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IEEE Standard for Software-Hardware Interface for Multi-Many-Core

IEEE Computer Society

Developed by the
Design Automation Standards Committee

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IEEE Standard for Software-Hardware Interface for Multi-Many-Core

Developed by the

Design Automation Standards Committee
of the
IEEE Computer Society

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Abstract: This standard is intended primarily for tool developers and hardware developers who would use Software Hardware Interface for Multi-Many-core (SHIM) to exchange hardware description for software tools. It also attempts to provide software developers with insights into what hardware information is described in SHIM to foster understanding of the intention and the extent of SHIM.

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Introduction

This introduction is not part of IEEE Std 2804-2019, IEEE Standard for Software-Hardware Interface for Multi-Many-Core.

This document is intended primarily for tool developers and hardware developers who would use SHIM to exchange hardware description for software tools. It also attempts to provide software developers with insights into what hardware information is described in SHIM to foster understanding of the intention and the extent of SHIM.

This document begins with the introduction to SHIM, providing the background, the overall concept, and model. It is followed by a clause detailing the concept of SHIM, such as the purpose, scope, design, interface, limitation, providing the basic idea why SHIM is as specified in this document and also trying to explain the basic principles for future extension of the specification. A clause describing the interface follows, which is a description of SHIM XML schema and APIs that are mostly derived directly from the schema via XML data binding technique. A clause providing some of the detailed use cases follows, allowing the reader to gain insights into how SHIM can be used in action. Finally, this document ends with various annexes that provide further detailed information.

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IEEE Standard for Software-Hardware Interface for Multi-Many-Core

1. Overview

1.1 Scope

The scope of this standard includes performance estimation accuracy for complex processors like Very Long Instruction Word (VLIW) core and complex contention scenarios, description of caches to include uncached memory regions and caches for subsets of memories, properties for coarse power consumption estimation, and reusability by separating eXtensible Markup Language (XML) files for processor description and other memory/communication-related information.

1.2 Purpose

The Software-Hardware Interface for Multi-Many-core (SHIM) defines an architecture description standard from the software design perspective—this provides a common interface that abstracts the hardware properties that are critical to enable multicore tools.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (shall equals is required to).[1, 2]

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (should equals is recommended that).

The word *may* is used to indicate a course of action permissible within the limits of the standard (may equals is permitted to).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (can equals is able to).

[1]The use of the word *must* is deprecated and cannot be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.
[2]The use of *will* is deprecated and cannot be used when stating mandatory requirements, *will* is only used in statements of fact.