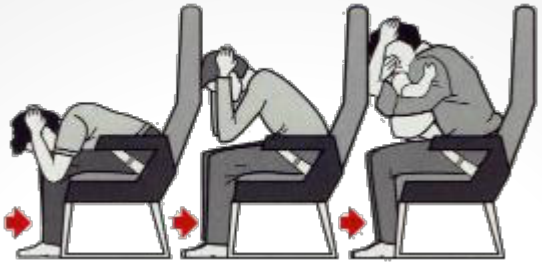


Brace for impact

@bephpug 2012

Christoph Lühr

@chluehr

basilicom

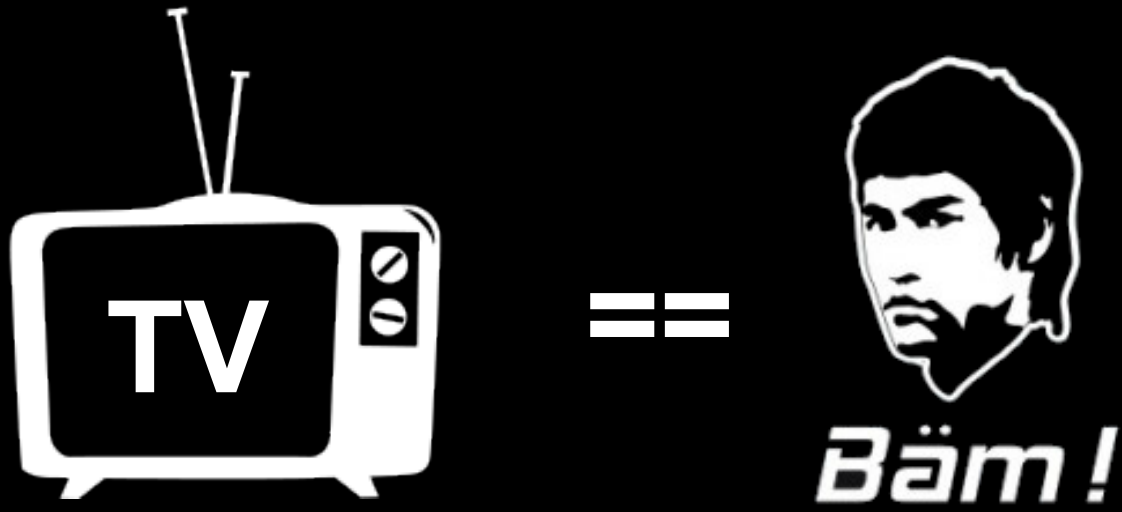
apps
concept
social
games
mobile
shop
banner
strategy
facebook
e-commerce
newsletter
websites
design
cms
marketing

(short term)

High Load Scenarios

DISCLAIMER

~~PHP~~

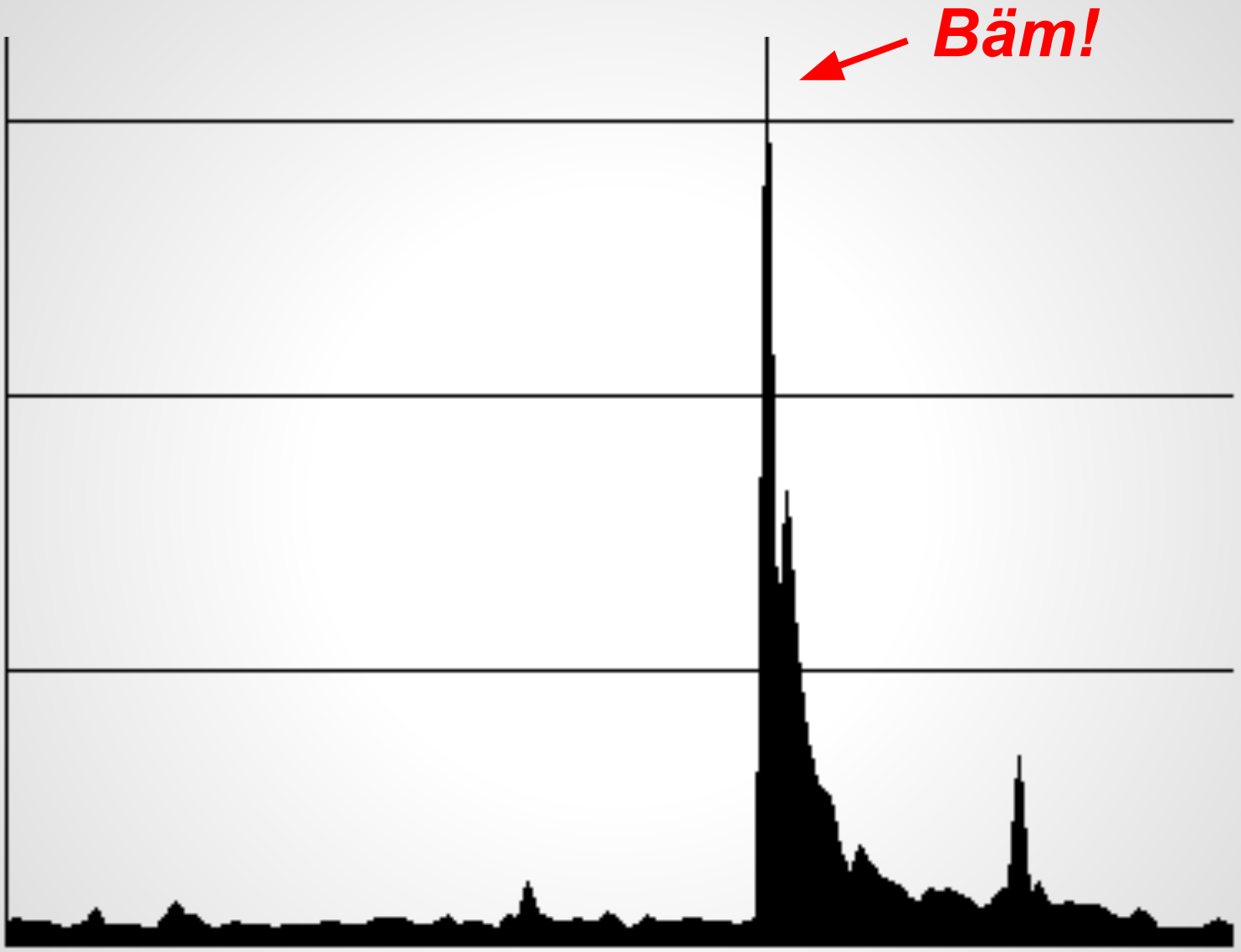


(if successful)

/.

"Slashdot Effect"

(now: Facebook, Bild.de, ...)


Bäm!

Why care?

$$$

TV ads are expensive

downtime == wasted money

Why me?

5 yrs++
Deutsche Bahn, Ferrero, Peugeot
BMW, Sony, UMG, studiVZ, ...

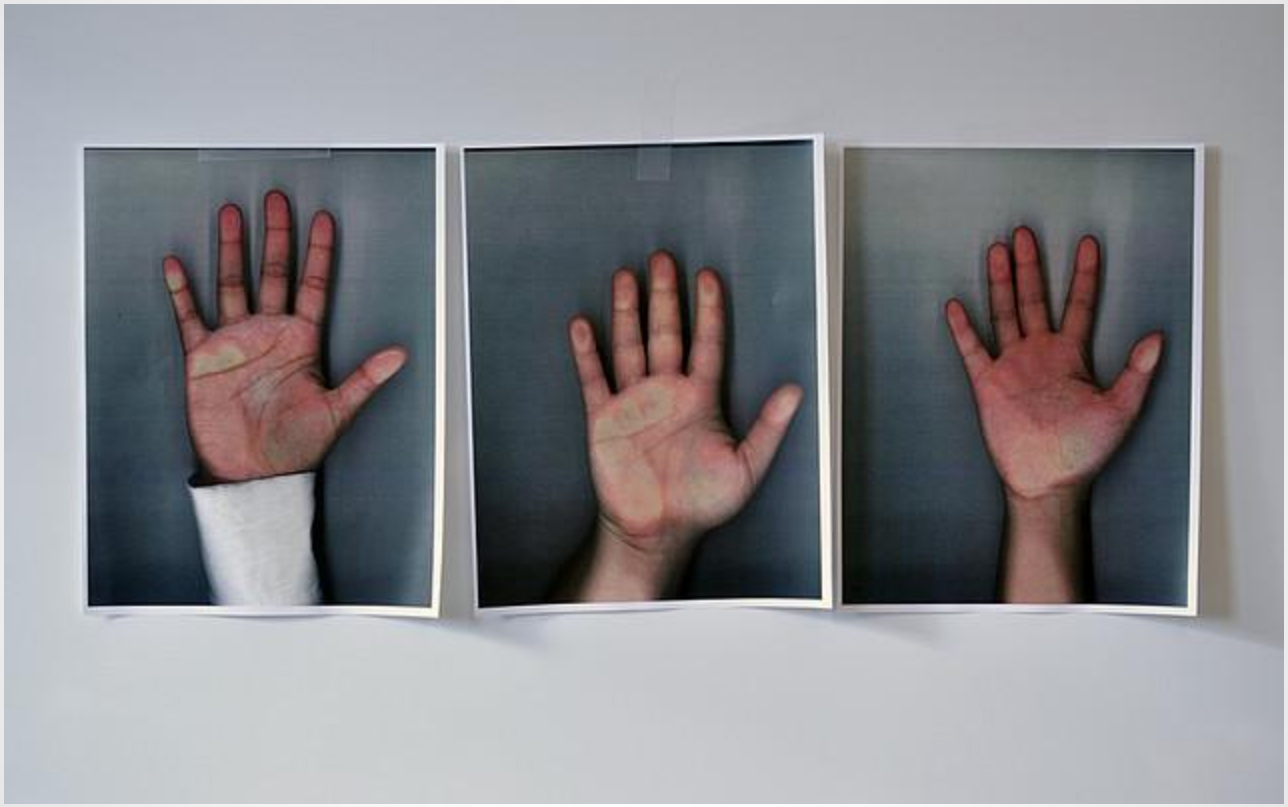


Image source: http://www.flickr.com/photos/stinajonsson/3932774410 CC BY-NC 2.0

Flight Plan

1. MAKE A PLAN
2. MAKE IT SCALE?
3. MAKE IT FAST!
4. [TEST, SIZE]
5. WATCH IT!

} Architecture

6. BONUS: EXAMPLES

Brace for impact

Plan

~~Brace~~ for impact

Knowledge is Power

Media plans

TV schedules

TELEVISION
LIES

Planning

- just **Peaks** matter
- Media / marketing exposure?
- Target group? Click Rate?
- Max. daily visits? Top hour?
- Pages ^ visit, resources ^ page?

- Do not forget storage / traffic requirements.

Planning

Metric	High-Case		Realistic-Case
TV Potential Users	7270000		7270000
Percentage of participating Users	4,5		0,8
Participating Users Total	327150		58160
Print Potential Users	660000		660000
Percentage of participating Users	3,5		0,7
Participating Users Total	23100		4620
Online Potential Users	53000000		53000000
Percentage of participating Users	0,6		0,2
Participating Users Total	318000		106000
Total Promo Users	668250		168780

Planning

Metric	High-Case		Realistic-Case	
Potential Users Total	670000	#	170000	#
Percentage of participating Users	100	%	100	%
Participating Users Total	670000	#	170000	#
Number of Campaign Days	14	#	14	#
Number of Visits per User during Campaign	1	#	1,2	#
Number of additional Viral User Visits per User	0,5	#	0,1	#
Visits total	1005000	#	221000	#
Percentage of Visits during Peak Day	20	%	15	%
Potential Peak DAUs / Visits per Day	201000	#	33150	#
Percentage of Peak Day DAUs in Top Hour	30	%/h	20	%/h
Potential Peak Day DAUs / Visits per Top Hour	60300	#/h	6630	#/h
HTTP Requests per PI	4	#/PI	3	#/PI
Initial HTTP Requests per Visit	20	#/V	20	#/V
Average Initial PI Size (KB)	700	kB	600	kB
Average consecutive PI Size (KB)	200	kB	150	kB
Traffic per Visit (KB)	1900	kB/V	1350	kB/V
Traffic Total (GB)	1821	gB/T	285	gB/T
Average PIs per Visit	6	#/V	5	#/V
Requests per Visit	44	#/V	35	#/V
Requests total in top Hour	2653200	#/Th	232050	#/Th
Average HTTP Requests per Second in top Hour	737	#/sTh	64	#/sTh

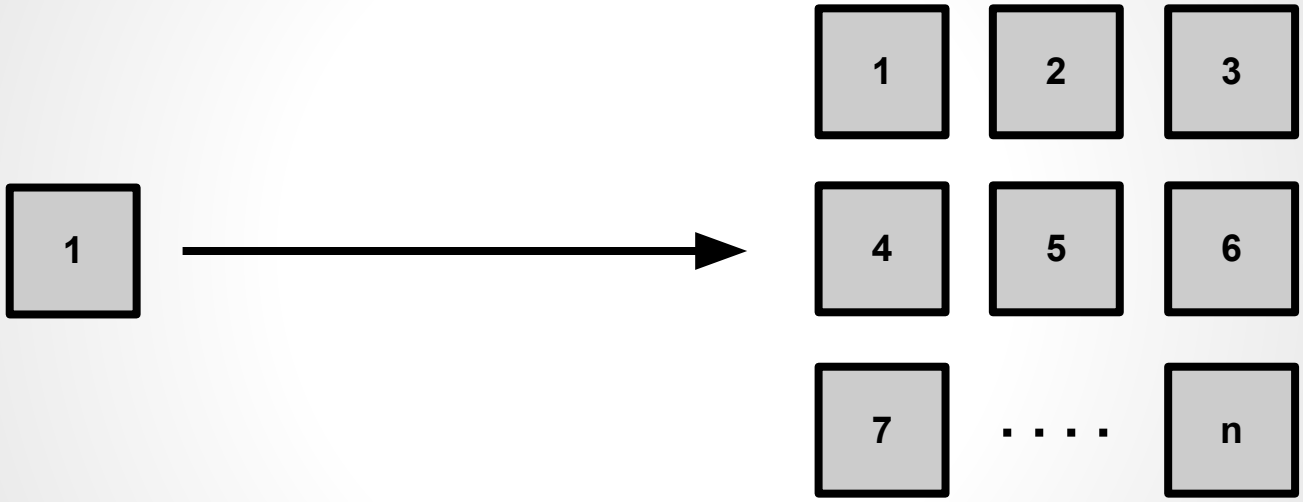
Architecture

(& Tool Time)

Fancy Solution

Elasticity
Scaling

"just add more boxes.."



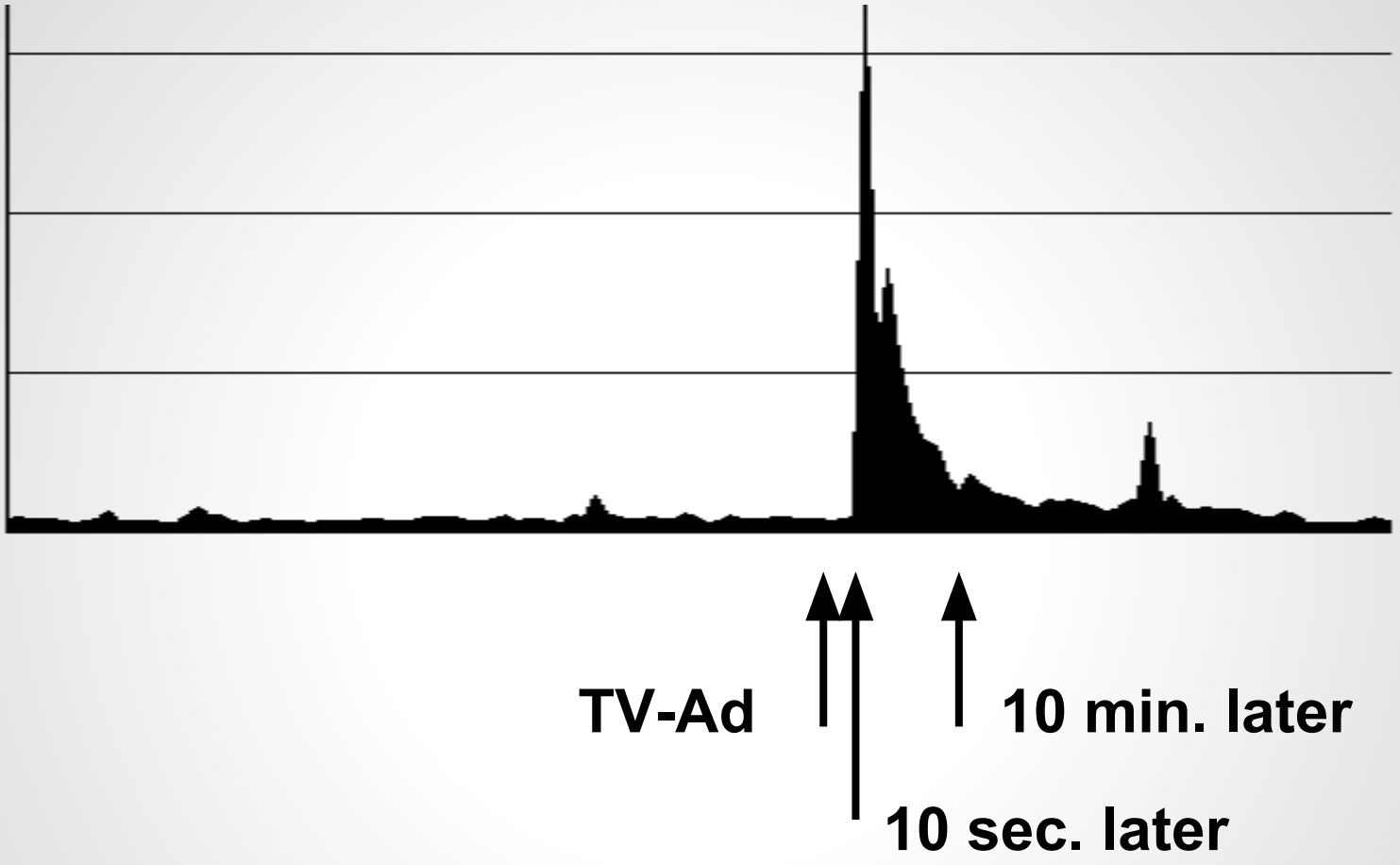
really?

System complexity ++

Database?

Time to spawn?

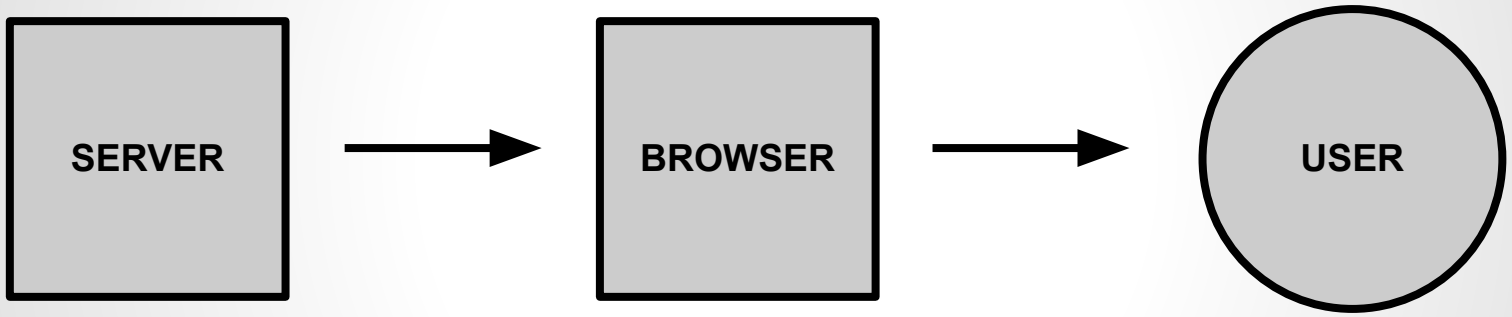
.....


TV-Ad
10 min. later
10 sec. later

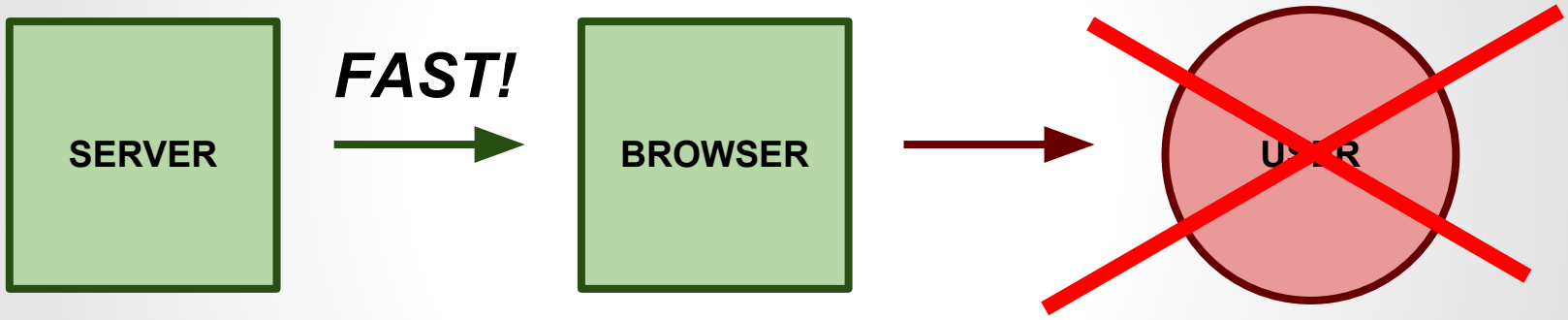
Traditional Solution

Performance ++

Performance



Performance



Performance Rules

Rule #1

Don't get hit.

- landing page on a different server.

Rule #2

Let others do the work

- use a Content Delivery Network (CloudFlare is free).

Rule #3

Serve static content

SERVE

STATIC

CONTENT!

Rule #3

Serve static content

- use a caching reverse proxy: **Varnish**
- **NGINX** is fast, too
- "static" can even mean only 5 mins.

Rule #4

Serve static content once

- use correct cache headers
- leverage browser caches
- allow external proxies to cache your content.

Rule #5

Minimize requests

- compress HTML
- combine / minify JS, CSS
- inline images
- **== get a good SpeedRanking.**

Rule #6

Avoid *dynamic* requests

- load data upfront
- stay in browser, validate via JS first
- collect data / batch requests
- load only on action (captcha, ...).

Rule #7

small is BIG

- don't load a framework for an insert()
- just write a logfile?
- use nodeJS.

Rule #8

De-couple / postpone

- use queuing and finite # of workers
- use external services (transloadit, youtube, ...).

Rule #9

Degrade gracefully

- skip doing hard work (thumbnails,...)
- hide expensive functionality (edit)
- ... to keep the site online.

Secret Rule #10

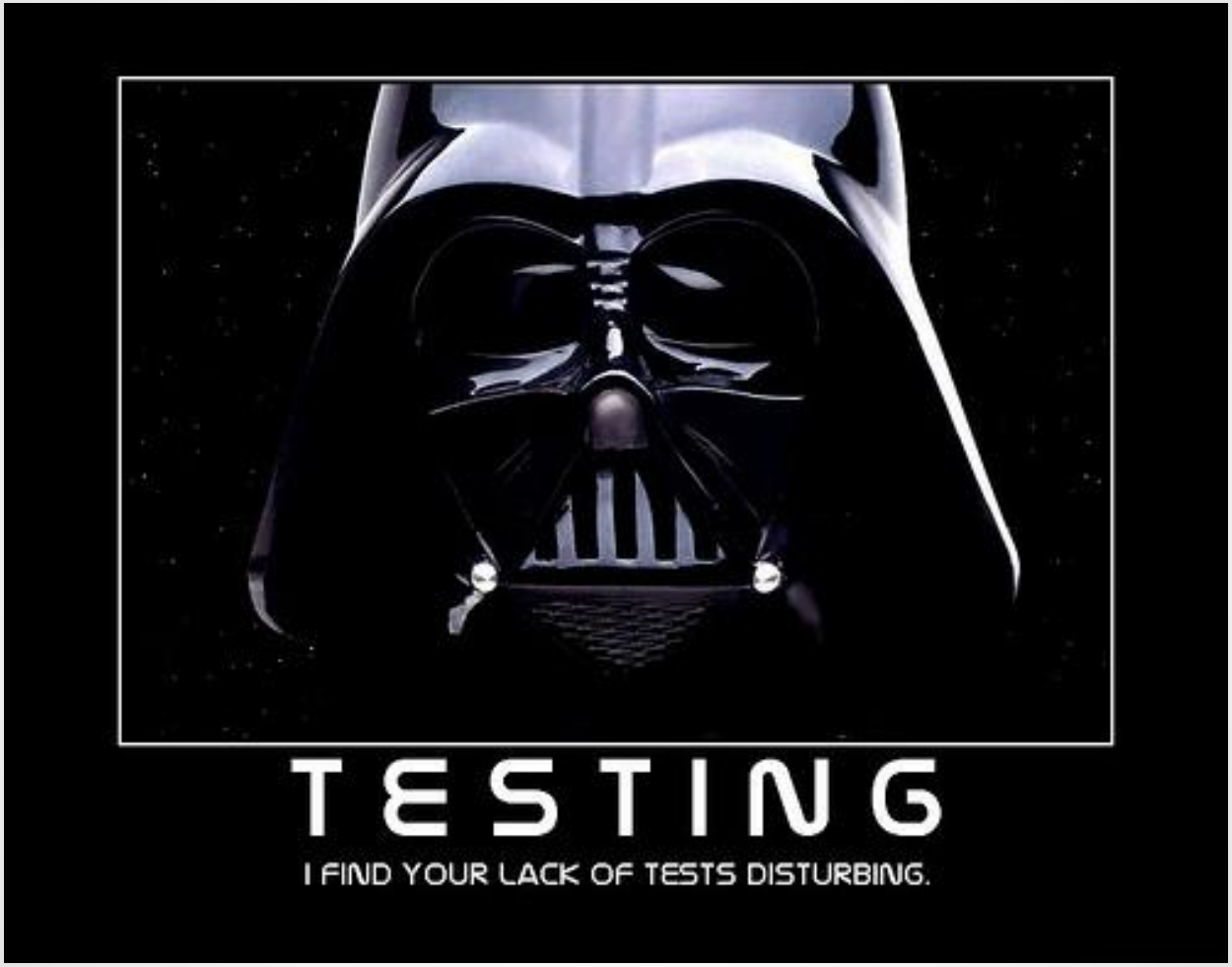
Cheat

- discard requests
- stats & voting: sample only 10%
- simulate server calls (spinner).

Final Rule #11

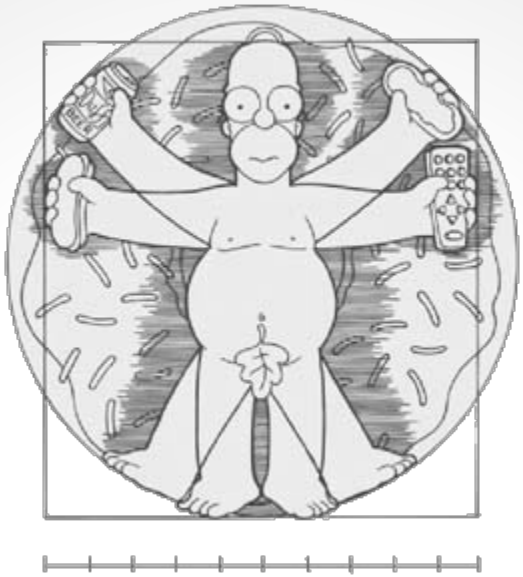
Don't go offline.

- put campaign on different server
- limit resources, don't kill your server
- if all fails, be sure to display a notice.


TESTING
I FIND YOUR LACK OF TESTS DISTURBING.

Testing

- Goal: Determine app limits/threshold
- Testing is **HARD**
- Test the production environment
- Monitor **performance** & **resources**
- httperf, apache bench, siege, JMeter.



Sizing & Tuning

Sizing & Tuning

- RAM
- CPU cores / CPU speed
- IO: Storage Type / Storage Size
- Cache memory (Varnish)
- MySQL tuning (Caches, ...)
- System/Network tuning (max_open_files, ...)
- Apache (max. childs, ...)

Rinse, repeat.

(building, testing, sizing)

Online:

Monitoring

Image source: http://www.officialpsds.com/Green-Radar-Screen-PSD61002.html Attribution

Monitoring

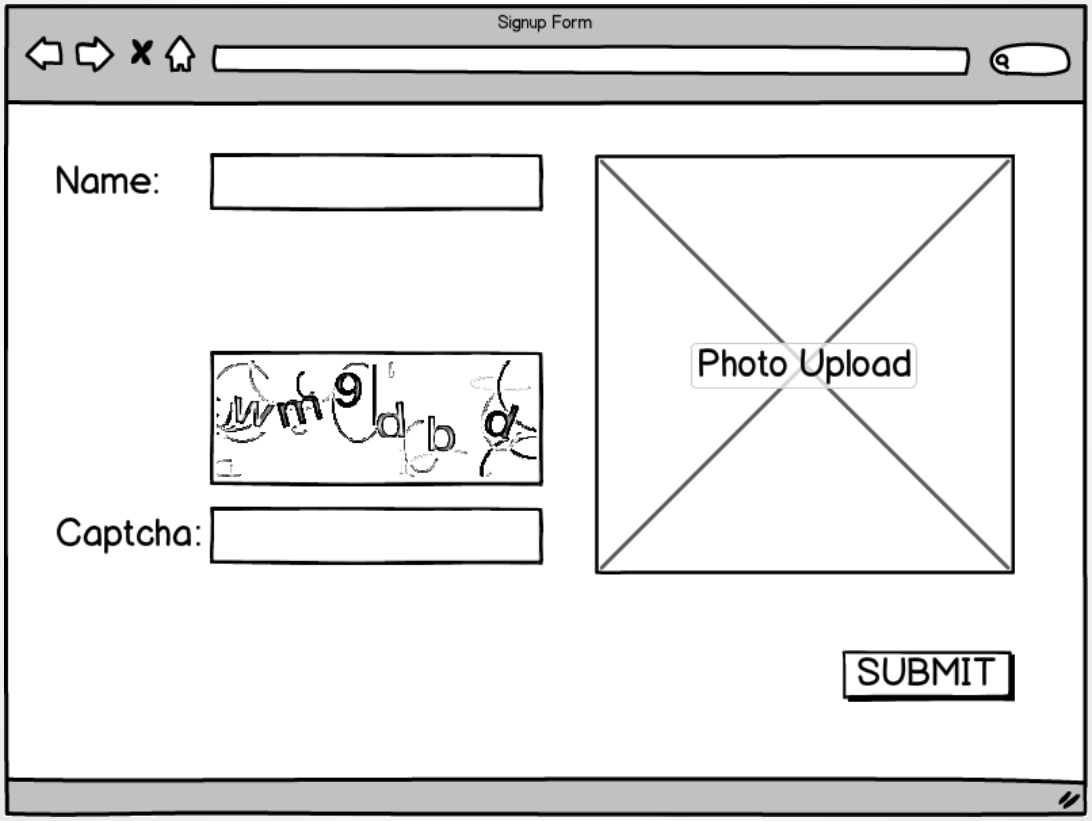
- **Access** *(Google Analytics)*
- **External Availability** *(Pingdom, ...)*
- **Speed, Latency &**

  Resources *(New Relic, ...)*
- **Application** *(# participants, ... StatHat)*

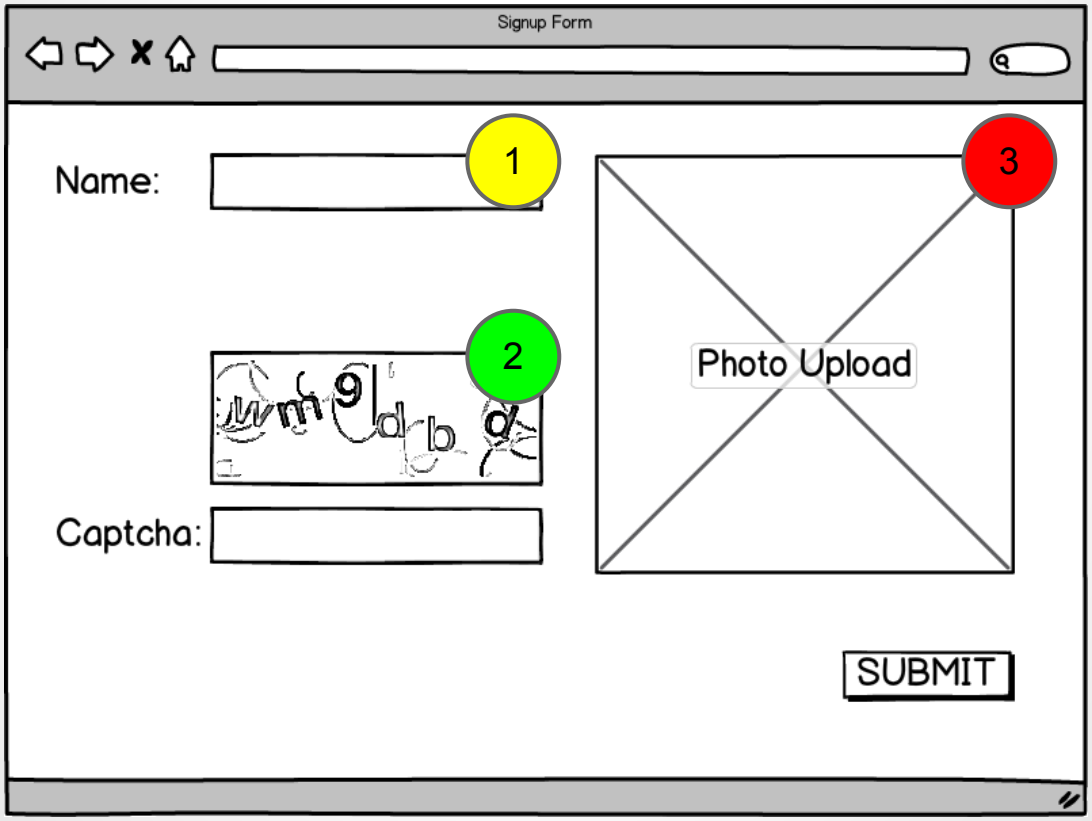
- *OR homegrown (statsd, etc.).*

Examples

Forms

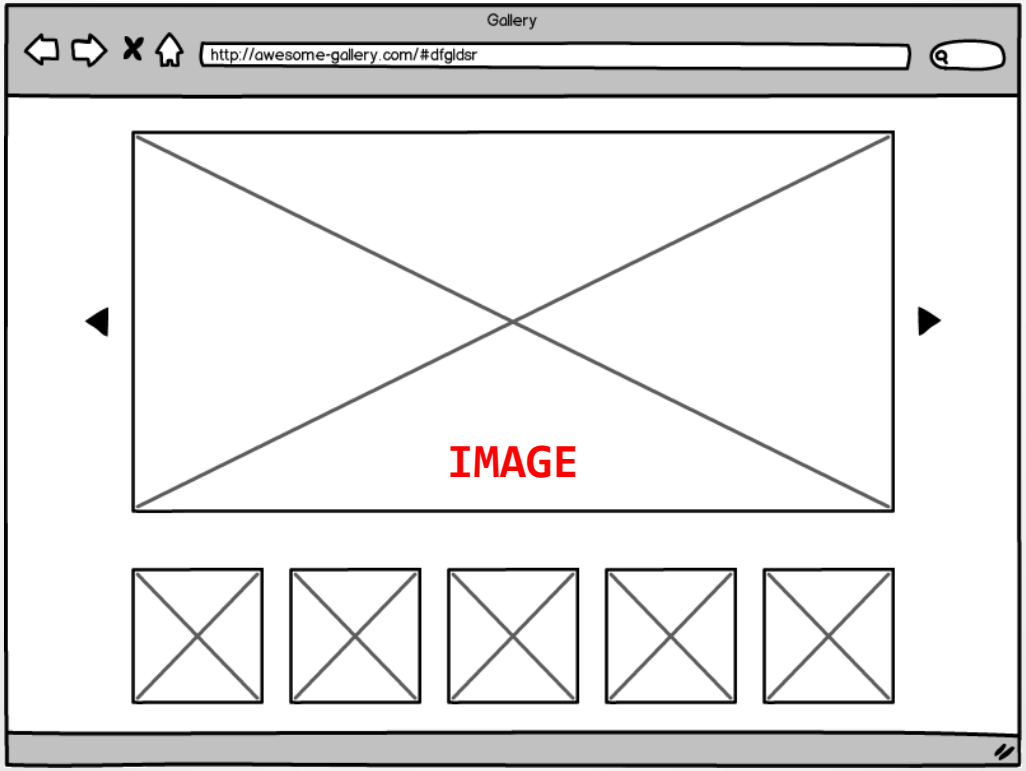


Forms



Gallery detail pages

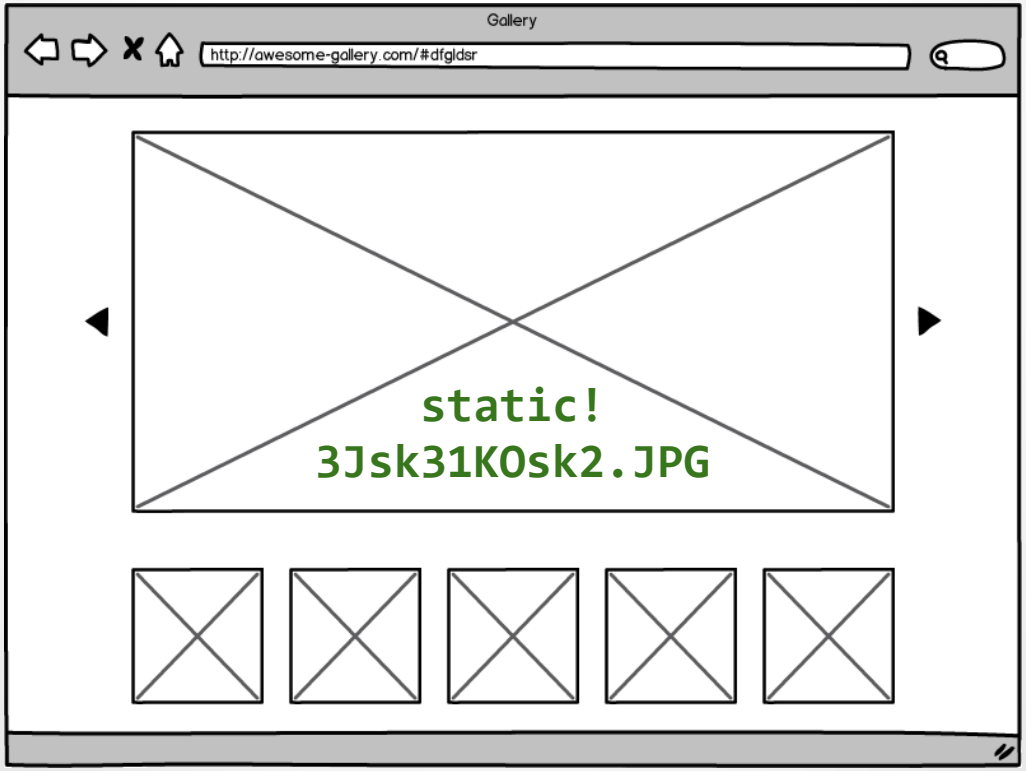
http://foo.com/view/?key=3Jsk31KOsk2



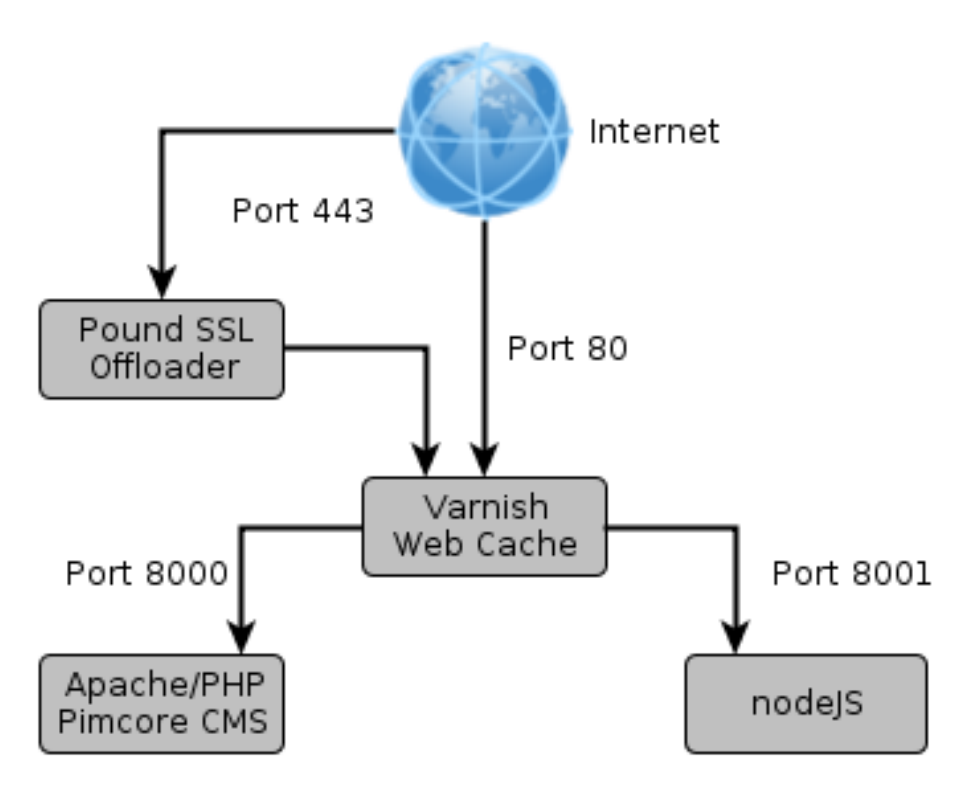
Gallery detail pages

http://foo.com/view/?key=3Jsk31KOsk2 ==> :-(

http://foo.com/view/ #3Jsk31KOsk2 ==> :-)



Simplified setup

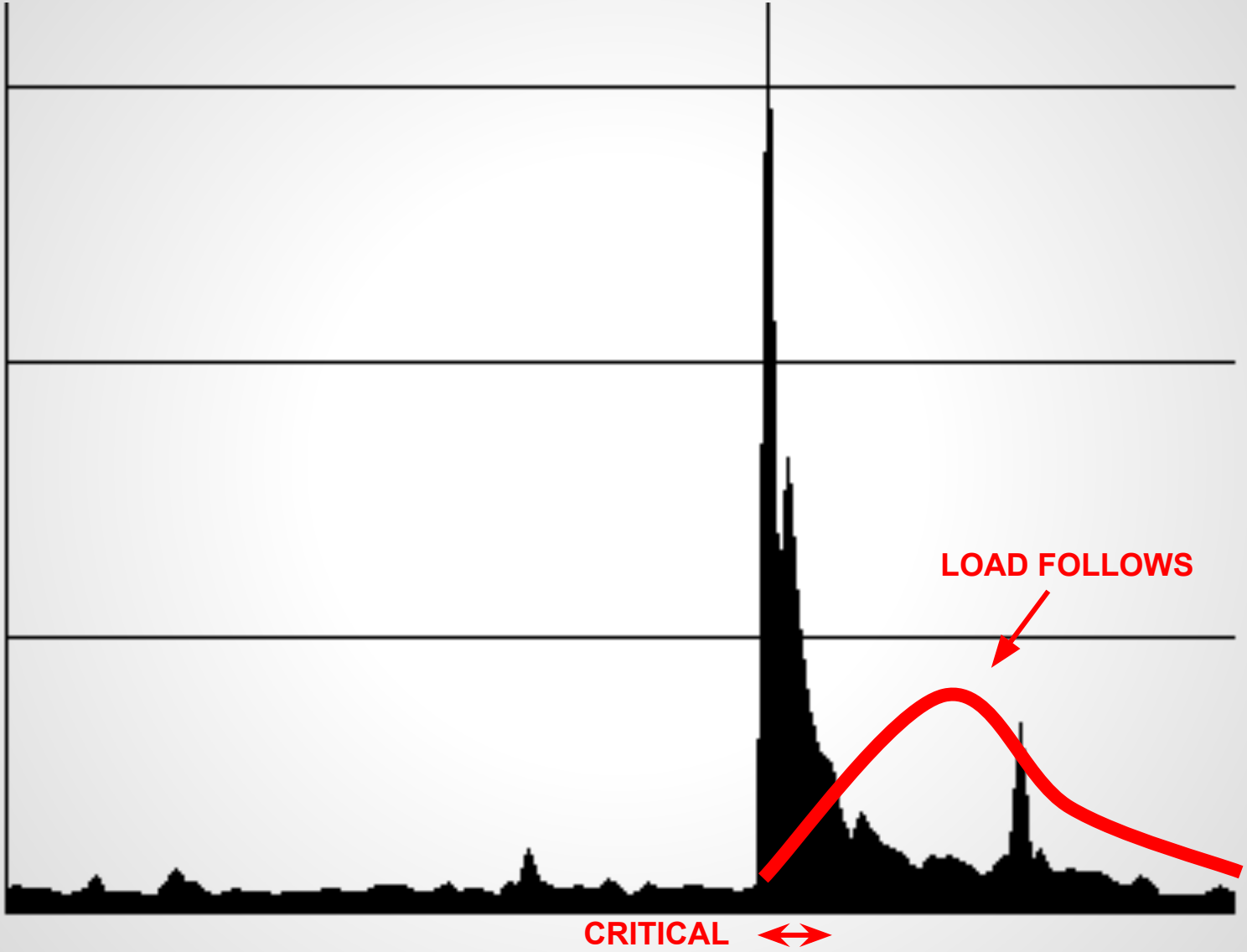


Summary

SERVE

STATIC

CONTENT!


LOAD FOLLOWS
CRITICAL

Questions?

Suggestions?

Thanks

... and always have a safe landing!

Contact

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Twitter: @chluehr

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Links

- **Google PageSpeed Insights**
  `https://developers.google.com/speed/pagespeed/insights`
- **Transloadit: Image / Video uploads / conversion**
  `https://transloadit.com/`
- **Pingdom Monitoring & Tools**
  `http://tools.pingdom.com/fpt/`
- **New Relic application & server monitoring**
  `http://newrelic.com/`
- **CloudFlare CDN**
  `https://www.cloudflare.com/`

Links

- **Continuous Performance Testing**
  http://qafoo.com/talks/12_05_ipc_se_continuous_performance_tests.pdf
- **Varnish**
  https://www.varnish-cache.org/
- **Varnish Speed**
  http://kly.no/posts/2010_10_23__High_End_Varnish___275_thousand_requests_per_second___.html

Links

- **NGINX**
  http://www.slideshare.net/Edorian/nginx-php-fpm-the-webserver-you-might-actually-like-php-usergroup-berlin
- **High Performance Web Sites - Steve Souders**
  http://shop.oreilly.com/product/9780596529307.do
- **Pound Load Balancer, Reverse Proxy & SSL Offloader**
  http://www.apsis.ch/pound