



PolyCruise: A Cross-Language Dynamic Information Flow Analysis

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<https://www.usenix.org/conference/usenixsecurity22/presentation/li-wen>

**This artifact appendix is included in the Artifact Appendices to the
Proceedings of the 31st USENIX Security Symposium and appends to
the paper of the same name that appears in the Proceedings of the
31st USENIX Security Symposium.**

August 10–12, 2022 • Boston, MA, USA

978-1-939133-31-1

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to the Proceedings of the 31st USENIX
Security Symposium is sponsored
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C Artifact Appendix

C.1 Abstract

This artifact contains a functional version of PolyCruise and the necessary dataset for the evaluation. To facilitate the usage of this artifact, we have prepared a Docker image with the necessary components to execute the artifact and visualize the result. Artifact users can compare the results obtained from executing this artifact with those presented in our paper. It is recommended that the host machine has at least 16GB memory and 32GB hard disk space.

C.2 Artifact check-list (meta-information)

- **Algorithm:** No
- **Program:** Yes
- **Compilation:** No
- **Transformations:** No
- **Binary:** No
- **Model:** No
- **Data set:** Contained in the package
- **Run-time environment:** Ubuntu 18.04
- **Hardware:** No
- **Run-time state:** No
- **Execution:** No
- **Security, privacy, and ethical concerns:** None
- **Metrics:** Please refer to our paper
- **Output:** Textual information on the terminal
- **Experiments:** Necessary scripts provided
- **How much disk space required (approximately)?:** 10 GB
- **How much time is needed to prepare workflow (approximately)?:** 10 min
- **How much time is needed to complete experiments (approximately)?:** 20 min
- **Publicly available (explicitly provide evolving version reference)?:** Yes, <https://github.com/Daybreak2019/PolyCruise>
- **Code licenses (if publicly available)?:** Yes
- **Data licenses (if publicly available)?:** Yes
- **Archived (explicitly provide DOI or stable reference)?:** Yes, <https://github.com/Daybreak2019/PolyCruise/releases/tag/v3.0>

C.3 Description

C.3.1 How to access

- Download the Docker image for this artifact
`docker pull daybreak2019/polycruise:1.1`
- Download the source code of PolyCruise
`git clone https://github.com/Daybreak2019/PolyCruise.git`

C.3.2 Hardware dependencies

The host machine may at least need 16GB memory and 32GB hard disk spaces.

C.3.3 Software dependencies

PolyCruise is mainly developed on LLVM 7.0 and Python 3.7. Other software dependencies such as libxml and cmake are also necessary to build the project. For ease of use of PolyCruise, we have prepared a Docker image with all software dependencies installed.

Moreover, real-world benchmarks have their own particular/additional dependencies. Hence, to fully reproduce the results in the paper, users should install these dependencies successfully and ensure each benchmark's test cases can pass. For demonstration purposes, we use Cvxopt as a concrete example of such benchmarks and have installed all of its dependencies in the Docker image.

More specifically, we note that the Docker image includes all the libraries/framework underlying PolyCruise, thus it can be used for experimenting with other real-world subjects as well (i.e., saving the time/trouble for installing ubuntu, llvm, etc.) On the other hand, since our real-world subjects are sizable, including the complete compilation and run-time environment (e.g., all the third-party library dependencies) for all of them in the single Docker image would make it clumsy to deploy conveniently. Using a traditional virtual machine would aggregate this concern since they are even heavier. This is why we chose to include the setup for one such subject only inside the image at this time.

C.3.4 Data sets

PolyCruise is published with a set of micro-benchmarks included inside its code repository. The real-world benchmarks can be retrieved from GitHub.

C.3.5 Models

N/A.

C.3.6 Security, privacy, and ethical concerns

There are no security, privacy, or ethical concerns with using this artifact.

C.4 Installation

- Step 1: Download the Docker image and run a Docker container based on the image
`docker pull daybreak2019/polycruise:1.1`
`docker run -it daybreak2019/polycruise:1.1`

