Anatomy of Oracle GraalVM

**Oracle GraalVM** – a high-performance runtime that speeds up the performance of Java and JVM-based applications, lowers application latency, improves peak throughput by reducing garbage collection time, and comes with 24x7 Oracle support. Supports JDK 17 and JDK 20.

**AOT MODE** (AHEAD-OF-TIME)

GraalVM Native Image utility performs AOT compilation to generate fast, self-contained native executables ideal for microservices.

The same **GraalVM compiler** generates binaries with only the classes, methods, and dependent libraries needed to run the program.

**PGO** (Profile Guided Optimization), only available with Oracle GraalVM, collects profiling data to create more efficient code.

GraalVM Native Image utility outputs a **native executable** that starts up fast and requires less memory due to no runtime compilation.

**JIT MODE** (JUST-IN-TIME)

**JIT** execution mode generates optimized machine code with better peak performance ideal for long-running applications.

The **interpreter** executes bytecode with no compilation.

**Client compiler** for quick response with minimal code optimization.

The **GraalVM compiler** applies aggressive optimizations to speed up performance and minimize garbage collection without code changes.

**BENEFIT**

- Up to **100x faster** helps scaling
- Up to **5x smaller** memory easier to containerize
- Up to **30% faster** throughput*
- **24x7 support** for reliability
- **Reduce cloud operations cost** or free up compute resources from faster performance and lower memory usage

Learn more [https://www.oracle.com/graalvm](https://www.oracle.com/graalvm)

Benchmark comparisons based on Oracle GraalVM release 22.0 vs JDK 17

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