「一入 Java 深似海」系列课程 - 第七期

第四节：Java 字节码操作

小马哥 @mercyblitz

「一入 Java 深似海」系列课程

- 讲师信息

小马哥，Java 劝退师，Apache 和 Spring Cloud 等知名开源架构成员。

- 微博：@mercyblitz
- GitHub：https://github.com/mercyblitz
- 课程详情：https://segmentfault.com/n/1330000017785588
- 课件资源：https://github.com/mercyblitz/segmentfault-lessons/

segmentfault 讲堂

主要议题

- Java 字节码基础
- Java 字节码操作框架
- Java Instrumentation

Java 字节码基础

Java 字节码基础

- Java 类文件

A class file consists of a stream of 8-bit bytes. All 16-bit, 32-bit, and 64-bit quantities are constructed by reading in two, four, and eight consecutive 8-bit bytes, respectively. Multibyte data items are always stored in big-endian order, where the high bytes come first. In the Java SE platform, this format is supported by interfaces java.io.DataInput and java.io.DataOutput and classes such as java.io.DataInputStream and java.io.DataOutputStream.

Java 字节码基础

- Java 类文件结构

```
ClassFile {
    u4             magic;
    u2             minor_version;
    u2             major_version;
    u2             constant_pool_count;
    cp_info        constant_pool[constant_pool_count-1];
    u2             access_flags;
    u2             this_class;
    u2             super_class;
    u2             interfaces_count;
    u2             interfaces[interfaces_count];
    u2             fields_count;
    field_info     fields[fields_count];
    u2             methods_count;
    method_info    methods[methods_count];
    u2             attributes_count;
    attribute_info attributes[attributes_count];
}
```

Java 字节码操作框架

Java 字节码操作框架

- 常见框架
  - ASM - https://asm.ow2.io
  - AspectJ - https://www.eclipse.org/aspectj/
  - BCEL - http://commons.apache.org/proper/commons-bcel/
  - CGLIB - https://github.com/cglib/cglib
  - Javassist - https://www.javassist.org/

Java Instrumentation

Java Instrumentation

- 什么是 Instrumentation

The java.lang.instrument package provides a Java programming language API for tools to instrument Java programming language applications -- for example, to monitor them or collect performance information. Tools use java.lang.instrument to modify the class file that defines a class -- generally, by inserting into the byte-code of methods additional byte-code which will perform the instrumentation.

java.lang.instrument was introduced in JDK 5.0.

下期预告

第八期 *Java I/O*

谢谢观看