

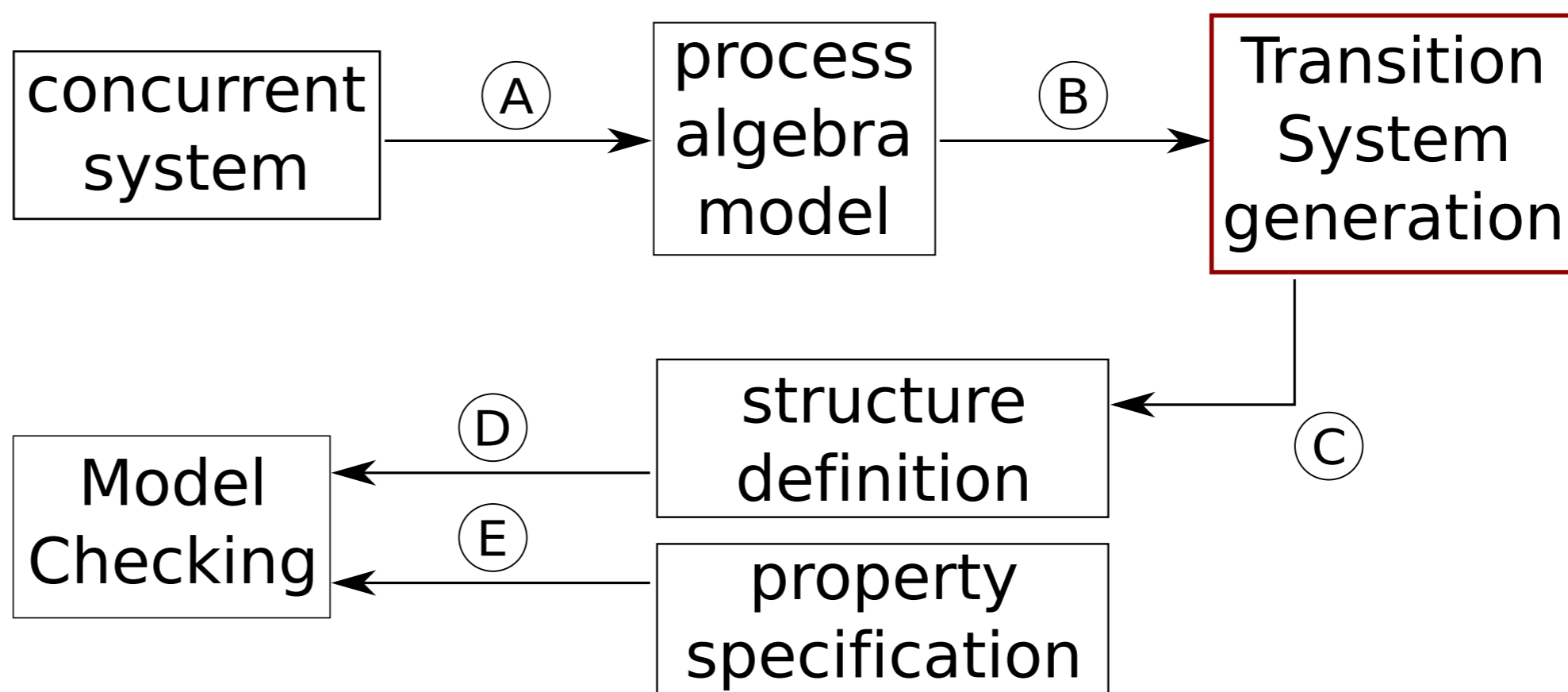
Quantitative Assessment of Web Services: Applying Scows to a real-life Scenario

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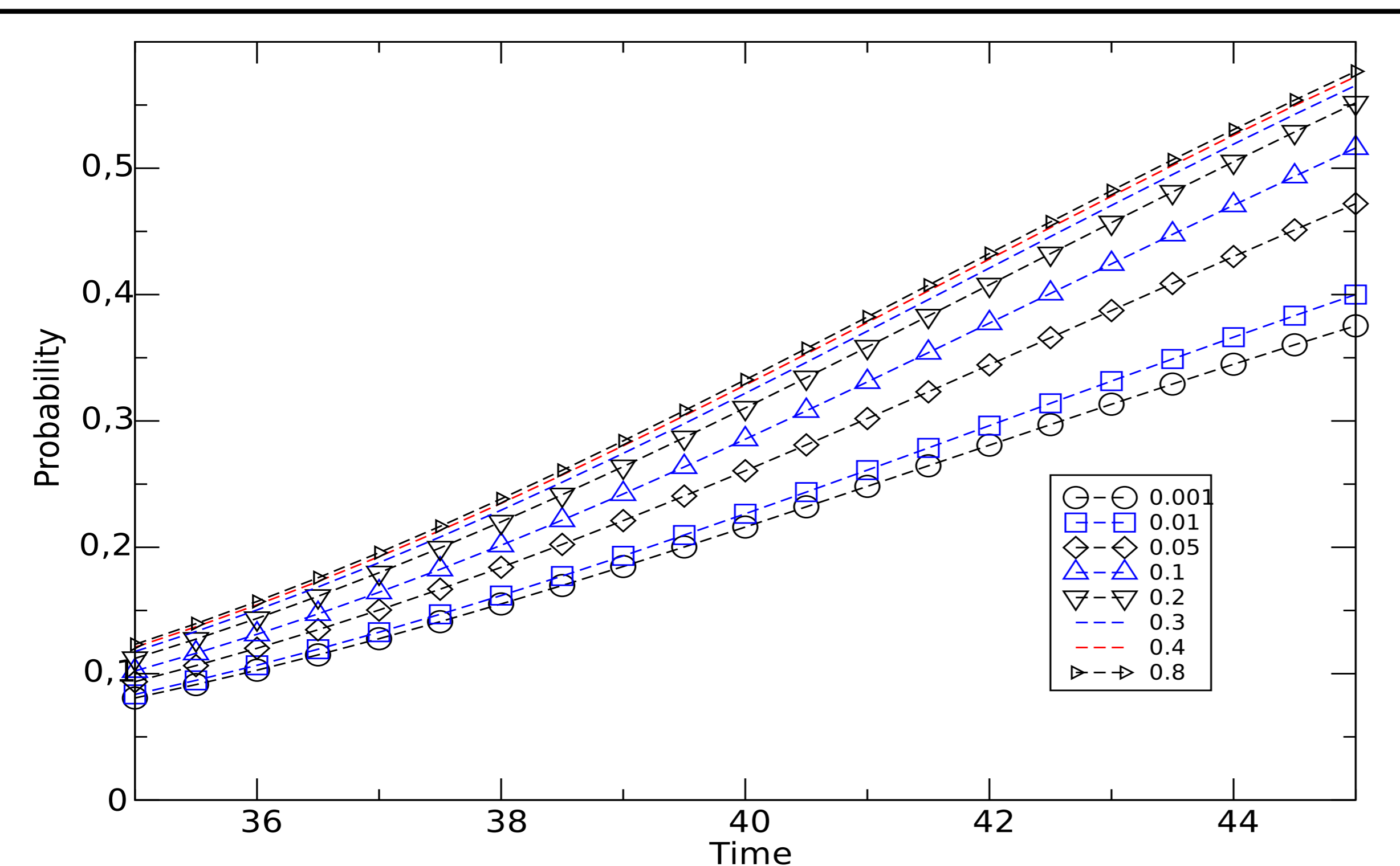
A concurrent system can be modeled (A) using a process algebra such as SCOWS. Applying recursively the operational semantics, the Transition System representing the whole behaviour of the model (B) can be derived. The result of this step can be used to define a CTMC (C) which (D), along with the specification of properties (E), allows the user to perform model checking using a model checking tool (e.g. PRISM¹).

SCOWS_Its^{2,3} is a Java tool that automatically derives LTSs associated with SCOWS services and minimizes them according to a notion of structural congruence.



The state space size needed to represent the LTS grows exponentially with the length of the specification given as input.

SCOWS_Its implements a definition of structural congruence to alleviate this problem: each node represents the equivalence class built on top of the congruence relation when considering SCOWS processes.



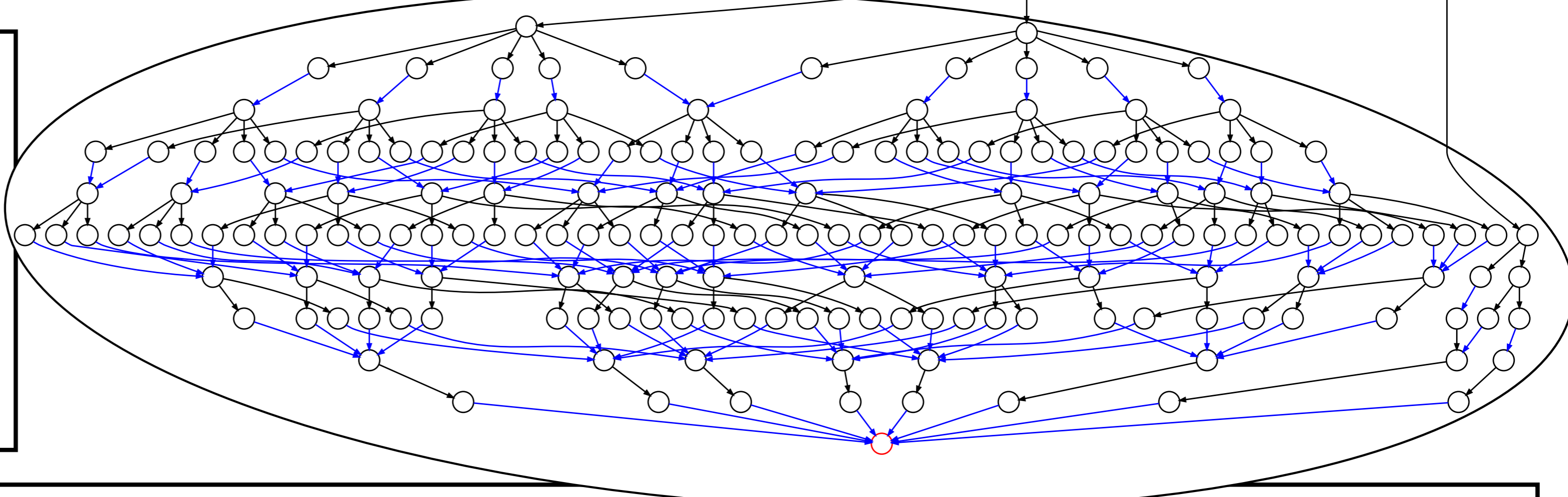
Probability to get a response (either positive or negative) to a loan request within time T, varying the rate at which the clerk processes the request.

Other variables used in the system are:
loginOk/loginFail: 3/0.25
supervisorRate: 0.1

Credit Request Scenario⁴

The example is composed of the following phases (grouped by ellipses):

1. login phase
2. credentials upload
3. evaluation and loan proposal
4. acceptance/refusal of the proposal
5. session cleanup



References

- (1) <http://www.prismmodelchecker.org/>
- (2) <http://disi.unitn.it/~cappello/>
- (3) I.Cappello and P.Quaglia, A Tool for Checking Probabilistic Properties of COWS Services, Proc. of TGC 2010. Lecture Notes in Computer Science. Springer. 2010. To appear.
- (4) <http://www.sensoria-ist.eu/>

