# Project Suggestion for ID2205: A Web-DE Based on Decomposite MAC Description Language

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## Background

Decomposite MAC Description Language (DMDL) is a graphical programming language and directive standard for developers to implement MAC designs and an implementation tool for various Software Defined Radio (SDR) platforms. A Gnu Radio-based implementation of the language can be found at `https://github.com/joqoko/gr-dmdl`. This implementation is supported on all software defined radio platforms that Gnu Radio supports, such as USRP. An in-depth paper on DMDL published in the 2018 Wireless Communications and Networking Conference (WCNC) can be provided upon request.

## A Quick Look at DMDL

The language is based on a Synchronous Data Flow model of computation and a MAC protocol is described by a directed graph. The vertices consists of blocks that resemble typical MAC-layer operations such as timers, back-offs, sending and receiving as well as blocks for performing measurments when DMDL is used for testing and simulation purposes. Tokens, or commands as they are called in DMDL, carry data and/or operate as function calls between the blocks. Figure 1 shows the classic ALOHA protocol in DMDL while figure 2 shows the more complex CSMA protocol that is part of the IEEE 802.11 standard.

Figure 1: A DMDL description of the ALOHA protocol.

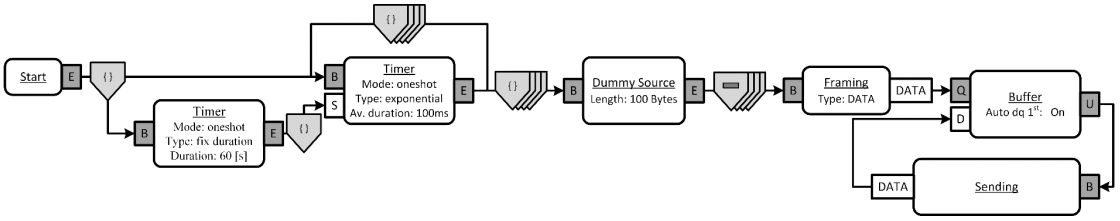
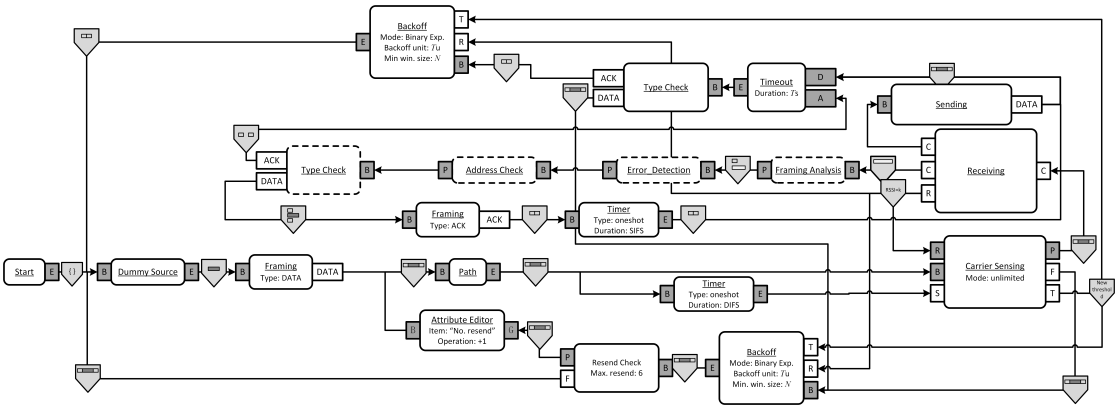


Figure 2: A DMDL description of the IEEE 802.11 standard's CSMA protocol.




## Scope of the Project

To further increase the accessibility, swift workflow and cross platform compatibility of DMDL, a web-based development environment is being planned for the language. The DE should have an intuitive drag-and-drop-type interface in order to facilitate the generation of the UML-like diagrams that make up the DMDL code. The user should be able to a) generate PDF-files and image files with the DE for use in presentations etc and b) program compatible hardware either connected to the user's computer or connected to a remote computer on, for instance, KTH. Building this DE is what will make up the project in ID2205.