Some title

Author name

x X pdf: pagename PARTICIPANTS

Participants

Michal Kruszewski, *Chair, Technical Editor, mkru@protonmail.com*

5 April 2023

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x X pdf: pagename PARTICIPANTS

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1. Overview

1.1. Scope

This document specifies the syntax and semantics of the Functional Bus Description Language (FBDL).

1.2. Purpose

This document is intended for the implementers of tools supporting the language and for users of the language. The focus is on defining the valid language constructs, their meanings and implications for the hardware and software that is specified or configured, how compliant tools are required to behave, and how to use the language.

1.3. Motivation

Describing and managing registers can be a tedious and error-prone task. The information about registers is utilized by software, hardware and verification engineers. Typically a specification of the registers is designed by the hardware designer or system architect. During the design and implementation phases it changes multiple times due to different reasons such as bugs, requirement changes, technical limitations, etc. A simple change in a single register may imply adjustments in both hardware and software. These adjustments cost money and time.

Several formal and informal tools exist to address issues related with registers management. However, they all share the same concept of describing registers at very low level. That is, the user has to implicitly define the registers layout. For example, in case of register containing multiple statuses, its user responsibility to specify the bit position for every status.

The FBDL is different in this terms. The user specifies the functionalities that must be provided by the data stored in the registers. The register layout is automatically generated based on the functional requirements. Such an approach allows to generate much more hardware description and software code than classical approach. Not only the register masks, addresses, and single read, write functions can be generated, but complete custom functions with optimized access methods. This in turn leads to shorter design iterations and fewer bugs.

1.4. Word usage

The terms "must", "must not", "required", "shall", "shall not", "should", "should not", "recommended", "may", and "optional" in this document are to be interpreted as described in the IETF Best Practices Document 14, RFC 2119.1.