

Colored images for:

Java Concurrent Programming: A Quantitative Approach by Henry H. Liu

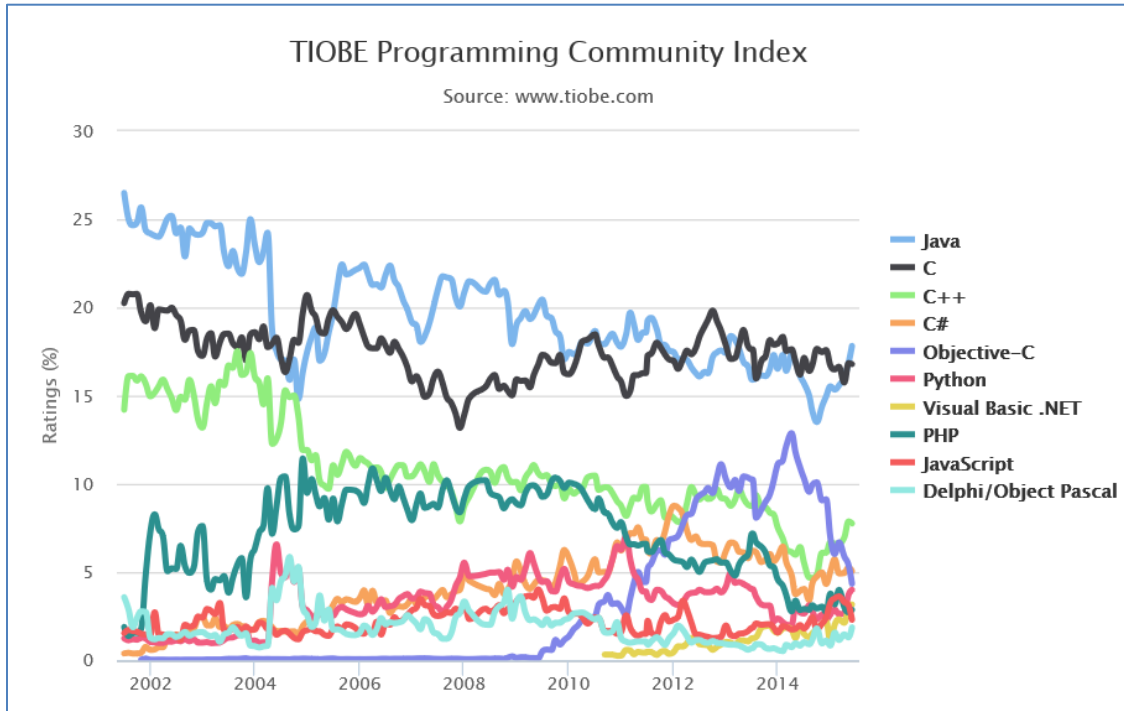


Figure P.1 Statistics on popularity of programming languages

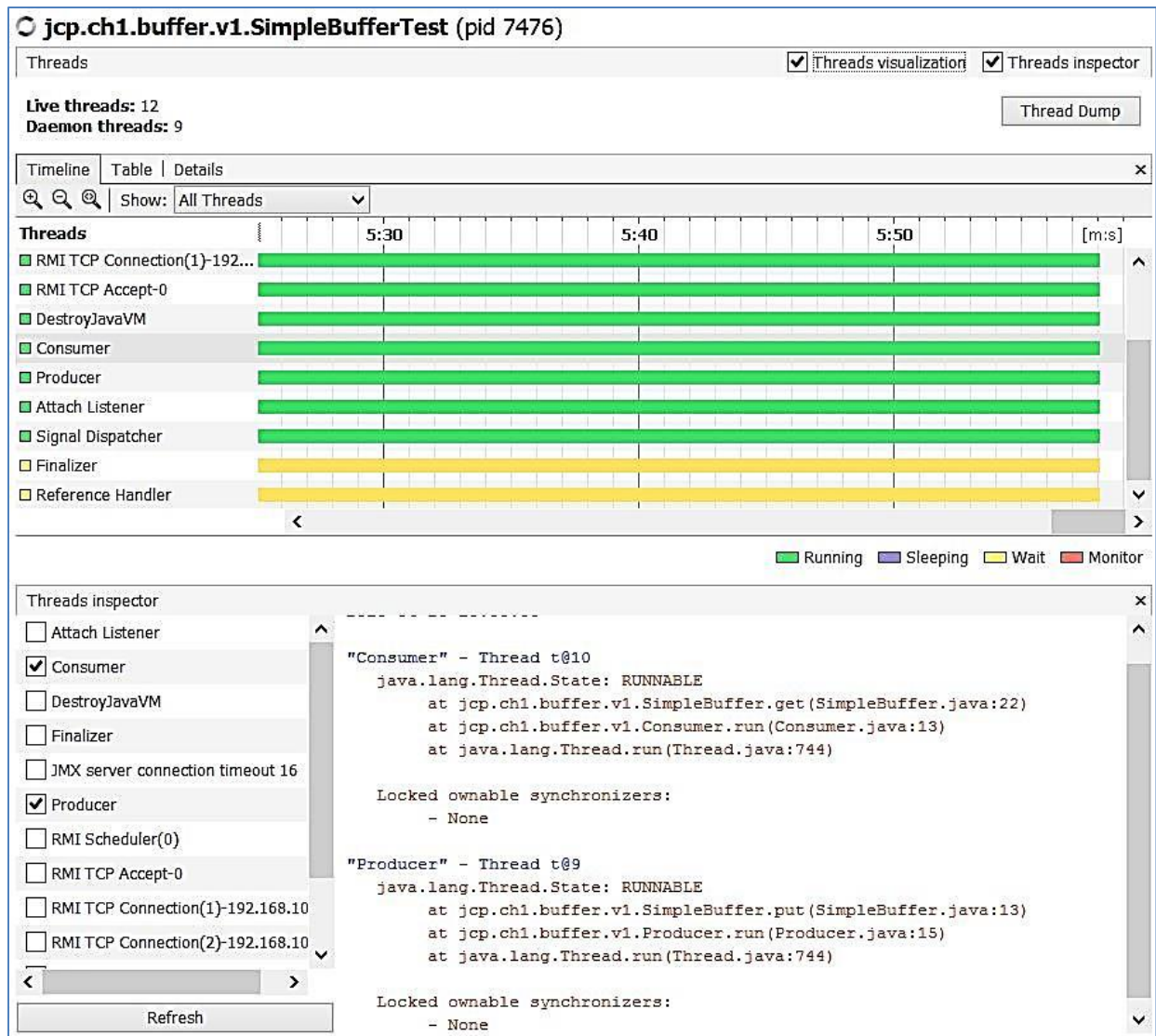


Figure 1.7 The states of the Producer and Consumer threads when *livelock* occurred

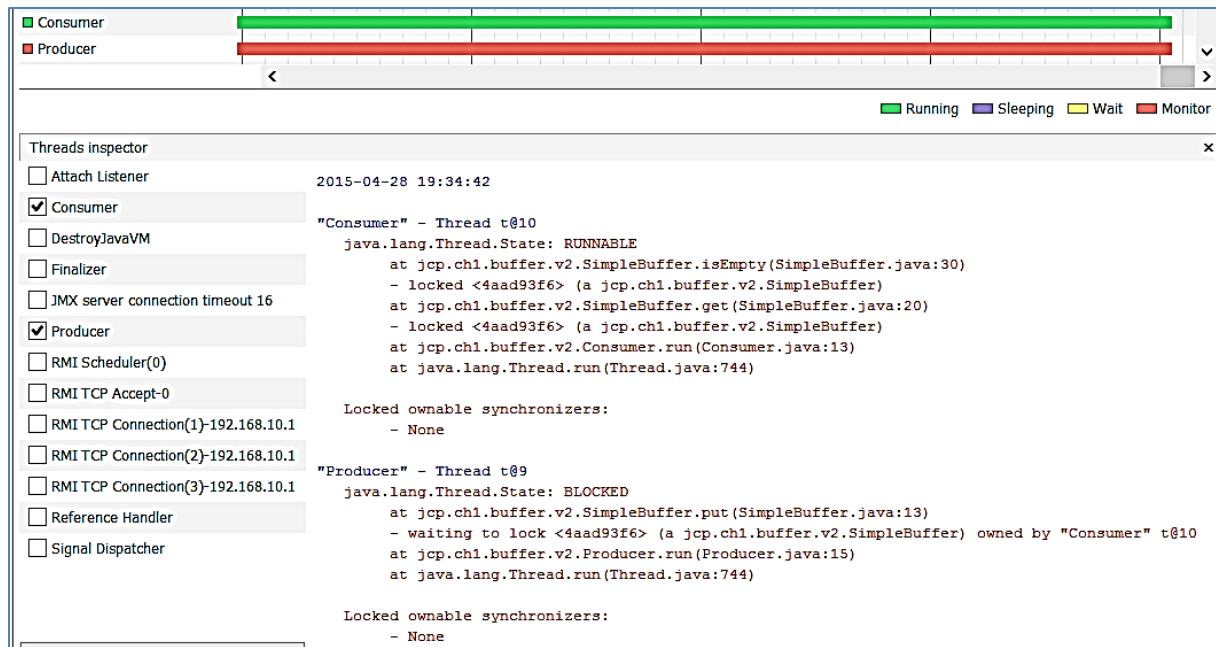


Figure 1.9 Thread states in the starvation situation: One was in RUNNABLE state while the other was in BLOCKED state

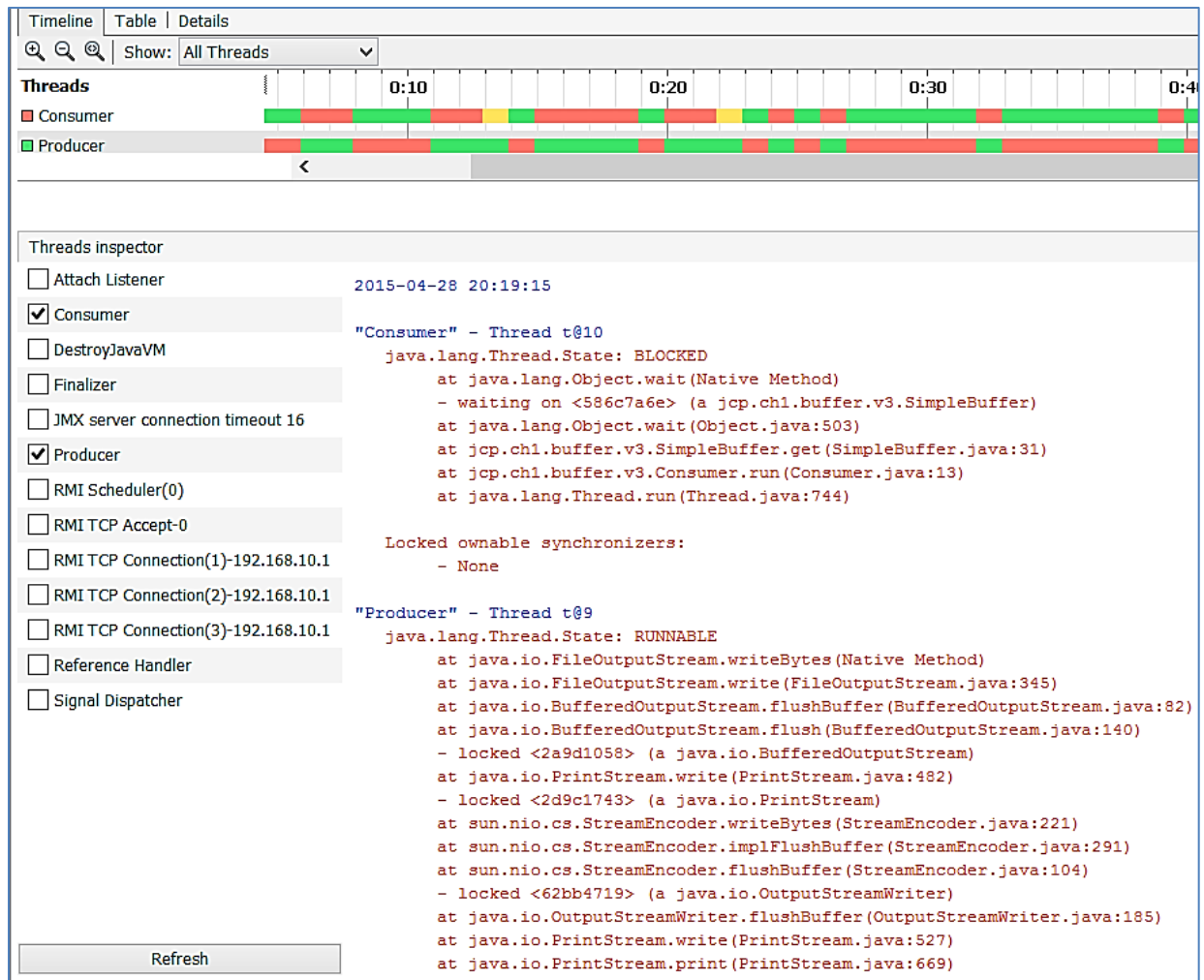


Figure 1.10 States of the Producer and Consumer threads with the SimpleBuffer class implemented with guarded blocks

jcp.ch1.deadlock.DeadlockDemo1 (pid 11160)

Threads

Live threads: 12
Daemon threads: 10

Deadlock detected!
Take a thread dump to get more info.

Timeline | Table | Details

Show: All Threads

Threads

0:00 0:10 0:20 0:30

- Child Thread
- Attach Listener
- Signal Dispatcher
- Finalizer
- Reference Handler
- Parent Thread

Threads inspector

Attach Listener 2015-04-29 19:08:03

Child Thread

Finalizer

JMX server connection timeout 14

Parent Thread

RMI Scheduler(0)

RMI TCP Accept-0

RMI TCP Connection(1)-192.168.10.1

RMI TCP Connection(2)-192.168.10.1

RMI TCP Connection(3)-192.168.10.1

Reference Handler

Signal Dispatcher

Refresh

```

"Child Thread" - Thread t@9
  java.lang.Thread.State: BLOCKED
    at jcp.ch1.deadlock.X.hangUp(X.java:21)
    - waiting to lock <785850e3> (a jcp.ch1.deadlock.X) owned by "Parent Thread" t@1
    at jcp.ch1.deadlock.Y.callMe(Y.java:16)
    - locked <266901dc> (a jcp.ch1.deadlock.Y)
    at jcp.ch1.deadlock.DeadlockDemo1.run(DeadlockDemo1.java:17)
    at java.lang.Thread.run(Thread.java:744)

Locked ownable synchronizers:
  - None

"Parent Thread" - Thread t@1
  java.lang.Thread.State: BLOCKED
    at jcp.ch1.deadlock.Y.hangUp(Y.java:20)
    - waiting to lock <266901dc> (a jcp.ch1.deadlock.Y) owned by "Child Thread" t@9
    at jcp.ch1.deadlock.X.callMe(X.java:17)
    - locked <785850e3> (a jcp.ch1.deadlock.X)
    at jcp.ch1.deadlock.DeadlockDemo1.<init>(DeadlockDemo1.java:12)
    at jcp.ch1.deadlock.DeadlockDemo1.main(DeadlockDemo1.java:22)

Locked ownable synchronizers:
  - None
  
```

Figure 1.12 A deadlock detected on the jvisualvm tool