OpenJDK 11

Using alt-java
Abstract

OpenJDK 11 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.
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.
PROVIDING FEEDBACK ON RED HAT DOCUMENTATION

We appreciate your feedback on our documentation. To provide feedback, you can highlight the text in a document and add comments.

This section explains how to submit feedback.

Prerequisites

- You are logged in to the Red Hat Customer Portal.
- In the Red Hat Customer Portal, view the document in **Multi-page HTML** format.

Procedure

To provide your feedback, perform the following steps:

1. Click the **Feedback** button in the top-right corner of the document to see existing feedback.

   ![NOTE]

   The feedback feature is enabled only in the **Multi-page HTML** format.

2. Highlight the section of the document where you want to provide feedback.

3. Click the **Add Feedback** pop-up that appears near the highlighted text.
   A text box appears in the feedback section on the right side of the page.

4. Enter your feedback in the text box and click **Submit**.
   A documentation issue is created.

5. To view the issue, click the issue tracker link in the feedback view.
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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