Static typing of complex presence constraints in interfaces (Artifact)

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— Abstract -

This artifact is based on TypeScriptIPC, a statically typed programming language with interfaces in which complex presence constraints can be defined. This enables developers to express inter-property constraints on interface properties. The need for these inter-property constraints stems from web APIs, which often impose a complex "dependency logic" between properties. For example, some prop-

erties may be mutually exclusive, or the presence of a property may depend on the presence of others, etc. TypeScriptIPC is a variant of TypeScript, in which interfaces are extended to express constraints over multiple properties, using propositional logic. This artifact contains documentation on how to build and run TypeScriptIPC, such that the code snippets from the paper can be run.

2012 ACM Subject Classification D.3.3 Language Constructs and Features, F.3.2 Semantics of Programming Languages, F.3.3 Studies of Program Constructs

Keywords and phrases type system, interfaces, dependency logic

Digital Object Identifier 10.4230/DARTS.4.3.1

Related Article Nathalie Oostvogels, Joeri De Koster, Wolfgang De Meuter, "Static typing of complex presence constraints in interfaces", in Proceedings of the 32nd European Conference on Object-Oriented Programming (ECOOP 2018), LIPIcs, Vol. 109, pp. 14:1–14:27, 2018.

http://dx.doi.org/10.4230/LIPIcs.ECOOP.2018.14

Related Conference 32nd European Conference on Object-Oriented Programming (ECOOP 2018), July 19–21, 2018, Amsterdam, Netherlands

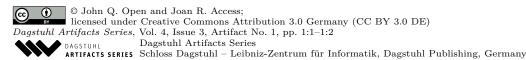
1 Scope

- $_{2}$ This artifact provides the necessary materials to run the code snippets from the accompanying
- 3 paper. It contains an implementation of the programming language TypeScriptIPC, which
- 4 was presented in "Static typing of complex presence constraints in interfaces". While the paper
- 5 contains a programming language that is a sound subset of TypeScript, the artifact extends
- ⁶ TypeScript in its entirety. Soundness remains guaranteed as long as only language constructs
- ⁷ from the formalisations in the paper are used.

2 Content

9 The artifact package includes:

 $^{^{1}}$ Funded by a PhD Fellowship of the Research Foundation - Flanders (FWO)



1:2 Static typing of complex presence constraints in interfaces (Artifact)

- a VirtualBox image that contains an installed version of TypeScriptIPC;
- a PDF (Instructions.pdf) that contains:
- detailed instructions for running TypeScriptIPC programs, as well as shortcuts for running the code snippets found in the tutorial, examples from the paper and tests from the provided test suite;
- a tutorial about programming with inter-property constraints;
- a list of differences between the formalisation and the implementation;
- a mapping of formalisation rules from the paper to procedures in which those rules are implemented.

3 Getting the artifact

- 20 The artifact endorsed by the Artifact Evaluation Committee is available free of charge on the
- Dagstuhl Research Online Publication Server (DROPS). In addition, the artifact is also available
- 22 at: https://github.com/noostvog/typescriptipc (aec branch). The instructions accompa-
- 23 nying the artifact are also available at http://soft.vub.ac.be/~noostvog/typescriptipc/
- 24 Instructions.pdf.

25 4 Tested platforms

- The artifact can be installed on any platform running node.js and npm (package manager for
- 27 node.js: at least version 5.7.1, to support npm ci). The provided VirtualBox image (.ova)
- 28 requires around 1GB of free RAM to run TypeScriptIPC, and 4 GB of free RAM to built
- 29 TypeScriptIPC as well.

5 License

The artifact is available under the MIT license.

MD5 sum of the artifact

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³⁴ Size of the artifact

 $3.76~\mathrm{GiB}$