Java Concurrency in Practice

Advanced Topics

Chapter-16

The Java Memory Model

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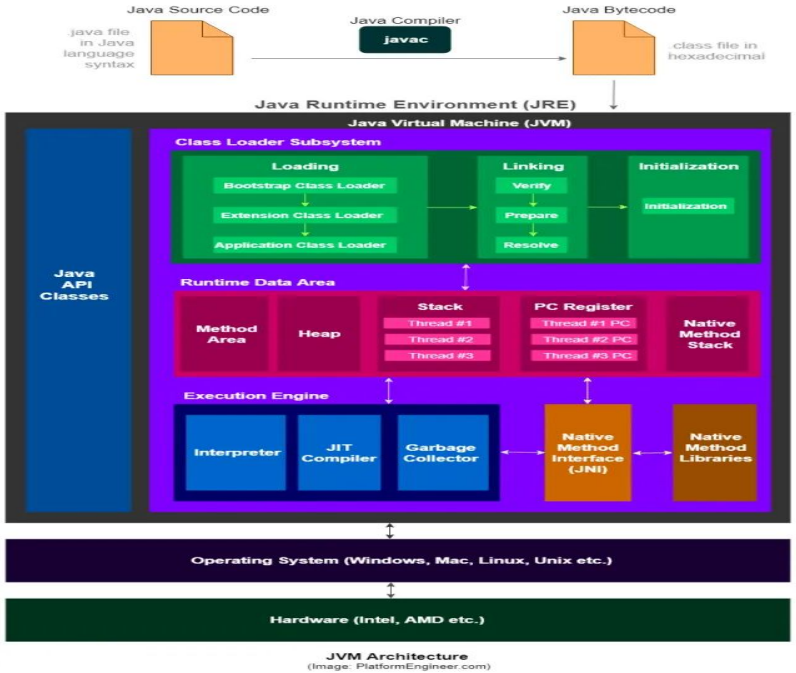
CONTENT

What is memory model (1/n)

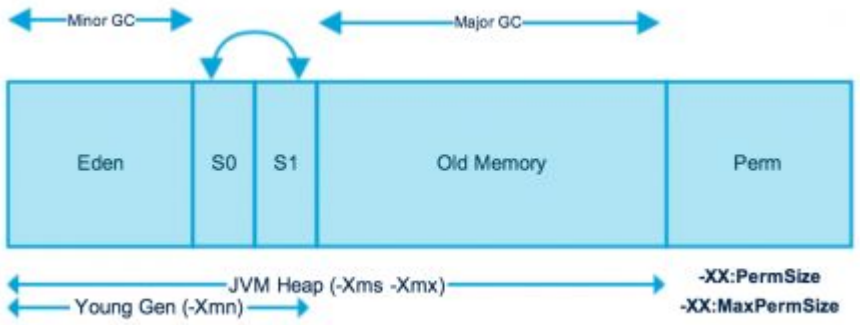
- **Understanding Java Memory Model** is an essential learning for serious **Java developers who develop, deploy, monitor, test, and tune performance** of a Java application.



JVM Architecture
(Image: PlatformEngineer.com)

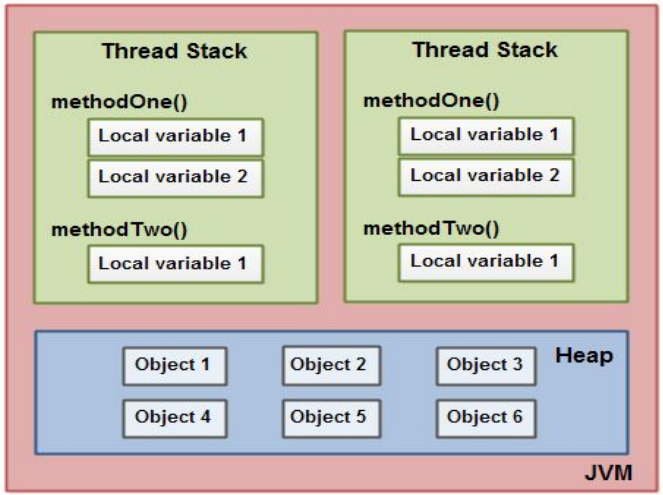
What is memory model (2/n)

- **The Java Memory Model (JMM) defines the allowable behavior of multithreaded programs**
- therefore describes when such **reorderings are possible**.
- It places **execution-time constraints on the relationship between threads and main memory in order to achieve consistent and reliable Java applications**.

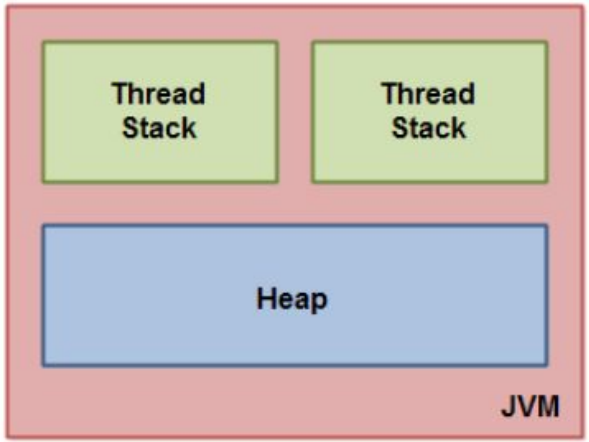


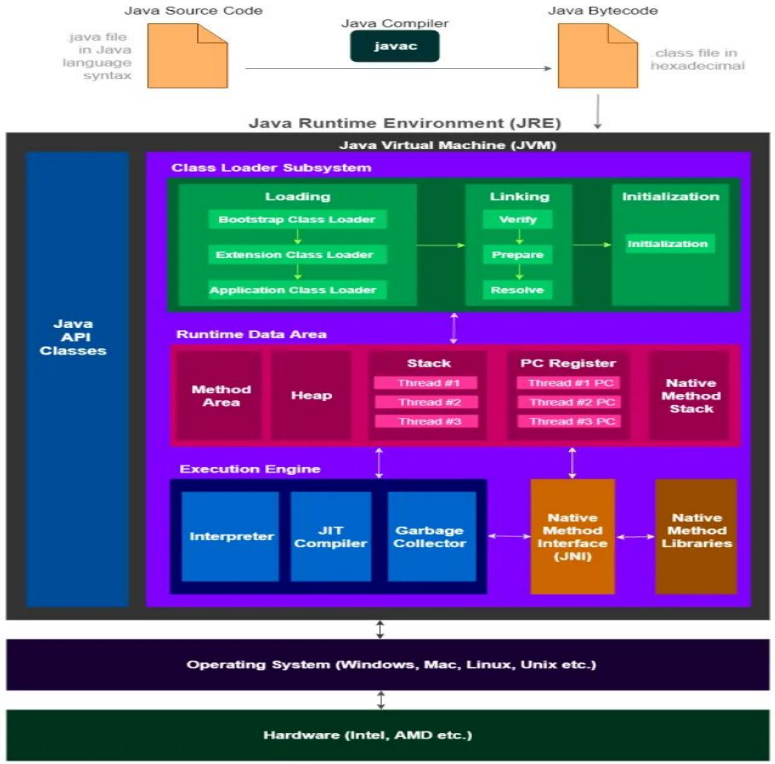
What is memory model (3/n)

- You must have used some of the following **JVM memory configurations** when running resource-intensive Java programs.
- -XmsSetting — initial Heap size
- -XmxSetting — maximum Heap size
- -XX:NewSizeSetting — new generation heap size
- -XX:MaxNewSizeSetting — maximum New generation heap size
- -XX:MaxPermGenSetting — maximum size of Permanent generation
- -XX:SurvivorRatioSetting — new heap size ratios (e.g. if Young Gen size is 10m and memory switch is –XX:SurvivorRatio=2, then 5m will be reserved for Eden space and 2.5m each for both Survivor spaces, default value = 8)
- -XX:NewRatio — providing ratio of Old/New Gen sizes (default value = 2)

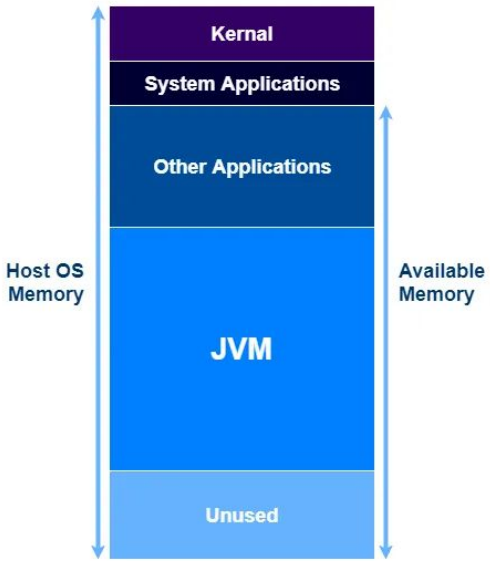

Thread Stack
methodOne()
Local variable 1
Local variable 2
methodTwo()
Local variable 1
Thread Stack
methodOne()
Local variable 1
Local variable 2
methodTwo()
Local variable 1
Object 1
Object 2
Object 3
Heap
Object 4
Object 5
Object 6
JVM

What is memory model





JVM Architecture
(Image: PlatformEngineer.com)

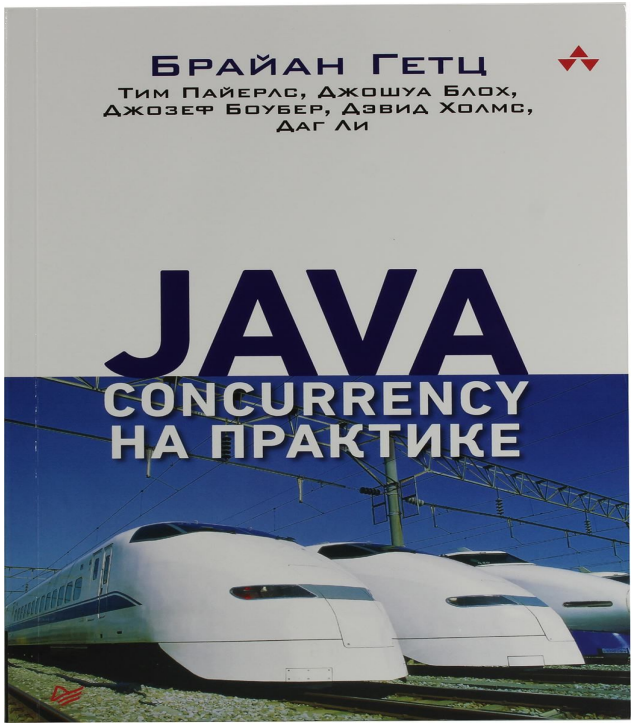


Host OS Memory and JVM
(Image: PlatformEngineer.com)

Summary

- the most common reasons to use **threads** is to exploit **multiple processors**, in

Resources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JAVA
CONCURRENCY
НА ПРАКТИКЕ

Reference

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Thank you!

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