GHC development flow

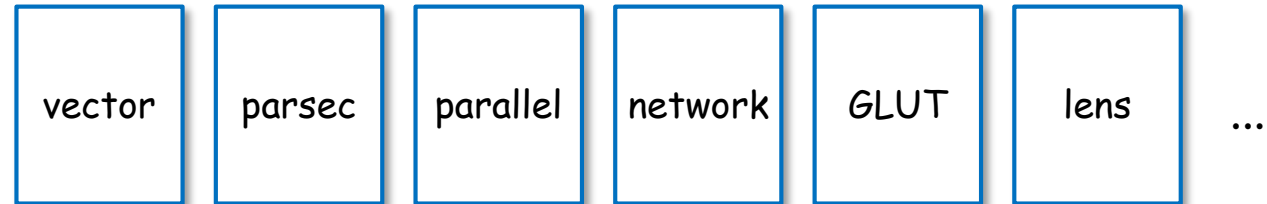*walking guide for new contributors*

Takenobu T.

WIP

NOTE
 - This is not an official document by the ghc development team.
 - Please refer to the official documents in detail.
 - This information is current as of Nov, 2016.
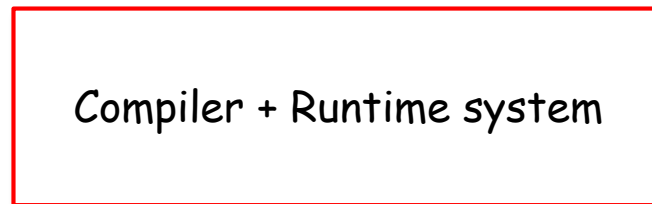
Overall relationship
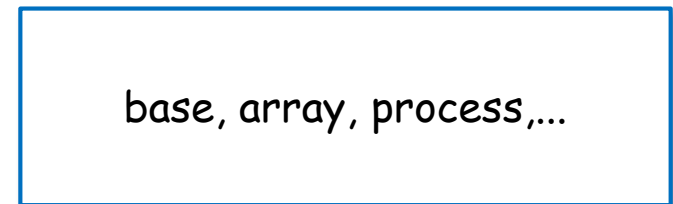
Development layers

Haskell packages

| vector | parsec | parallel | network | GLUT | lens | ... |

GHC compiler
+ Core Libraries

GHC compiler

Compiler + Runtime system

Main ML : ghc-devs at haskell.org [1]
Steering by GHC Committee [2]

Haskell Core Libraries

base, array, process,...

Main ML : libraries at haskell.org [3]
Steering by Core Libraries Committee [4]

Haskell Language

Language Report

Haskell 98, Haskell 2010,
Haskell 2020
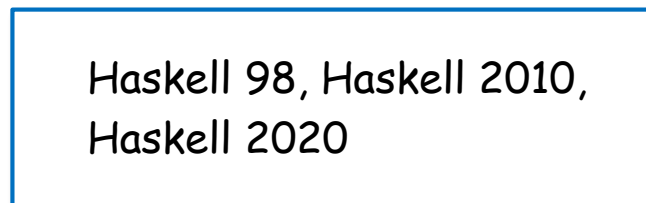
Main ML : haskell-prime at haskell.org [5]
Steering by Haskell 2020 Committee [6]

GHC compiler development flow

GHC compiler development flow (overview)

report the bug [8]   fix the bug [9]   add the feature [10][11]   create and update pages   construct and maintain infra

report

proposal

committer [7]

code development

release management [12]

wiki pages [13]

infra-structure tools [14]
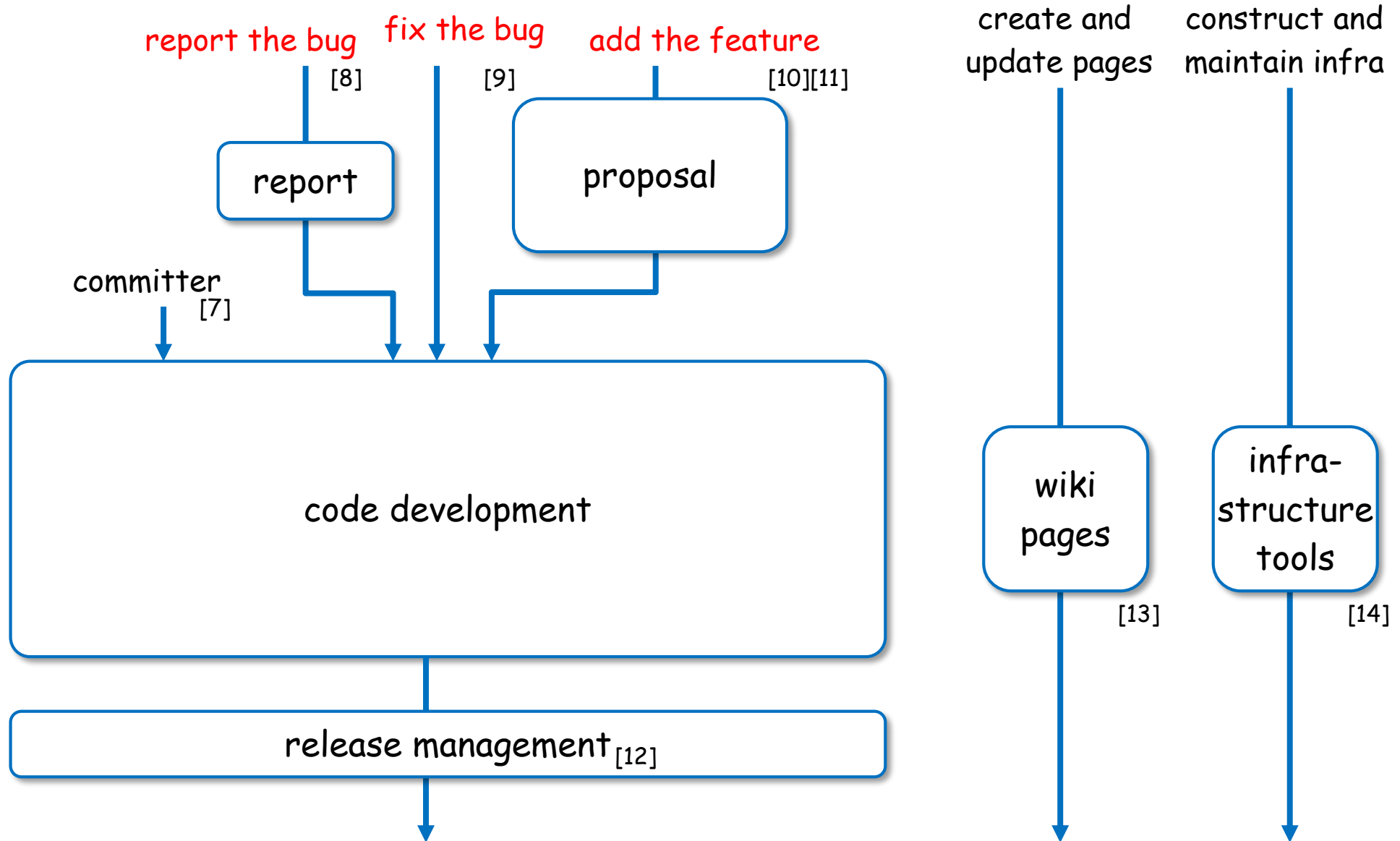
GHC compiler code development flow

report the bug   fix the bug   add the feature

report [8]

proposal [10][11]

committer

direct commit

patch flow [9]

github PR flow

Under discussion

release management

create the ticket

[8][15]   ticket
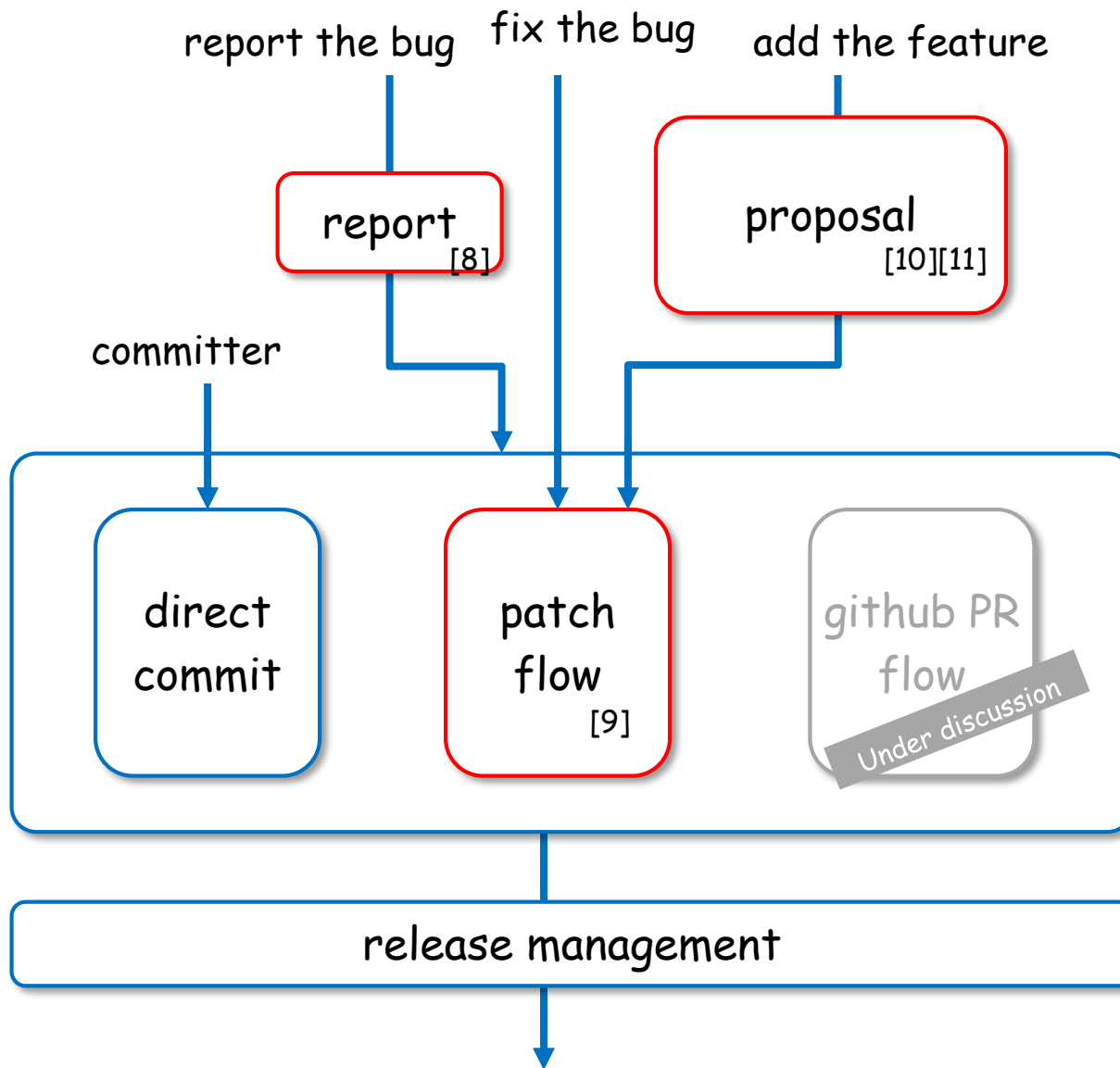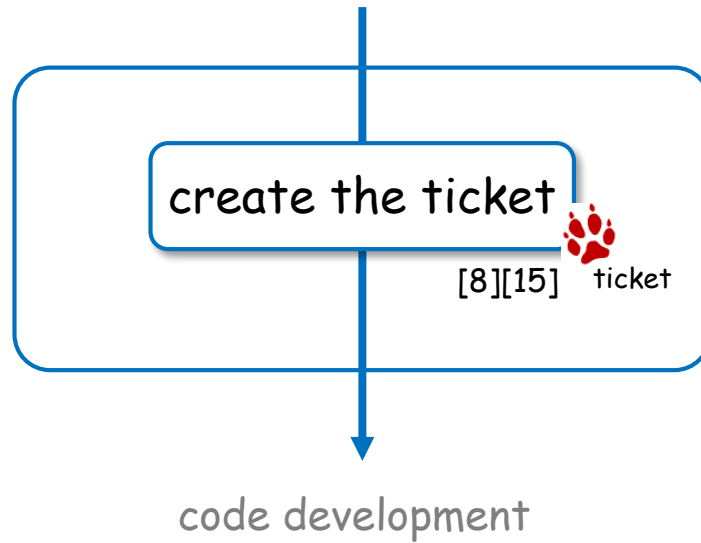
code development

[1]
Please consult ghc-devs ML if you worry.

Various ticket states of trac [15] ticket

create a ticket

New — The ticket is waiting for someone to look at it and/or discussion is underway on how to fix the issue.

acquire ownership
(set "Owner" field")

Assigned — Someone has said they are working on fixing the issue.

create a patch and request review
(set "Differential Rev(s)" field")

Patch — There is a patch to fix the issue that is awaiting review.

patch

merge the patch to target branches

Marge — A patch fixing the issue is present in the `master` branch and we are considering backporting it to the stable branch.

patch
master

resolved
(set "Milestone" field")

Closed — As of the release listed in the "Milestone" field the bug is considered resolved.

Proposal flow

traditional process on trac [10]

- write the proposal — wiki
- create the ticket — ticket
- discussion
- update the ticket — ticket
- wait for approval — ticket

ghc-proposals process on github [11]

NEW

- write the proposal
- pull request
- discussion
- revise proposal
- request review by steering committee
- wait for approval
- create the ticket — ticket

code development

Please refer to the documentation in details.

Patch flow

```
                    [9]
┌─────────────────────────┐
│  ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐  │
│  │ create the ticket │  │ [15]
│  └ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘  │ ticket
│  ┌───────────────────┐  │
│  │   add a test case │  │ [16]
│  └───────────────────┘  │
│  ┌───────────────────┐  │
│  │     fix the bug   │  │ [17]
│  └───────────────────┘  │
│  ┌───────────────────┐  │
│  │     validation    │  │
│  └───────────────────┘  │
│  ┌───────────────────┐  │
│  │    code review    │  │ [18]
│  └───────────────────┘  │
│  ┌───────────────────┐  │
│  │ update the ticket │  │ ticket
│  └───────────────────┘  │
│  ┌───────────────────┐  │
│  │   wait for review │  │
│  └───────────────────┘  │
│  ┌───────────────────┐  │
│  │  wait for release │  │
│  └───────────────────┘  │
└─────────────────────────┘
```
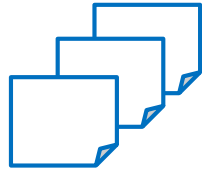
release management
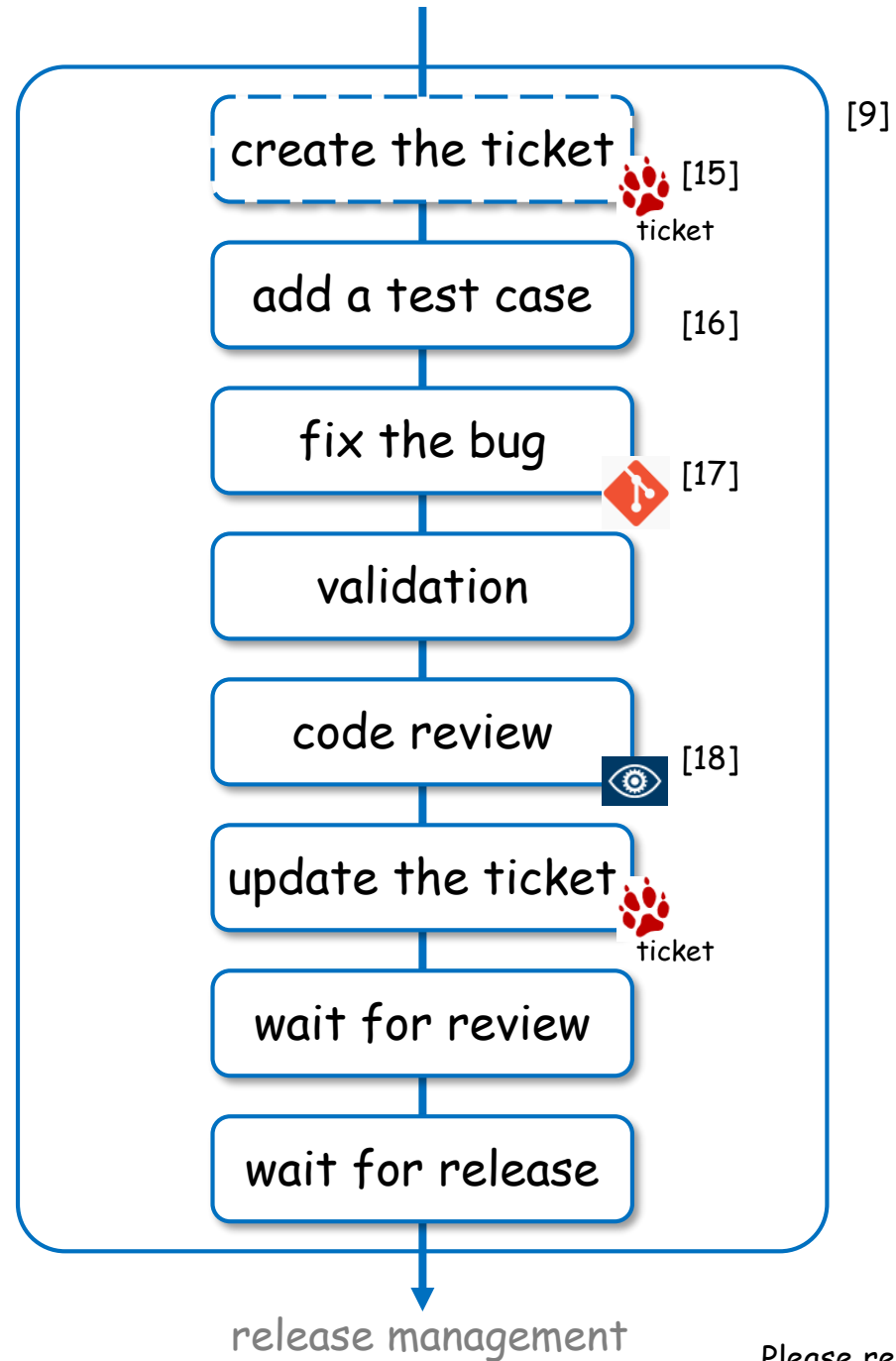
Please refer to the documentation in details.

Document development flow
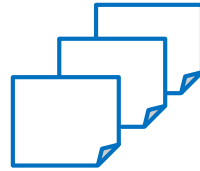
Various documents

Haskell

Haskell wiki
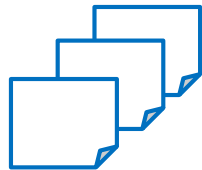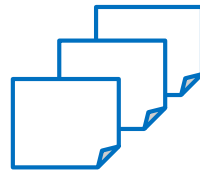
wiki.haskell.org

Hackage documents

hackage.haskell.org

...

GHC

Trac wiki (GHC wiki)

ghc.haskell.org/trac/ghc/wiki

[13]

about GHC's implementation
* how GHC works
* how to modify it

The GHC users guide

downloads.haskell.org/~ghc/
latest/docs/html/users_guide

[28]

Core Libraries documents

downloads.haskell.org/~ghc/
latest/docs/html/libraries

[30]

...

Document development of GHC
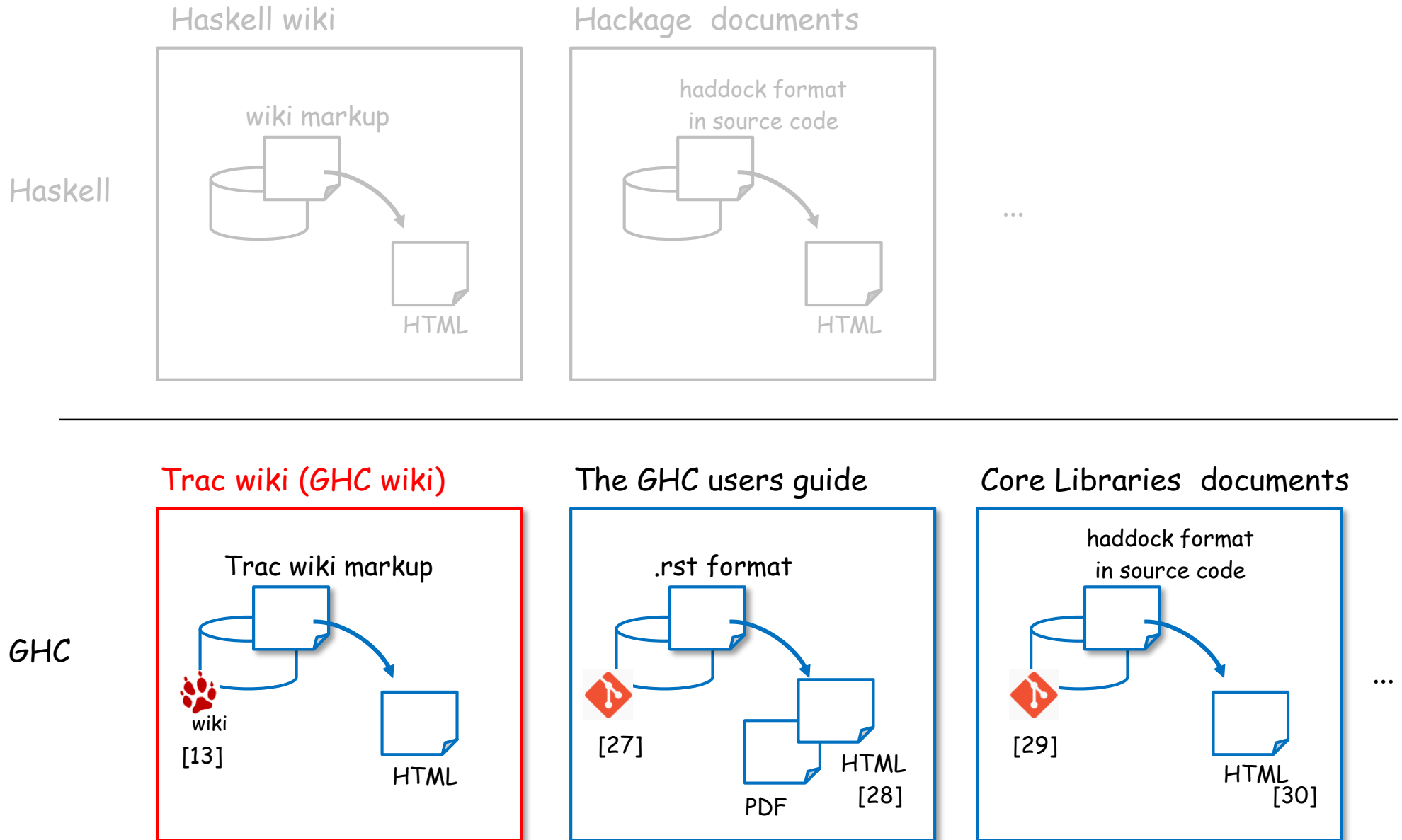
Trac wiki description flow [13]

wiki

[13][23][26]

register account [23]

log in [23]

create a page
page
[25][23][24]

update a page
page
[23][24]

There are no formal process to discuss or review.
Please consult ghc-devs ML if you worry. [1]

automated generation of HTML
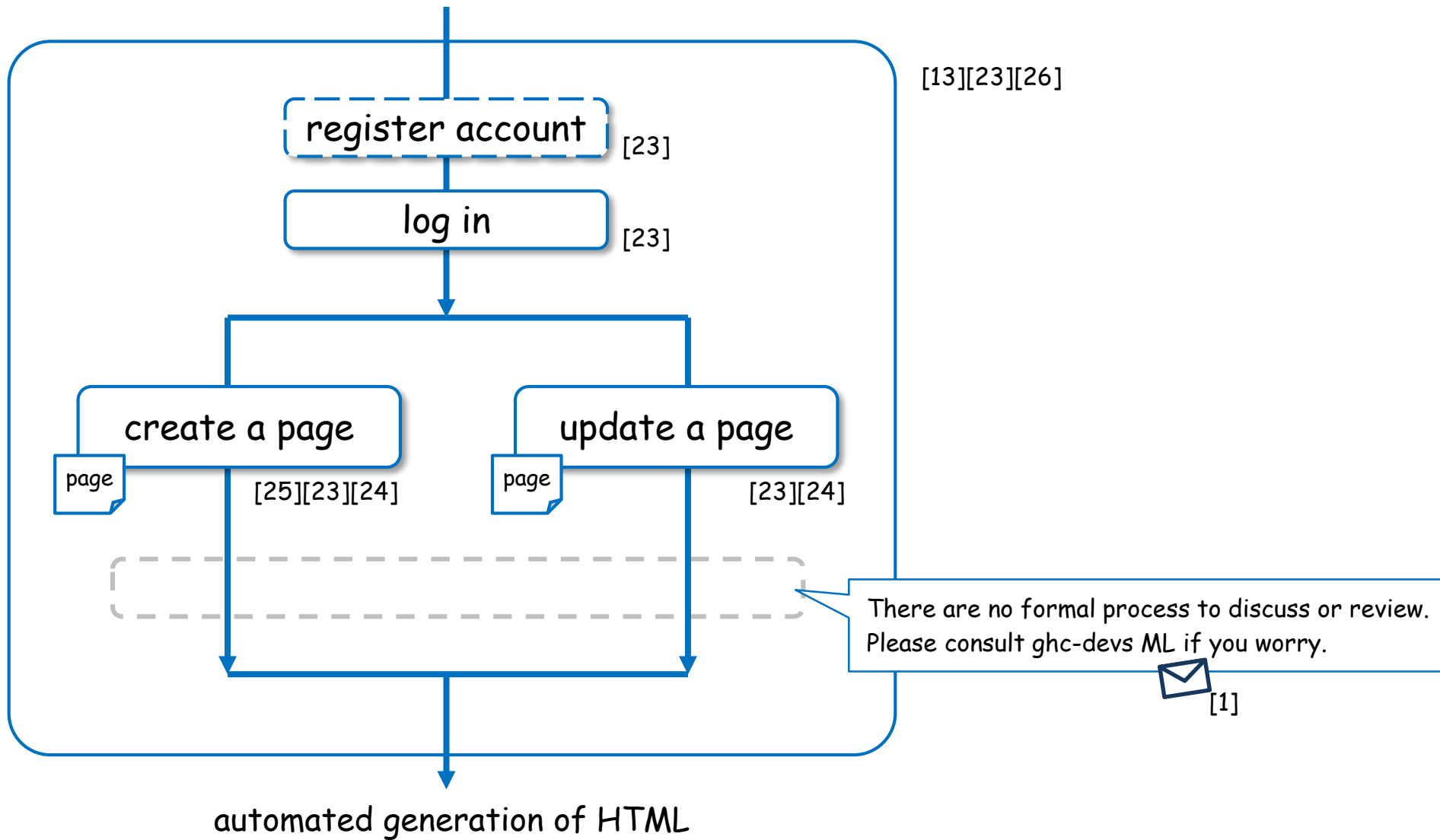
Infrastructure tools

Tool relation

communication

discussion

ghc-devs ML [1]

information

Trac (wiki) [13]
wiki

code management

issue tracking, discussion and PR

Github [11]

issue tracking and discussion

Trac (ticket) [15]
ticket

code review

Phabricator [18]

code repository

Git [17]

performance regression

Perf [22]

phabricator cli

Arcanist [18]

automated build

Harbormaster [19]

automated build

Travis [20]

various builds

GHC builder [21]

References

References

[1]   ghc-devs -- GHC development discussion
        https://mail.haskell.org/mailman/listinfo/ghc-devs

[2]   Call for Nominations: GHC Steering Committee
        https://ghc.haskell.org/trac/ghc/blog/steering-committee-cfn

[3]   Libraries -- Discussion about libraries for Haskell
        https://mail.haskell.org/cgi-bin/mailman/listinfo/libraries

[4]   Core Libraries Committee
        https://wiki.haskell.org/Core_Libraries_Committee

[5]   Haskell-prime -- Haskell' - A Haskell Standard Revision - discussion list
        https://mail.haskell.org/cgi-bin/mailman/listinfo/haskell-prime

[6]   Welcome to Haskell'
        https://prime.haskell.org

[7]   The Glasgow Haskell Team
        https://ghc.haskell.org/trac/ghc/wiki/TeamGHC

[8]   Reporting bugs in GHC
        https://ghc.haskell.org/trac/ghc/wiki/ReportABug

[9]   How to contribute a patch to GHC
        https://ghc.haskell.org/trac/ghc/wiki/WorkingConventions/FixingBugs

[10]   How to contribute a new feature to GHC
        https://ghc.haskell.org/trac/ghc/wiki/WorkingConventions/AddingFeatures

References

[11] GHC Proposals
      https://github.com/ghc-proposals/ghc-proposals

[12] Release management and branches
      https://ghc.haskell.org/trac/ghc/wiki/WorkingConventions/Releases

[13] Welcome to the GHC Developer Wiki
      https://ghc.haskell.org/trac/ghc/wiki

[14] Developer's Infrastructure
      https://ghc.haskell.org/trac/ghc/wiki/Infrastructure

[15] The Bug Tracker
      https://ghc.haskell.org/trac/ghc/wiki/WorkingConventions/BugTracker

[16] Adding new test cases
      https://ghc.haskell.org/trac/ghc/wiki/Building/RunningTests/Adding

[17] Using git with GHC
      https://ghc.haskell.org/trac/ghc/wiki/WorkingConventions/Git

[18] Using Phabricator for GHC development
      https://ghc.haskell.org/trac/ghc/wiki/Phabricator

[19] Harbormaster: continuous integration & patch building for GHC
      https://ghc.haskell.org/trac/ghc/wiki/Phabricator/Harbormaster

[20] Travis
      https://ghc.haskell.org/trac/ghc/wiki/Travis

References

[21]   The GHC Builder
         https://ghc.haskell.org/trac/ghc/wiki/Builder

[22]   perf
         https://perf.haskell.org/ghc

References

[23]   Notes on Trac Wiki formatting
        https://ghc.haskell.org/trac/ghc/wiki/TracWikiMisc

[24]   WikiFormatting
        https://ghc.haskell.org/trac/ghc/wiki/WikiFormatting

[25]   Steps to Add a New Wiki Page
        https://ghc.haskell.org/trac/ghc/wiki/WikiNewPage

[26]   The Trac Wiki System
        https://ghc.haskell.org/trac/ghc/wiki/TracWiki

[27]   source:ghc/docs/users_guide
        https://ghc.haskell.org/trac/ghc/browser/ghc/docs/users_guide

[28]   Glasgow Haskell Compiler Users Guide
        https://downloads.haskell.org/~ghc/latest/docs/html/users_guide

[29]   source:ghc/libraries
        https://ghc.haskell.org/trac/ghc/browser/ghc/libraries

[30]   Haskell Hierarchical Libraries
        https://downloads.haskell.org/~ghc/latest/docs/html/libraries

References

See also

[31]   Working on GHC
         https://ghc.haskell.org/trac/ghc/wiki/WorkingConventions

[32]   Resources for newcomers to GHC
         https://ghc.haskell.org/trac/ghc/wiki/Newcomers

[33]   Haskell :: Reddit
         https://www.reddit.com/r/haskell

[34]   IRC Channels
         https://www.haskell.org/irc
         http://ircbrowse.net/ghc