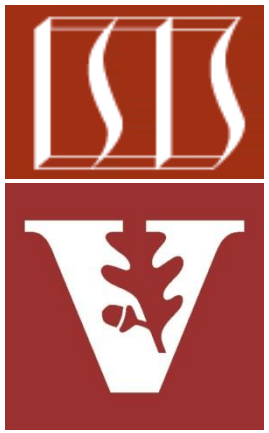
Java ConditionObject: Common Use Cases

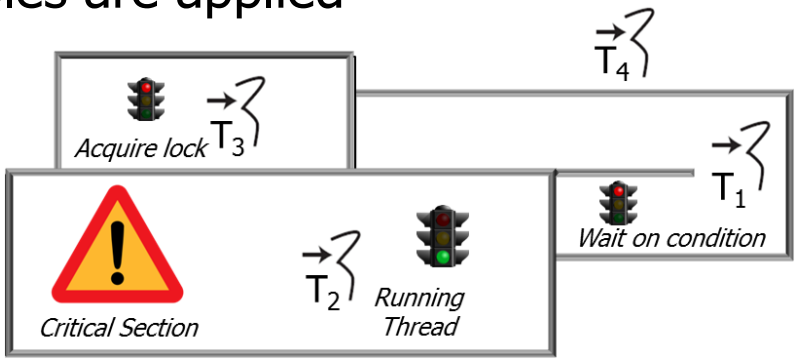


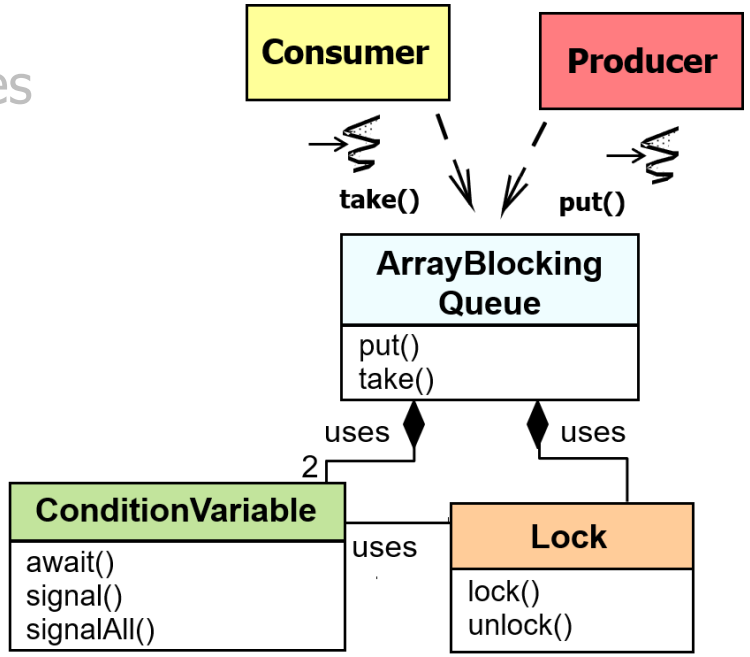
Douglas C. Schmidt
d.schmidt@vanderbilt.edu
www.dre.vanderbilt.edu/~schmidt

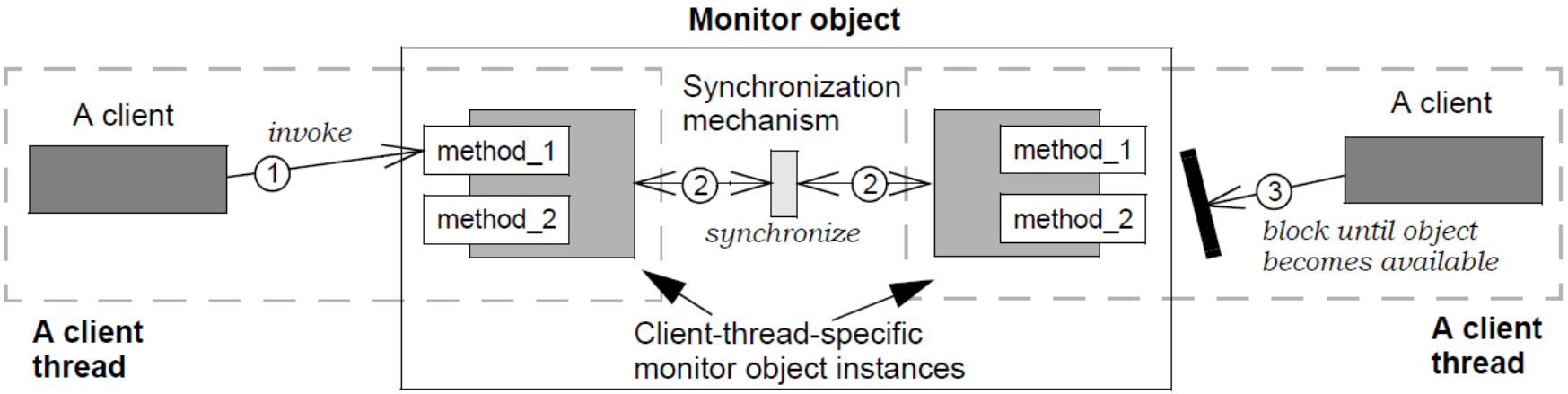
Institute for Software Integrated Systems
Vanderbilt University
Nashville, Tennessee, USA

Learning Objectives in this Part of the Lesson

- Understand what condition variables are
- Note a human known use of condition variables
- Know what pattern they implement
- Recognize common use cases where condition variables are applied







Applying Condition Variables in Practice

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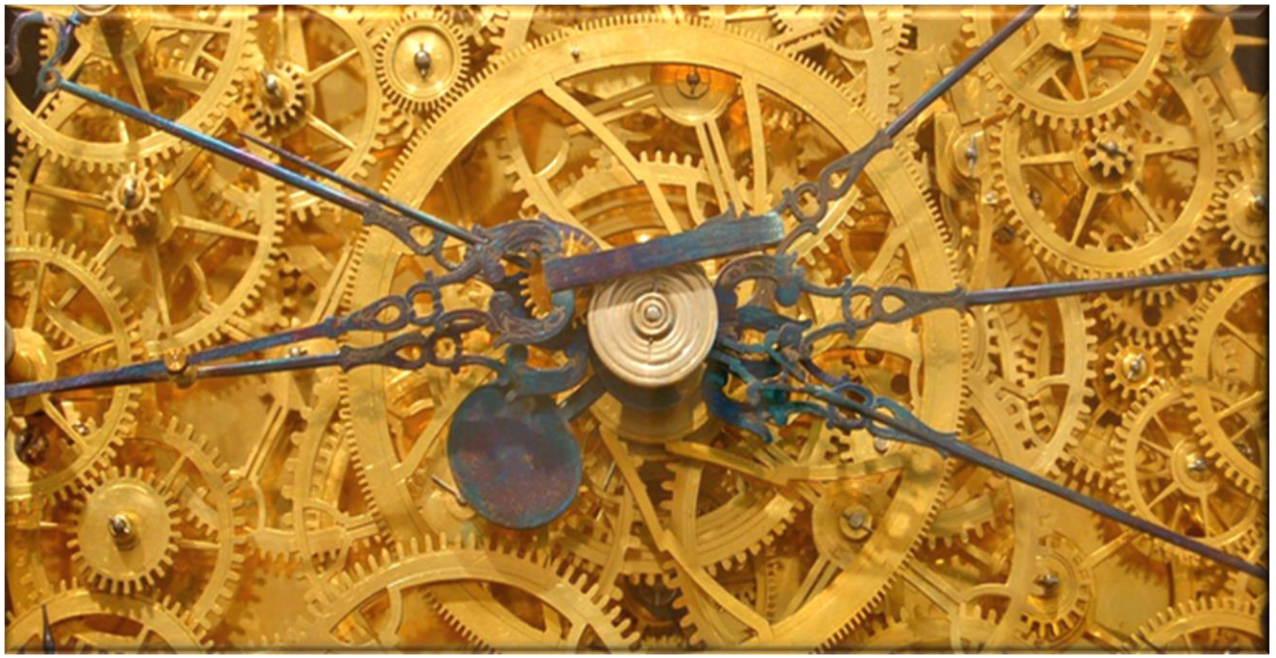
- CVs are powerful, but can be hard to grok & apply correctly



See en.wikipedia.org/wiki/Grok

Applying Condition Variables in Practice

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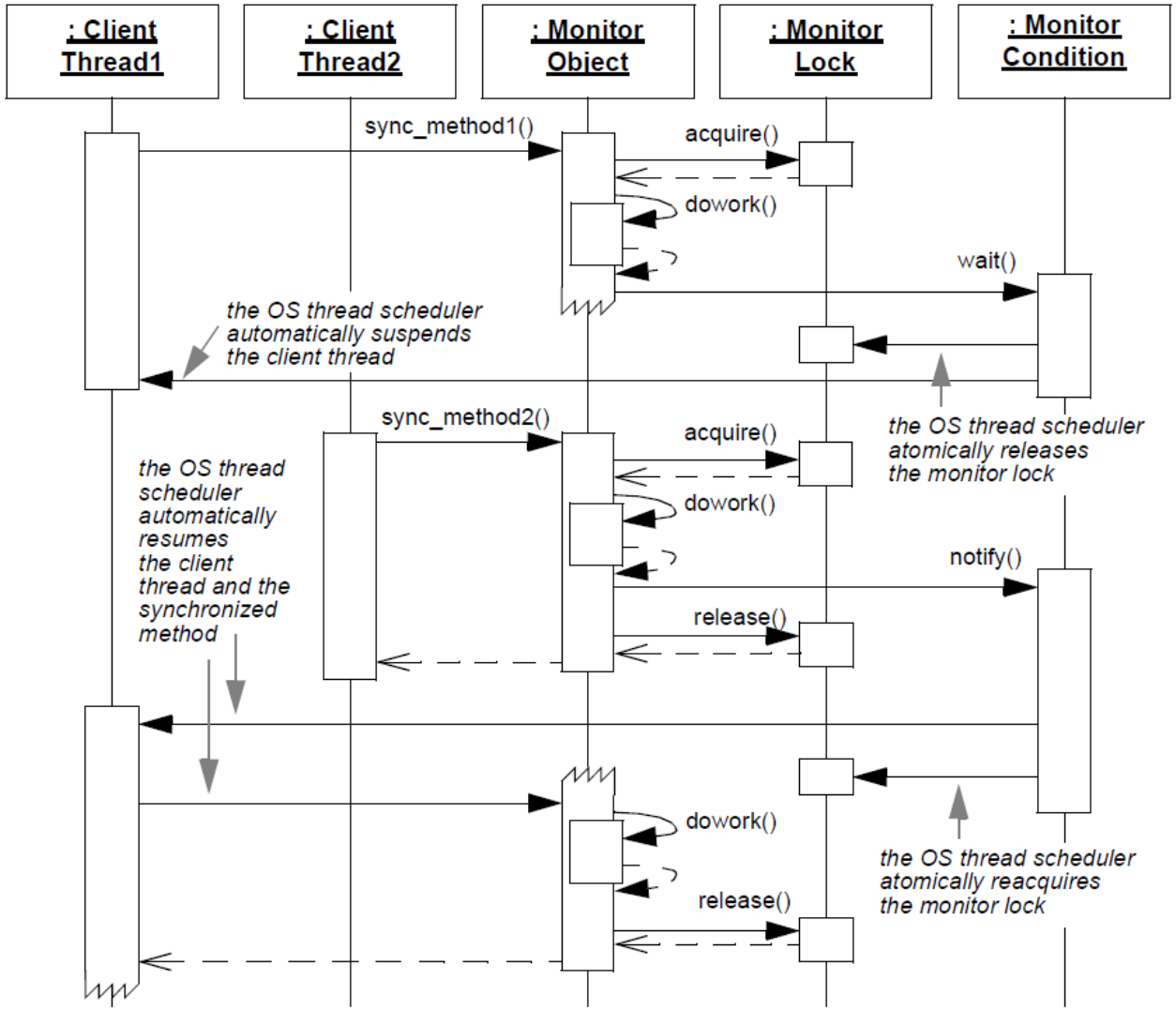
  - The protocol for using CVs involves several "moving parts"



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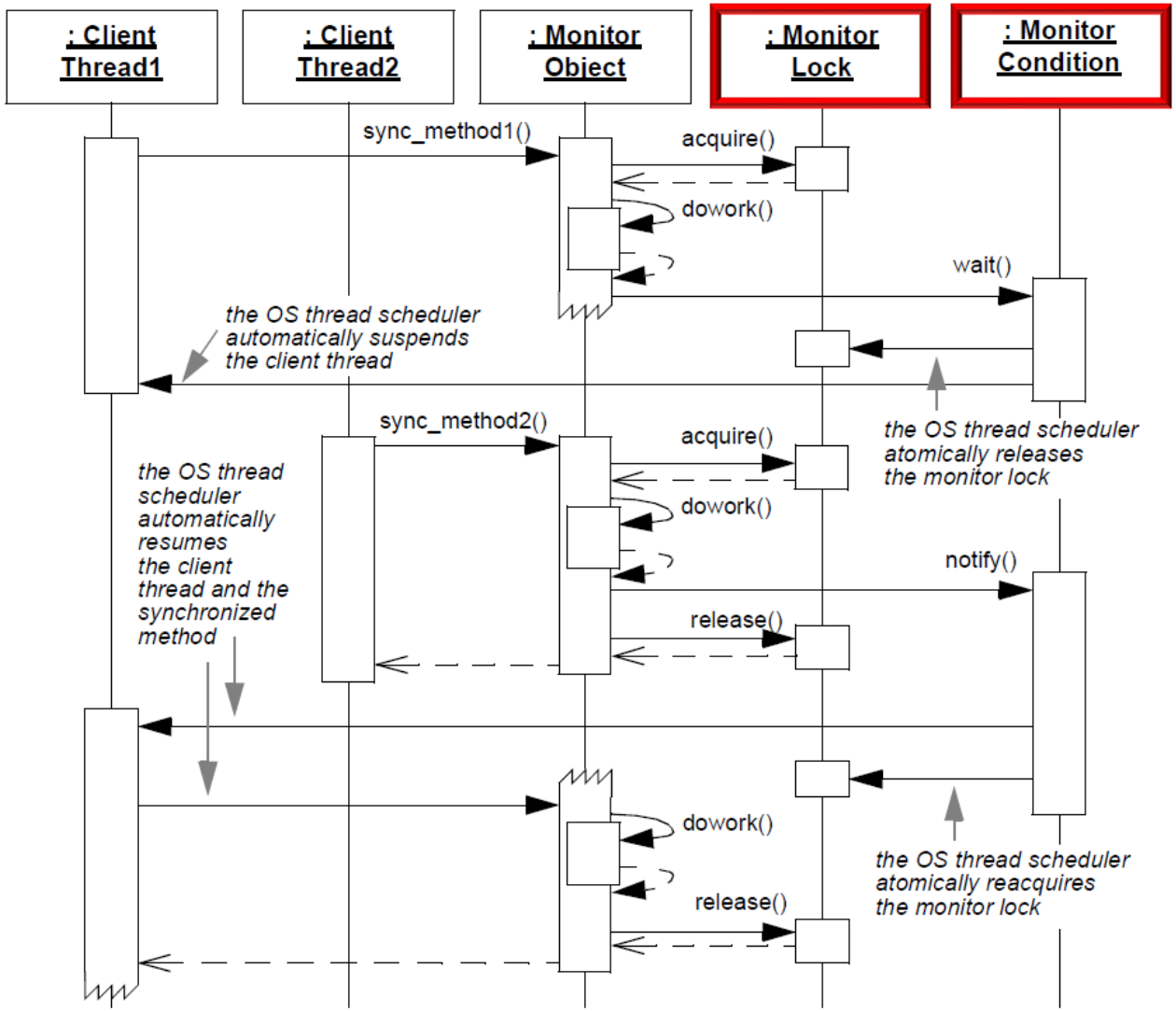
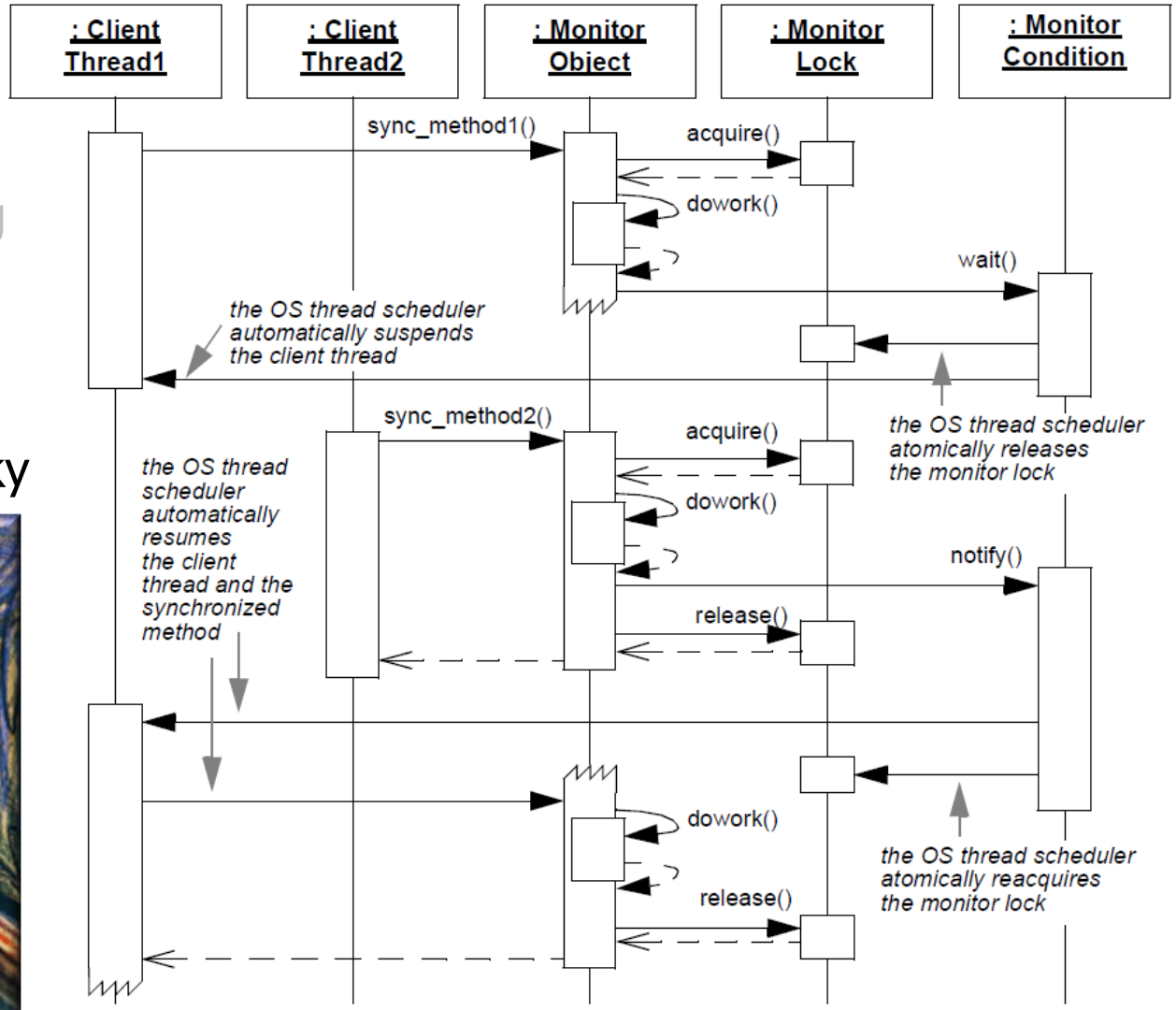
- CVs are powerful, but can be hard to grok & apply correctly, e.g.
  - The protocol for using CVs involves several "moving parts"
    - i.e., a condition variable & a lock



Applying Condition Variables in Practice

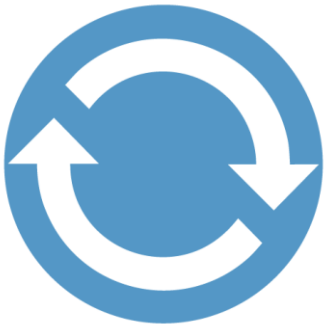
- CVs are powerful, but can be hard to grok & apply correctly, e.g.
  - The protocol for using CVs involves several "moving parts"
  - The non-determinism of concurrency is tricky

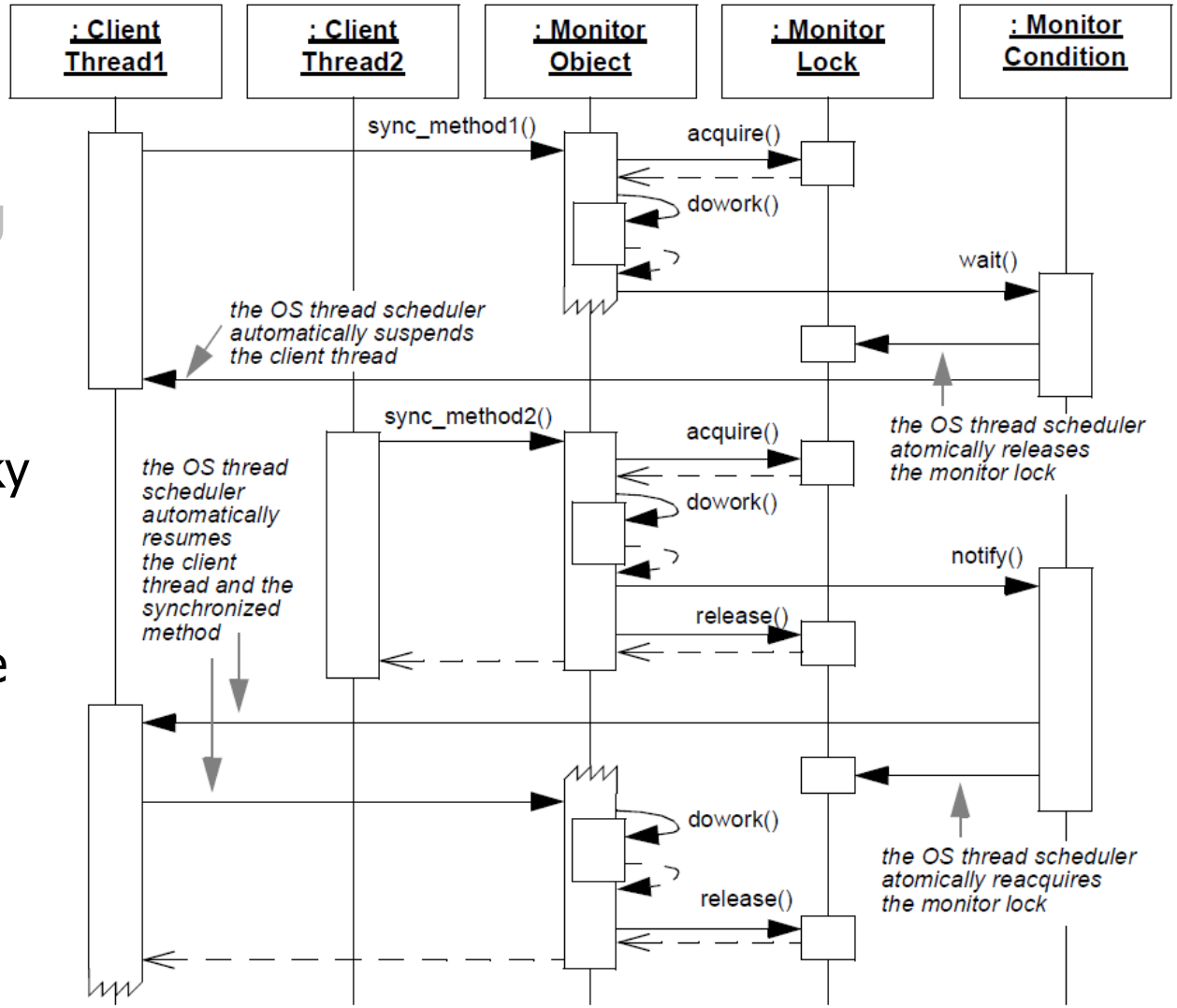


See en.wikipedia.org/wiki/Nondeterministic_algorithm

Applying Condition Variables in Practice

- CVs are powerful, but can be hard to grok & apply correctly, e.g.
  - The protocol for using CVs involves several "moving parts"
  - The non-determinism of concurrency is tricky
    - i.e., a loop may be needed to ensure a resource is available





See stackoverflow.com/a/38313778

Applying Condition Variables in Practice

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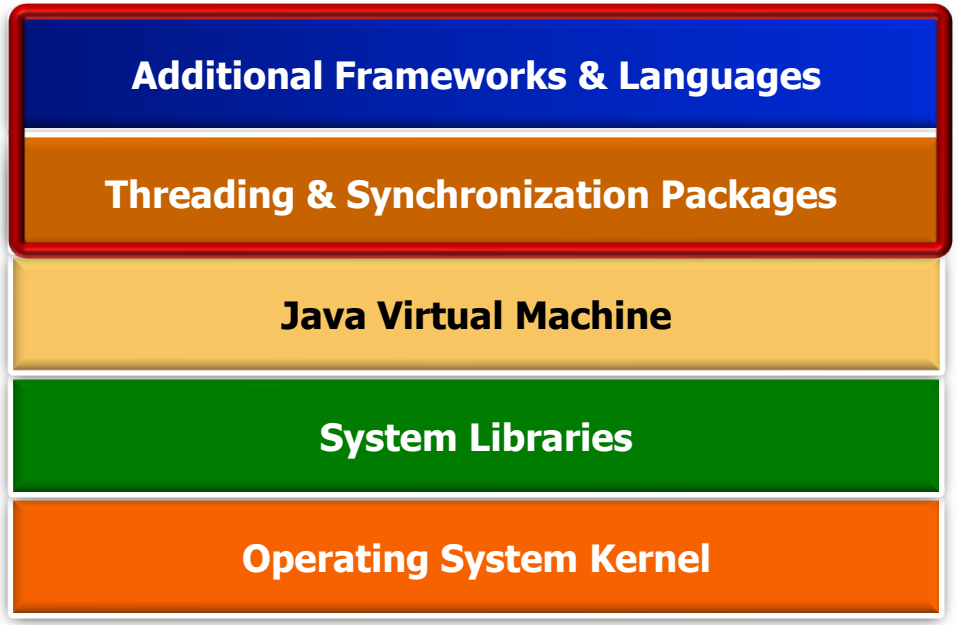

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/locks/AbstractQueuedSynchronizer.ConditionObject.html

Applying Condition Variables in Practice

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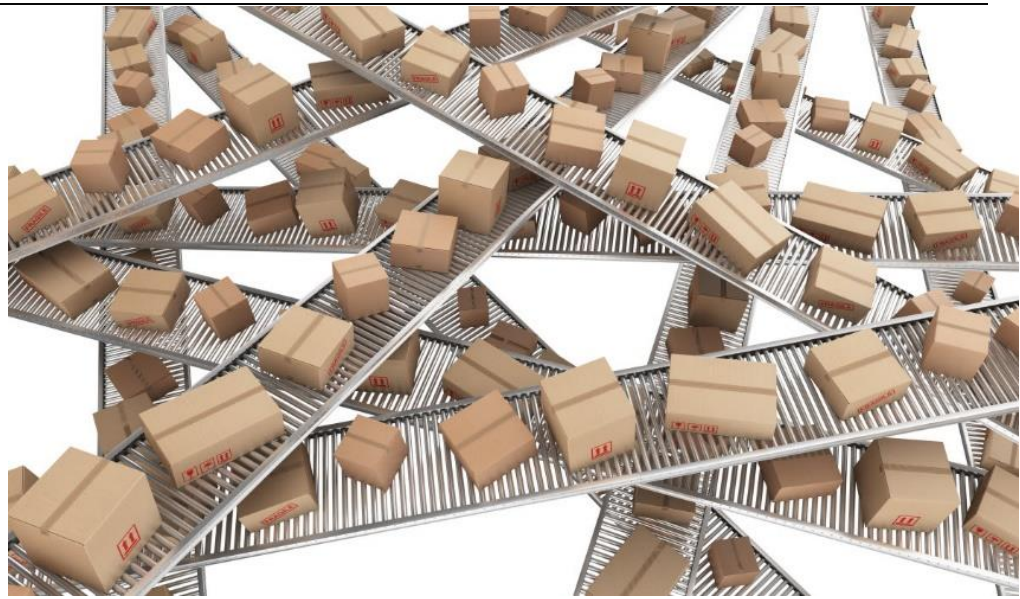
  - CVs form the basis for higher-level synchronizers in Java, e.g.
    - Blocking queues & deques in java.util.concurrent* packages



See docs.oracle.com/javase/tutorial/collections/implementations/queue.html

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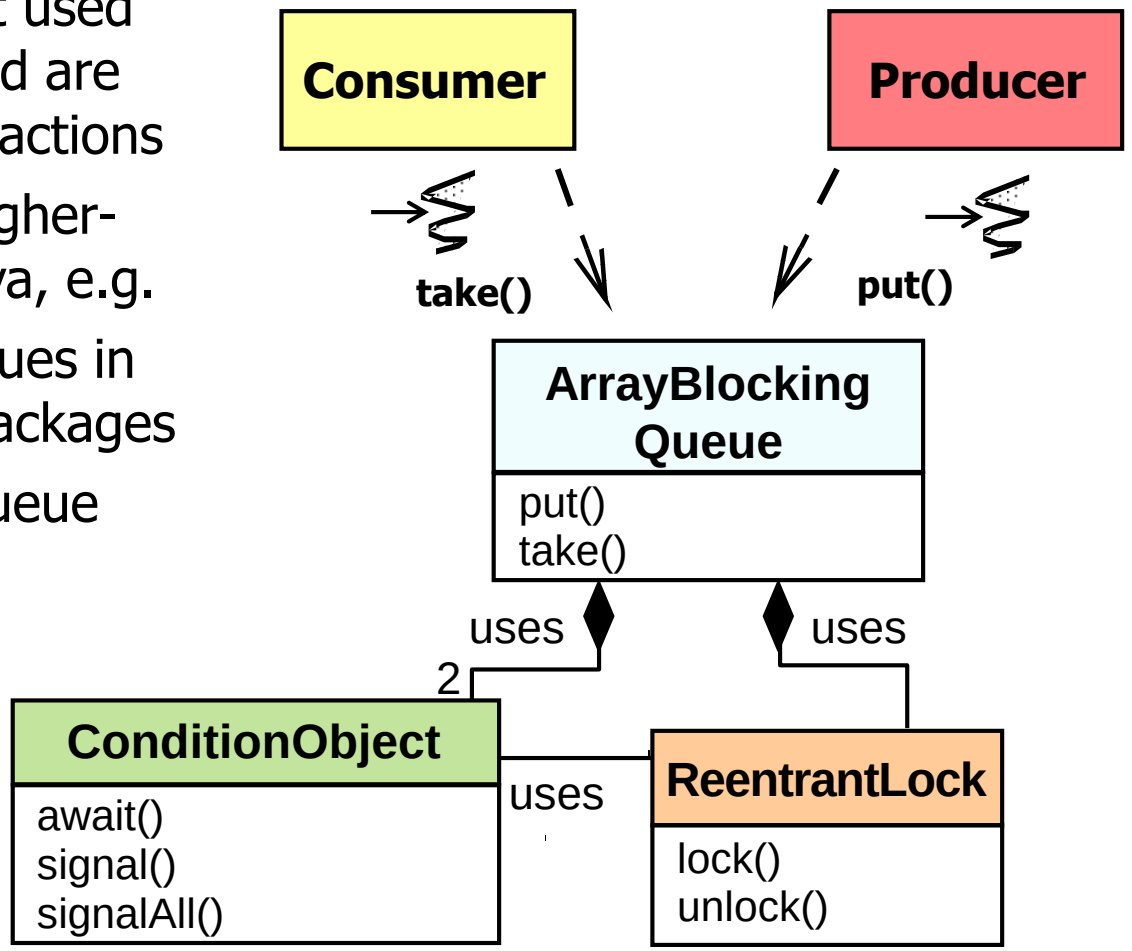
      - e.g., ArrayBlockingQueue



See upcoming discussion in "*Java ConditionObject: Example Application*"

Applying Condition Variables in Practice

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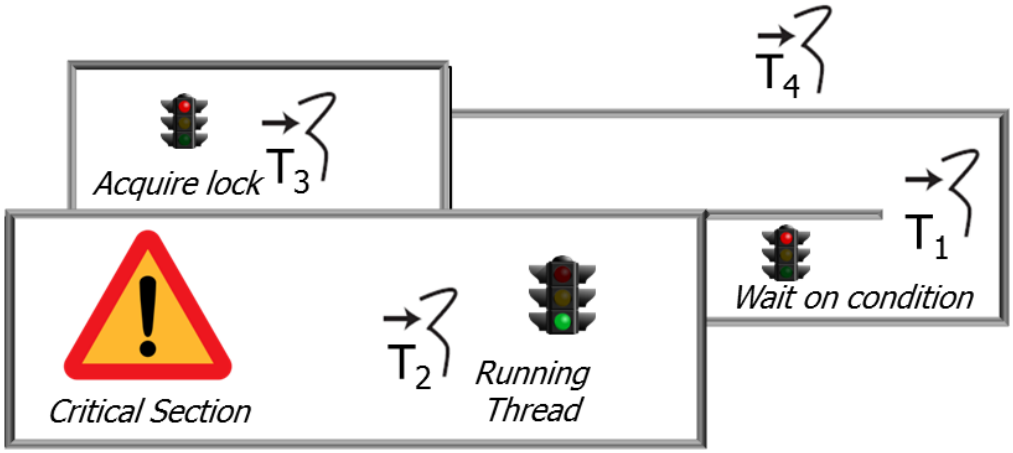
    - Blocking queues & deques in java.util.concurrent* packages
    - Java built-in monitor objects



See upcoming lesson on "*Java Built-in Monitor Objects*"

Applying Condition Variables in Practice

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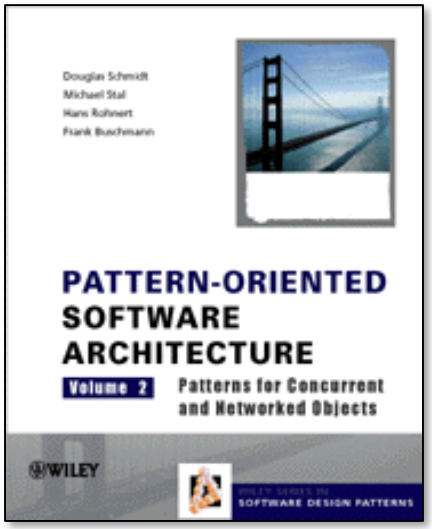
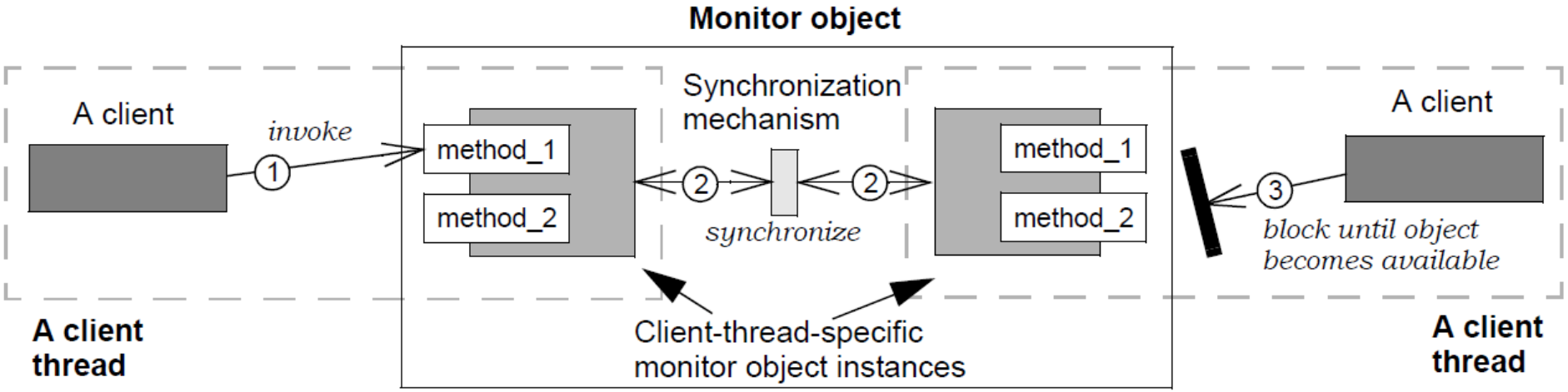
  - CVs form the basis for higher-level synchronizers in Java, e.g.
    - Blocking queues & deques in java.util.concurrent* packages
    - Java built-in monitor objects
    - The *Monitor Object* pattern





See www.dre.vanderbilt.edu/~schmidt/PDF/monitor.pdf

End of Java ConditionObject: Common Use Cases