Introduction

This Model form is a short description of the QuasiCertifProtocol model that comes, for the Model Checking Contest 2013 @ Petri Nets ("suprise model category"), with: a set of PNML files, a set of properties to be checked (possibly one file per model instance) and an optional set of properties concerning the model (invariants, etc. – possibly one file per model instance). For Coloured Nets, equivalent PNML P/T net files are proposed too.
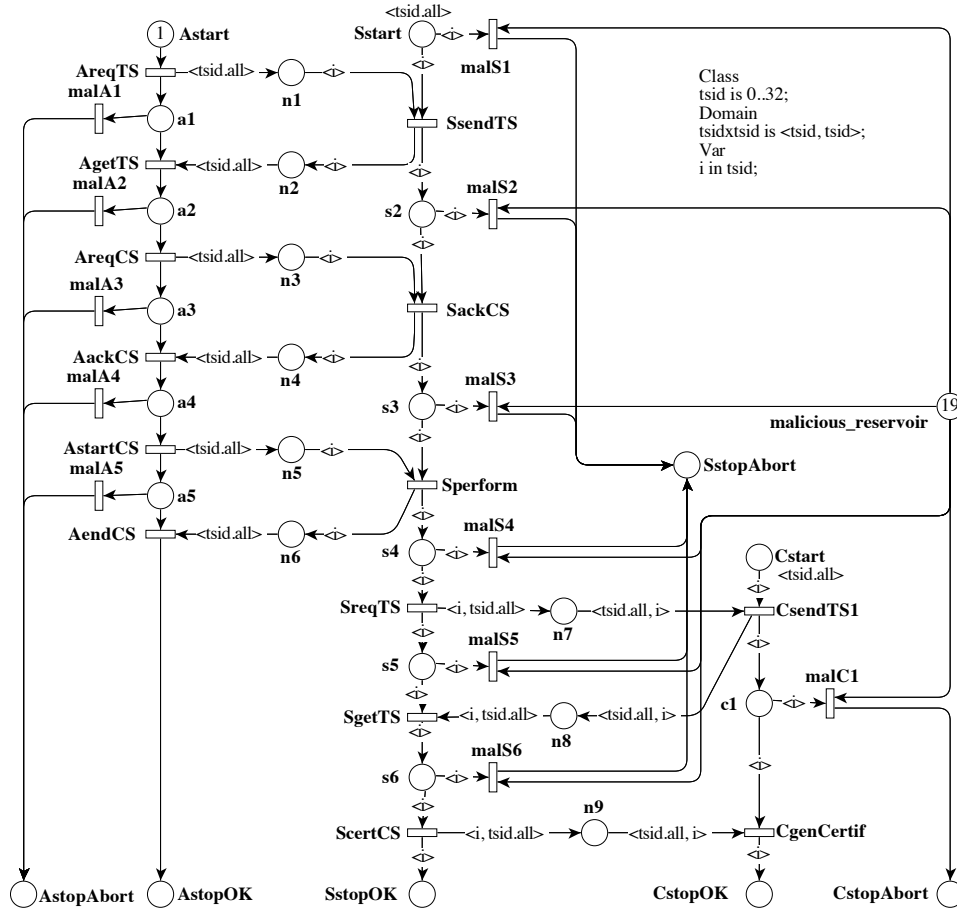
QuasiCertifProtocol

Figure 1: Presentation of the model for instance 32

Presentation

Description: This Petri net models a quasi certification protocol on top of a DHT. In this protocol, an Actor A contact a server S (key $k = hash(S)$ for the corresponding root node in the DHT) to perform a service. Once S has finished, S contact C (key $k' = hash(A + S)$ for the corresponding root node in the DHT) that will certify that A did a service S at a timestamp t. To get this certificate, any X contact C for his answer.

This service relies on numerous algorithms scheduled by means of a protocol. Reliability over the DHT is ensured by replication over *"leaf sets"* of size L (we assume it is the same value for S and C). The Petri net in the Figure models this protocol where A, S and C interact. The objective is to certify that either one actor behave maliciously (i.e. does not respect the protocol) and then no certification is issued or, if all is OK, one certificate is appropriately emitted.

Origin: The QuasiCertification service is presented in:

- X. Bonnaire, R. Cortés, F. Kordon, O. Marin, A Scalable Architecture for Highly Reliable Certification, published TrustCom 2013.

Scaling parameter

Name	Description	Values
L	Size of the leafset	2, 6, 10, 18, 22, 28, 32

Information about the Model

Data on the Model

Number of places	Number of transitions	Number of arcs	Scaling parameter value
30	26	77	all

Stated Properties

safe	✔	free choice	?	event graph	?
deadlock	✔	state machine	?	reversible	✗

Other Properties (not mandatory)

The size of this model evolves approximately in 10^L, where L is the size of the leaf sets for S and C.