User manual for Timed-CSP Simulator

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1 Introduction

Timed Csp Simulator is based on the presentation of Timed Csp in [3]. For a brief discussion of the tool architecture see [1]. The semantical questions regarding simulating Timed Csp are discussed in [2].

2 Supported operators

In addition to CSP-M operators already defined in ProB, Timed-CSP Simulator supports several timed operators of Timed-CSP. These extra operators are listed in Table 1 where:

- d denotes a time delay which is either an integer i or a rational number $\frac{i}{j}$ where i and j are integers.
- P, Q are Timed-CSP processes.

Name	Pretty print	ASCII
Delay event prefix	$a \xrightarrow{d} P$	`a -<d>-> P`
Wait	$WAIT\, d$	`WAIT d`
Timed timeout	$P \overset{d}{\triangleright} Q$	`P [<d>> Q`
Timed interrupt	$P \overset{d}{\triangle} Q$	`P /<d> Q`

Table 1: Timed Operators in Timed-CSP Simulators

3 Timed-CSP mode

There are two ways to activate Timed-CSP mode in ProB while opening files:

Explicit: Files are named with the extension ".tcsp".

Implicit: Files contain one of the timed operators listed in Table 1.

4 Timed-CSP animation

Timed-CSP simulators supports two animation strategy:

Random: At each step of the animation, the simulator randomly selects an event or timed progress available from the interface to perform.

Maximal progress: At each step of the animation, the simulator selects an event or timed progress available from the interface to perform, with respect to the following priority:

1. Randomly select an external event.
2. Select an internal event.
3. Select a maximal timed progress.
4. Select a random timed progress.

References

[1] Marc Dragon, Andy Gimblett, and Markus Roggenbach. A Simulator for Timed CSP. In Jens Bendisposto, Cliff Jones, Michael Leuschel, and Alexander Romanovsky, editors, *AVoCS'11 – Proceedings of the Eleventh International Workshop on Automated Verification of Critical Systems*. Newcastle University, 2011.

[2] Faron Moller, Hoang Nga Nguyen, and Markus Roggenbach. Theoretical foundations for simulating timed csp. Technical report, Swansea University, 3 2012.

[3] S. Schneider. *Concurrent and real-time systems: the CSP approach*. Citeseer, 2000.