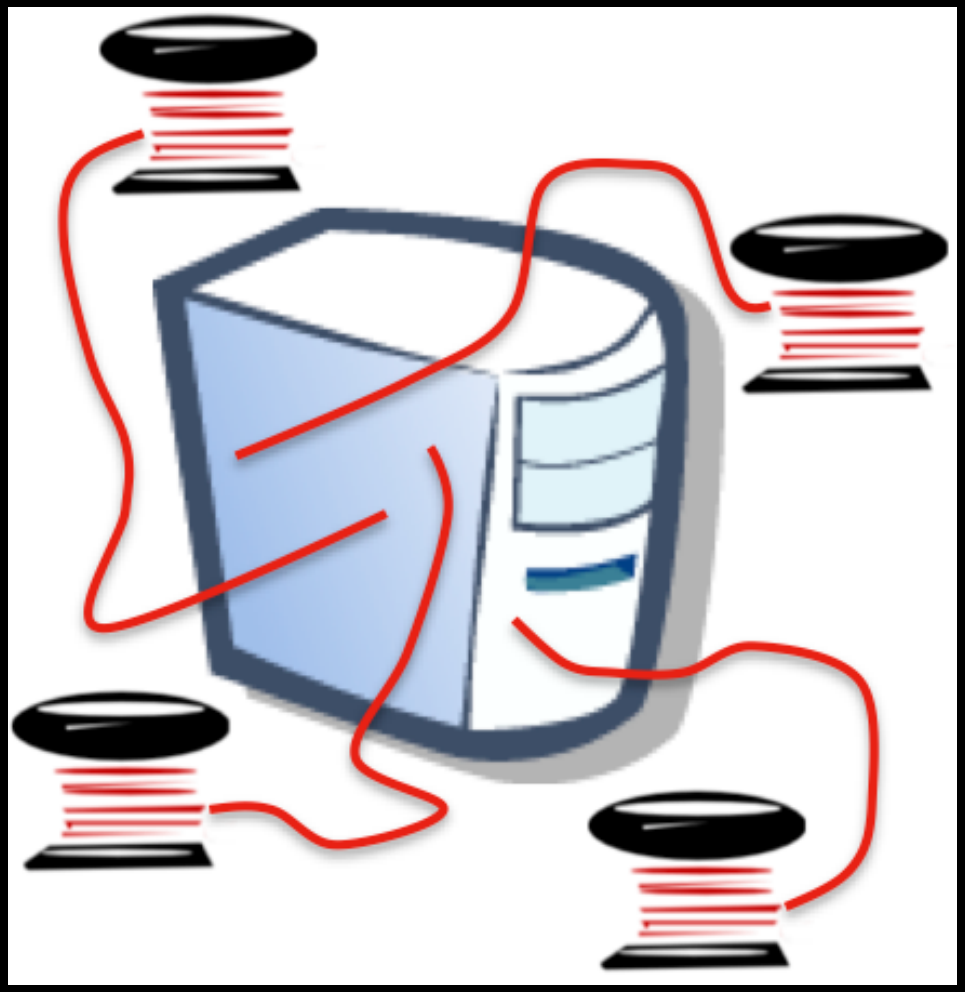
MULTITHREADING IN RUBY

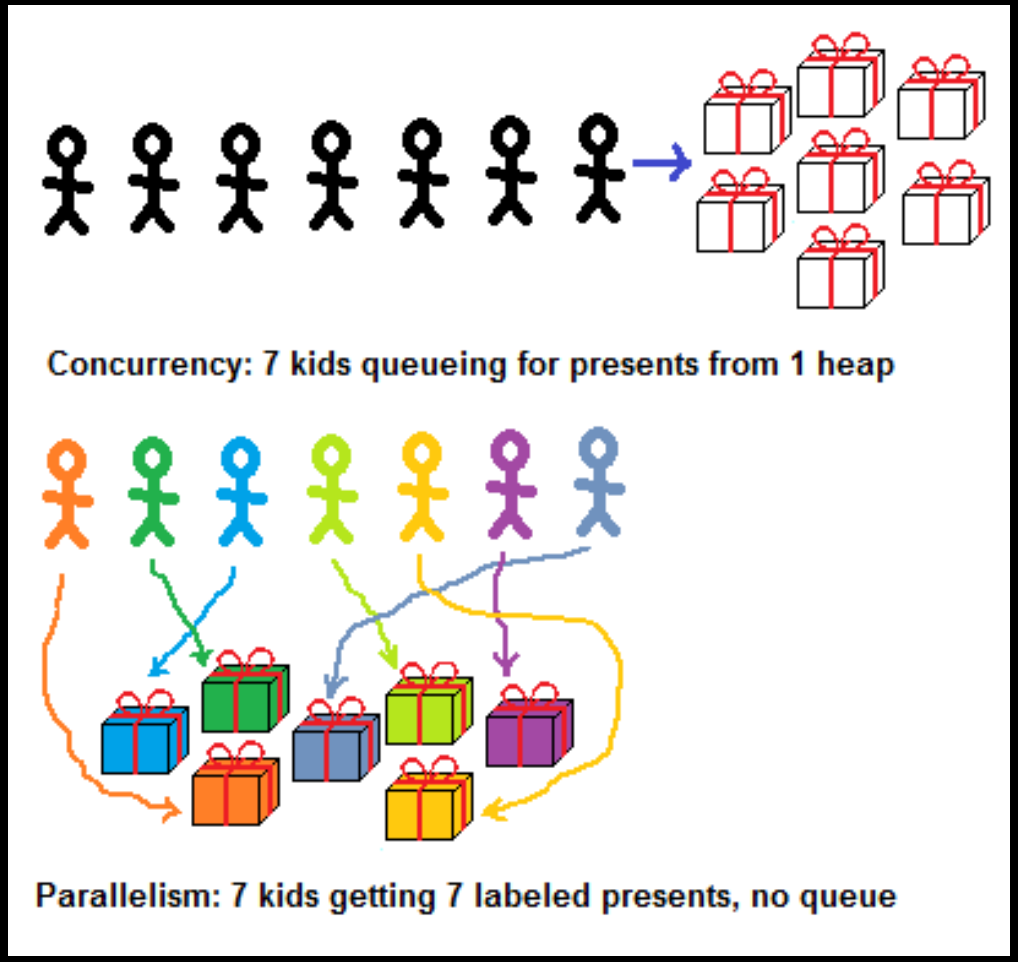
hieuk09 - PLZ

MULTI-THREAD?



http://vichargrave.com/multithreaded-work-queue-based-server-2/

Concurrency vs Parallelism



Why multi-thread/process?

- Faster
- More efficient

Why not?

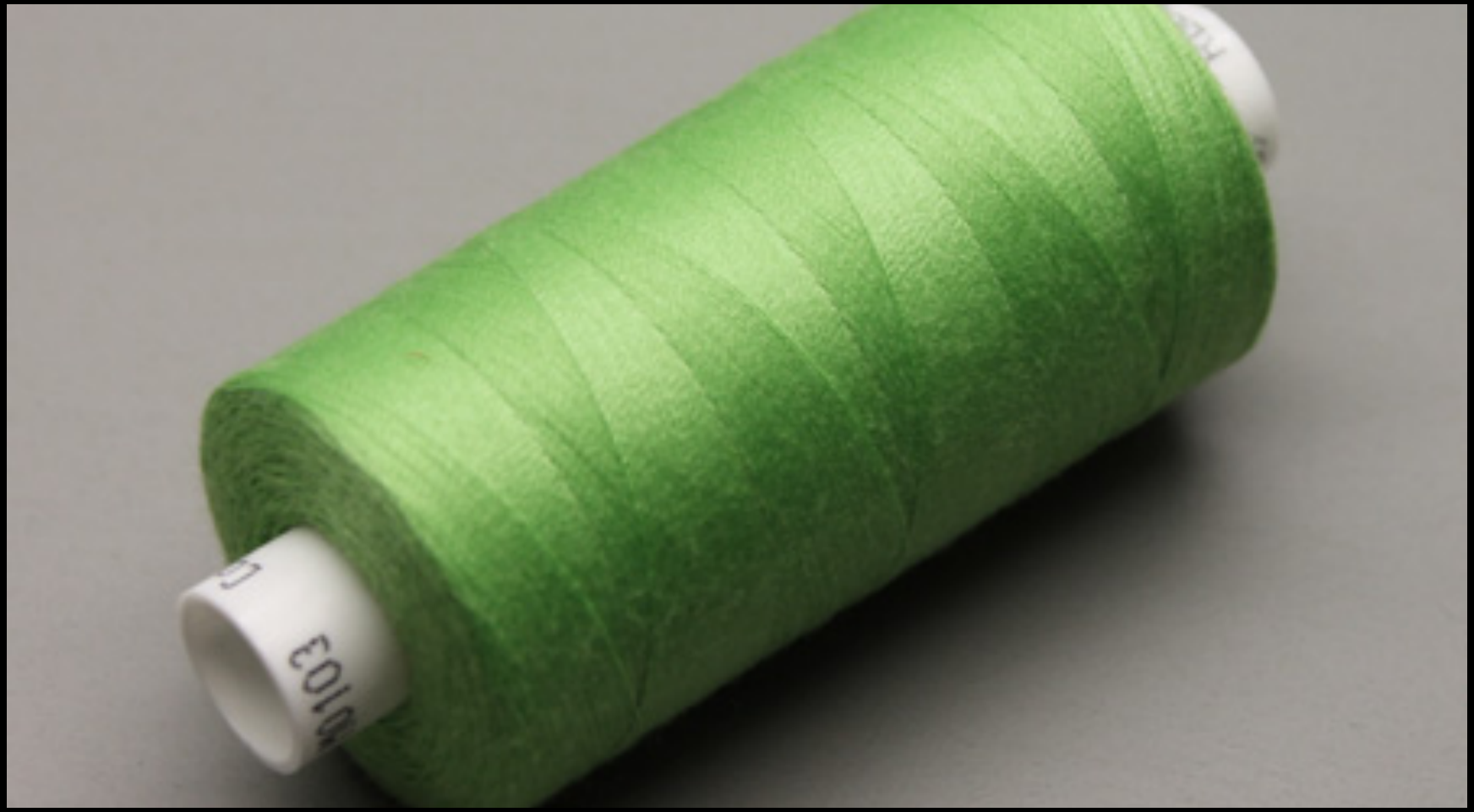
- More complex
- More memory
- Deadlock!
- Thread-safe!

Thread vs Process

Processes	Threads
Uses more memory	**Uses less memory**
If parent dies before children have exited, children can become zombie processes	**All threads die when the process dies (no chance of zombies)**
More expensive for forked processes to switch context since OS needs to save and reload everything	**Threads have considerably less overhead since they share address space and memory**
Forked processes are given a new virtual memory space (process isolation)	Threads share the same memory, so need to control and deal with concurrent memory issues
Requires inter-process communication	**Can "communicate" via queues and shared memory**
Slower to create and destroy	**Faster to create and destroy**
Easier to code and debug	Can be significantly more complex to code and debug

http://www.toptal.com/ruby/ruby-concurrency-and-parallelism-a-practical-primer

Ruby thread is just green thread



Other ruby?

- Jruby have ruby thread as native thread
- Rubinius have green thread in its VM

http://stackoverflow.com/questions/56087/does-ruby-have-real-multithreading

How to use?

Make your code thread-safe

- Be careful
- Constant & Environment variable should be constant
- Use mutex

Prevent deadlock

Fiber

- Light-weight concurrency
- Make asynchronous looks like synchronous

https://www.igvita.com/2010/03/22/untangling-evented-code-with-ruby-fibers/

http://ruby-doc.org/core-2.2.0/Fiber.html

Benchmarking

```
no sleep

single thread:     4800.4 i/s
fiber:             1228.2 i/s - 3.91x slower
multithread:       832.5 i/s - 5.77x slower


sleep 0.1

multithread:        9.8 i/s
fiber:              0.5 i/s - 19.78x slower
single thread:      0.5 i/s - 19.78x slower
```

https://github.com/hieuk09/sample-multithread

When to use?

- Task can be split to independent tasks
- Task have heavily IO bound tasks
- Task which is very slow

Application

- Unicorn
- Puma
- Resque
- Sidekiq
- …

QUESTION?