

Reconciling Event Structures with Modern Multiprocessors (Artifact)

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Abstract

The artifact is a virtual machine image containing two Coq packages which include mechanization of proofs stated in the paper. The first package `imm` contains a modified version of the Intermediate Memory Model, extended with the support of se-

quentially consistent atomics, and the compilation correctness proofs from it to hardware models. The second package `weakestmoToImm` contains a definition of the Weakestmo memory model as well as a compilation correctness proof from it to IMM.

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Keywords and phrases Weak Memory Consistency, Event Structures, IMM, Weakestmo

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1 Scope

The artifact provides formal machine-checked proofs for the theorems stated in the paper.

2 Content

The artifact package includes VirtualBox image with Ubuntu 18.04 (64 bit) containing two Coq packages: `imm` and `weakestmoToIMM`.



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3 Getting the artifact

The artifact endorsed by the Artifact Evaluation Committee is available free of charge on the Dagstuhl Research Online Publication Server (DROPS). In addition, the most recent version of the source code of the `imm` and `weakestmoToImm` packages can be found at <https://github.com/weakmemory/imm> and <https://github.com/weakmemory/weakestmoToImm/> correspondingly.

4 Tested platforms

The artifact was tested by authors on Ubuntu 18.04 (64 bit) with Intel Core i5 (2.30GHz × 4) and 8GB RAM.

5 License

The source code of the Coq packages is distributed under the MIT License (MIT)

6 MD5 sum of the artifact

7e6f145f56db2f4952dc9cdcc77d28f6

7 Size of the artifact

6.3 GiB

A How to use the artifact

Import the VirtualBox image into VirtualBox, and boot the machine.

The login is `semantics` and the password is `semantics`.

All necessary software is installed, and the `imm` and `weakestmoToImm` projects are checked out to `/home/semantics/Desktop/imm` and `/home/semantics/Desktop/weakestmoToImm` correspondingly. Additionally, Emacs (with Proof General), VS Code, and CoqIDE are installed so that you can browse the sources and the latest version of the paper copied to `/home/semantics/Desktop/paper.pdf`.

B Compilation of packages

The proofs might be checked by opening a terminal and running:

- for `imm`

```
cd /home/semantics/Desktop/imm
make clean; make -j2
```

- for `weakestmoToImm`

```
cd /home/semantics/Desktop/weakestmoToImm
make clean; make -j2
```

The build terminating without printing “error” is successful. Please, note that building of the proofs might take a lot of time (especially, the `imm` project).

C MD5 sum of the artifact

7e6f145f56db2f4952dc9cdec77d28f6

D Size of the artifact

6.28 GB