fee4dc35d10 : test...storage: properly pipeline origin and cont...		
provenance.tasks: add the revision -> origin cache task		
swf/storage/provenance/tasks.py  77		

tree [515f00d44e92c65322aaa9bf3fa097c00ddb9c7d](#)
parent [fc3a8b59ca1df424d860f2c29ab07fee4dc35d10](#)
author Nicolas Dandrimont <nicolas@dandrimont.eu> 1472732773 +0200
committer Nicolas Dandrimont <nicolas@dandrimont.eu> 1472732773 +0200

provenance.tasks: add the revision -> origin cache task

id: [963634dca6ba5dc37e3ee426ba091092c267f9f6](#)

SWHID computation: a worked example



Releases

tag v0.0.51
Tagger: Nicolas Dandrimont <nicolas@dandrimont.eu>
Date: Wed Aug 24 14:36:03 2016 +0200

Release swh.storage v0.0.51

- Add new metadata column to origin_visit
- Update swh-add-directory script for updated API [...]

commit c0c9f16b1e134f593e7567570a1761b156e6eb1d

object c0c9f16b1e134f593e7567570a1761b156e6eb1d
type commit
tag v0.0.51
tagger Nicolas Dandrimont <nicolas@dandrimont.eu> 1472042163 +0200

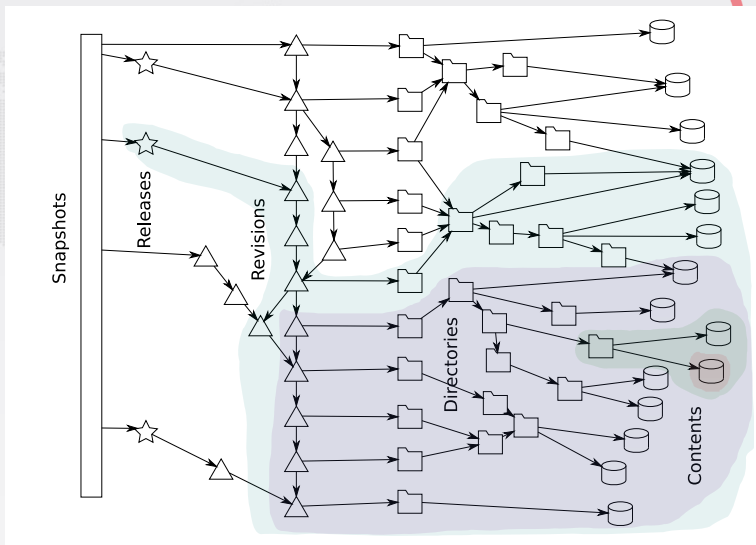
Release swh.storage v0.0.51

- Add new metadata column to origin_visit
- Update swh-add-directory script for updated API
- BEGIN PGP SIGNATURE-----

iQIzBAABCAADBDQJXvZTNFhxuaWNvbGFzQGRhbmRyaW1vbnQuZXUACgkQ7AWLMo2+
neqorw/aaq6SOb5DijzEa+kWN3rXgVS+1K1vEVh1wNKAwx8eKJ7aX2kEiLDtt7uf
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=kOxP
-----END PGP SIGNATURE-----

id: 85083a5cc14a441c89dea73f5bdf67c3f9c6afdb

SWHID computation: a worked example




git show-refs

Snapshots

```
commit 08ffeb25770109525eb3ce21691466c53a1d9158 refs/heads/atime
commit ba5443a24e3f9fe323a46c292cec4fcbe61c67eb refs/heads/directory-listing-arrays
commit d69e0dbf892383ff6589b27f1e1c05d27238d9c5 refs/heads/foo
commit cf7f9eea0eb22f8946908f5a8019f67de468e08 refs/heads/master
commit 7eca197fc66d2024047e54b1ed9e8b44361a0fc2 refs/heads/tmp-directory-add
commit 642a205f37de85005a85d427b53ee4fb2252e82e refs/heads/tmp/generic-releases
tag 20f043b1379cf768d966597799fd4907c757f755 refs/tags/v0.0.1
tag 72a21991a384e539996dbb867bfb0bee72aee2cd refs/tags/v0.0.10
tag 3590e0ca0ebb070e5b376705fa230bbfa4ffa5cc refs/tags/v0.0.11
tag 33378427a403ba569a67777b8d58f6674fbc6556 refs/tags/v0.0.12
tag 06f74652755b327cf590311c2bfa036cf3b4b35d refs/tags/v0.0.13
tag 5a6325fe86ab854b581d7442667d92a11e32f3bd refs/tags/v0.0.14
tag 586fba4e580b4f5fab05f599367643c3cb1a9c7f refs/tags/v0.0.15
tag 8cd8b885f4098bf363177742bd289f660e5be51c refs/tags/v0.0.16
tag a542444ee3f0fbed35efb202fee035c809abc7d6 refs/tags/v0.0.17
tag 228a2f1650dd12222e556559462e1e06fc4993d9 refs/tags/v0.0.18
tag 606979a4ca05d497fc0d24aad0dce82636ef47c refs/tags/v0.0.19
tag 32bf5a59fc2a323baa6d5f15a6ad5382ec275a67 refs/tags/v0.0.2
tag 3147c3d31ec46cf6492f881e908b1237ebdff2c7 refs/tags/v0.0.20
tag 215ea50dab11e082e0b72e76eb4b6073a87908 refs/tags/v0.0.21
tag 3fb168c2072a5d6252124257a1e5dfc0f5ffa1df refs/tags/v0.0.22
tag 8cdbee8da4d73fc5d262789e460a16ac3c72aba4 refs/tags/v0.0.23
...
```

id: b464cad1b66fff266a37b46ea6e7a04b545e904b

- 
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First step: the name of the game

Origin of the SWHID acronym

SWHIDs were born as

- intrinsic identifiers
- designed for
 - *software source code*
 - archived in [Software Heritage](#)

Hence the acronym:

SW Software
H Heritage
ID Identifier

Proposed reformulation

SWHIDs are

- based on a *cryptographic hash*
- can be used *independently of the Software Heritage Archive*,
- *not restricted to source code*

Hence the proposal:

SW Software
H Heritage Hash
ID Identifier

Setting the stage

Our goal

Create a *specification* that

- is *complete*, *precise* and *non ambiguous* (pictures are *simplified representations*!)
- allows any "person skilled in the art" to implement *the same calculation algorithm*

To this end we need to get right:

- five key parts in the core: *cnt*, *dir*, *rel*, *rev*, *snp*
- qualifiers: easier, but important too
- reference to external standards used (e.g. SHA algorithm)

What we have

- [high level documentation](#) from Software Heritage
- two complete implementations ([one in Python](#) for SWH, [one in OCaml](#) for Opam)
- a [draft specification](#) that needs to be completed

Governance and License

Bylaws

Detailed in the [Governance Document](#)

- consensus based decision making
- open process to produce an Approved Specification

License

[specification](#) [Community Specification License](#)

[contributions](#) [specific CLA](#) accepted by sign-off on GitHub

Coordination by the [Core Team](#)

[Alexios Zavras](#), [Jean-François Abramatic](#), [Morane Gruenpeter](#),
[Roberto Di Cosmo](#), [Stefano Zacchioli](#)

Roles: [maintainers](#), [editors](#)

Documents, collaboration tools and workflow

Specification document

sources [GitHub repository https://github.com/swhid/specification](https://github.com/swhid/specification)
rendered [swhid.org website](https://swhid.org)

Working on the specification

- **contribution workflow** based on *issues* and *pull requests* on GitHub
 - N.B: pull requests *must be signed-off*
- editors *merge* pull requests *on consensus*
- merges *rebuild* the **rendered version on swhid.org**

Mailing list: swhid-discuss

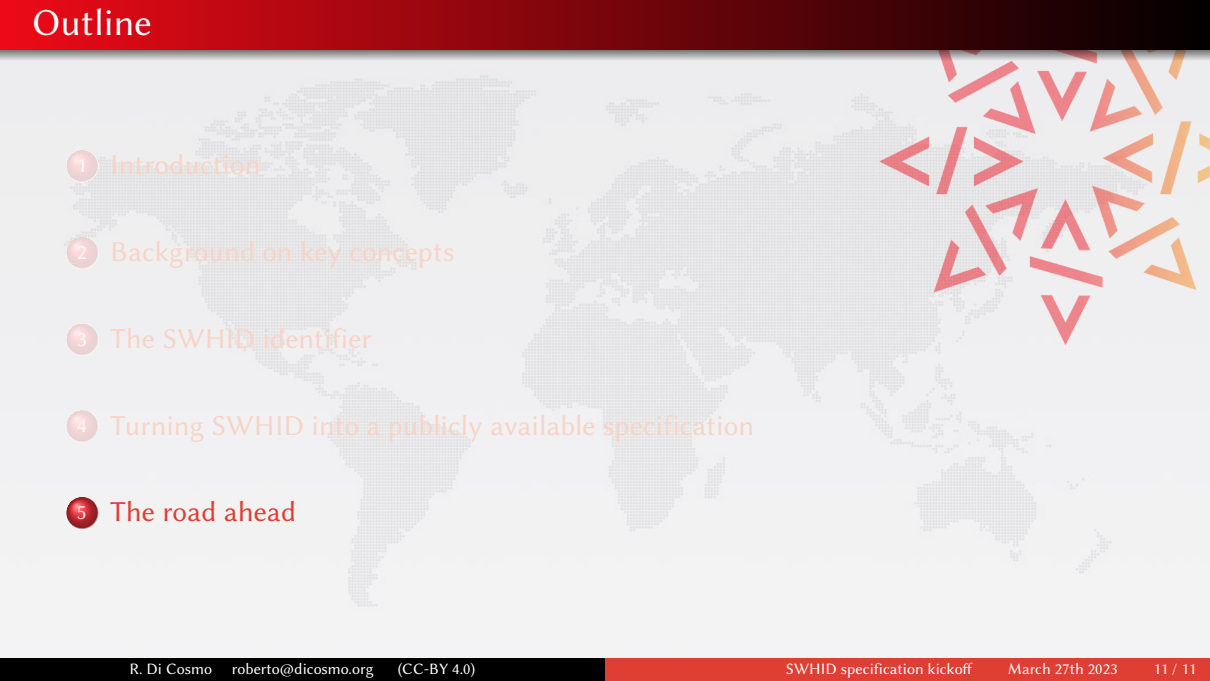
used mostly for coordination by the editors
(e.g. scheduling meeting, votes, version freeze, etc.)

Working with issues and pull requests

- the directory SWHID
 - [issue](#)
 - [pull request](#)

Taking a vote

- the name of the game poll is open at <https://bit.ly/swhid-name-poll>

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Timeline

- **phase 1** complete and accurate v1.0 as soon as possible (end of April desirable)
 - help establish the whole process
 - cover *only* what is already known and being used
 - focus on items labeled **blocker**, make them *complete, precise and non ambiguous*
- **phase 2** work towards v1.1
 - handle other feedback / input / requests
 - get the version candidate to become an ISO standard

Questions?

Links

- main entry point: <https://swhid.org>
- specification sources: <https://github.com/swhid/specification>