Red Hat build of OpenJDK 21

Using alt-java
Red Hat build of OpenJDK 21 Using alt-java
Abstract

Red Hat build of OpenJDK 21 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 binaries, 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.
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

Red Hat packages contain a mitigation for the SSB vulnerability in the form of a patch for the `java` binary. This patch disables an optimization present in x86-64 (Intel and AMD) processors. Disabling that optimization reduces the risk of kernel side-channel attacks, but also reduces CPU performance.

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 Critical Patch Update release (1.8.0 282.b08, 11.0.10.9) onwards, the `alt-java` binary is included in Red Hat build of OpenJDK 21 and Red Hat build of OpenJDK 11 GA RPM packages.

Additional resources

- For more information about the performance impact of SSB mitigation, see [Kernel Side-Channel Attack using Speculative Store Bypass - CVE-2018-3639](#) on the Red Hat Customer Portal
- For more information about the `java` binary patch, see [RH1566890](#) in the [Red Hat Bugzilla](#) documentation.
CHAPTER 2. DIFFERENCES BETWEEN JAVA AND ALT-JAVA

Similarities exist between alt-java and java binaries, with the exception of the SSB mitigation.

Although the SBB mitigation patch exists only for x86-64 architecture, Intel and AMD, the alt-java exists on all architectures. For non-x86 architectures, the alt-java binary is identical to java binary, except alt-java has no patches.

Additional resources

- For more information about similarities between alt-java and java, see RH1750419 in the Red Hat Bugzilla documentation.
CHAPTER 3. ALT-JAVA AND JAVA USES

Depending on your needs, you can use either the alt-java binary or the java binary to run your application’s code.

3.1. ALT-JAVA USAGE

Use alt-java for any applications that run untrusted code. Be aware that using alt-java is not a solution to all speculative execution vulnerabilities.

3.2. JAVA USAGE

Use the java binary for performance-critical tasks in a secure environment.

Additional resources

- See Java and Speculative Execution Vulnerabilities.
CHAPTER 4. PERFORMANCE IMPACT OF ALT-JAVA

The alt-java binary contains the SSB mitigation, so the SSB mitigation performance impact no longer exists on java.

NOTE

Using alt-java might significantly reduce the performance of Java programs.

You can find detailed information of some Java performance issues that might exist with using alt-java by selecting any of the Red Hat Bugzilla links listed in the Additional resources section.

Additional resources

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

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