How to integrate Plug-ins with ProB

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Outline

- Project organization / Getting involved
- Current architecture
- Upcoming version
- Plan for the afternoon session

Prolog Sources

http://nightly.cobra.cs.uni-duesseldorf.de/source/

Index of /source

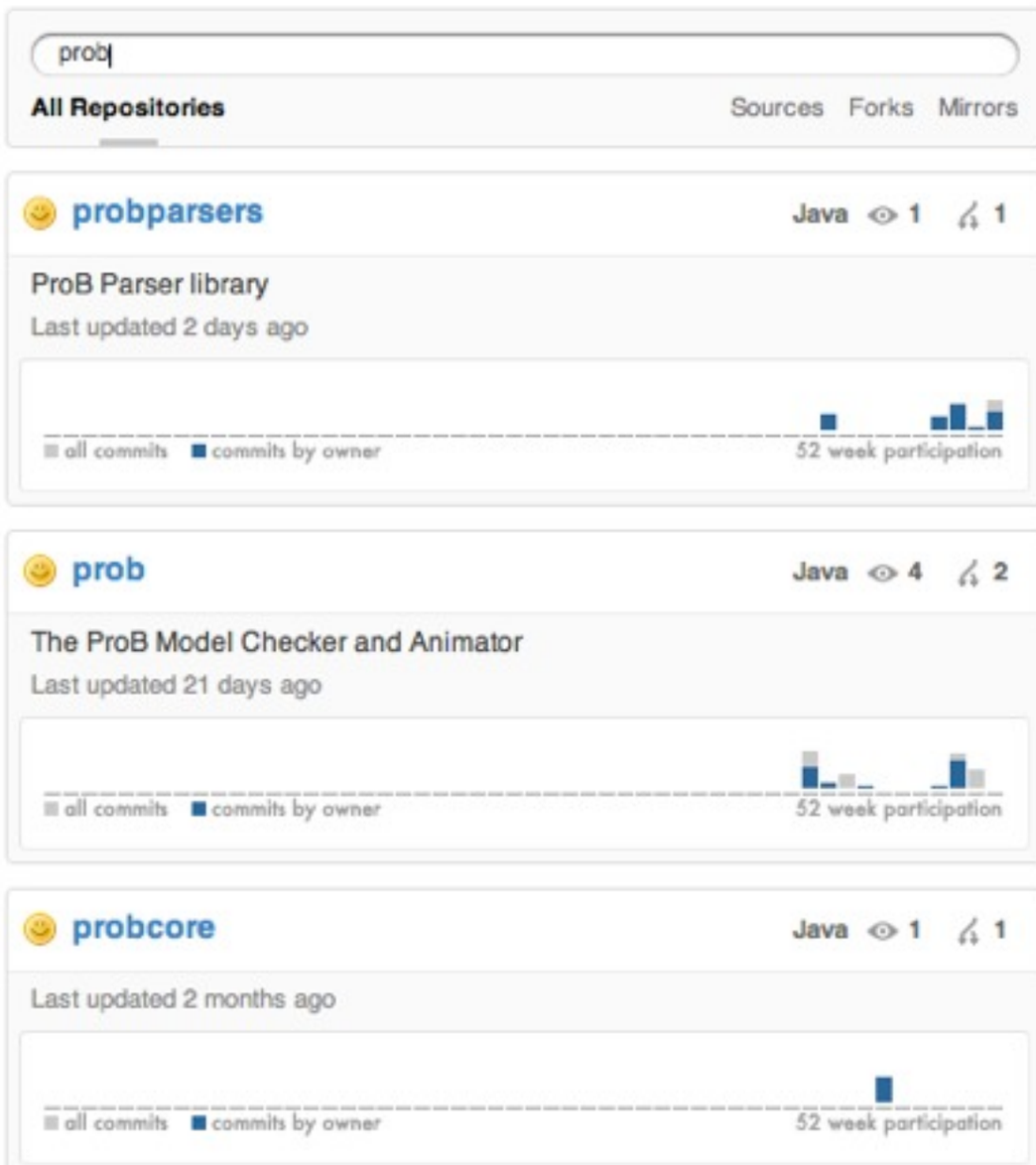
Name	Last modified	Size	Description
Parent Directory		-	
ProB_src.tgz	13-Feb-2012 16:03	21M	

Apache/2.2.14 (Ubuntu) Server at nightly.cobra.cs.uni-duesseldorf.de Port 80

- Building from source requires a Sicstus Prolog Licence.
- You can use our nightly builds:
  - http://nightly.cobra.cs.uni-duesseldorf.de/cli/ (console version)
  - http://nightly.cobra.cs.uni-duesseldorf.de/tcl/ (tcl/tk version)
- Build process: Build tcl version, if it succeeds release the sources

Java Sources

http://github.com/bendisposto



Parser Libraries

Current ProB plug-in

ProB 2.0 core

prob

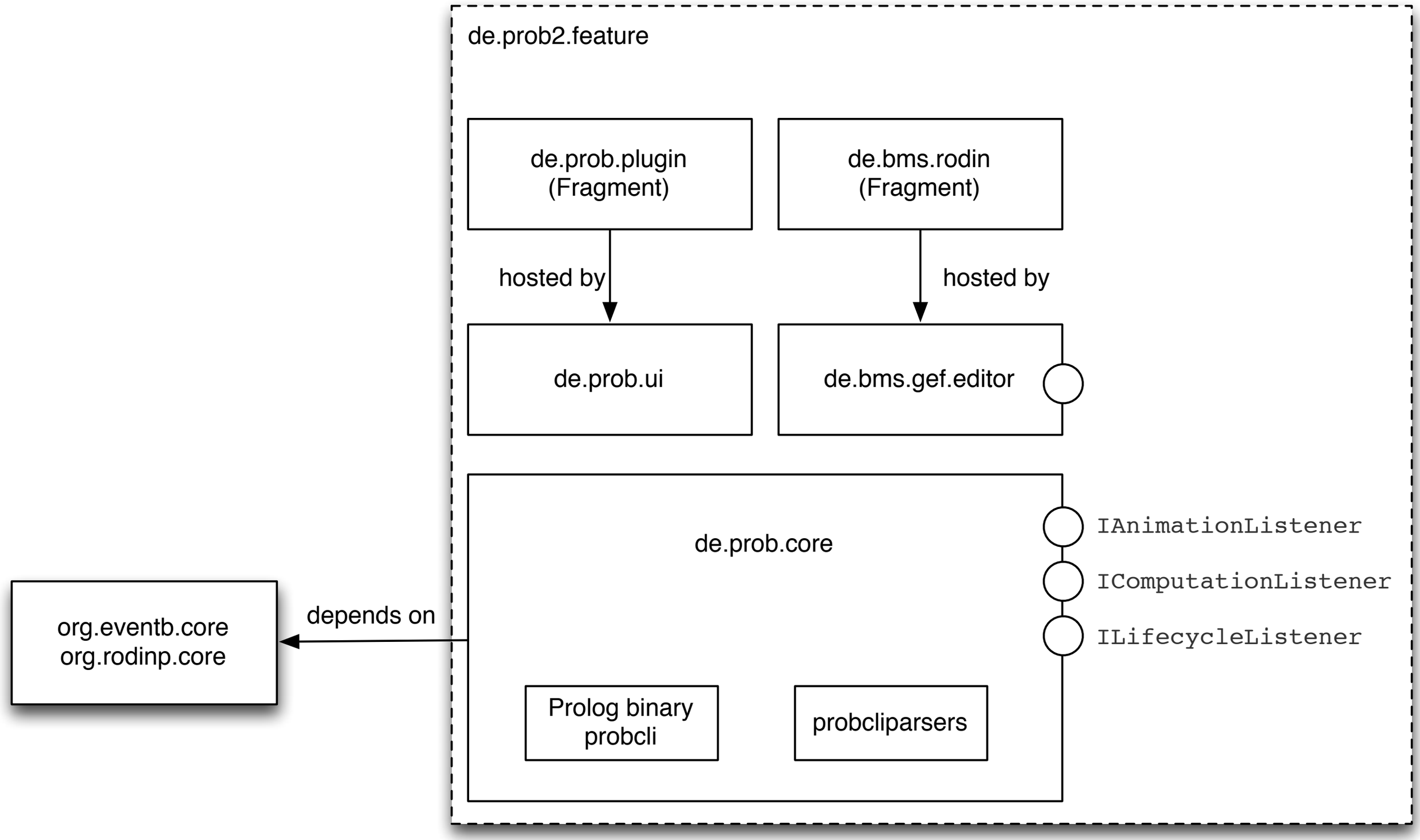
prob /

name
de.bmotionstudio.gef.editor
de.bmotionstudio.rodin
de.prob.core
de.prob.plugin
de.prob.ui
de.prob.update_site
de.prob2.feature
.gitignore
README.md
epl-v10.html

B-Motion Studio

ProB Plug-in

Metadata


de.prob2.feature
de.prob.plugin
(Fragment)
de.bms.rodin
(Fragment)
hosted by
hosted by
de.prob.ui
de.bms.gef.editor
de.prob.core
IAnimationListener
IComputationListener
ILifecycleListener
org.eventb.core
org.rodinp.core
depends on
Prolog binary
probcli
probcliparsers

Using ProB in your tool

- No particular extension mechanism for the UI
- Except for the usual Eclipse mechanisms
  - You can add toolbar buttons, context menus, ...
  - or even disable/replace existing implementation
- Reuse of existing view is simple (via part id)

de.prob.core

- `Animator a = Animator.getAnimator()`
  - Will transparently start a new animator if neccessary
  - Otherwise it returns a singleton instance of the Animator
- `a.execute(someCommand);`
  - executes the command
  - catches and reports errors from Prolog
  - stores results inside the command object
  - never reuse a command instance!

Commands

- A command encapsulates a query to the Prolog core and its result

```
public interface IComposableCommand {

  void writeCommand(IPrologTermOutput pto)
       throws CommandException;

  void processResult(ISimplifiedROMap<String, PrologTerm> bindings)
       throws CommandException;
}
```

Commands

- Assume we want to call the foo/3 Prolog Predicate
- The first argument is a number and Prolog will return values for the other arguments

```
| ?- foo(1,X,Y).
X = bar,
Y = baz ? ;
no
```

Foo Command

```
public class FooCommand implements IComposableCommand {

  void writeCommand(IPrologTermOutput pto) { // foo(1,X,Y)
     pto.openTerm("foo").printNumber(1).printVariable("X").print
     Variable("Y").closeTerm();
   }

  void processResult(ISimplifiedROMap<String, PrologTerm> b) {
     CompoundPrologTerm x = (CompoundPrologTerm) b.get("X");
     System.out.println(x.getFunctor()); // bar
  }
}
```

IntegerPrologTerm	numbers (Java BigInteger)
CompoundPrologTerm	functor with some arguments (atoms = no args)
ListPrologTerm	Prolog Lists (implements Java List interface)
VariablePrologTerm	must not occur in answers

Mesh-ups

- Implementing new commands is most likely a job for the Düsseldorf team
- But most of the time new Commands are not required
- Instead you write mesh-ups of existing commands

ExploreStateCommand

```
public final class ExploreStateCommand implements IComposableCommand {

  public ExploreStateCommand(String stateID) {
     getOpsCmd = new GetEnabledOperationsCommand(stateId);
     checkInvCmd = new CheckInvariantStatusCommand(stateId);
     allCommands = new ComposedCommand(getOpsCmd, checkInvCmd);
  }

  public void processResult(ISimplifiedROMap<String, PrologTerm> b) {
     allCommands.processResult(b);
     invariantOk = checkInvCmd.getResult();
     enabledOperations = getOpsCmd.getEnabledOperations();
  }

  public void writeCommand(IPrologTermOutput pto){
     allCommands.writeCommand(pto);
  }

}
```

Recipe for Mesh-ups

- Instanciate the commands you want to call
- Stick them into a ComposedCommand
- Delegate writeCommand to the ComposedCommand
- processResult must call the ComposedCommand's processResult first
- Then get the results from the contained commands

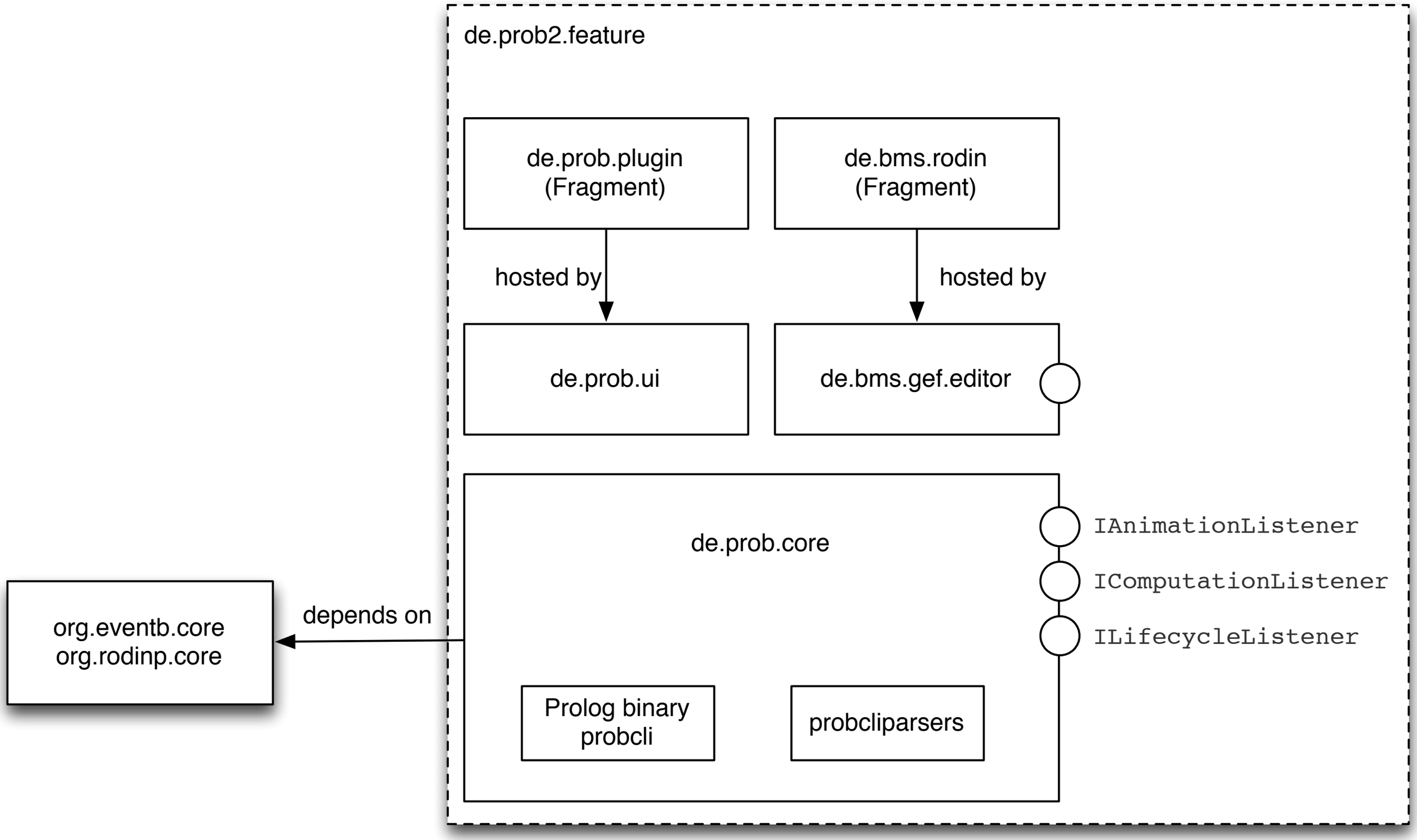
Static methods

- Most commands have static methods

```
public static State exploreState(Animator a, String id) {
        ExploreStateCommand command = new
                ExploreStateCommand(stateID);
        a.execute(command);
        return command.getState();
}
```

- The idea was to use the static methods as a "DSL"
- Be prepared that these methods will disapear in the future

ProB 2.0 ?


de.prob2.feature
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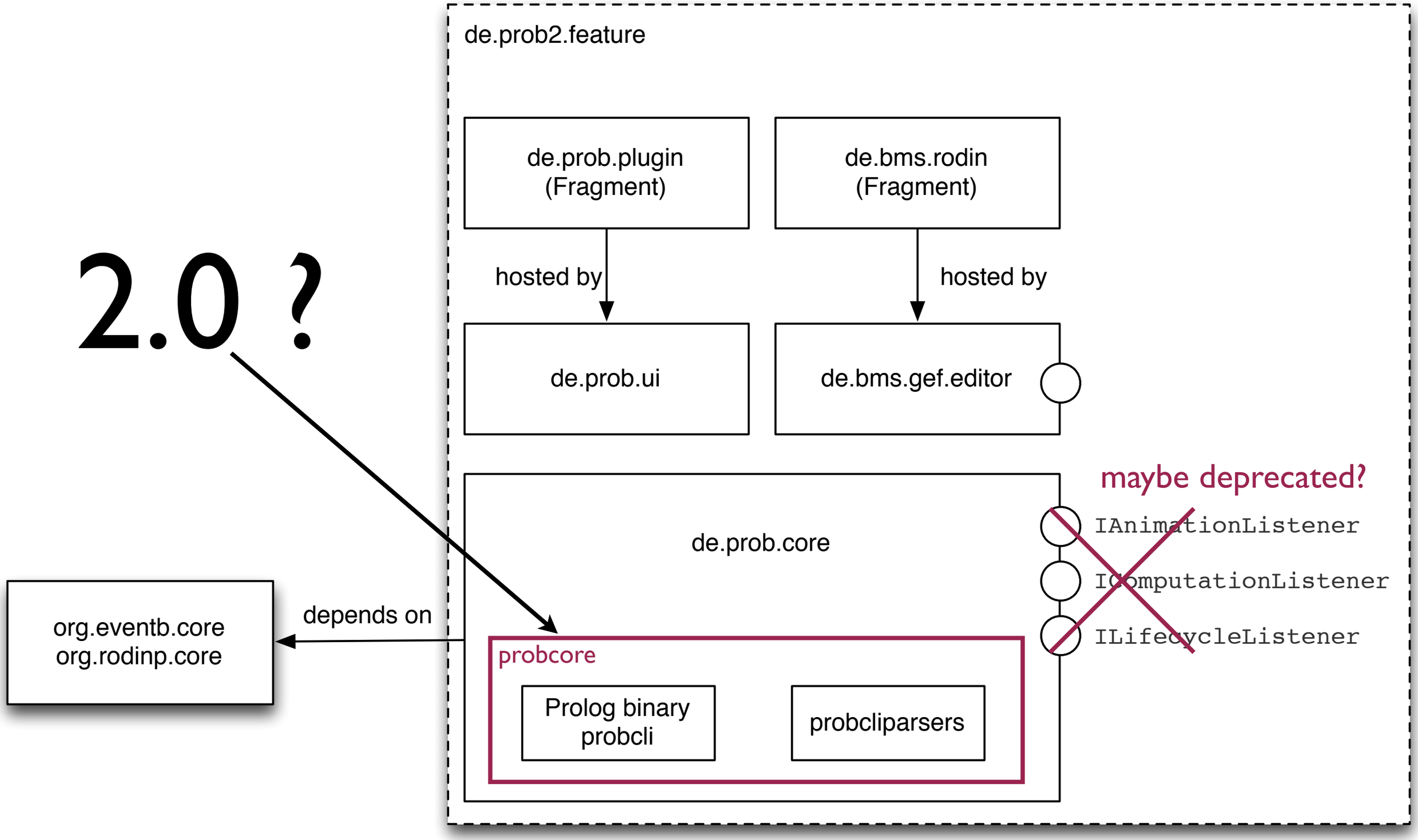

At this level of abstraction only minor changes

probcore

- Work in progress (on github: probcore)
- Features
  - Commandline version of ProB + REPL
  - Improved architecture
  - Embedded Groovy + internal ProB DSL
  - State Space Abstraction
  - Support for multiple languages (classical B, CSP, Z, ...)

ProB 2.0 UI

- Will use Eclipse 4.x
- Stand-alone version, but we reuse parts of the implementation for the Rodin plug-in
- The latest improvements will be automatically available in the Rodin plug-in
- Requirements document (draft): http://goo.gl/KS2bh

This afternoon

- Bring your own problem
  Backup plan: Hands-on session
  (http://www.stups.uni-duesseldorf.de/ProB/developer_tutorial/)
- Discussion on ProB 2.0 requirements