



Azul Zulu builds of OpenJDK

Azul Zulu 19 General Availability

Release Notes

Revision 1.5

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Revision History

Revision	Date	Description
0.1	September 20, 2022	Initial version of the document.
0.2	September 20, 2022	Added OpenJFX bugs and "What's new".
1.0	September 20, 2022	Ready for release.
1.1	September 20, 2022	Types of distribution: SA and CA.
1.2	September 20, 2022	Added Known Issues.
1.3	September 20, 2022	Updated Known Issues: JEP-356.
1.4	September 20, 2022	Updated Known Issues: JVM TI.
1.5	September 20, 2022	Correct JavaFX version number.

Release Details

Release Date: September 20, 2022

This release is a General Availability release of Azul Zulu 19. The following table describes which Azul Zulu versions are published with this release.

Azul Zulu Version*	JDK Version	JavaFX Version
19.28.81 (CA)	19.0.0+36	19.0.0+101
19.28.82 (SA)		

* Azul provides two types of distribution packages for each Java version:

- **SA** distributions are tested, certified, and commercially supported Azul Zulu builds of OpenJDK. Azul ensures that the software that uses the Accessible APIs of the product does not have to include specific licenses 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.

Supported Platforms

This section provides information about the operating systems that are supported in this release of Azul Zulu.

Operating System	Azul Zulu 19
Windows (x86)	
Windows Server 2022	Yes
Windows Server 2019	Yes
Windows Server 2016	Yes
Windows Server 2012 R2	Yes

Windows Client 11	Yes
Windows Client 10	Yes
Windows (ARM 64-bit)	
Windows 11	Yes
Linux (x86)	
RHEL 8.x	Yes
RHEL 7.x	Yes
RHEL 6.x	Yes
SLES 15	Yes
SLES 12	Yes
CentOS Stream	Yes
CentOS 8.x	Yes
Ubuntu 20.04	Yes
Ubuntu 18.04	Yes
Debian 11	Yes
Debian 10	Yes
Debian 9	Yes
CoreOS	Yes
Alpine Linux 3.11 or later	Yes
Linux (ARM 64-bit)	
Ubuntu 20.04	Yes
Alpine Linux 3.11 or later	Yes
MacOS (x86)	
macOS 12	Yes
macOS 11	Yes
MacOS (Apple Silicon)	

macOS 12	Yes
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What's New

OpenJFX enhancements:

- [JDK-8274771](#)
Map, FlatMap and OrElse fluent bindings for ObservableValue
- [JDK-8283346](#)
Optimize observable ArrayList creation in FXCollections
- [JDK-8286552](#)
TextFormatter: UpdateValue/UpdateText is called, when no ValueConverter is set
- [JDK-8268225](#)
Support :focus-visible and :focus-within CSS pseudoclasses
- [JDK-8277309](#)
Add support for H.265/HEVC to HTTP Live Streaming

IANA Time Zone Data Version

This release of Azul Zulu comes with IANA Time Zone Database version 2022a.

Fixed Issues

OpenJDK Bug Fixes

The following table describes the OpenJDK changes implemented in this release.

OpenJDK Patch ID	Synopsis
JDK-8283350	(tz) Update Timezone Data to 2022a
JDK-8285445	cannot open file "NUL:"

OpenJDK Patch ID	Synopsis
JDK-8284866	Add test to JDK-8273056
JDK-8285686	Update FreeType to 2.12.0
JDK-8287109	Distrust.java failed with CertificateExpiredException
JDK-8286855	javac error on invalid jar should only print filename
JDK-8286594	(zipfs) Mention paths with dot elements in ZipException and cleanups
JDK-8286444	javac errors after JDK-8251329 are not helpful enough to find root cause
JDK-8286293	Tests ShortResponseBody and ShortResponseBodyWithRetry should use less resources
JDK-8286198	[linux] Fix process-memory information
JDK-8286029	Add classpath exemption to globals_vectorApiSupport_***.S.inc
JDK-8286013	Incorrect test configurations for compiler/stable/TestStableShort.java
JDK-8285956	(fs) Excessive default poll interval in PollingWatchService
JDK-8285921	serviceability/dcmd/jvmti/AttachFailed/AttachReturnError.java fails on Alpine
JDK-8285828	runtime/execstack/TestCheckJDK.java fails with zipped debug symbols
JDK-8285523	Improve test java/io/FileOutputStream/OpenNUL.java
JDK-8285517	System.getenv() returns unexpected value if environment variable has non ASCII character
JDK-8285515	(dc) DatagramChannel.disconnect fails with "Invalid argument" on macOS 12.4
JDK-8285397	JNI exception pending in CUPSfuncs.c:250
JDK-8285394	Compiler blackholes can be eliminated due to stale ciMethod::intrinsic_id()
JDK-8285342	Zero build failure with clang due to values not handled in switch
JDK-8284992	Fix misleading Vector API doc for LSHR operator
JDK-8284920	Incorrect Token type causes XPath expression to return incorrect results

OpenJDK Patch ID	Synopsis
JDK-8284884	Replace polling with waiting in javax/swing/text/html/parser/Parser/8078268/bug8078268.java
JDK-8284848	C2: Compiler blackhole arguments should be treated as globally escaping
JDK-8284758	[linux] improve print_container_info
JDK-8284754	print more interesting env variables in hs_err and VM.info
JDK-8284620	CodeBuffer may leak _overflow_arena
JDK-8284549	JFR: FieldTable leaks FieldInfoTable member
JDK-8284548	Invalid XPath expression causes StringIndexOutOfBoundsException
JDK-8284532	Memory leak in BitSet::BitMapFragmentTable in JFR leak profiler
JDK-8284458	CodeHeapState::aggregate() leaks blob_name
JDK-8284369	TestFailedAllocationBadGraph fails with -XX:TieredStopAtLevel < 4
JDK-8284094	Memory leak in invoker_completeInvokeRequest()
JDK-8284033	Leak XVisualInfo in getAllConfigs in awt_GraphicsEnv.c
JDK-8284023	java.sun.awt.X11GraphicsDevice.getDoubleBufferVisuals() leaks XdbeScreenVisualInfo
JDK-8283834	Unmappable character for US-ASCII encoding in TestPredicateInputBelowLoopPredicate
JDK-8283725	Launching java with "-Xlog:gc*=trace,safepoint*=trace,class*=trace" crashes the JVM
JDK-8283641	Large value for CompileThresholdScaling causes assert
JDK-8283555	G1: Concurrent mark accesses uninitialized BOT of closed archive regions
JDK-8283497	[windows] print TMP and TEMP in hs_err and VM.info
JDK-8283469	Don't use memset to initialize members in FileMapInfo and fix memory leak
JDK-8283451	C2: assert(_base == Long) failed: Not a Long
JDK-8283422	Create a new test for JDK-8254790

OpenJDK Patch ID	Synopsis
JDK-8283408	Fix a C2 crash when filling arrays with unsafe
JDK-8283379	Memory leak in FileHeaderHelper
JDK-8283279	[Testbug] Improve TestGetSwapSpaceSize
JDK-8283249	CompressedClassPointers.java fails on ppc with 'Narrow klass shift: 0' missing
JDK-8283217	Leak FcObjectSet in getFontConfigLocations() in fontpath.c
JDK-8283187	C2: loop candidate for superword not always unrolled fully if superword fails
JDK-8283022	com/sun/crypto/provider/Cipher/AEAD/GCMBufferTest.java failing with -Xcomp after 8273297
JDK-8282929	Localized monetary symbols are not reflected in <code>toLocalizedPattern</code> return value
JDK-8282887	Potential memory leak in sun.util.locale.provider.HostLocaleProviderAdapterImpl.getNumberPattern() on Windows
JDK-8282874	Bad performance on gather/scatter API caused by different IntSpecies of indexMap
JDK-8282628	Potential memory leak in sun.font.FontConfigManager.getFontConfig()
JDK-8282592	C2: assert(false) failed: graph should be schedulable
JDK-8282590	C2: assert(addp.is_AddP() && addp.outcnt() > 0) failed: Don't process dead nodes
JDK-8282583	Update BCEL md to include the copyright notice
JDK-8282551	Properly initialize L32X64MixRandom state
JDK-8282538	PKCS11 tests fail on CentOS Stream 9
JDK-8282509	[exploded image] ResolvedClassTest fails with similar output
JDK-8282444	Module finder incorrectly assumes default file system path-separator character

OpenJDK Patch ID	Synopsis
JDK-8282422	JTable.print() failed with UnsupportedCharsetException on AIX ko_KR locale
JDK-8282382	Report glibc malloc tunables in error reports
JDK-8282345	handle latest VS2022 in abstract_vm_version
JDK-8282312	Minor corrections to evbroadcasti32x4 intrinsic on x86
JDK-8282295	SymbolPropertyEntry::set_method_type fails with assert
JDK-8282293	Domain value for system property jdk.https.negotiate.cbt should be case-insensitive
JDK-8282231	x86-32: runtime call to SharedRuntime::ldiv corrupts registers
JDK-8282219	jdk/java/lang/ProcessBuilder/Basic.java fails on AIX
JDK-8282194	C1: Missing side effects of dynamic constant linkage
JDK-8282172	CompileBroker::log metaspace_failure is called from non-Java/compiler threads
JDK-8282170	JVMTI SetBreakpoint metaspace allocation test
JDK-8282142	[TestCase] compiler/inlining/ResolvedClassTest.java will fail when --with-jvm-features=-compiler1
JDK-8282080	Lambda deserialization fails for Object method references on interfaces
JDK-8282045	When loop strip mining fails, safepoints are removed from loop anyway
JDK-8282042	[testbug] FileEncodingTest.java depends on default encoding
JDK-8282008	Incorrect handling of quoted arguments in ProcessBuilder
JDK-8281822	Test failures on non-DTrace builds due to incomplete DTrace* flags handling
JDK-8281811	assert(_base == Tuple) failed: Not a Tuple after JDK-8280799
JDK-8281771	Crash in java_lang_invoke_MethodType::print_signature
JDK-8281638	jfr/event/allocation tests fail with release VMs after JDK-8281318 due to lack of -XX:+UnlockDiagnosticVMOptions

OpenJDK Patch ID	Synopsis
JDK-8281615	Deadlock caused by jdwp agent
JDK-8281544	assert(VM_Version::supports_avx512bw()) failed for Tests jdk/incubator/vector/
JDK-8281522	Rename ADLC classes which have the same name as hotspot variants
JDK-8281450	Remove unnecessary operator new and delete from ObjectMonitor
JDK-8281338	NSAccessibilityPressAction action for tree node and NSAccessibilityShowMenuAction action not working
JDK-8281318	Improve jfr/event/allocation tests reliability
JDK-8281275	Upgrading from 8 to 11 no longer accepts '/' as filepath separator in gc paths
JDK-8281274	deal with ActiveProcessorCount in os::Linux::print_container_info
JDK-8281266	[JVMCI] MetaUtil.toInternalName() doesn't handle hidden classes correctly
JDK-8281181	Do not use CPU Shares to compute active processor count
JDK-8281168	Micro-optimize VarForm.getMemberName for interpreter
JDK-8281093	Violating Attribute-Value Normalization in the XML specification 1.0
JDK-8281043	Intrinsify recursive ObjectMonitor locking for PPC64
JDK-8280964	[Linux aarch64] : drawImage dithers TYPE_BYTE_INDEXED images incorrectly
JDK-8280956	Re-examine copyright headers on files in src/java.desktop/macosx/native/libawt_lwawt/awt/a11y
JDK-8280941	os::print_memory_mappings() prints segment preceeding the inclusion range
JDK-8280940	gtest os.release_multi_mappings_vm is racy
JDK-8280901	MethodHandle::linkToNative stub is missing w/ -Xint
JDK-8280867	Cpuid1Ecx feature parsing is incorrect for AMD CPUs

OpenJDK Patch ID	Synopsis
JDK-8280799	C2: assert(false) failed: cyclic dependency prevents range check elimination
JDK-8280684	JfrRecorderService fails with guarantee(num_written > 0) when no space left on device.
JDK-8280600	C2: assert(!had_error) failed: bad dominance
JDK-8280593	[PPC64, S390] redundant allocation of MacroAssembler in StubGenerator ctor
JDK-8280476	[macOS] : hotspot arm64 bug exposed by latest clang
JDK-8280401	[sspi] gss_accept_sec_context leaves output_token uninitialized
JDK-8280373	Update Xalan serializer / SystemIDResolver to align with JDK-8270492
JDK-8280123	C2: Infinite loop in CMoveINode::Ideal during IGVN
JDK-8280041	Retry loop issues in java.io.ClassCache
JDK-8280004	DCmdArgument<jlong>::parse_value() should handle NULL input
JDK-8279842	HTTPS Channel Binding support for Java GSS/Kerberos
JDK-8279837	C2: assert(is_Loop()) failed: invalid node class: Region
JDK-8279822	CI: Constant pool entries in error state are not supported
JDK-8279669	test/jdk/com/sun/jdi/TestScaffold.java uses wrong condition
JDK-8279668	x86: AVX2 versions of vpxor should be asserted
JDK-8279597	[TESTBUG] ReturnBlobToWrongHeapTest.java fails with -XX:TieredStopAtLevel=1 on machines with many cores
JDK-8279586	[macos] custom JCheckBox and JRadioButton with custom icon set: focus is still displayed after unchecking
JDK-8279560	AArch64: generate_compare_long_string_same_encoding and LARGE_LOOP_PREFETCH alignment
JDK-8279532	ProblemList sun/security/ssl/SSLSessionImpl/NoInvalidateSocketException.java

OpenJDK Patch ID	Synopsis
JDK-8279529	ProblemList java/nio/channels/DatagramChannel/ManySourcesAndTargets.java on macosx-aarch64
JDK-8279520	SPNEGO has not passed channel binding info into the underlying mechanism
JDK-8279515	C1: No inlining through invokedynamic and invokestatic call sites when resolved class is not linked
JDK-8279437	[JVMCI] exception in HotSpotJVMCIruntime.translate can exit the VM
JDK-8279356	Method linking fails with guarantee(mh.adapter() != NULL) failed: Adapter blob must already exist!
JDK-8279227	Access Bridge: Wrong frame position and hit test result on HiDPI display
JDK-8279219	[REDO] C2 crash when allocating array of size too large
JDK-8278966	two microbenchmarks tests fail "assert(!jvms.method().has_exception_handlers()) failed: no exception handler expected" after JDK-8275638
JDK-8278951	containers/cgroup/PlainRead.java fails on Ubuntu 21.10
JDK-8278948	compiler/vectorapi/reshape/TestVectorCastAVX1.java crashes in assembler
JDK-8278851	Correct signer logic for jars signed with multiple digest algorithms
JDK-8278796	Incorrect behavior of FloatVector.withLane on x86
JDK-8278794	Infinite loop in DeflaterOutputStream.finish()
JDK-8278549	UNIX sun/font coding misses SUSE distro detection on recent distro SUSE 15
JDK-8278519	serviceability/jvmti/FieldAccessWatch/FieldAccessWatch.java failed "assert(handle != __null) failed: JNI handle should not be null"
JDK-8278472	Invalid value set to CANDIDATEFORM structure
JDK-8278381	[GCC 11] Address::make_raw() does not initialize rspec

OpenJDK Patch ID	Synopsis
JDK-8278346	java/nio/file/Files/probeContentType/Basic.java fails on Linux SLES15 machine
JDK-8278186	org.jcp.xml.dsig.internal.dom.Utils.parseIdFromSameDocumentURI throws StringIndexOutOfBoundsException when calling substring method
JDK-8278065	Refactor subclassAudits to use ClassValue
JDK-8277922	Unable to click JCheckBox in JTable through Java Access Bridge
JDK-8277893	Arraycopy stress tests
JDK-8277072	ObjectStreamClass caches keep ClassLoaders alive
JDK-8277055	Assert "missing inlining msg" with -XX:+PrintIntrinsics
JDK-8276990	Memory leak in invoker.c fillInvokeRequest() during JDI operations
JDK-8275830	C2: Receiver downcast is missing when inlining through method handle linkers
JDK-8275638	GraphKit::combine_exception_states fails with "matching stack sizes" assert
JDK-8275337	C1: assert(false) failed: live_in set of first block must be empty
JDK-8274939	Incorrect size of the pixel storage is used by the robot on macOS
JDK-8274751	Drag And Drop hangs on Windows
JDK-8274735	javax.imageio.IIOException: Unsupported Image Type while processing a valid JPEG image
JDK-8274524	SSLSocket.close() hangs if it is called during the ssl handshake
JDK-8273139	C2: assert(f > 1 && f >= 0) failed: Incorrect frequency
JDK-8272493	Suboptimal code generation around Preconditions.checkIndex intrinsic with AVX2
JDK-8271055	Crash during deoptimization with "assert(bb.is_reachable()) failed: getting result from unreachable basicblock" with -XX:+VerifyStack
JDK-8271008	appcds/*/MethodHandlesAsCollectorTest.java tests time out because of excessive GC (CodeCache GC Threshold) in loom

OpenJDK Patch ID	Synopsis
JDK-8265317	[vector] assert(payload.is_object()) failed: expected 'object' value for scalar-replaced boxed vector but got: NULL
JDK-8258814	Compilation logging crashes for thread suspension / debugging tests
JDK-8256368	Avoid repeated upcalls into Java to re-resolve MH/VH linkers/invokers
JDK-8255266	Update Public Suffix List to 3c213aa
JDK-8249592	Robot.mouseMove moves cursor to incorrect location when display scale varies and Java runs in DPI Unaware mode
JDK-8240903	Add test to check that jmod hashes are reproducible
JDK-8240756	[macos] SwingSet2:TableDemo:Printed Japanese characters were garbled
JDK-8236136	tests which use CompilationMode shouldn't be run w/ TieredStopAtLevel
JDK-8225122	Test AncestorResized.java fails when Windows desktop is scaled.
JDK-8214733	runtime/8176717/TestInheritFD.java timed out
JDK-8206187	javax.management.remote.mandatory/connection/DefaultAgentFilterTest.java fails with Port already in use
JDK-8181571	printing to CUPS fails on mac sandbox app
JDK-8292260	[BACKOUT] JDK-8279219: [REDO] C2 crash when allocating array of size too large
JDK-8139173	[macosx] JInternalFrame shadow is not properly drawn
JDK-8287362	FieldAccessWatch testcase failed on AIX platform
JDK-8287162	(zipfs) Performance regression related to support for POSIX file permissions
JDK-8287119	Add Distrust.java to ProblemList

OpenJFX Bug Fixes

The following table describes the JavaFX changes implemented in this release.

OpenJDK Patch ID	Synopsis	Subcomponent
JDK-8290331	Binding value left null when immediately revalidated in invalidation listener	base
JDK-8291906	Bindings.createXxxBinding inherit incorrect method docs	base
JDK-8187307	ListView, TableView, TreeView: receives editCancel event when edit is committed	controls
JDK-8187309	TreeCell must not change tree's data	controls
JDK-8187596	TreeView selection incorrectly changes after deleting an unselected row	controls
JDK-8193442	Removing TreeItem from a TreeTableView sometime changes selectedItem	controls
JDK-8244234	MenuBar: NPE on removing from scene with open popup	controls
JDK-8251480	TableColumnHeader: calc of cell width must respect row styling	controls
JDK-8251481	TableCell accessing row: NPE on auto-sizing	controls
JDK-8251483	TableCell: NPE on modifying item's list	controls
JDK-8273336	Clicking a selected cell from a group of selected cells in a TableView clears the selected items list but remains selected	controls
JDK-8273339	IOOBE with ListChangeListener added to the selectedItem list of a TableView	controls
JDK-8276056	Control.skin.setSkin(Skin) fails to call dispose() on discarded Skin	controls
JDK-8277122	SplitPane divider drag can hang the layout	controls
JDK-8277853	With Touch enabled devices scrollbar disappears and the table is scrolled to the beginning	controls
JDK-8277756	DatePicker listener might not be added when using second constructor	controls

OpenJDK Patch ID	Synopsis	Subcomponent
JDK-8277785	ListView scrollTo jumps to wrong location when CellHeight is changed	controls
JDK-8279228	Leak in ScrollPaneSkin, related to touch events	controls
JDK-8281723	Spinner with split horizontal arrows and a border places right arrow incorrectly	controls
JDK-8282093	LineChart path incorrect when outside lower bound	controls
JDK-8282100	Missed top/left bouncing for ScrollPane on Raspberry Pi with Touchscreen	controls
JDK-8283509	Invisible menus can lead to IndexOutOfBoundsException	controls
JDK-8284676	TreeTableView loses sort ordering when applied on empty table	controls
JDK-8284665	First selected item of a TreeItem multiple selection gets removed if new items are constantly added to the TreeTableView	controls
JDK-8285197	TableColumnHeader: calc of cell width must respect row styling (TreeTableView)	controls
JDK-8286261	Selection of non-expanded non-leaf treeitem grows unexpectedly when adding two-level descendants	controls
JDK-8289751	Multiple unit test failures after JDK-8251483	controls
JDK-8290348	TreeTableView jumping to top	controls
JDK-8277572	ImageStorage should correctly handle MIME types for images encoded in data URIs	graphics
JDK-8279013	ES2Pipeline fails to detect AMD vega20 graphics card	graphics
JDK-8285217	[Android] Window's screen is not updated after native screen was disposed	graphics
JDK-8288137	The set of available printers is not updated without application restart	graphics

OpenJDK Patch ID	Synopsis	Subcomponent
JDK-8291502	Mouse or touch presses on a non-focusable region don't clear the focusVisible flag of the current focus owner	graphics
JDK-8280840	Update libFFI to 3.4.2	media
JDK-8282054	Mediaplayer not working with HTTP Live Stream link with query parameter appended with file extension m3u8	media
JDK-8283218	Update GStreamer to 1.20.1	media
JDK-8283318	Videos with unusual sizes cannot be played on windows	media
JDK-8283403	Update Glib to 2.72.0	media
JDK-8280369	native library cache should be platform/arch specific	other
JDK-8281089	JavaFX built with VS2019 and jlinked into JDK 11.x fails to start	other
JDK-8286678	Fix mistakes in FX API docs	other
JDK-8281953	NullPointerException in InputMethod components in JFXPanel	swing
JDK-8088420	JavaFX WebView memory leak via EventListener	web
JDK-8255940	localStorage is null after window.close()	web
JDK-8269115	WebView paste event contains old data	web
JDK-8278759	PointerEvent: buttons property set to 0 when mouse down	web
JDK-8278980	Update WebKit to 613.1	web
JDK-8280020	Underline and line-through not straight in WebView	web
JDK-8280841	Update SQLite to 3.37.2	web
JDK-8281711	Cherry-pick WebKit 613.1 stabilization fixes	web
JDK-8282099	Cherry-pick WebKit 613.1 stabilization fixes (2)	web
JDK-8282134	Certain regex can cause a JS trap in WebView	web
JDK-8283328	Update libxml2 to 2.9.13	web

OpenJDK Patch ID	Synopsis	Subcomponent
JDK-8284184	Crash in GraphicsContextJava::drawLinesForText on https://us.yahoo.com/	web
JDK-8286256	Update libxml2 to 2.9.14	web
JDK-8286257	Update libxslt to 1.1.35	web
JDK-8289587	IllegalArgumentException: Color.rgb's red parameter (-16776961) expects color values 0-255	web
JDK-8271054	[REDO] Wrong stage gets focused after modal stage creation	window-toolkit
JDK-8284654	Modal behavior returns to wrong stage	window-toolkit

Known issues

- In this release, JRE bits do not support the pseudorandom number generators introduced in the [JEP-356](#), as a workaround JDK bits can be used instead.
- Zulu 19.28 32-bit bundles do not support JVM Tool Interface (TI).

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