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Verification

Problem 1: The CSMA/CD Protocol (cont'd) [10 Points]

This exercise build upon the yesterdays model of the CSMA/CD protocol. You model so far only captures discrete events, now we are going to introduce timed behavior. We modify the sender to send a message of fixed length **length**, which is the time between the beginning and the end of a message. Additionally, the medium has a transmission delay **delay**, which is the time between the beginning (or end) of a message is sent and the beginning (or end) of a message is received. For example, if the beginning of a message is sent at time t, it will be received by the receiver at time t + delay.

- a) Model/modify the system with the assumption length > delay. Verify that the system is correct in the sense that all sent messages are indeed received. [5 Points]
- b) Refine the medium to allow messages of length $length \leq delay$. Verify that the refined system is correct in the sense that all sent messages are indeed received. [5 Points]

You may present your solution in the morning session on Thursday.

The exercise was taken from the Quantitative Model Checking lecture by Kim G. Larsen. You can find more problems to exercise at http://people.cs.aau.dk/~kgl/QMC2010/exercises/.