Welcome to the TSAN Project!

The goal of this Project is to explore and incubate a Thread SANitizer (TSAN) feature that could be integrated into the HotSpot JVM and the JVM Tool Interface (JVM TI). This includes working, evaluating, and incubating a Thread Sanitizer implementation for Java.

The rest of this page will provide basic information for downloading, building, and testing Java TSAN.

Prerequisites

Java TSAN has only been tested on 64-bit Linux. It may work on other platforms that LLVM TSAN supports with some build changes.

Java TSAN is dependent on the C/C++ ThreadSanitizer implementation for GCC/LLVM. Java TSAN requires a new API for proper symbolization of Java stack traces, which is only available in update-to-date versions of C/C++ ThreadSanitizer. This requires building OpenJDK with LLVM 7.0 or later, or GCC 9 or later. Currently we recommend developers and testers use LLVM 8.0.

Building

Java TSAN implementation is in the "tsan" branch in the Git repository. Developers need to clone this branch:

```
git clone --branch tsan https://github.com/openjdk/tsan.git jdk-tsan
```

Newer toolchains come with new warnings and the codebase hasn't been cleaned up for those warnings yet, so `--disable-warnings-as-errors` is needed.

Java TSAN exists as a JVM feature "tsan", which is enabled by default on the "tsan" branch in the repository. It can be disabled with the configure flag "--with-jvm-features=-tsan".

To build OpenJDK with LLVM, pass the configure flags "--with-toolchain-type=clang --with-toolchain-path=<path_to_llvm_root_dir>/bin".

Running

Note: the method of including the TSAN runtime in the JVM is not finalized and could change in the future.

Run Java with TSAN enabled:

```
./images/jdk/bin/java -XX:+ThreadSanitizer
```

Testing

The tests for TSAN are at `test/hotspot/jtreg/tsan/

```
make test TEST="hotspot/jtreg/tsan"
```

Resources

- TSAN Project
- TSAN JEP proposal
- Repositories
- Mailing list: tsan-dev

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Space contributors

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