CSC 3210
Computer Organization and Programming

JVM Architecture
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Over-view
• Java Platform
• Compiling and Linking Process
• Java Virtual Machine
  • Java Bytecode
  • Classloader
  • Execution Engine
  • Runtime Data Area

Java platform
• Suit of programs that facilitate developing and running programs written in the Java programming Language.
  o Java Development Kit (JDK)
    ➢ Java compiler
  o Java Runtime Environment (JRE)
  o Just-in-time (JIT) compiler
Java platform

- Why we need Java platform?
  Cross platform. → Write once, run anywhere.

Refer to
https://www.youtube.com/watch?v=2Xa3Y4xz8_s&list=PLckPQEKYlbxewuI8YfxhKsZq-fX6_RU1P

Compiling and linking process

- C compiling and linking process
- Java compiling and linking process

What is Java Virtual Machine?

- Virtual Machine is a software implementation of a machine that executes program like a physical machine.
- Java virtual machine is specific to the machine running Java Bytecode.
What is Java Virtual Machine?

What is Java Bytecode?

• A middle-language between Java (user language) and the machine language.
  Example: use xxd command to check the content in a .class file.

Class loader

• A class loader loads the compiled Java Bytecode to the Runtime Data Areas.
Execution Engine

• Execute Java Bytecode.
• Executing the machine command one by one.
• Each command consists of a 1-byte OpCode and additional Operand.

Java Compiler and JIT Compiler.

Runtime Data Area

• Memory area assigned when JVM program runs on the OS.
References

1. http://www.cubrid.org/blog/dev-platform/understanding-jvm-internals/