Flash Sale Engineering

by @EmilStolarsky
Shopify

243,000+ SHOPS

$14B+ TOTAL GMV

300M+ UNIQUE VISITS/MONTH

1000+ EMPLOYEES
How Shopify works
kyliecosmetics.com. 600 IN A 23.227.38.32
THE INTERNET

LB

RAILS

MYSQL
MEMCACHED
REDIS

RESQUE WORKER
GitHub Shop

Shirts and tanks for all!

Get the pride gear!

Prietocat and Transpocat

Water Bottle

GitHub Username Shirt

Octocat Figurine

The Internet

LB

Rails

MySQL

Memcached

Redis

Resque Worker
RESQUE WORKER

THE INTERNET

LB

RAILS

MYSQL
MEMCACHED
REDIS
Your order is being processed.

If you're not automatically redirected, refresh this page.

THE INTERNET

LB

RAILS

MYSQL
MEMCACHED
REDIS

RESQUE WORKER
RESQUE WORKER

THE INTERNET

LB

RAILS

MYSQL

MEMCACHED

REDIS

RESQUE WORKER
Flash Sales
Have you met the girl named Goldie Blox? She likes to think outside the box.
Write Heavy Traffic
Reputation
1. Nginx
2. Caching
3. Throttling
Robust Piece of Software
1. Nginx
2. Caching
3. Throttling
"The fastest code is the code that never runs"

- Michael Scott
Shopify/cacheable
Fastly

nginx1

nginx2

nginx3

nginx4

SHOPIFY
Fastly Drawbacks

- nginx1
- nginx2
- nginx3
- nginx4

SHOPIFY
shop_state:session_state
Throughput by LB

Total: 20.14M

23:11:20
1. Nginx
2. Caching
3. Throttling
Back Pressure
GET /checkout
GET /checkout

GET /throttle_page
GET /checkout
200: throttle page

GET /throttle_page
200: (cached by LB)
USER

GET /checkout
200: throttle page

RAILS

GET /throttle_page
200: (cached by LB)

GET /checkout?poll=1
200: throttle page
GET /checkout

200: throttle page

GET /checkout?poll=1

200: throttle page

GET /checkout?poll=1

200: throttle page

GET /checkout?poll=1

302: /checkout

302: /checkout

302: set checkout pass

200: (cached by LB)
Throttling Queueing
Stateless* fair queueing
* - Almost Stateless
Stateless fair queueing

Timeline of timestamp in cookie
Stateless fair queueing

Lag delimiter
Stateless fair queueing

high priority

low priority
Stateless fair queueing

Bucket of high priority requests (max 16)
Stateless fair queueing

high priority
Stateless Fair queueing
Stateless Fair queueing
Stateless Fair queueing

high priority

low priority

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$\Delta t$
Stateless Fair queueing

- high priority
- low priority

$t$
Stateless fair queueing

high priority
Why do I care?
Caching
Throttling Queueing
We’re hiring!
Thanks!

Follow me on Twitter @EmilStolarsky