

Instructions for Potential Attendees of the Bucharest DEPLOY 2-day course (July 14th – July 16th, 2010)

Stefan Hallerstede and Thai Son Hoang

6 July 2010

This document should be forwarded to all potential attendees of the Bucharest DEPLOY 2-day course from July 14th to July 16th.

1 Pre-reading Material

The following documents are available from the DEPLOY repository at the following address <http://deploy-eprints.ecs.soton.ac.uk/234/>. They are material associated with Jean-Raymond Abrial's recently published book - *Modelling in Event-B: System and Software Engineering*.

- Chapter 1, *Introduction* (book chapter).
- Chapter 2, *Controlling Cars on a Bridge* (book chapter).
- Summary of the Mathematical Notation (slides and 4-up handout format).
- Summary of the Event-B Notation (slides and 4-up handout format).
- Summary of the Proof Obligations (slides and 4-up handout format).

These documents are available to you in advance as we expect you **TO READ THEM BEFORE COMING TO THE COURSE**.

The reason is that the course lasts only 2 days and we want to concentrate on its main purpose, namely: how to build MODELS of systems. For this to be efficient, we shall suppose that you already have a certain understanding of the various Event-B features.

2 How to Read these Documents

The summary documents (*mathematical notation*, *Event-B notation*, and *proof obligations*) take the form of a number of slides: We thought that, under this form, it was the best way for you to have a quick view of their contents.

We suggest you “read” the documents in the following order: *Introduction*, *mathematical notation*, *Event-B notation*, *proof obligations*, then *Controlling Cars on a Bridge*. The first two documents, i.e. *introduction* and *mathematical notation* are indispensable for our 2-day training.

The “Introduction” is the first chapter of Jean-Raymond Abrial's book hence contains also the overview of the book. We suggest you to skip these sections for the first reading and start from section 3.

The “Summary of the Mathematical Notation” is quite big (120 slides). We are not expecting you to read all of these slides very carefully. They constitute a REFERENCE to which you can come back when you have some doubts. The part describing the set-theoretic notation (from slide 49 to slide 113) is full of little diagrams which are quite useful as they will help you remembering

what each set-theoretic construct is supposed to mean. After a quick browsing on all slides, we suggest that it might be useful for you to concentrate for a while on these set theory slides.

The “Summary of Event-B Notation” is shorter than the previous one (34 slides only). These slides contain an ENTIRE INFORMAL DESCRIPTION of the Event-B notation (to be compared with Java or C++ similar presentations). It has to be read carefully. Two complete examples are proposed together with the description of each feature. These examples are important to follow carefully as they will be used in the next document.

The “Summary of Proof Obligations” is slightly bigger than the previous one (65 slides). It is the most important of the three documents. It describes in details the proof obligations which are (automatically) extracted from an Event-B text. As for the “Summary of Mathematical Notation” document, this one is also a REFERENCE, to which you can come back. Each proof obligation is described formally and then illustrated by means of the examples proposed in the previous document. There are 12 different proof obligations. You might concentrate to begin with on the 5 most important ones (from slides 9 to 29).

The “Controlling Cars on a Bridge” is the second sample chapter from Jean-Raymond Abrial’s book and contains the first complete example of developing a control system in Event-B.

If you have any problem understanding some of these documents, do not hesitate to send us some mail BEFORE THE COURSE: Thai Son Hoang (htson@inf.ethz.ch), Stefan Hallerstede (halstefa@cs.uni-duesseldorf.de)

3 About the Examples

The examples which are proposed in the “Event-B Notation” document and used in the “Proof Obligation Document” have all been developed with the Rodin Platform. This is a document named “search.zip”.

You are expected to *import* “search.zip” in the personal Rodin Platform incarnation downloaded on your laptop. We think that it might be VERY INSTRUCTIVE for you to follow the Rodin implementation of these examples while reading the “Event-B” and the “Proof Obligations” documents.

By the way, we expect that EACH OF YOU comes to the course with the Rodin Platform loaded on his laptop. If it is not presently the case, it is now the right time to do so. This is very easy to do (follow the instruction as given in SourceForge <http://sourceforge.net/projects/rodin-b-sharp/>). Do not forget to download the Atelier-B provers (instruction as in the Welcome page the first time you launch Rodin): this is sometimes forgotten by beginners. If you have any problems with downloading Rodin and the Atelier-B provers, please do not hesitate to ask for advice by sending mails to Son or Stefan.

4 Organization of the Course

The course will contains both presentations and practical exercises session. Slides and texts corresponding to each presentation will be distributed to you. Most of the exercises will be done in the Rodin Platform (this is why you should bring your laptop with Rodin). You will learn how to enter Event-B models within the platform and also how to PROVE the proof obligations, which the tool was not able to discharge automatically. We think that a little project might be proposed too.

The detailed schedule will be available later.

5 Preparing for the Course

As mentioned before, it is very important that each participant coming to the course with a laptop that has a copy of Rodin installed (with the Atelier-B provers included).