COQ DEVELOPMENT TEAM SESSION

Coq Development Team
CoqPL 2022
Online
January 22nd, 2022
OUTLINE

1. Coq 8.14 and Coq 8.15
2. Coq Platforms
3. Coq Future
4. Q & A
Coq Releases Schedule

- **April 2021**: Coq Platform 2021.02.1 (8.13.2) release
- **July 2021**: 8.14 Feature freeze
- **October 2021**: 8.14.0 release
- **December 2021**: 8.14.1 release
- **January 2022**: 8.15.0 release
Coq 8.14 Features

https://coq.inria.fr/refman/changes.html#version-8-14

- Change of the case representation: more efficient and closer to user-level syntax. Fixes an incompleteness bug in the type-checking of cumulative inductive types leading to a subject reduction failure (proof in MetaCoq)

- Separate coqnative binary for native compilation

- Improvements to typeclasses, canonical structure resolution and notations

- Removal of omega replaced by lia

- Ltac2 APIs for manipulating inductive types and pretty-printing

- Standard library improvements, notably a new Sint63 module for primitive signed integers.
Coq 8.15 Features

https://coq.inria.fr/refman/changes.html#version-8-15

- Fix **apply with** w.r.t. renaming of arguments
- **auto** tactics: Hint Unfold fixed, use discrimination nets consistently
- Typeclass resolution handles stuck constraints depending on mode declarations and uses a **best effort** mode resulting in more palatable error messages (not showing constraints that can be solved)
- More consistent **locality** attribute support.
- **Import** now allows selective import of names and components (e.g. notations, hints) from a library/module.
- A **visual Ltac debugger** is now available in CoqIDE
The *github.com/coq/platform* project

A coherent *distribution* of Coq packages

Main objectives: easy, standard, tested

Output:

- Scripts to setup/install on Win, OSX, Linux
- Binary installers for Win, Linux (snap), OSX
- Customizable! Just choose a package list (e.g. for lectures)

[Coq Platform Charter by Michael Soegtrop](#)
The release process

Coq is now released in the platform

(about one month after the package release on github)

**user**: look at the platform installers/scripts

**library dev**: test against the platform

**platform package dev**: we will ask you “please tag”

**plugin dev**: put your plugin in Coq’s CI

CEP#52 Release process for Coq 8.14 by Enrico Tassi
Coq Platform 2021.02.1

Coq 8.12.1 +

unicoq
menhir
mathcomp-
interval
vst
hierarchy-builder
flocq
hott
bignums
coquelicot
equations
menhirlib
simple-io
compcert
Coq Platform 2021.09.0

Coq 8.13.2 +

Alternatives:

Coq 8.14.0 + beta set of packages

Coq 8.14.0 + Visual Ltac Debugger preview

Coq 8.13.2 with previous package pick, Coq 8.12.2 to help porting
Coq Platform 2022.01.0

Coq 8.14.1 +

Alternatives:
- Coq 8.15.0 + beta set of packages
- Coq 8.13.2 + full packages
Coq Future

- **UI** support (M. Dénès, E. Tassi, G. Gilbert, E J-G. Arias)

- Improved **Ltac2** support (P. M. Pédrot, G. Gilbert)

- **Rewrite** rules (T. Winterhalter, CEP PR#50)

- Support for **inductive-inductive** types (M. Sozeau, PR #12464)

- Deep “small-inversion” in pattern-matching compilation (H. Herbelin, T. Martinez, M. Lenon-Bertrand, J.-F. Monin)

- **Eta**-reduction and **contravariant** subtyping (H. Herbelin, M. Sozeau, CEP #47)

- **Is Sized Typing for Coq Practical?** (Chan, Li & Bowman)
Development news

- Bug minimizer integrated in CI by J. Gross
- Docker Images for CI maintained by Erik Martin-Dorel
- Coq-community project: https://github.com/coq-community
- Day-to-day communication: https://coq.zulipchat.com
- Discourse forum: https://coq.discourse.group
- Coq Team webpage: https://coq.inria.fr/coq-team
- Upcoming survey

Coq Winter Hackaton 2022: online on February 15th-17th.
Q & A Time!
Coq 8.13 Features (January 2021)

https://coq.inria.fr/refman/changes.html#version-8-13

- Primitive **persistent array** type
- UIP for equality in SProp (with a caveat)
- Improvements of notations, implicit argument handling
- More consistent grammars in the reference manual, matching the implementation
- lia and zify enhancements to support boolean operators and the signed integers
Upgrading to 8.13 - Warnings

• Hint ... raises a **warning** if no locality attribute is given

  [Migration HowTo (by Pierre Marie Pédrot)](https://youtu.be/RLRNtkpExY) for the CoqPL 2021 explanation :-)

• Notation selection, more specific notation first
  - specific = matches a larger term
  - order of `Import` matters, most recent wins
The coq-native OPAM package

- lazy < vm_compute < **native_compute**
  - $\lambda$-terms compiled using ocamlopt
  - Interesting to run reflexive tactics

- CEP#48 by Erik Martin Dorel & Pierre Roux
  - **opt in:** opam install coq-native
  - warning: requires more memory/time to compile .vo