

Type Regression Testing to Detect Breaking Changes in Node.js Libraries (Artifact)

Gianluca Mezzetti

Aarhus University, Denmark
mezzetti@gmail.com

Anders Møller

Aarhus University, Denmark
amoeller@cs.au.dk

Martin Toldam Torp

Aarhus University, Denmark
torp@cs.au.dk

Abstract

This artifact provides an implementation of a novel technique, type regression testing, to automatically determine whether an update of a npm library implementation affects the types of its public interface, according to how the library is being used by other npm packages. Type regression testing is implemented in the tool `NoREGRETS`. A run of `NoREGRETS` is parameterized with a pre-update and post-update version of the library, and it consists of three fully automatic phases. First, `NoREGRETS` fetches a list of clients that depend upon the pre-update library, and that have a test suite that succeeds on the

pre-update version. Second, `NoREGRETS` uses an ECMAScript 6 proxy instrumentation to generate the API model of both the pre-update and post-update libraries, based on observations of how the client test suites interact with the library. Third, the two models are compared, and inconsistencies are reported as type regressions.

This artifact contains the source code and an installation of `NoREGRETS`, with a guide for how to use the tool and reproduce the experimental results presented in the paper.

2012 ACM Subject Classification Software and its engineering → Software libraries and repositories

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1 Scope

The artifact provides the `NoREGRETS` implementation of the type regressions testing technique used to answer the research questions in the companion paper. Furthermore, `NoREGRETS` is preconfigured such that the experiments from the paper can be replicated easily.

2 Content

The artifact package includes a virtual machine with:

- A pre-installed version of `NoREGRETS`.
- A guide describing both how to use `NoREGRETS` to reproduce the results from the paper and how new benchmarks can be added to `NoREGRETS`.



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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 artifact is also available at <http://brics.dk/noregrets>.

4 Tested platforms

The artifact works on any platform that can run a VirtualBox VM, including, Windows, Mac and Linux. We recommend that the VM is run with at least 12GB of memory. Otherwise, NoREGRETS may fail with out-of-memory exceptions for some benchmarks. At least 30GB of free space is also required.

5 License

The artifact is available under Apache License 2.0.

6 MD5 sum of the artifact

e2b883f996f10ebe7475722093e40061

7 Size of the artifact

6.2 GB

A Getting started

The NoREGRETS artifact is installed in an OVF virtual machine. We recommend opening the VM with VirtualBox,¹ but any virtualization software should work. Notice, VMware may show a warning but the VM should boot anyway. Double click the NoRegrets.ova file to import the VM (about 30GB of free space is required). Once the VM has started, a browser will automatically open on a page containing a detailed guide of NoREGRETS. If the browser is closed, you may find the guide at `~/NoRegrets/guide/index.html`

VM credentials:

- Username: noregrets
- Password: noregrets

¹ <https://virtualbox.org/>