Mixed Messages: Measuring Conformance and Non-Interference in TypeScript (Artifact)*

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Abstract

In the paper *Mixed Messages: Measuring Conformance and Non-Interference in TypeScript* we present our experiences of evaluating gradual typing using our tool TypeScript TPD. The tool, based on the polymorphic blame calculus, monitors JavaScript libraries and TypeScript clients against the corresponding TypeScript definition. Our experiments yield two conclusions. First, TypeScript definitions are prone to error. Second, there are serious technical concerns with the use of the JavaScript proxy mechanism for enforcing contracts. This artifact includes all the libraries we tested, their definition files, and the source code of our tool. From this, all libraries can be wrapped and tested to reproduce the log data that formed our conclusion. All conformance errors and examples of interference are documented, and can be verified against the generated logs.

1 Scope

The aim of the artifact is to enable the reproduction of conformance errors and examples of interference found through the use of TPD. All libraries can be wrapped with TPD and tested to produce logs that match the tables presented in the paper.

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† Core artifact developer.

2   Content

The artifact is provided as VirtualBox disk image running Ubuntu 16.04. Accompanying the disk image is a detail guide on how to load, run, and evaluate the artifact, provided as a `README.html` file. The main components of the virtual machine are:

- The source code of TypeScript TPD that can be compiled and executed.
- The 122 libraries that can be wrapped and tested to generate the logs, from which, the examples are taken.
- The examples of type-errors and interference collected and recorded.
- A small test program that includes examples from the paper.

To simplify use of the artifact, all libraries and dependencies are pre-installed on the virtual machine. Scripts are provided to automate the process of wrapping the libraries, testing the libraries, and producing the tables from the paper. A skeleton library, client, and definition file are included to allow users to experiment with the tool. All stages are described in detail in the accompanying `README.html` file.

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).
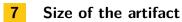
4   Tested platforms

The artifact is known to work on any platform running Oracle VirtualBox version 5 (`https://www.virtualbox.org/`) with at least 20 GB of free space on disk and at least 4 GB of free space in RAM. Import the image using `File > Import Appliance`.

5   License

MIT (`http://opensource.org/licenses/MIT`)

6   MD5 sum of the artifact

b5a1d04103fbd86820b32168ebb0504f

7   Size of the artifact

5.1 GB

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