



OpenJDK 8

Using alt-java

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Abstract

OpenJDK 8 is a Red Hat offering on the Red Hat Enterprise Linux platform. The Using alt-java guide provides an overview of alt-java, defines the differences between java and alt-java, and explains how to use alt-java.

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MAKING OPEN SOURCE MORE INCLUSIVE

Red Hat is committed to replacing problematic language in our code, documentation, and web properties. We are beginning with these four terms: master, slave, blacklist, and whitelist. Because of the enormity of this endeavor, these changes will be implemented gradually over several upcoming releases. For more details, see [our CTO Chris Wright's message](#).

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CHAPTER 1. OVERVIEW OF ALT-JAVA

The family of Spectre/Meltdown vulnerabilities includes Speculative Store Bypass (SSB), which may affect the Java VM ([CVE-2018-3639](#)).

Red Hat packages contain a mitigation for this vulnerability in the form of a patch for the Java binary. However, this patch reduces performance by up to 10% in some cases. This is described in [RH1566890](#).

Since the patch reduces performance, it has been removed from the “java” launcher. A new binary “alt-java” is now available. From the January 2021 CPU release (1.8.0 282.b08, 11.0.10.9) onwards the alt-java binary is included in OpenJDK 1.8.0 and 11 GA rpms.

CHAPTER 2. DIFFERENCES BETWEEN JAVA AND ALT-JAVA

“alt-java” is the same as “java”, except for the SSB mitigation. Refer, [RH1750419](#).

Although the SBB mitigation patch is there only for x86-64 (Intel and AMD), the alt-java is present on all architectures. So on non-x86, the alt-java is identical to java without any patches.

CHAPTER 3. USING ALT-JAVA AND JAVA

3.1. USING ALT-JAVA

Use “alt-java” for any applications that run untrusted code. However, be aware that it is not a solution to all speculative execution vulnerabilities. For more information refer, [Java and Speculative Execution Vulnerabilities](#).

3.2. USING JAVA

Use the “java” binary for performance-critical tasks in a secure environment. All of the RPMs in a Red Hat Enterprise Linux system except IcedTea-Web use the “java” binary. IcedTea-Web may be used to run untrusted code, so it uses “alt-java” as its launcher.

CHAPTER 4. PERFORMANCE IMPACT OF ALT-JAVA

By moving the SSB mitigation to “alt-java”, the performance impact on “java” is removed.

Using “alt-java” may significantly reduce the performance of Java programs. You can find detailed information in Red Hat Bugzilla:

- [\(java-11-openjdk\)Seccomp related performance regression in RHEL8](#)
- [\(java-1.8.0-openjdk\)Seccomp related performance regression in RHEL8](#)
- [CVE-2018-3639](#)
- [CVE-2018-3639 hw: cpu: speculative store bypass](#)
- [CVE-2018-3639 java-1.8.0-openjdk: hw: cpu: speculative store bypass \(rhel-7.6\)](#)

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