



Zulu Release Notes

Zulu 11.43 (11.0.9.1) for Arm v8 64-bit

Release Date: October 20, 2020

Document Version: 1.5

Last Modified: November 17, 2020

Revision History

Revision	Date	Description
1.0	October 20, 2020	Initial version of the document.
1.1	October 21, 2020	Updated the description of the new property "jdk.jndi.ldap.mech-sAllowedToSendCredentials."
1.2	October 23, 2020	Updated In-Depth Non-CVE Security Fixes table.
1.3	October 30, 2020	Updated the description of CA builds. Increased the font size in the CVE table.
1.4	November 6, 2020	Added information to the What's New section: Azul Zulu 11 off-cycle updates released to align with OpenJDK off-cycle November 2020 updates.
1.5	November 17, 2020	Added information to the What's New section: JDK-8214440 to November 2020 OpenJDK Bug Fixes.

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Zulu Overview

Azul Systems® Zulu® is an implementation of the Java Standard Edition (SE) based on OpenJDK and optimized for embedded devices. Zulu includes Java Development Kit (JDK) that provides a collection of tools for application development.

What's New

November 6, 2020

Zulu 11.43.100 release

Summary

This Azul Zulu™ release is an alignment with the corresponding OpenJDK off-cycle update releases that are happening in November 2020. The primary motivation for these off-cycle OpenJDK updates is fixing a regression that introduced a crashing bug (in the C2 compiler, [JDK-8250861](#)) in the October OpenJDK update of the various projects.

The latest Azul Zulu™ builds that fix this regression are now available for download from regular locations including the Azul website. These builds contain all fixes and patches released on November 6, 2020, in coordination with OpenJDK.

The details of the released Zulu versions are specified in the following table:

Java SE Version	Java Update Type*	Zulu Version	JDK Version	Based on**	
				Zulu Version	JDK Version
11	PSU	11.43	11.0.9.1+1	11.43	11.0.9+11

*Java Update Type:

- **CPU** (Critical Patch Updates) contain fixes to security vulnerabilities and critical bug fixes. Zulu CPU releases are generally based on prior-cycle PSU releases, with only security fixes applied. They provide a low-risk vehicle for the potentially urgent deployment of security fixes when issues of sufficient severity arise. CPU releases are available in SA distributions.
- **PSU** (Patch Set Updates) incorporates all of fixes in the corresponding CPU, as well as additional non-security bug fixes. Zulu PSU releases incorporate both security fixes and other accumulated changes that align the release contents with the associated OpenJDK project quarterly release. PSU releases are available in SA and CA distributions.

****Based on:** Zulu CPU releases are based on prior-cycle PSU releases. Zulu PSU releases are based on the current-cycle CPU releases.

*****Includes Support for JavaFX Version:** Information is relevant for the builds that include JavaFX support.

Resolved Issues

OpenJDK Bug Fixes

OpenJDK Patch ID	Zulu Version	Synopsis	CPU/PSU
JDK-8214440	8.50	ldap over a TLS connection negotiate failed with "javax.net.ssl.SSLPeerUnverifiedException: hostname of the server " does not match the hostname in the server's certificate"	PSU
JDK-8236512	8.50	PKCS11 Connection closed after Cipher.doFinal and NoPadding	PSU
JDK-8249266	15.28	Bump release strings for JDK 15.0.1	PSU
JDK-8250861	15.28, 13.35, 11.43, 11.42, 8.50, 8.49	Crash in MinINode::Ideal(PhaseGVN*, bool)	PSU + CPU
JDK-8255781	11.43	Bump patch update version for OpenJDK: jdk-11.0.9.1	PSU
JDK-8255933	13.35	Bump patch update version for OpenJDK: jdk-13.0.5.1	PSU

Zulu Bug Fixes

OpenJDK Patch ID	Zulu Version	Synopsis	CPU/PSU
ZULU-19069	11.43	Add a property to ignore encoding in ZipFile constructor	PSU

OpenJDK Patch ID	Zulu Version	Synopsis	CPU/PSU
ZULU-19073	11.43	Wrap in doPrivileged the property to ignore encoding in ZipFile constructor	PSU
ZULU-19076	11.43	make static and final the property to ignore encoding in ZipFile constructor	PSU

October 20, 2020

Zulu 11.43.88 release

Summary

Azul Zulu distribution types:

SA are tested, certified, and commercially supported Azul Zulu builds of OpenJDK whereby Azul ensures that software that uses the Accessible APIs of the product is not required to carry a specific license and that such use does not contaminate the code or intellectual property of such software with any license requirements.

CA are Azul Zulu builds of OpenJDK that are free to download and use.

The details of the released Zulu versions are specified in the following table:

Java SE Version	Java Update Type*	Zulu Version	JDK Version	Based on**	
				Zulu Version	JDK Version
11	PSU	11.43	11.0.9+11	11.42	11.0.8.0.101+5

*Java Update Type:

- **CPU** (Critical Patch Updates) contain fixes to security vulnerabilities and critical bug fixes. Zulu CPU releases are generally based on prior-cycle PSU releases, with only security fixes applied. They provide a low-risk vehicle for the potentially urgent deployment of security fixes when issues of sufficient severity arise. CPU releases are available in SA distributions.
- **PSU** (Patch Set Updates) incorporates all of fixes in the corresponding CPU, as well as additional non-security bug fixes. Zulu PSU releases incorporate both security fixes and

other accumulated changes that align the release contents with the associated OpenJDK project quarterly release. PSU releases are available in SA and CA distributions.

****Based on:** Zulu CPU releases are based on prior-cycle PSU releases. Zulu PSU releases are based on the current-cycle CPU releases.

IANA time zone data version

This release of Zulu comes with IANA time zone data version 2020a. For more information, see [Timezone Data Versions in the JRE Software](#). Please note that Zulu with IANA time zone data version 2020b version or later will be delivered shortly.

New Features

Shenandoah garbage collector included in Zulu

Now both Zulu 11 and Zulu 15 PSU releases include Shenandoah as a product feature. Please note, it is disabled by default in runtime. To enable Shenandoah in runtime, use `-XX:+UseShenandoahGC` flag. Please note that the product may not be mature enough for production use and should be pre-tested with your application.

Additions and Changes in Behavior

JDK-8237990: New system and environment runtime property for LDAP context

Introduced in all Zulu versions.

The `jdk.jndi.ldap.mechsAllowedToSendCredentials` property sets the list of authentication mechanisms that are allowed to send credentials over a non-encrypted connection in the LDAP context. Possible values are:

- `all` allows all mechanisms
- (empty value) allows none
- `mech1,mech2,...,mechN` allows the given authentication mechanisms

If the property is not set, all mechanisms are allowed. Note that "none" and "anonymous" authentication mechanisms are always allowed irrespective of the property value.

In previous versions, user credentials could be sent over an unencrypted connection.

JDK-8245417: New runtime properties to control TLS workflow

Introduced in all Zulu versions.

- The `jdk.tls.maxHandshakeMessageSize` property controls the maximum size limit for the handshake message. The default property value is 32768.
- The `jdk.tls.maxCertificateChainLength` property controls the maximum length for the certificate chain. The default property value is 10.

Note that when the corresponding data size exceeds the allowed value, an exception is thrown from various parts of the JDK. For example: `The size of the handshake message <actual size> exceeds the maximum allowed size <maxHandshakeMessageSize>`.

In previous versions, the maximum handshake messages size was limited to 2^{24} bytes, and there was no limit on the length of certificate chains.

JDK-8236862: New runtime property to control the number of interfaces allowed for Proxies

Introduced in all Zulu versions.

The `jdk.serialProxyInterfaceLimit` property sets the implementation limit on the number of interfaces allowed for Proxies. The property range is from 0 to 65535; the default value is 65535.

In previous versions, the maximum number of interfaces was 65535 and you couldn't set a lower value.

JDK-8233624: New mapping rules from a Java native method name to a C native library implementation function name

Introduced in all Zulu versions.

The JNI methods mapping rules have been changed, for details on new rules, see [Troubleshooting tips](#).

Note, if a Java class or package name for some reason begins with a digit "0", "1", "2", or "3", no native library search is performed, and the attempt to link the native method invocation throws `UnsatisfiedLinkError`.

To resolve compatibility issues, you can either set the `XX:+UseLegacyJNINameEscaping` runtime flag to skip the extra mapping check or notify your library provider to update the JNI names according to the new mapping rules and to reissue and redeploy the libraries.

Features and Supported Platforms

Supported Platforms

Zulu is delivered as binary builds of OpenJDK on Linux Kernel 3.10.x or higher. The following platforms are supported:

- Arm v8 CPU with 64-bit support.
- Linux Arm 64-bit EABI.

Supported Functionality

Hotspot Compilers

Zulu for Arm v8 64-bit architecture supports both server (C2) and client (C1) compilers in addition to the optimized template interpreter. The following command-line options can be used to switch between the implementations:

- `-Xint` – Runs the application in interpreted-only mode.
- `-Xcomp` – Enforces compilation of methods on first invocation.
- `-Xbatch` – Disables background compilation so that compilation of all methods proceeds as a foreground task until completed.
- `-XX:[+/-]TieredCompilation` - Enables or disables the tiered compilation (enabled by default). When the tiered compilation is disabled, only the server compiler is used.
- `-XX:TieredStopAtLevel=X` -Limits the compilation level (0 - interpreted, 1 - client compiler is used only, 4 - full tiered compilation to up C2).

Refer to the extended list of the [Advanced JIT Compiler Options](#), for more information about fine-tuning the compilation behavior. For example, you can tune the compilation thresholds in order to balance the startup time and execution performance.

Getting Started with Zulu

To start working with the Zulu perform the following steps:

Extract the Installation Archive

- Download one of the installation archives and save it in a reasonable location on your system.
- Extract the downloaded archive:

```
$ tar -xzf zulu11.43.100-ca-jdk11.0.9.1-linux_
aarch64.tar.gz
```

- Copy the extracted directory into the following location:

```
/usr/lib/jvm
```

Add Debug Symbols

If you do not need debug symbols, skip this step.

- Download one of the archives with the debug symbols:

```
zulu11.43.100-ca-dbg-jdk11.0.9.1-linux_aarch64.zip
```

- Copy the archive to:

```
/usr/lib/jvm/zulu11.43.100-ca-jdk11.0.9.1-linux_
aarch64
```

- Extract the archive. For example,

```
$ unzip zulu11.43.100-ca-dbg-jdk11.0.9.1-linux_
aarch64.zip
```

Verify Java Version

- Run a simple Java command:

```
$ java -version
```

If needed, provide the fully qualified path. For example:

```
$ /usr/lib/jvm/zulu11.43.100-ca-jdk11.0.9.1-linux_
aarch64/bin/java -version
```

- Inspect the system response. Correct sample output should look as follows:

```
openjdk version "11.0.9.1" 2020-11-06 LTS
```

```
OpenJDK Runtime Environment Zulu11.43+100-CA (build
11.0.9.1+1-LTS)
```

```
OpenJDK 64-Bit Server VM Zulu11.43+100-CA (build
11.0.9.1+1-LTS, mixed mode)
```

Zulu Resolved Issues

This section summarizes JDK Common Vulnerabilities and Exposure (CVE) fixes reflecting October, 2020 OpenJDK changes implemented for the following Zulu levels:

- Zulu 15
- Zulu 13
- Zulu 11
- Zulu 8

JDK Common Vulnerabilities and Exposure (CVE) Fixes

October, 2020 CVE Fixes

CVSS VERSION 3.0 RISK															
CVE #	Component	Protocol	Remote Exploit without Auth.	Base Score	Attack Vector	Attack Complex	Privs Req'd	User Interact	Scope	Confidentiality	Integrity	Availability	Supported Zulu Versions Affected	Modules Changed to Address CVE	Notes
CVE-2020-14803	Libraries	Multiple	Yes	5.3	Network	Low	None	None	Unchanged	Low	None	None	15, 13, 11	15, 13, 11: java.base	Note 1
CVE-2020-14792	Hotspot	Multiple	Yes	4.2	Network	High	None	Required	Unchanged	Low	Low	None	15, 13, 11, 8, 7, 6	15, 13, 11: hotspot 8, 7, 6: HOTSPOT	Note 2

October, 2020 CVE Fixes

CVSS VERSION 3.0 RISK															
CVE #	Component	Protocol	Remote Exploit without Auth.	Base Score	Attack Vector	Attack Complex	Privs Req'd	User Interact	Scope	Confidentiality	Integrity	Availability	Supported Zulu Versions Affected	Modules Changed to Address CVE	Notes
CVE-2020-14797	Libraries	Multiple	Yes	3.7	Network	High	None	None	Unchanged	None	Low	None	15, 13, 11, 8, 7	15, 13, 11: java.base 8, 7: JDK	Note 2
CVE-2020-14782	Libraries	Multiple	Yes	3.7	Network	High	None	None	Unchanged	None	Low	None	15, 13, 11, 8, 7	15, 13, 11: java.base 8, 7: JDK	Note 2
CVE-2020-14781	JNDI	Multiple	Yes	3.7	Network	High	None	None	Unchanged	Low	None	None	15, 13, 11, 8, 7, 6	15, 13, 11: java.naming 8, 7, 6: JDK	Note 2
CVE-2020-14779	Serialization	Multiple	Yes	3.7	Network	High	None	None	Unchanged	None	None	Low	15, 13, 11, 8, 7, 6	15, 13, 11: java.base 8, 7, 6: JDK JDK	Note 2

October, 2020 CVE Fixes

CVSS VERSION 3.0 RISK															
CVE #	Component	Protocol	Remote Exploit without Auth.	Base Score	Attack Vector	Attack Complex	Privs Req'd	User Interact	Scope	Confidentiality	Integrity	Availability	Supported Zulu Versions Affected	Modules Changed to Address CVE	Notes
CVE-2020-14798	Libraries	Multiple	Yes	3.1	Network	High	None	Required	Unchanged	None	Low	None	15, 13, 11, 8, 7	15, 13, 11: java.base 8, 7: JDK	Note 1
CVE-2020-14796	Libraries	Multiple	Yes	3.1	Network	High	None	Required	Unchanged	Low	None	None	15, 13, 11, 8, 7	15, 13, 11: java.base 8, 7: JDK	Note 1

Base and Impact Metric:

Metrics	Values
Attack Vector	Network (N), Adjacent (A), Local (L), and Physical (P)
Attack Complexity	Low (L) and High (H)
Privileges Required	None (N), Low (L), and High (H)
User Interaction	None (N) and Required (R)
Scope	Unchanged (U) and Changed (C)
Confidentiality Impact	High (H), Low (L), and None (N)

Integrity Impact	High (H), Low (L), and None (N)
Availability Impact	High (H), Low (L), and None (N)

Notes:

ID	Notes
1	This vulnerability applies to Java deployments that load and run untrusted code (e.g., code that comes from the internet) and rely on the Java sandbox for security. This vulnerability does not apply to Java deployments, typically in servers, that load and run only trusted code (e.g., code installed by an administrator).
2	This vulnerability applies to client and server deployment of Java. This vulnerability can be exploited through untrusted code executed under Java sandbox restrictions. It can also be exploited by supplying data to APIs in the specified Component without using untrusted code executed under Java sandbox restrictions, such as through a web service.

In-Depth Non-CVE Security Fixes

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8253019	Enhanced JPEG decoding	CPU
JDK-8249927	Specify limits of <code>jdk.serialProxyInterfaceLimit</code>	CPU
JDK-8248574	Improve jpeg processing	CPU
JDK-8248177	Improve XML support	CPU
JDK-8248171	Better query support	CPU
JDK-8245417	Improve certificate chain handling	CPU
JDK-8245412	Better class definitions	CPU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8245407	Enhance zoning of times	CPU
JDK-8244955	Additional Fix for JDK-8240124	CPU
JDK-8244479	Further constrain certificates	CPU
JDK-8243302	Advanced class supports	CPU
JDK-8240124	Better VM Interning	CPU
JDK-8236196	Improve string pooling	CPU
JDK-8233624	Enhance JNI Inkage	CPU

Other OpenJDK Bug Fixes

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8253813	Backout JDK-8244287 from 11u: it causes several crashes	PSU
JDK-8253283	[11u] Test build/translations/VerifyTranslations.java failing after JDK-8252258	PSU
JDK-8253134	JMM_VERSION should remain at 0x20020000 (JDK 10) in JDK 11	PSU
JDK-8253050	jfr disassemble command processes --max-chunks incorrectly	PSU
JDK-8253019	Enhanced JPEG decoding	CPU
JDK-8252804	[test] Fix 'ReleaseDeflater.java' test after downport of 8234011	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8252497	Incorrect numeric currency code for ROL	PSU
JDK-8252258	[11u] JDK-8242154 changes the default vendor	PSU
JDK-8252157	JDK-8231209 11u backport breaks jmm binary compatibility	PSU
JDK-8252120	compiler/oracle/TestCompileCommand.java misspells "occured"	PSU
JDK-8251487	Shenandoah: missing detail timing tracking for final mark cleaning phase	PSU
JDK-8251469	Better cleanup for test/jdk/javax/imageio/SetOutput.java	PSU
JDK-8251451	Shenandoah: Remark ObjectSynchronizer roots with I-U	PSU
JDK-8251354	Shenandoah: Fix JFR test failures	PSU
JDK-8251117	Cannot check P11Key size in P11Cipher and P11AEADCipher	PSU
JDK-8250844	Make sure {type,obj}ArrayOopDesc accessors check the bounds	PSU
JDK-8250827	Shenandoah: needs to reset/finish StringTable's dead count before/after parallel walk	PSU
JDK-8250826	jhsdb does not work with coredump which comes from Substrate VM	PSU
JDK-8250787	Provider.put no longer registering aliases in FIPS env	PSU
JDK-8250784	Shenandoah: A Low-Pause-Time Garbage Collector	PSU
JDK-8250755	Better cleanup for jdk/test/javax/imageio/plugins/shared/CanWriteSequence.java	PSU
JDK-8250636	iso8601_time returns incorrect offset part on MacOS	PSU
JDK-8250627	Use -XX:+/-UseContainerSupport for enabling/disabling Java container metrics	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8250609	C2 crash in <code>lfNode::fold_compares</code>	PSU
JDK-8250582	Revert Principal Name type to NT-UNKNOWN when requesting TGS Kerberos tickets	PSU
JDK-8249953	Shenandoah: <code>gc/shenandoah/mxbeans</code> tests should account for corner cases	PSU
JDK-8249927	Specify limits of <code>jdk.serialProxyInterfaceLimit</code>	CPU
JDK-8249801	Shenandoah: Clear soft-refs on requested GC cycle	PSU
JDK-8249560	Shenandoah: Fix racy GC request handling	PSU
JDK-8249278	Revert JDK-8226253 which breaks the spec of <code>AccessibleState.SHOWING</code> for <code>JList</code>	PSU
JDK-8249277	<code>TestVerifyIterativeGVN.java</code> is failing with timeout in OpenJDK 11	PSU
JDK-8249255	Build fails if source code in cygwin home dir	PSU
JDK-8249251	[dark_mode ubuntu 20.04] The selected menu is not highlighted in <code>GTKLookAndFeel</code>	PSU
JDK-8249215	<code>JFrame::setVisible</code> crashed with <code>-Dfile.encoding=UTF-8</code> on Japanese Windows.	PSU
JDK-8249159	Downport test rework for <code>SSLSocketTemplate</code> from 8224650	PSU
JDK-8248987	AOT's <code>Linker.java</code> seems to eagerly fail-fast on Windows.	PSU
JDK-8248851	CMS: Missing memory fences between free chunk check and class read	PSU
JDK-8248574	Improve jpeg processing	CPU
JDK-8248495	[macos] <code>zerovm</code> is broken due to <code>libffi</code> headers location	PSU
JDK-8248385	[testbug][11u] Adapt <code>TestInitExceptions</code> to <code>jtreg 5.1</code>	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8248348	Regression caused by the update to BCEL 6.0	PSU
JDK-8248219	aarch64: missing memory barrier in fast_storefield and fast_accessfield	PSU
JDK-8248214	Add paddings for TaskQueueSuper to reduce false-sharing cache contention	PSU
JDK-8247979	aarch64: missing side effect of killing flags for clearArray_reg_reg	PSU
JDK-8247874	Replacement in VersionProps.java.template not working when --with-vendor-bug-url contains '&'	PSU
JDK-8247824	CTW: C2 (Shenandoah) compilation fails with SEGV in SBC2Support::pin_and_expand	PSU
JDK-8247615	Initialize the bytes left for the heap sampler	PSU
JDK-8247502	PhaseStringOpts crashes while optimising effectively dead code	PSU
JDK-8247350	[aarch64] assert(false) failed: wrong size of mach node	PSU
JDK-8247246	[JVMCI] `ResolvedJavaType.getDeclaredMethod()` can throw NoClassDefFoundError.	PSU
JDK-8246453	TestClone crashes with "all collected exceptions must come from the same place"	PSU
JDK-8246330	Add TLS Tests for Legacy ECDSA curves	PSU
JDK-8246203	Segmentation fault in verification due to stack overflow with -XX:+VerifyIterativeGVN	PSU
JDK-8246196	javax/management/MBeanServer/OldMBeanServerTest fails with AssertionError	PSU
JDK-8246193	Possible NPE in ENC-PA-REP search in AS-REQ	PSU
JDK-8246153	TestEliminateArrayCopy fails with -XX:+StressReflectiveCode	PSU
JDK-8246094	[macos] Sound Recording and playback is not working	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8246027	Minimal fastdebug build broken after JDK-8245801	PSU
JDK-8245981	Upgrade to jQuery 3.5.1	PSU
JDK-8245880	Shenandoah: check class unloading flag early in concurrent code root scan	PSU
JDK-8245832	JDK build make-static-libs should build all JDK libraries	PSU
JDK-8245801	StressRecompilation triggers assert "redundant OSR recompilation detected. memory leak in CodeCache!"	PSU
JDK-8245714	"Bad graph detected in build_loop_late" when loads are pinned on loop limit check uncommon branch	PSU
JDK-8245616	Bump update version for OpenJDK: jdk-11.0.9	PSU
JDK-8245417	Improve certificate chain handling	CPU
JDK-8245412	Better class definitions	CPU
JDK-8245407	Enhance zoning of times	CPU
JDK-8245283	JFR: Can't handle constant dynamic used by Jacoco agent	PSU
JDK-8245151	jarsigner should not raise duplicate warnings on verification	PSU
JDK-8244955	Additional Fix for JDK-8240124	CPU
JDK-8244818	[macos] Java2D Queue Flusher crash while moving application window to external monitor	PSU
JDK-8244763	Update --release 8 symbol information after JSR 337 MR3	PSU
JDK-8244729	Shenandoah: remove resolve paths from SBSA::generate_shenandoah_lrb	PSU
JDK-8244719	CTW: C2 compilation fails with "assert(!VerifyHashTableKeys _hash_lock == 0) failed: remove node from hash	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
	table before modifying it"	
JDK-8244703	"platform encoding not initialized" exceptions with debugger, JNI	PSU
JDK-8244479	Further constrain certificates	CPU
JDK-8244287	JFR: Methods samples have line number 0	PSU
JDK-8244225	stringop-overflow warning on strcpy call from compile_the_world_in	PSU
JDK-8244196	adjust output in os_linux	PSU
JDK-8244164	AArch64: jaotc generates incorrect code for compressed OOPs with non-zero heap base	PSU
JDK-8244151	Update MUSCLE PC/SC-Lite headers to the latest release 1.8.26	PSU
JDK-8244136	Improved Buffer supports	CPU
JDK-8244087	2020-04-24 public suffix list update v ff6fcea	PSU
JDK-8243925	Toolkit#getScreenInsets() returns wrong value on HiDPI screens (Windows)	PSU
JDK-8243489	Thread CPU Load event may contain wrong data for CPU time under certain conditions	PSU
JDK-8243470	[macos] bring back O2 opt level for unsafe.cpp	PSU
JDK-8243453	java --describe-module failed with non-ASCII module name under non-UTF8 environment	PSU
JDK-8243389	enhance os::pd_print_cpu_info on linux	PSU
JDK-8243326	Cleanup use of volatile in taskqueue code	PSU
JDK-8243321	Add Entrust root CA - G4 to Oracle Root CA program	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8243320	Add SSL root certificates to Oracle Root CA program	PSU
JDK-8243302	Advanced class supports	CPU
JDK-8243138	Enhance BaseLdapServer to support starttls extended request	PSU
JDK-8243029	Rewrite javax/net/ssl/compatibility/Compatibility.java with a flexible interop test framework	PSU
JDK-8242793	Incorrect copyright header in ContinuousCallSiteTargetChange.java	PSU
JDK-8242695	Enhanced Buffer Support	CPU
JDK-8242685	Better Path Validation	CPU
JDK-8242680	Improved URI support	CPU
JDK-8242556	Cannot load RSASSA-PSS public key with non-null params from byte array	PSU
JDK-8242283	Can't start JVM when java home path includes non-ASCII character	PSU
JDK-8242184	Default signature algorithm for an RSASSA-PSS key	PSU
JDK-8241750	x86_32 build failure after JDK-8227269	CPU
JDK-8241574	Shenandoah: remove ShenandoahAssertToSpaceClosure	PSU
JDK-8241478	vmTestbase/gc/gctests/Steal/steal001/steal001.java fails with OOME	PSU
JDK-8241319	WB_GetCodeBlob doesn't have ResourceMark	PSU
JDK-8241138	http.nonProxyHosts=* causes StringIndexOutOfBoundsException in DefaultProxySelector	PSU
JDK-8241130	com.sun.jndi.ldap.EventSupport.removeDeadNotifier: java.lang.NullPointerException	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8241114	Better range handling	CPU
JDK-8241086	Test runtime/NMT/HugeArenaTracking.java is failing on 32bit Windows	PSU
JDK-8241065	Shenandoah: remove leftover code after JDK-8231086	PSU
JDK-8241007	Shenandoah: remove ShenandoahCriticalControlThreadPriority support	PSU
JDK-8240676	Meet not symmetric failure when running lucene on jdk8	PSU
JDK-8240295	hs_err elapsed time in seconds is not accurate enough	PSU
JDK-8240169	javadoc fails to link to docs with non-matching modularity	PSU
JDK-8240124	Better VM Interning	CPU
JDK-8239385	Support the 'canonicalize' setting (krb5.conf) in the Kerberos client	PSU
JDK-8239083	C1 assert(known_holder == NULL (known_holder->is_instance_klass() && (!known_holder->is_interface() ((ciInstanceKlass*)known_holder)->has_nonstatic_concrete_methods()))), "should be non-static concrete method");	PSU
JDK-8238710	LingeredApp doesn't log stdout/stderr if exits with non-zero code	PSU
JDK-8238448	RSASSA-PSS signature verification fail when using certain odd key sizes	PSU
JDK-8238388	libj2gss/NativeFunc.o "multiple definition" link errors with GCC10	PSU
JDK-8238386	(sctp) jdk.sctp/unix/native/libjsctp/SctpNet.c "multiple definition" link errors with GCC10	PSU
JDK-8238380	java.base/unix/native/libjava/childproc.c "multiple definition" link errors with GCC10	PSU
JDK-8238284	[macos] Zero VM build fails due to an obvious typo	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8238270	java.net HTTP/2 client does not decrease stream count when receives 204 response	PSU
JDK-8237995	Enhance certificate processing	CPU
JDK-8237990	Enhanced LDAP contexts	CPU
JDK-8237977	Further update javax/net/ssl/compatibility/Compatibility.java	PSU
JDK-8237888	security/infra/java/security/cert/CertPathValidator/certification/LuxTrustCA.java fails when checking validity interval	PSU
JDK-8237182	Update copyright header for shenandoah and epsilon files	PSU
JDK-8236862	Enhance support of Proxy class	CPU
JDK-8236617	jtreg test containers/docker/TestMemoryAwareness.java fails after 8226575	PSU
JDK-8236548	Localized time zone name inconsistency between English and other locales	PSU
JDK-8236464	SO_LINGER option is ignored by SSLSocket in JDK 11	PSU
JDK-8236196	Improve string pooling	CPU
JDK-8235846	Improve WindbgDebuggerLocal implementation	PSU
JDK-8234687	change javap reporting on unknown attributes	PSU
JDK-8234541	C1 emits an empty message when it inlines successfully	PSU
JDK-8234535	Cross compilation fails due to missing CFLAGS for the BUILD_CC	PSU
JDK-8234385	[TESTBUG] java/awt/EventQueue/6980209/bug6980209.java fails in linux nightly	PSU
JDK-8234347	"Turkey" meta time zone does not generate composed localized names	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8234149	[TESTBUG]Several swing regression tests do not dispose Frame at end	PSU
JDK-8234058	runtime/CompressedOops/CompressedClassPointers.java fails with 'Narrow class base: 0x0000000000000000' missing from stdout/stderr	PSU
JDK-8234011	(zipfs) Memory leak in ZipFileSystem.releaseDeflater()	PSU
JDK-8233958	Memory retention due to HttpURLConnection finalizer that serves no purpose	PSU
JDK-8233829	javac cannot find non-ASCII module name under non-UTF8 environment	PSU
JDK-8233741	AES Countermode (CTR) optimization using AVX512 + VAES instructions	PSU
JDK-8233686	XML transformer uses excessive amount of memory	PSU
JDK-8233624	Enhance JNI Inkage	CPU
JDK-8233452	java.math.BigDecimal.sqrt() with RoundingMode.FLOOR results in incorrect result	PSU
JDK-8233386	Initialize NULL fields for unused decorations	PSU
JDK-8233228	Disable weak named curves by default in TLS, CertPath, and Signed JAR	PSU
JDK-8233027	OopMapSet::all_do does oms.next() twice during iteration	PSU
JDK-8232855	jshell missing word in /help help	PSU
JDK-8232161	Align some one-way conversion in MS950 charset with Windows	PSU
JDK-8232083	Minimal VM is broken after JDK-8231586	PSU
JDK-8231968	getCurrentThreadAllocatedBytes default implementation s/b getThreadAllocatedBytes	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8231953	Wrong assumption in assertion in oop::register_oop	PSU
JDK-8231586	enlarge encoding space for OopMapValue offsets	PSU
JDK-8231209	[REDO] JDK-8207266 ThreadMXBean::getThreadAllocatedBytes() can be quicker for self thread	PSU
JDK-8230870	(zipfs) Add a ZIP FS test that is similar to test/jdk/java/util/zip/EntryCount64k.java	PSU
JDK-8230767	FlightRecorderListener returns null recording	PSU
JDK-8230402	Allocation of compile task fails with assert: "Leaking compilation tasks?"	PSU
JDK-8230094	CCE in createXMLEventWriter(Result) over an arbitrary XMLStreamWriter	PSU
JDK-8230010	Remove jdk8037819/BasicTest1.java	PSU
JDK-8230002	javax/xml/jaxp/unittest/transform/SecureProcessingTest.java runs zero test	PSU
JDK-8230000	some httpclients testng tests run zero test	PSU
JDK-8229815	Upgrade Jline to 3.12.1	PSU
JDK-8229378	jdwp library loader in linker_md.c quietly truncates on buffer overflow	PSU
JDK-8228967	Trust/Key store and SSL context utilities for tests	PSU
JDK-8228448	Jconsole can't connect to itself	PSU
JDK-8227595	keytool/fakegen/DefaultSignatureAlgorithm.java fails due to "exitValue = 6"	PSU
JDK-8227269	Slow class loading when running with JDWP	CPU
JDK-8227059	sun/security/tools/keytool/DefaultSignatureAlgorithm.java timed out	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8226848	jline/terminal/impl files missing classpath exception clause in license header	PSU
JDK-8226809	Circular reference in printed stack trace is not correctly indented & ambiguous	PSU
JDK-8226697	Several tests which need the @key headful keyword are missing it.	PSU
JDK-8226575	OperatingSystemMXBean should be made container aware	PSU
JDK-8226536	Catch OOM from deopt that fails rematerializing objects	PSU
JDK-8225625	AES Electronic Codebook (ECB) encryption and decryption optimization using AVX512 + VAES instructions	PSU
JDK-8225037	java.net.JarURLConnection::getJarEntry() throws NullPointerException	PSU
JDK-8224234	compiler/codegen/TestCharVect2.java fails in test_mulc	PSU
JDK-8224184	jshell got IOException at exiting with AIX	PSU
JDK-8223940	Private key not supported by chosen signature algorithm	PSU
JDK-8223777	In posix_spawn mode, failing to exec() jspawnhelper may not result in an error	PSU
JDK-8223688	JShell: crash on the instantiation of raw anonymous class	PSU
JDK-8222769	[TESTBUG] TestJFRNetworkEvents should not rely on hostname command	PSU
JDK-8222079	Don't use memset to initialize fields decode_env constructor in disassembler.cpp	PSU
JDK-8222074	Enhance auto vectorization for x86	PSU
JDK-8221918	runtime/SharedArchiveFile/serviceability/ReplaceCriticalClasses.java fails: Shared archive not found	PSU
JDK-8221759	Crash when completing "java.io.File.path"	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8221658	aarch64: add necessary predicate for ubfx patterns	PSU
JDK-8220150	[macos] macos10.14 Mojave returns anti-aliased glyphs instead of aliased B&W glyphs	PSU
JDK-8219712	code_size2 (defined in stub_routines_x86.hpp) is too small on new Skylake CPUs	PSU
JDK-8218948	SimpleDateFormat :: format - Zone Names are not reflected correctly during run time	PSU
JDK-8216974	HttpConnection not returned to the pool after 204 response	PSU
JDK-8216021	RunTest.gmk might set concurrency level to 1 on Windows	PSU
JDK-8215438	jshell tool: Ctrl-D causes EOF	PSU
JDK-8215354	x86_32 build failures after JDK-8214074 (Ghash optimization using AVX instructions)	PSU
JDK-8215244	jdk/jshell/ToolBasicTest.java testHistoryReference failed	PSU
JDK-8215243	JShell tests failing intermittently with "Problem cleaning up the following threads:"	PSU
JDK-8214797	TestJmapCoreMetaspace.java timed out	PSU
JDK-8214491	Upgrade to JLine 3.9.0	PSU
JDK-8214074	Optimize Ghash using AVX instructions	PSU
JDK-8213703	LambdaConversionException: Invalid receiver type not a subtype of implementation type interface	PSU
JDK-8213574	Deadlock in string table expansion when dumping lots of CDS classes	PSU
JDK-8213275	runtime/SharedArchiveFile/serviceability/ReplaceCriticalClasses.java fails with ClassNotFoundException: jdk.internal.vm.PostVMInitHook	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8213214	Set -Djava.io.tmpdir= when running tests	PSU
JDK-8213182	Minimal VM build failure after JDK-8212200 (assert when shared java.lang.Object is redefined by JVMTI agent)	PSU
JDK-8212807	tools/jar/multiRelease/Basic.java times out	PSU
JDK-8212665	com/sun/jdi/DeferredStepTest.java: jj1 (line 57) - unexpected. lastLine=52, minLine=52, maxLine=55	PSU
JDK-8212629	[TEST] wrong breakpoint in test/jdk/com/sun/jdi/DeferredStepTest	PSU
JDK-8212200	assert(on_stack()) failed when shared java.lang.object is redefined by JVMTI agent	PSU
JDK-8211694	JShell: Redeclared variable should be reset	PSU
JDK-8211292	[TEST] convert com/sun/jdi/DeferredStepTest.sh test	PSU
JDK-8210977	jdk/jfr/event/oldobject/TestThreadLocalLeak.java fails to find ThreadLocalObject	PSU
JDK-8210760	[TEST] rewrite com/sun/jdi shell tests to java version - step4	PSU
JDK-8210748	[TESTBUG] lib.jdb.Jdb.waitForPrompt() should clarify which output is the pending reply after a timeout	PSU
JDK-8210725	com/sun/jdi/RedefineClearBreakpoint.java fails with waitForPrompt timed out after 60 seconds	PSU
JDK-8210560	[TEST] convert com/sun/jdi redefineClass-related tests	PSU
JDK-8210527	JShell: NullPointerException in jdk.jshell.Eval.translateExceptionStack	PSU
JDK-8210422	runtime/modules/ModuleStress/ExportModuleStressTest.java - assertion failed: address not aligned: 0x00000008baadbabe	CPU
JDK-8210243	[TEST] rewrite com/sun/jdi shell tests to java version - step3	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8210155	Lock ClassLoaderDataGraph	CPU
JDK-8210131	vmTestbase/nsk/jvmti/scenarios/allocation/AP10/ap10t001/TestDescription.java failed with ObjectFree: GetCurrentThreadCpuTimerInfo returned unexpected error code	PSU
JDK-8209821	Make JVMTI GetClassLoaderClasses not walk CLDG	CPU
JDK-8209608	Problem list com/sun/jdi/BreakpointWithFullGC.java	PSU
JDK-8209605	com/sun/jdi/BreakpointWithFullGC.java fails with ZGC	PSU
JDK-8209604	[TEST] rewrite com/sun/jdi shell tests to java version - step2	PSU
JDK-8209517	com/sun/jdi/BreakpointWithFullGC.java fails with timeout	PSU
JDK-8209378	Fix Minimal VM after JDK-8208677 Move inner metaspace cleaning out of class unloading	CPU
JDK-8209343	Test javax/swing/border/TestTitledBorderLeak.java should be marked as headful	PSU
JDK-8209342	Problemlist SA tests on Solaris due to Error attaching to process: Can't create thread_db agent!	PSU
JDK-8209332	[TEST] test/jdk/com/sun/jdi/CatchPatternTest.sh is incorrect	PSU
JDK-8209109	[TEST] rewrite com/sun/jdi shell tests to java version - step1	PSU
JDK-8208677	Move inner metaspace cleaning out of class unloading	CPU
JDK-8208281	java/nio/channels/AsynchronousSocketChannel/Basic.java timed out	PSU
JDK-8206309	Tier1 SA tests fail	PSU
JDK-8205534	Remove SymbolTable dependency from serviceability agent	PSU

OpenJDK Patch ID	Synopsis	CPU/PSU
JDK-8204994	SA might fail to attach to process with "Windbg Error: WaitForEvent failed"	PSU
JDK-8203928	[Test] Convert non-JDB scaffolding serviceability shell script tests to java	PSU
JDK-8203393	com/sun/jdi/JdbMethodExitTest.sh and JdbExprTest.sh fail due to timeout	PSU
JDK-8203382	Rename SystemDictionary::initialize_wk_class to resolve_wk_class	PSU
JDK-8203281	[Windows] JComboBox change in ui when editor.setBorder() is called	PSU
JDK-8203026	java.rmi.NoSuchObjectException: no such object in table	PSU
JDK-8202117	com/sun/jndi/ldap/RemoveNamingListenerTest.java fails intermittently: Connection reset	PSU
JDK-8193367	annotated type variables bounds crash javac	PSU
JDK-8172404	Tools should warn if weak algorithms are used before restricting them	PSU
JDK-8160768	Add capability to custom resolve host/domain names within the default JNDI LDAP provider	PSU
JDK-8151678	com/sun/jndi/ldap/LdapTimeoutTest.java failed due to timeout on DeadServerNoTimeoutTest is incorrect	PSU
JDK-8134599	TEST_BUG: java/rmi/transport/closeServerSocket/CloseServerSocket.java fails intermittently with Address already in use	PSU
JDK-8067354	com/sun/jdi/GetLocalVariables4Test.sh failed	PSU
JDK-8062947	Fix exception message to correctly represent LDAP connection failure	PSU
JDK-8022535	[TEST BUG] javax/swing/text/html/parser/Test8017492.java fails	PSU
JDK-6949753	[TEST BUG]: java/awt/print/PageFormat/PDialogTest.java needs update by removing a infinite loop	PSU
JDK-6532025	GIF reader throws misleading exception with truncated images	PSU

Zulu Bug Fixes

OpenJDK Patch ID	Synopsis	CPU/PSU
ZULU-18668	missing part of JDK-8213250 backport	CPU

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