Performance & Security Improvements

Sander Mak
FELLOW & SOFTWARE ARCHITECT
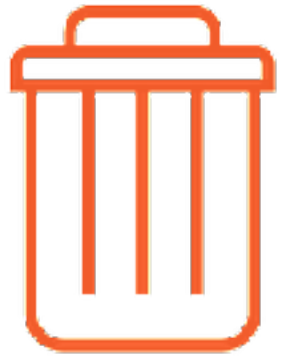
@Sander_Mak

Garbage Collection

G1 GC

Default since Java 9

Several incremental improvements up to Java 11

Garbage Collection

Epsilon GC

Apps with predictable, bounded memory usage

Short-lived

Performance testing

```
-XX:+UnlockExperimentalVMOptions
-XX:+UseEpsilonGC
```

Z Garbage Collector

Goals

Pause times under 10ms

No pause time increase with heap size increase

Scale to multi-terabyte heaps

Z Garbage Collector

Coloured pointers

	64 bit pointer

Linux/x64 only

```
-XX:+UnlockExperimentalVMOptions
-XX:+UseZGC
```
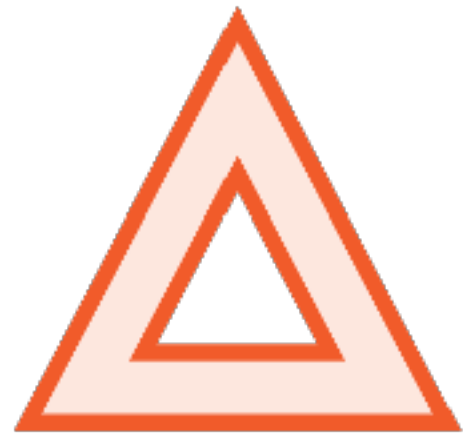
TLS 1.3

Legacy algorithms pruned

All handshake messages except first encrypted

Elliptic curve algorithms in base specification

Not all of TLS 1.3 implemented

JEP 332: openjdk.java.net/jeps/332

TLS 1.3: Compatibility Risks

Cipher suite mismatches

DSA certificates cannot be used

DTLS 1.3 not implemented

Summary

What's New in Java 11

Course Wrap-up

Java 11 Introduction

Oracle JDK & OpenJDK convergence

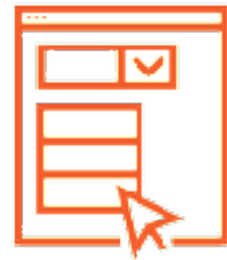More frequent & incremental releases

Launching Single-file Source-code
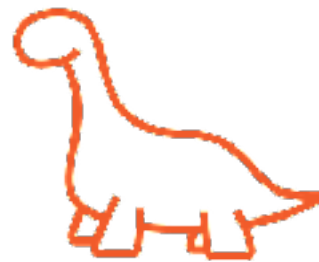
Course Wrap-up

Deprecations & Removals

Removal of enterprise APIs from JDK

JavaFX moved into OpenJFX project

Applets & Java Web Start removed
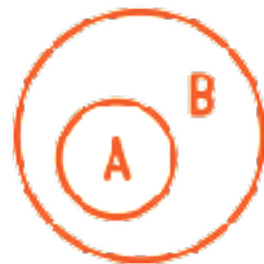
Course Wrap-up

Language & Library Improvements

New HttpClient API

Use **var** in lambdas

Nest-based Access-control

Course Wrap-up

Performance & Security Improvements

Epsilon GC & ZGC

HTTPS

TLS 1.3 support

Additional Resources

17 Java Enhancement Proposals:

openjdk.java.net/projects/jdk/11/

What's New in Java {9, 10}
Java 9 Modularity: First Look