# Java9 - Features abseits von Jigsaw und JShell

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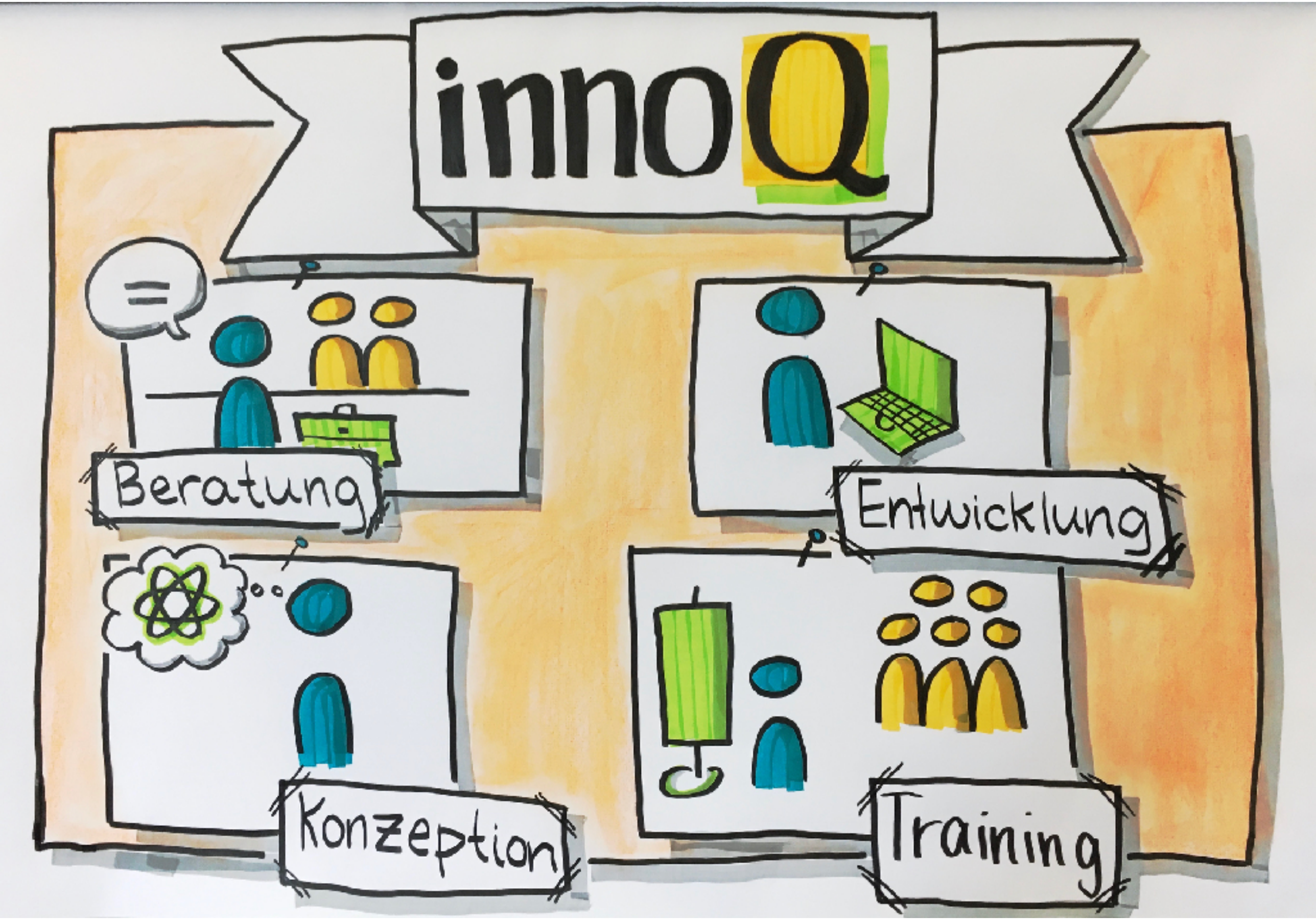
# Michael Vitz

Senior Consultant @ innoQ

michael.vitz@innoq.com

@michaelvitz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# Zeitplan

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# JDK 9

The goal of this Project is to produce an open-source reference implementation of the Java SE 9 Platform defined by JSR 379 in the Java Community Process.

The schedule and features of this release are proposed and tracked via the JEP Process, as amended by the JEP 2.0 proposal.

## Schedule

| | |
|---|---|
| 2016/05/26 | Feature Complete |
| 2016/12/22 | Feature Extension Complete |
| 2017/01/05 | Rampdown Start |
| 2017/02/09 | All Tests Run |
| 2017/02/16 | Zero Bug Bounce |
| 2017/03/16 | Rampdown Phase Two |
| 2017/06/22 | Initial Release Candidate |
| 2017/07/06 | Final Release Candidate |
| 2017/09/21 | General Availability |

http://openjdk.java.net/projects/jdk9/

## End of Public Updates for Oracle JDK 8

As outlined in the Oracle JDK Support Roadmap below, Oracle will not post further updates of Java SE 8 to its public download sites for commercial use after September 2018. Customers who need continued access to critical bug fixes and security fixes as well as general maintenance for Java SE 8 or previous versions can get long term support through Oracle Java SE Advanced, Oracle Java SE Advanced Desktop, or Oracle Java SE Suite. All other users are recommended to upgrade to the latest major releases of the Oracle JDK or OpenJDK.

Oracle does not plan to migrate desktops from Java 8 to Java 9 through the auto update feature. Instead of relying on a pre-installed standalone JRE, we will begin encouraging application developers to deliver JREs with their applications. More details will be made available through early 2018.

### Java SE Public Updates

| Release | GA Date | End of Public Updates Notification | End of Public Updates |
|---|---|---|---|
| 8 | Mar 2014 | Sep 2017 | Sep 2018* |
| 9 | Sep 2017 | Sep 2017 | Mar 2018** |
| 18.3*** | Mar 2018 | Mar 2018 | Sep 2018 |

* or later.
** Java SE 9 will be a short term release, and users should immediately transition to the next release (18.3) when available.
*** Oracle has proposed a new version scheme (YY.M) starting in March, 2018. Java SE 18.3 will be a short term release and users should transition to the next release when available.

http://www.oracle.com/technetwork/java/eol-135779.html

# Features

102: Process API Updates
110: HTTP 2 Client
143: Improve Contended Locking
158: Unified JVM Logging
165: Compiler Control
193: Variable Handles
197: Segmented Code Cache
199: Smart Java Compilation, Phase Two
200: The Modular JDK
201: Modular Source Code
211: Elide Deprecation Warnings on Import Statements
212: Resolve Lint and Doclint Warnings
213: Milling Project Coin
214: Remove GC Combinations Deprecated in JDK 8
215: Tiered Attribution for javac
216: Process Import Statements Correctly
217: Annotations Pipeline 2.0
219: Datagram Transport Layer Security (DTLS)
220: Modular Run-Time Images
221: Simplified Doclet API
222: jshell: The Java Shell (Read-Eval-Print Loop)
223: New Version-String Scheme
224: HTML5 Javadoc
225: Javadoc Search
226: UTF-8 Property Files
227: Unicode 7.0
228: Add More Diagnostic Commands
229: Create PKCS12 Keystores by Default
231: Remove Launch-Time JRE Version Selection
232: Improve Secure Application Performance
233: Generate Run-Time Compiler Tests Automatically
235: Test Class-File Attributes Generated by javac
236: Parser API for Nashorn
237: Linux/AArch64 Port
238: Multi-Release JAR Files
240: Remove the JVM TI hprof Agent
241: Remove the jhat Tool
243: Java-Level JVM Compiler Interface
244: TLS Application-Layer Protocol Negotiation Extension
245: Validate JVM Command-Line Flag Arguments
246: Leverage CPU Instructions for GHASH and RSA
247: Compile for Older Platform Versions
248: Make G1 the Default Garbage Collector
249: OCSP Stapling for TLS
250: Store Interned Strings in CDS Archives
251: Multi-Resolution Images
252: Use CLDR Locale Data by Default
253: Prepare JavaFX UI Controls & CSS APIs for Modularization
254: Compact Strings
255: Merge Selected Xerces 2.11.0 Updates into JAXP
256: BeanInfo Annotations
257: Update JavaFX/Media to Newer Version of GStreamer
258: HarfBuzz Font-Layout Engine
259: Stack-Walking API
260: Encapsulate Most Internal APIs
261: Module System
262: TIFF Image I/O
263: HiDPI Graphics on Windows and Linux
264: Platform Logging API and Service
265: Marlin Graphics Renderer
266: More Concurrency Updates
267: Unicode 8.0
268: XML Catalogs
269: Convenience Factory Methods for Collections
270: Reserved Stack Areas for Critical Sections
271: Unified GC Logging
272: Platform-Specific Desktop Features
273: DRBG-Based SecureRandom Implementations
274: Enhanced Method Handles
275: Modular Java Application Packaging
276: Dynamic Linking of Language-Defined Object Models
277: Enhanced Deprecation
278: Additional Tests for Humongous Objects in G1
279: Improve Test-Failure Troubleshooting
280: Indify String Concatenation
281: HotSpot C++ Unit-Test Framework
282: jlink: The Java Linker
283: Enable GTK 3 on Linux
284: New HotSpot Build System
285: Spin-Wait Hints
287: SHA-3 Hash Algorithms
288: Disable SHA-1 Certificates
289: Deprecate the Applet API
290: Filter Incoming Serialization Data
291: Deprecate the Concurrent Mark Sweep (CMS) Garbage Collector
292: Implement Selected ECMAScript 6 Features in Nashorn
294: Linux/s390x Port
295: Ahead-of-Time Compilation
297: Unified arm32/arm64 Port
298: Remove Demos and Samples
299: Reorganize Documentation

http://openjdk.java.net/projects/jdk9/

# JEP 102

# Process API Updates

```
ProcessHandle.current().pid()
```

```
ProcessHandle
    .allProcesses()
    .map(ProcessHandle::pid)
    .forEach(System.out::println);
```

```
ProcessHandle
    .allProcesses()
    .filter(p -> !
      p.parent().isPresent())
  .map(p -> p.info())
  .forEach(System.out::println);
```

```
ProcessHandle
    .current()
    .destroy();
```

# JEP 213

# Milling Project Coin

@SafeVargs an privaten

```
public static void
execute(Connection con)
            throws SQLException {
        try (con) {
            // ...
        }
}
```

```
private static
Comparator<MyClass> C =
      new Comparator<>() {
            @Override
            public int compare(
                  MyClass o1,
                  MyClass o2) {
                  return 0;
            }
};
```

```
public interface Lambda {
    public int a(int _);
    public default void
        t(Lambda l) {
            t(_ -> 0);
    }
}
```

```
public interface Foo {
        private String bar() {
                return "FooBar";
        }
}
```

# JEP 223

# New Version-String

# Versionsnummer

- [1-9][0-9]*((\.0)*\.[1-9][0-9]*)*
- $MAJOR.$MINOR.$SECURITY

# Versionsstring

- $VNUM(-$PRE)?\+$BUILD(-$OPT)?
- $VNUM-$PRE(-$OPT)?
- $VNUM(+-$OPT)?

# 9.0.0

9

# 10

http://mail.openjdk.java.net/pipermail/jdk-dev/2017-October/000007.html

# 18.3

http://mail.openjdk.java.net/pipermail/jdk-dev/2017-October/000007.html

# 10

http://mail.openjdk.java.net/pipermail/jdk-dev/2017-November/000089.html

```
final Runtime.Version version =
    Runtime.version();
System.out.println(version.toString());
System.out.println(version.major());
System.out.println(version.minor());
System.out.println(version.security());
```

```
final Runtime.Version newVersion =
    Runtime.Version.parse("9.1");

System.out.println(
    newVersion.compareTo(version));
```

```
Name                                  Syntax
------------------------------------  ---------------
java.version                          $VNUM(\-$PRE)?
java.runtime.version                  $VSTR
java.vm.version                       $VSTR
java.specification.version            $VNUM
java.vm.specification.version         $VNUM
```

# JEP 225

# Javadoc Search

# Java® Platform, Standard Edition & Java Development Kit Version 9 API Specification

This document is divided into three sections:

Java SE

The Java Platform, Standard Edition (Java SE) APIs define the core Java platform for general-purpose computi

JDK

The Java Development Kit (JDK) APIs are specific to the JDK and will not necessarily be available in all implem whose names start with jdk.

JavaFX

The JavaFX APIs define a set of user-interface controls, graphics, media, and web packages for developing rich with javafx.

**Java SE**

| Module | Description |
|---|---|
| java.activation | Defines the JavaBeans Activation Framework (JAF) API. |
| java.base | Defines the foundational APIs of the Java SE Platform. |
| java.compiler | Defines the Language Model, Annotation Processing, and Java Compiler APIs. |
| java.corba | Defines the Java binding of the OMG CORBA APIs, and the RMI-IIOP API. |
| java.datatransfer | Defines the API for transferring data between and within applications. |
| java.desktop | Defines the AWT and Swing user interface toolkits, plus APIs for accessibility, audio, imaging, |
| java.instrument | Defines services that allow agents to instrument programs running on the JVM. |
| java.logging | Defines the Java Logging API. |
| java.management | Defines the Java Management Extensions (JMX) API. |

**Types**

- javafx.beans.binding.**StringB**inding
- java.lang.**StringB**uffer
- java.io.**StringB**ufferInputStream
- java.lang.**StringB**uilder

**Members**

- javafx.beans.binding.**StringB**inding.StringBinding()
- java.lang.**StringB**uffer.StringBuffer()
- java.lang.**StringB**uffer.StringBuffer(CharSequence)
- java.lang.**StringB**uffer.StringBuffer(int)
- java.lang.**StringB**uffer.StringBuffer(String)
- java.io.**StringB**ufferInputStream.StringBufferInputStream(String)
- java.lang.**StringB**uilder.StringBuilder()
- java.lang.**StringB**uilder.StringBuilder(CharSequence)
- java.lang.**StringB**uilder.StringBuilder(int)
- java.lang.**StringB**uilder.StringBuilder(String)
- javafx.beans.binding.**StringB**inding.bind(Observable...)
- javafx.beans.binding.Bindings.create**StringB**inding(Callable, Observable...)
- javafx.beans.binding.**StringB**inding.unbind(Observable...)
- javafx.beans.binding.**StringB**inding.addListener(ChangeListener)
- javafx.beans.binding.**StringB**inding.addListener(InvalidationListener)
- java.lang.**StringB**uffer.append(boolean)
- java.lang.**StringB**uilder.append(boolean)
- java.lang.**StringB**uffer.append(char)
- java.lang.**StringB**uilder.append(char)
- java.lang.**StringB**uffer.append(CharSequence)
- java.lang.**StringB**uilder.append(CharSequence)
- java.lang.**StringB**uffer.append(CharSequence, int, int)
- java.lang.**StringB**uilder.append(CharSequence, int, int)
- java.lang.**StringB**uffer.append(char[])
- java.lang.**StringB**uilder.append(char[])

# JEP 238

# Multi-Release JAR

jar root
- A.class
- B.class
- C.class
- META-INF
  - versions
    - 9
      - A.class
      - B.class
    - 10
      - A.class

https://github.com/hboutemy/maven-jep238

# JEP 247

# Compile for Older Platform Versions

--release

# JEP 269

# Convenience Factory Methods for Collections

```
List.of(1, 2, 3);

Set.of(1, 2, 1);
```

```
Map.of("foo", "bar");
Map.ofEntries(
      Map.entry("foo", "bar"));
```

# JEP 277

# Enhanced Deprecation

```java
@Documented
@Retention(RetentionPolicy.RUNTIME)
@Target(value={CONSTRUCTOR, FIELD, LOCAL_VARIABLE, METHOD, PACKAGE, MODULE, PARAMETER, TYPE})
public @interface Deprecated {
    /**
     * Returns the version in which the annotated element became deprecated.
     * The version string is in the same format and namespace as the value of
     * the {@code @since} javadoc tag. The default value is the empty
     * string.
     *
     * @return the version string
     * @since 9
     */
    String since() default "";

    /**
     * Indicates whether the annotated element is subject to removal in a
     * future version. The default value is {@code false}.
     *
     * @return whether the element is subject to removal
     * @since 9
     */
    boolean forRemoval() default false;
}
```

java.util.logging.LogManager.addPropertyChangeListener
java.util.logging.LogManager.removePropertyChangeListener
java.util.jar.Pack200.Packer.addPropertyChangeListener
java.util.jar.Pack200.Packer.removePropertyChangeListener
java.util.jar.Pack200.Unpacker.addPropertyChangeListener
java.util.jar.Pack200.Unpacker.removePropertyChangeListener

# RFR 8159535: Mark deprecated javax.security.auth.Policy API with forRemoval=true

**Weijun Wang** weijun.wang at oracle.com
*Fri Oct 20 03:56:09 UTC 2017*


- Previous message: RFR 8180289: jarsigner treats timestamped signed jar invalid after the signer cert expires
- Next message: RFR 8159535: Mark deprecated javax.security.auth.Policy API with forRemoval=true
- **Messages sorted by:** [ date ] [ thread ] [ subject ] [ author ]


---

Please review this patch. A CSR [1] is also filed.

```
diff --git a/src/java.base/share/classes/javax/security/auth/Policy.java b/src/java.base/share/classes/javax/security/auth/Policy.java
--- a/src/java.base/share/classes/javax/security/auth/Policy.java
+++ b/src/java.base/share/classes/javax/security/auth/Policy.java
@@ -152,11 +152,12 @@
   *
   * These two APIs provide callers the means to query the
   * Policy for Principal-based Permission entries.
+ * This class is subject to removal in a future version of Java SE.
   *
   * @since 1.4
   * @see java.security.Security security properties
   */
- at Deprecated(since="1.4")
+ at Deprecated(since="1.4", forRemoval=true)
 public abstract class Policy {

     private static Policy policy;
```

Thanks
Max

[1] https://bugs.openjdk.java.net/browse/JDK-8189621

http://mail.openjdk.java.net/pipermail/security-dev/2017-October/016417.html

# java.util.Stream

# Erweiterungen

```
    /**
     * Returns, if this stream is ordered, a stream consisting of the longest
     * prefix of elements taken from this stream that match the given predicate.
     * Otherwise returns, if this stream is unordered, a stream consisting of a
     * subset of elements taken from this stream that match the given predicate.
     *
...
     *
     * <p>This is a <a href="package-summary.html#StreamOps">short-circuiting
     * stateful intermediate operation</a>.
     *
...
     *
     * @param predicate a <a href="package-summary.html#NonInterference">non-interfering</a>,
     *                  <a href="package-summary.html#Statelessness">stateless</a>
     *                  predicate to apply to elements to determine the longest
     *                  prefix of elements.
     * @return the new stream
     * @since 9
     */
    default Stream<T> takeWhile(Predicate<? super T> predicate) {
```

```
    /**
     * Returns, if this stream is ordered, a stream consisting of the remaining
     * elements of this stream after dropping the longest prefix of elements
     * that match the given predicate.  Otherwise returns, if this stream is
     * unordered, a stream consisting of the remaining elements of this stream
     * after dropping a subset of elements that match the given predicate.
...
     * <p>Independent of whether this stream is ordered or unordered if all
     * elements of this stream match the given predicate then this operation
     * drops all elements (the result is an empty stream), or if no elements of
     * the stream match the given predicate then no elements are dropped (the
     * result is the same as the input).
     *
     * <p>This is a <a href="package-summary.html#StreamOps">stateful
     * intermediate operation</a>.
...
     * @param predicate a <a href="package-summary.html#NonInterference">non-interfering</a>,
     *                  <a href="package-summary.html#Statelessness">stateless</a>
     *                  predicate to apply to elements to determine the longest
     *                  prefix of elements.
     * @return the new stream
     * @since 9
     */
    default Stream<T> dropWhile(Predicate<? super T> predicate) {
```

```
    /**
     * Returns a sequential ordered {@code Stream} produced by iterative
     * application of the given {@code next} function to an initial element,
     * conditioned on satisfying the given {@code hasNext} predicate.  The
     * stream terminates as soon as the {@code hasNext} predicate returns false.
…
     * <p>The resulting sequence may be empty if the {@code hasNext} predicate
     * does not hold on the seed value.  Otherwise the first element will be the
     * supplied {@code seed} value, the next element (if present) will be the
     * result of applying the {@code next} function to the {@code seed} value,
     * and so on iteratively until the {@code hasNext} predicate indicates that
     * the stream should terminate.
…
     * @param <T> the type of stream elements
     * @param seed the initial element
     * @param hasNext a predicate to apply to elements to determine when the
     *                stream must terminate.
     * @param next a function to be applied to the previous element to produce
     *             a new element
     * @return a new sequential {@code Stream}
     * @since 9
     */
    public static<T> Stream<T> iterate(T seed, Predicate<? super T> hasNext,
        UnaryOperator<T> next) {
```

```java
/**
 * Returns a sequential {@code Stream} containing a single element, if
 * non-null, otherwise returns an empty {@code Stream}.
 *
 * @param t the single element
 * @param <T> the type of stream elements
 * @return a stream with a single element if the specified element
 *         is non-null, otherwise an empty stream
 * @since 9
 */
public static<T> Stream<T> ofNullable(T t) {
    return t == null ? Stream.empty()
                     : StreamSupport.stream(new Streams.StreamBuilderImpl<>(t), false);
}
```

# java.util.Optional

# Erweiterungen

```java
/**
 * If a value is present, returns a sequential {@link Stream} containing
 * only that value, otherwise returns an empty {@code Stream}.
 *
 * @apiNote
 * This method can be used to transform a {@code Stream} of optional
 * elements to a {@code Stream} of present value elements:
 * <pre>{@code
 *     Stream<Optional<T>> os = ..
 *     Stream<T> s = os.flatMap(Optional::stream)
 * }</pre>
 *
 * @return the optional value as a {@code Stream}
 * @since 9
 */
public Stream<T> stream() {
    if (!isPresent()) {
        return Stream.empty();
    } else {
        return Stream.of(value);
    }
}
```

```java
/**
 * If a value is present, returns an {@code Optional} describing the value,
 * otherwise returns an {@code Optional} produced by the supplying function.
 *
 * @param supplier the supplying function that produces an {@code Optional}
 *        to be returned
 * @return returns an {@code Optional} describing the value of this
 *         {@code Optional}, if a value is present, otherwise an
 *         {@code Optional} produced by the supplying function.
 * @throws NullPointerException if the supplying function is {@code null} or
 *         produces a {@code null} result
 * @since 9
 */
public Optional<T> or(Supplier<? extends Optional<? extends T>> supplier) {
    Objects.requireNonNull(supplier);
    if (isPresent()) {
        return this;
    } else {
        @SuppressWarnings("unchecked")
        Optional<T> r = (Optional<T>) supplier.get();
        return Objects.requireNonNull(r);
    }
}
```

```java
/**
 * If a value is present, performs the given action with the value,
 * otherwise performs the given empty-based action.
 *
 * @param action the action to be performed, if a value is present
 * @param emptyAction the empty-based action to be performed, if no value is
 *        present
 * @throws NullPointerException if a value is present and the given action
 *         is {@code null}, or no value is present and the given empty-based
 *         action is {@code null}.
 * @since 9
 */
public void ifPresentOrElse(Consumer<? super T> action, Runnable emptyAction) {
    if (value != null) {
        action.accept(value);
    } else {
        emptyAction.run();
    }
}
```

# java.util.Objects

# Erweiterungen

```java
/**
 * Returns the first argument if it is non-{@code null} and
 * otherwise returns the non-{@code null} second argument.
 *
 * @param obj an object
 * @param defaultObj a non-{@code null} object to return if the first argument
 *                   is {@code null}
 * @param <T> the type of the reference
 * @return the first argument if it is non-{@code null} and
 *         otherwise the second argument if it is non-{@code null}
 * @throws NullPointerException if both {@code obj} is null and
 *         {@code defaultObj} is {@code null}
 * @since 9
 */
public static <T> T requireNonNullElse(T obj, T defaultObj) {
    return (obj != null) ? obj : requireNonNull(defaultObj, "defaultObj");
}
```

```java
/**
 * Returns the first argument if it is non-{@code null} and otherwise
 * returns the non-{@code null} value of {@code supplier.get()}.
 *
 * @param obj an object
 * @param supplier of a non-{@code null} object to return if the first argument
 *                 is {@code null}
 * @param <T> the type of the first argument and return type
 * @return the first argument if it is non-{@code null} and otherwise
 *         the value from {@code supplier.get()} if it is non-{@code null}
 * @throws NullPointerException if both {@code obj} is null and
 *         either the {@code supplier} is {@code null} or
 *         the {@code supplier.get()} value is {@code null}
 * @since 9
 */
public static <T> T requireNonNullElseGet(T obj, Supplier<? extends T> supplier) {
    return (obj != null) ? obj
                 : requireNonNull(requireNonNull(supplier, "supplier").get(),
"supplier.get()");
}
```

```java
/**
 * Checks if the {@code index} is within the bounds of the range from
 * {@code 0} (inclusive) to {@code length} (exclusive).
 *
 * <p>The {@code index} is defined to be out-of-bounds if any of the
 * following inequalities is true:
 * <ul>
 *  <li>{@code index < 0}</li>
 *  <li>{@code index >= length}</li>
 *  <li>{@code length < 0}, which is implied from the former inequalities</li>
 * </ul>
 *
 * @param index the index
 * @param length the upper-bound (exclusive) of the range
 * @return {@code index} if it is within bounds of the range
 * @throws IndexOutOfBoundsException if the {@code index} is out-of-bounds
 * @since 9
 */
@ForceInline
public static
int checkIndex(int index, int length) {
    return Preconditions.checkIndex(index, length, null);
}
```

# Weitere Interessante JEPs

- JEP 11: Incubator Modules
- JEP 110: HTTP/2 Client (Incubator)
- JEP 226: UTF-8 Property Resource Bundles
- JEP 259: Stack-Walking API
- JEP 266: More Concurrency Updates

# Java 10

## JDK 10

This release will be the Reference Implementation of the next version of the Java SE Platform, as specified by JSR 383 in the Java Community Process.

### Status

The development repositories are open for bug fixes, small enhancements, and JEPs as proposed and tracked via the JEP Process.

### Schedule

| | |
|---|---|
| 2017/12/14 | Rampdown Phase One |
| 2018/01/11 | All Tests Run |
| 2018/01/18 | Rampdown Phase Two |
| 2018/02/22 | Final Release Candidate |
| 2018/03/20 | General Availability |

### Features

#### JEPs proposed to target JDK 10 (1, 2)

313: Remove the Native-Header Generation Tool (javah)
316: Heap Allocation on Alternative Memory Devices

#### JEPs targeted to JDK 10, so far

286: Local-Variable Type Inference
296: Consolidate the JDK Forest into a Single Repository
304: Garbage-Collector Interface
307: Parallel Full GC for G1
310: Application Class-Data Sharing
312: Thread-Local Handshakes

Last update: 2017/11/27 22:10 UTC

http://openjdk.java.net/projects/jdk/10/

# Danke!

Fragen?

Kommentare?

Michael Vitz | @michaelvitz

michael.vitz@innoq.com

https://www.innoq.com/de/talks/2017/11/jvm-con-2017-java9-features/

innoQ

www.innoq.com

**innoQ Deutschland GmbH**

Krischerstr. 100
40789 Monheim am Rhein

Ohlauer Straße 43
10999 Berlin

Ludwigstraße 180 E
63067 Offenbach

Kreuzstr. 16
80331 München