

A Model Driven Analysis of the 802.11 CSMA/CA Protocol through SD2PN

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ABSTRACT

Unified Modelling Language (UML) has been conferred as the *de facto* standard in modeling by majority in the software system development community. Among the various types of diagrams that exist under the umbrella of UML is Sequence Diagram. Sequence Diagrams are capable of modeling interactional behaviours as well as dynamic happenings in a system, and as such are generally used in the modeling of complex software systems. However in this paper, Sequence Diagrams are used in the modeling of the IEEE 802.11 Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) protocol. The Sequence Diagram representing this protocol will then be used for formal, mathematical analysis by first transforming the Sequence Diagram through the MDA model transformation tool called SD2PN, and performing analysis such as liveness analysis, boundedness analysis and reachability analysis of the resulting Petri Net.

KEYWORDS: sequence diagrams, Petri Nets; modelling, IEEE 802.11.