Rodin 3.10 and its plug-ins

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Introduction

- a new version of Rodin is released each year
- this year's version: 3.10, soon to be released
- overview of new features and bugs fixed
- we have also updated several older plug-ins
- development is supported by the French ANR project Event-B Rodin Plus (EBRP, ANR-19-CE25-0010)

New manual proof rules

- rewrite rule for direct product:
  $(f \otimes g)(x) \equiv f(x) \mapsto g(x)$
- rewrite rule for parallel product:
  $(f \| g)(x) \equiv f(prj1(x)) \mapsto g(prj2(x))$
- inference rule on bounds of upto:
  deduces $a = c \wedge b = d$ from $a \,..\, b \mathrel{=} c \,..\, d$, provided that $a \leq b$

Abstract expression extensions

Abstract expression has been extended with pattern matching:

- with maplets: $a \mapsto b = e$
- with a constructor when the datatype only has one
  (to deconstruct record-like datatypes)

Datatype constructor typing

Reminder: inductive datatypes are implemented in Rodin Core, even though they are only usable through the Theory plug-in.

Datatypes were unusable if all type parameters could not be deduced from each constructor.
Example:

$$\mathrm{Either}(A, B) = \mathrm{Left}(a \otimes A) \mid \mathrm{Right}(b \otimes B)$$

B could not be deduced from Left(0), etc.

Now, one can use *oftype*, e.g.:

$$\mathrm{Left}(0) \otimes \mathrm{Either}(\mathbb{Z}, BOOL)$$

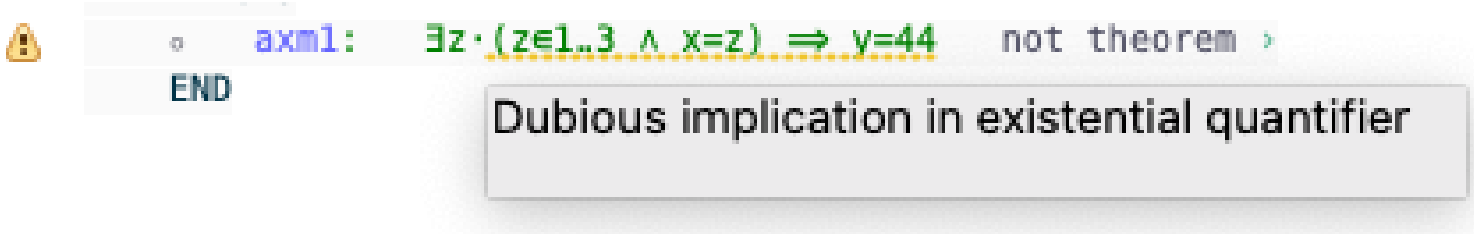
Breaking bug in translation of datatypes

The "tradition" holds: Peter Riviere found another breaking bug in Rodin this year.

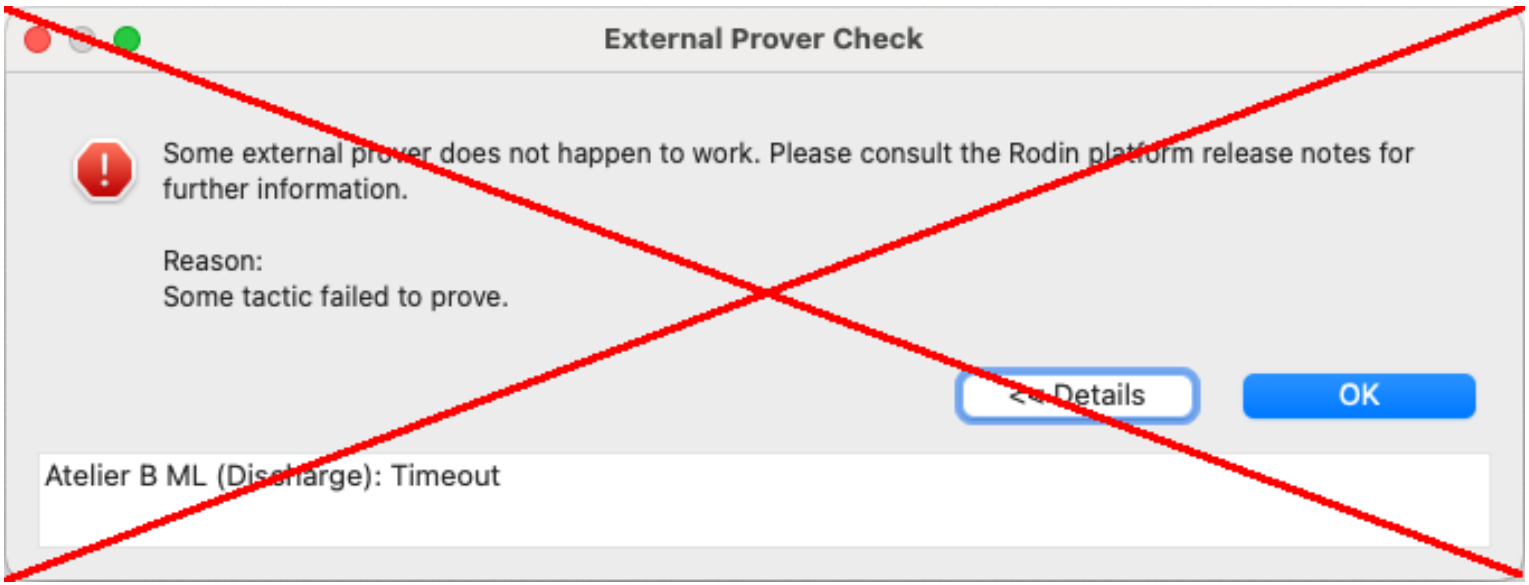
- the translation of datatypes for SMT provers was wrong
- should not affect many people: requires to use the Theory and SMT provers plug-ins and to manually add Alt-Ergo (which is not enabled by default)

Miscellaneous issues

- warning on existentials with implication:



- external provers check reworked



- unified behaviour of Proof Control history
- tactic profile dialog fixed

Atelier B plug-in

In collaboration with Clearsy, we released two new versions:

- version 2.4.0:
  - provers from Atelier B version 24.04.2
  - added Apple Silicon builds
- version 2.4.1:
  - fixed a breaking bug with some Chinese editions of Windows

SMT plug-in

The SMT provers plug-in is being updated:

- CVC4 updated from version 1.5 to 1.8
- Z3 updated from version 4.4.1 to 4.14.1
- CVC5 added (version 1.2.1)
- Apple Silicon builds in addition to 64-bit Intel ones

Should be released soon (along with Rodin 3.10), then Rodin and its most used plug-ins will work natively on Apple Silicon macs.

Compatibility updates

Although Eclipse and Rodin offer a very stable platform, some old plug-ins stopped working with recent Rodin releases.

We have updated and released:

- B2Latex (release 0.8)
- Renaming Refactory (release 1.4.0)
- Generic Instantiation (Soton) (release 1.1.0)

Conclusion

- Rodin is regularly updated
- we try to keep updated as many plug-ins as possible
- we still work on the Theory plug-in
- do not hesitate to report bugs or request new features on SourceForge or by email
- please test the release candidate of Rodin 3.10!

Thanks

Questions?