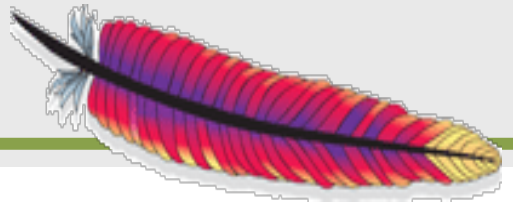
An introduction to Apache Traffic Server

Leif Hedstrom

December 2011

Who am I?



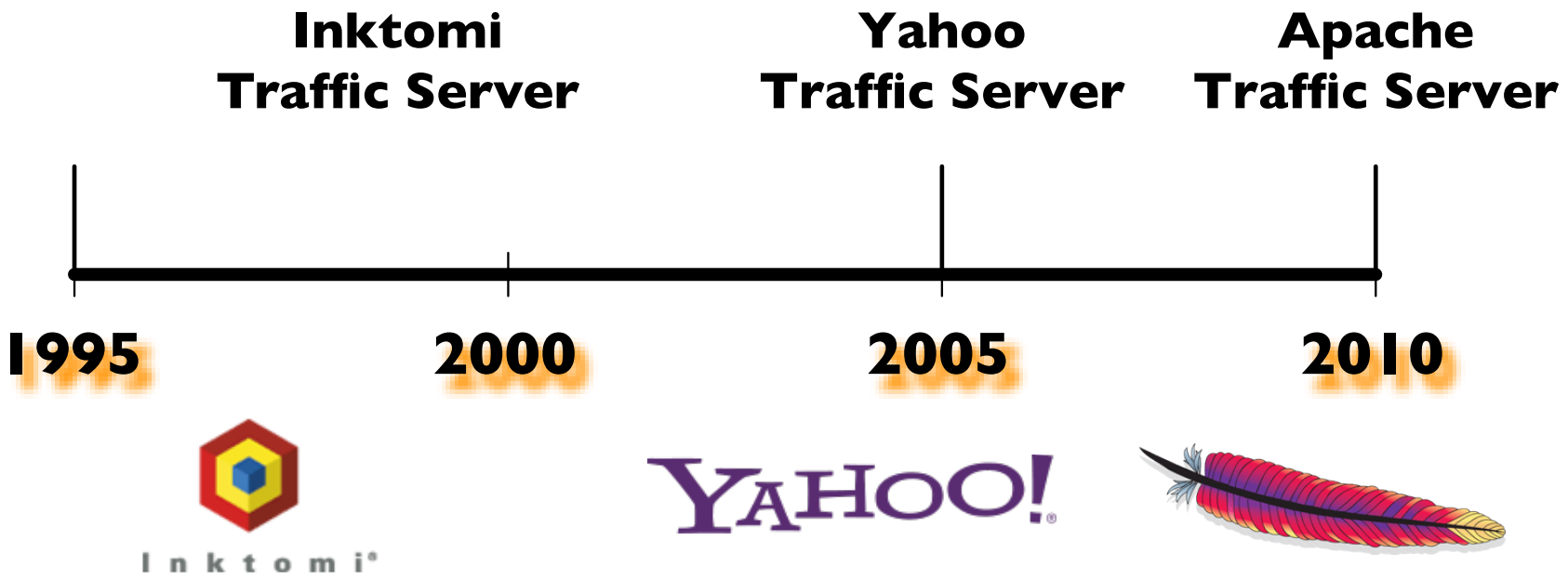
- One of the drivers to open source Traffic Server (at Yahoo)
- Committer for Apache Traffic Server
- VP of Apache Traffic Server PMC
- ASF member
- Go Daddy's Principal Architect for Hosting

zwoop@apache.org

@zwoop

+zwoop

History of Traffic Server



Plenty of FOSS Proxy Servers

traffic server

NGINX

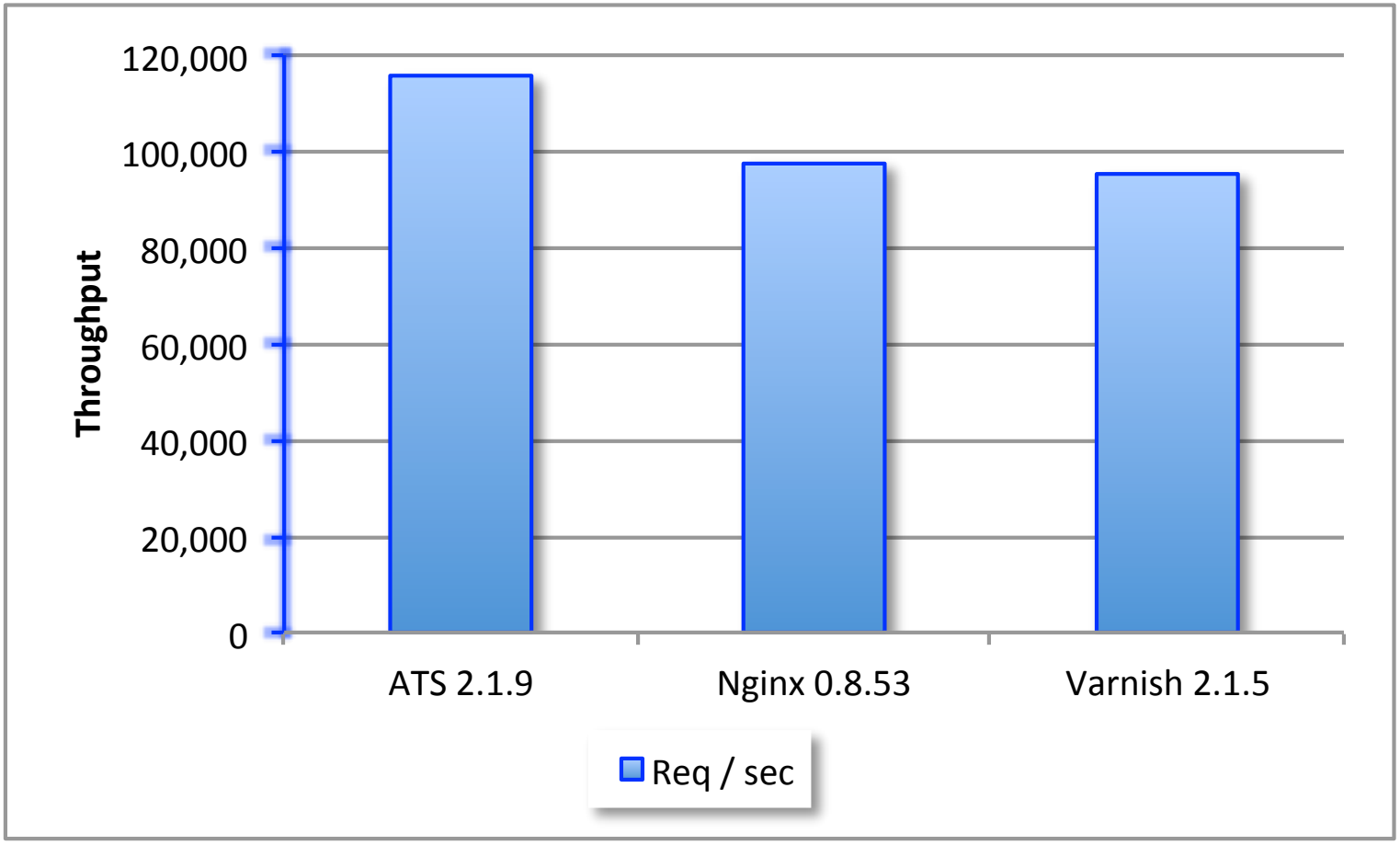
HA PROXY

Varnish

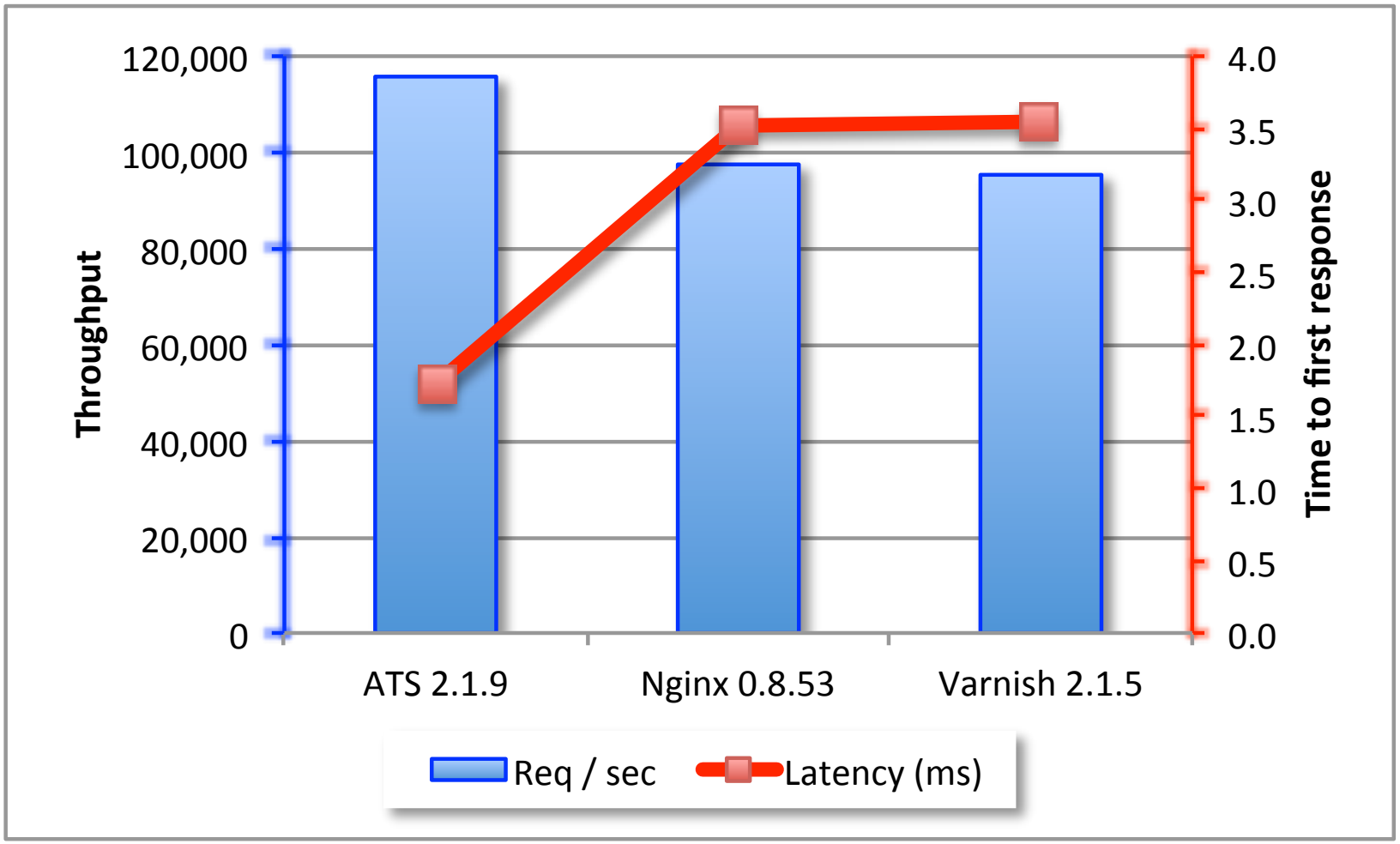
Features

	ATS	HAproxy	nginx	Squid	Varnish	mod_proxy
Worker Threads	Y	N	N	N	Y	Y
Multi-Process	N	Y	Y	N	Y	Y
Event-driven	Y	Y	Y	Y	sometimes	Y
Plugin APIs	Y	N	Y	part	Y	Y
Forward Proxy	Y	N	N	Y	N	Y
Reverse Proxy	Y	Y	Y	Y	Y	Y
Transp. Proxy	Y	Y	N	Y	N	N
Load Balancer	weak	Y	Y	Y	Y	Y
Persistent Cache	Y	N	Y	Y	sorta	Y
ESI	Y	N	N	Y	kinda	N
ICP	soon	N	N	Y	N	N
Keep-Alive	Y	N	Y	Y	Y	Y
SSL	Y	N	Y	Y	N	Y
Pipeline	Y	N	Y	Y	N	Y

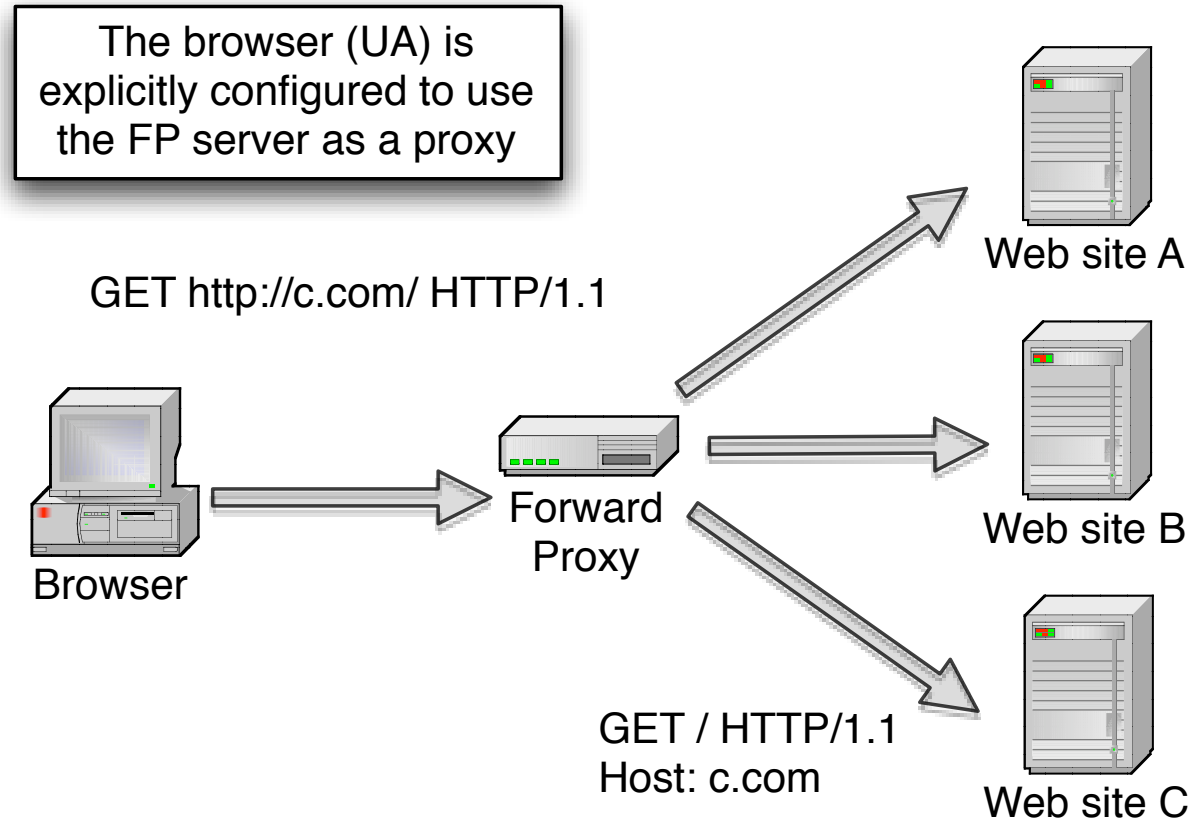
Mandatory useless benchmark ...



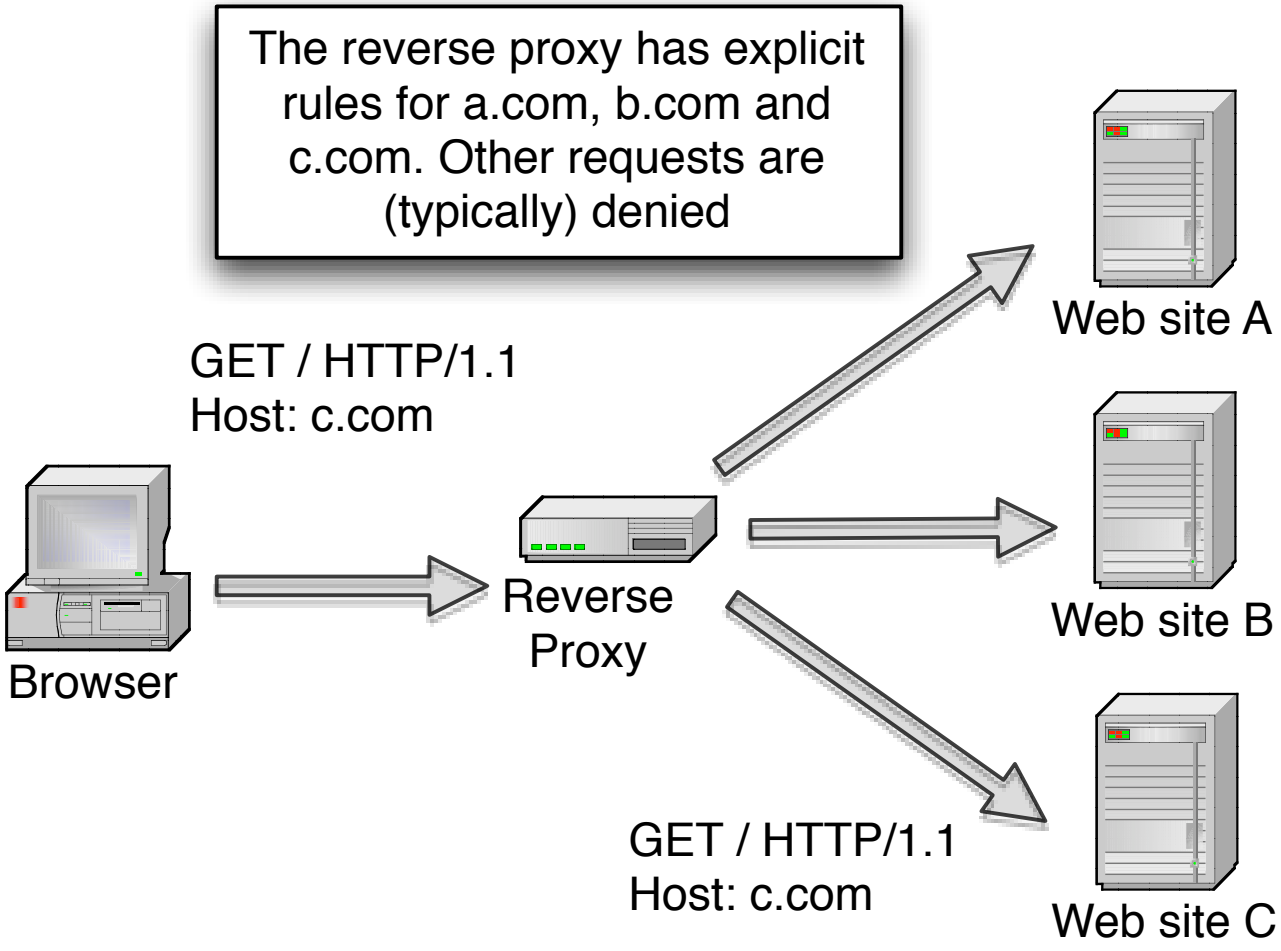
Less useless benchmark ...



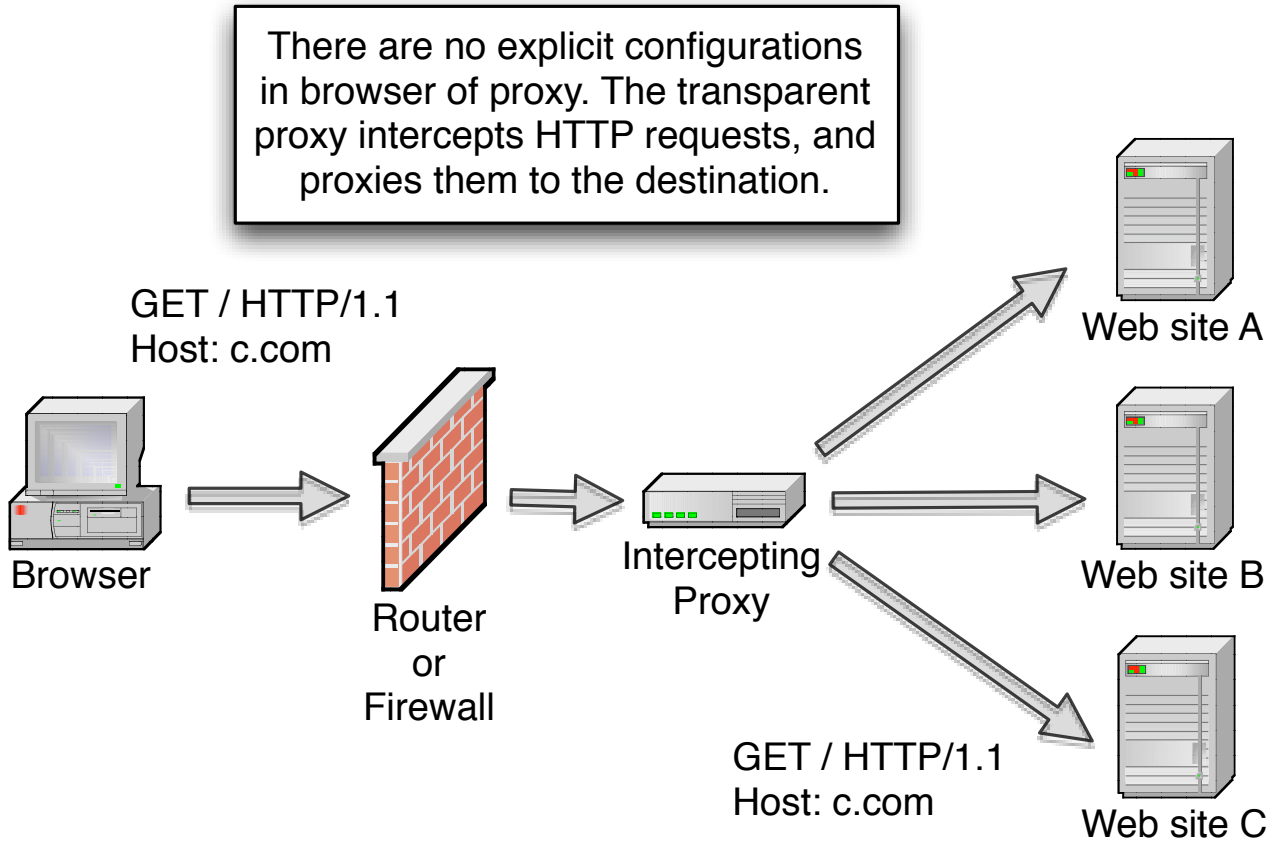
Intermediaries - Forward Proxy



Intermediaries - Reverse Proxy



Intermediaries - Intercepting Proxy



Web Cash?

http://www.flickr.com/photos/amagill/3366720659/

No, Web Cache!

http://www.flickr.com/photos/dglazkov/287092560/

Common enemies of performance

3-Way handshake

Congestion control

DNS lookups

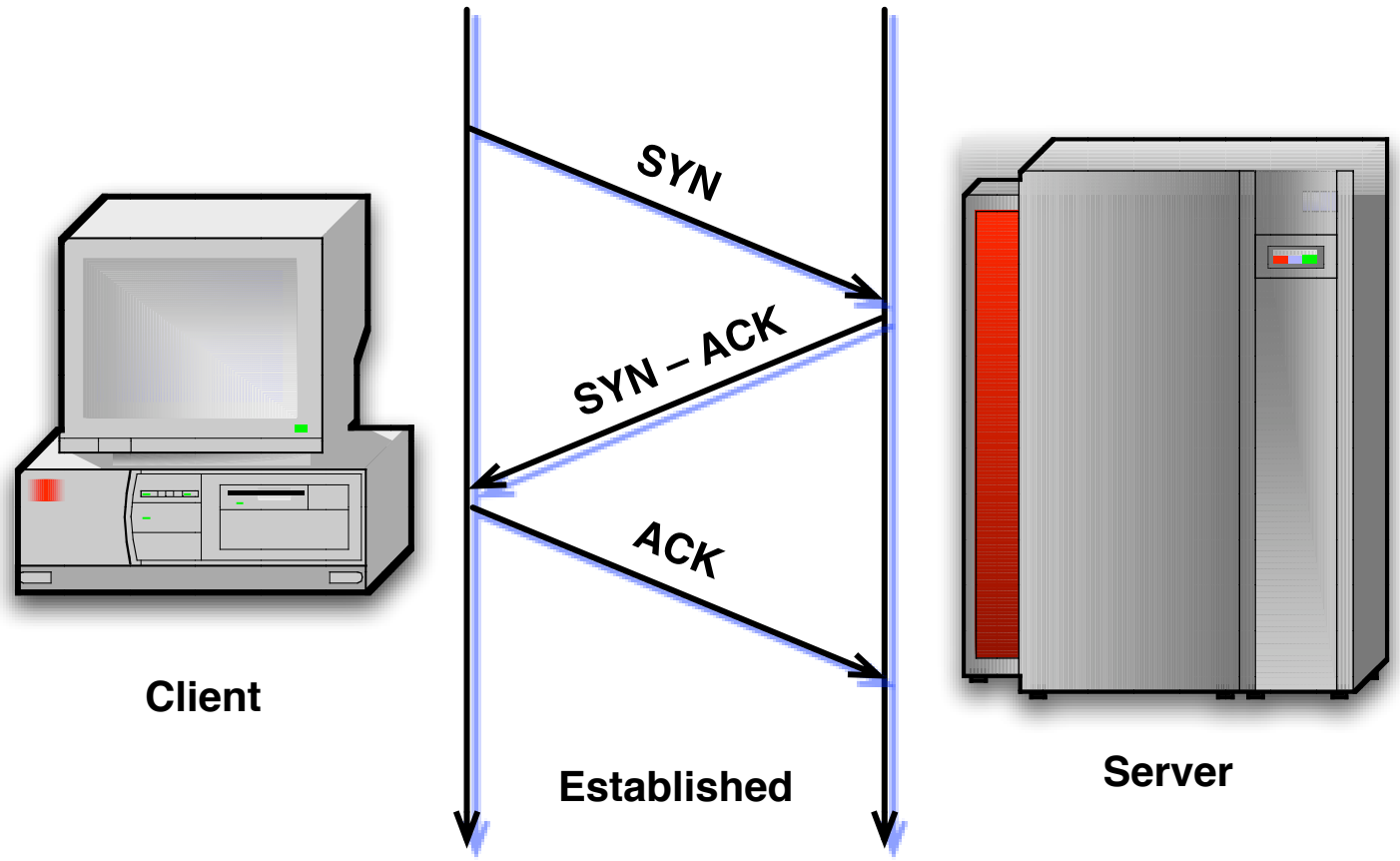
Common enemies of performance

3-Way handshake

Congestion control

DNS lookups

TCP 3-way Handshake



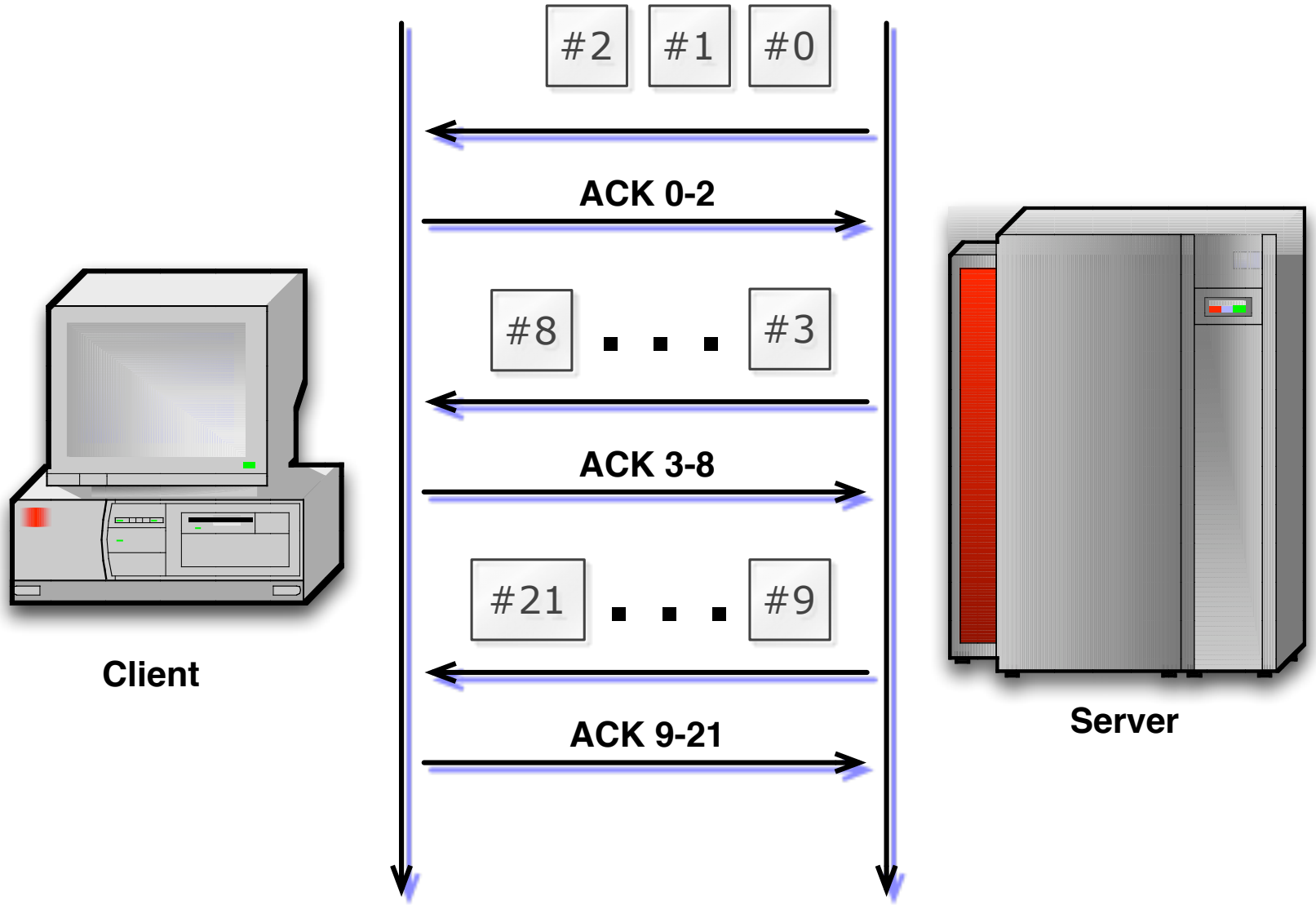
Common enemies of performance

3-Way handshake

Congestion control

DNS lookups

Congestion control



Common enemies of performance

3-Way handshake

Congestion control

DNS lookups

http://news.example.com/

http://finance.example.com/

http://groups.example.com/

http://news.example.com/

http://finance.example.com/

http://groups.example.com/

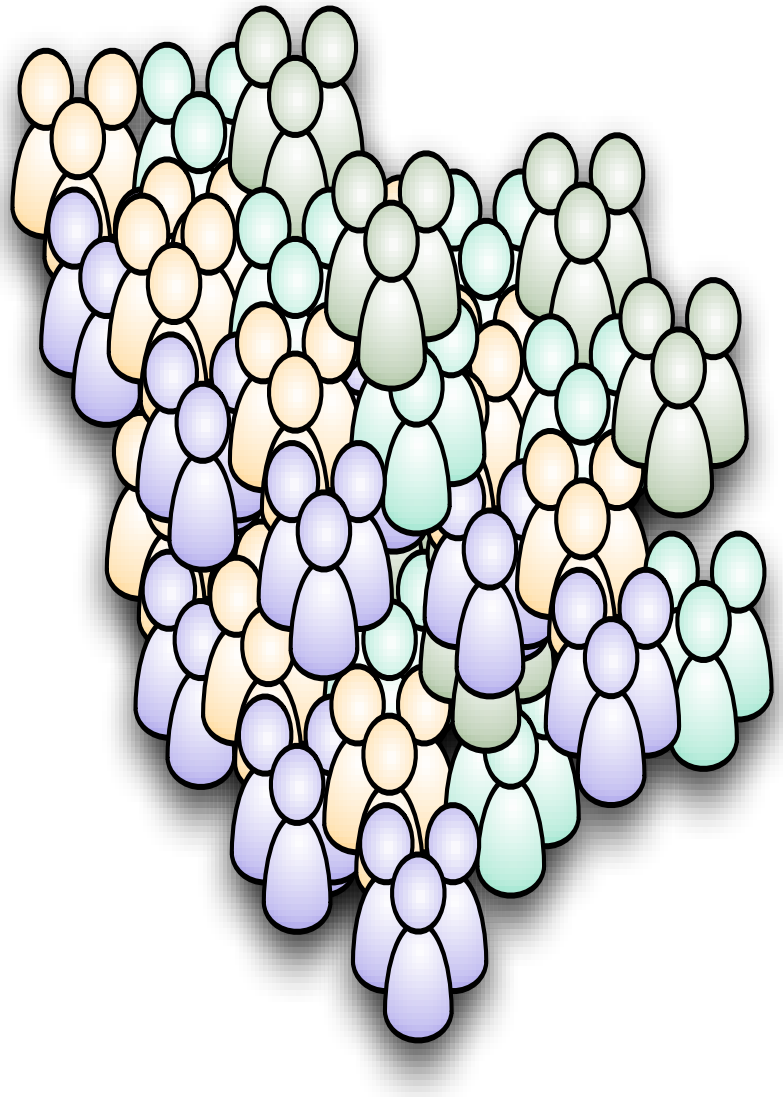
vs

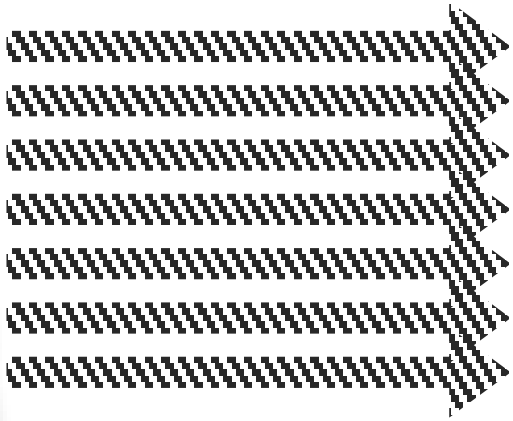
http://www.example.com/news

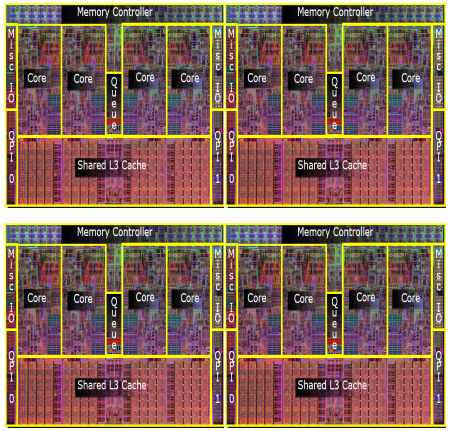
http://www.example.com/finance

http://www.example.com/groups

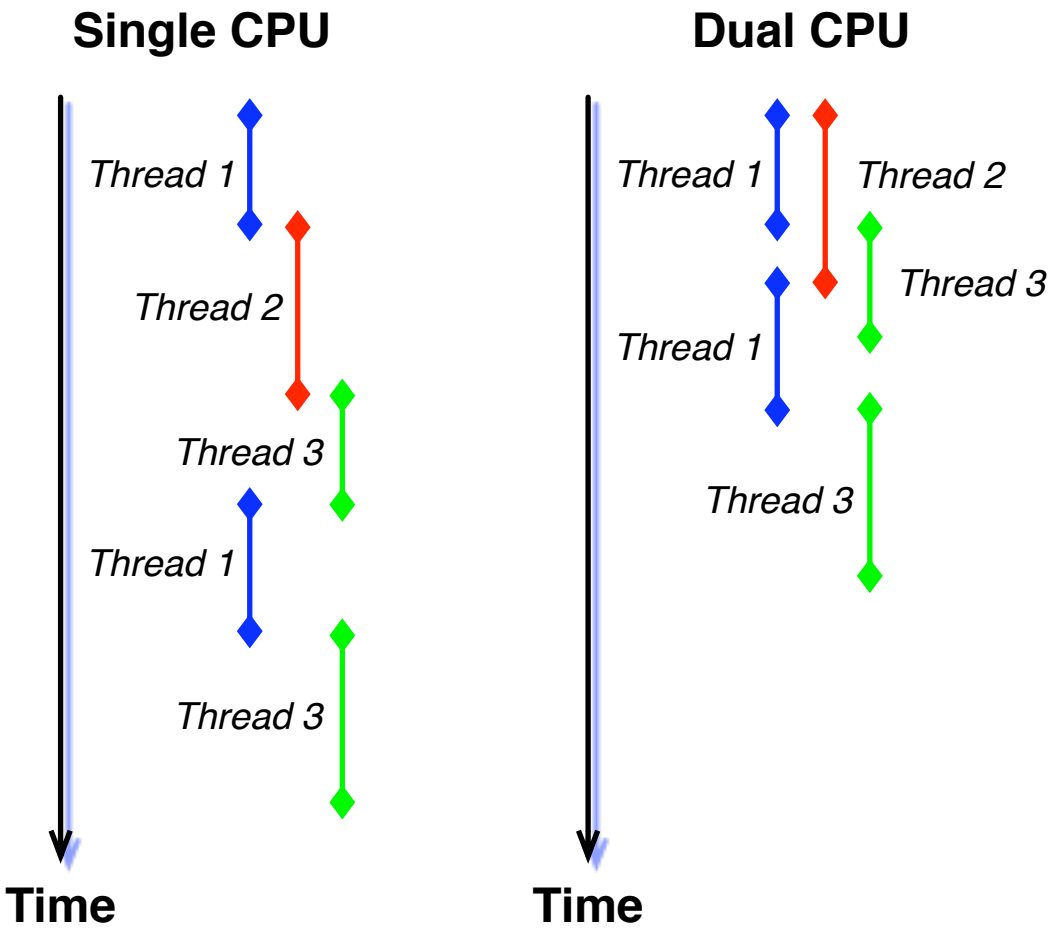
The concurrency problem







Solution 1: Multithreading

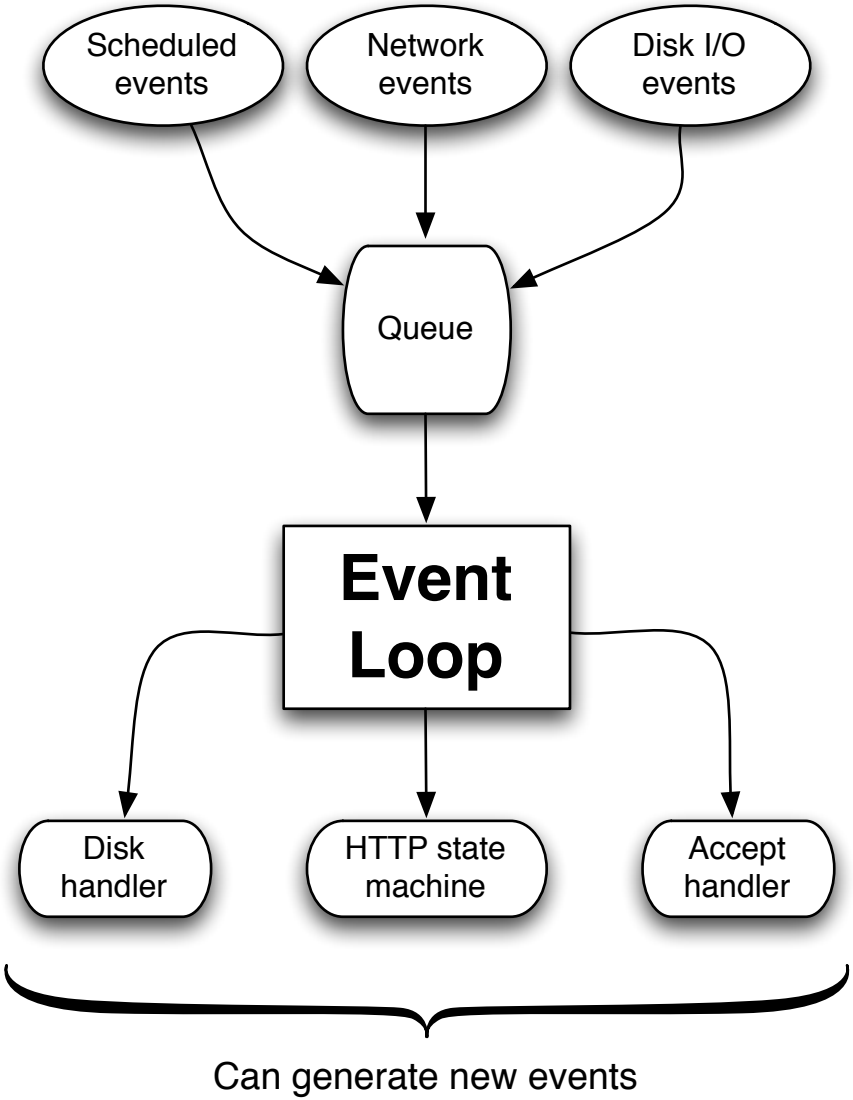


Problems with multi-threading

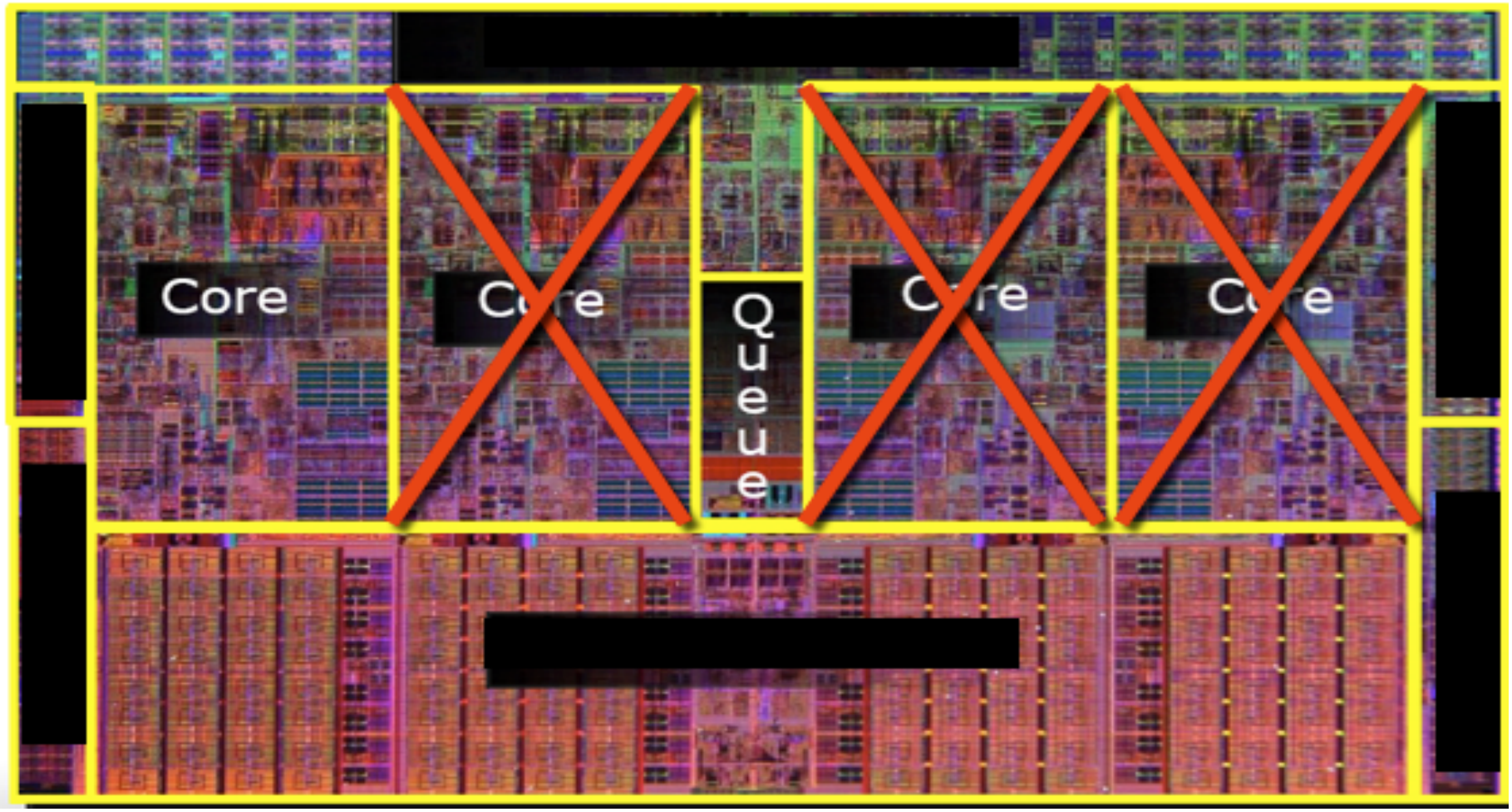
"When two trains approach each other at a crossing, both shall come to a full stop and neither shall start up again until the other has gone."

From Wikipedia, Illogical statute passed by Kansas legislation.

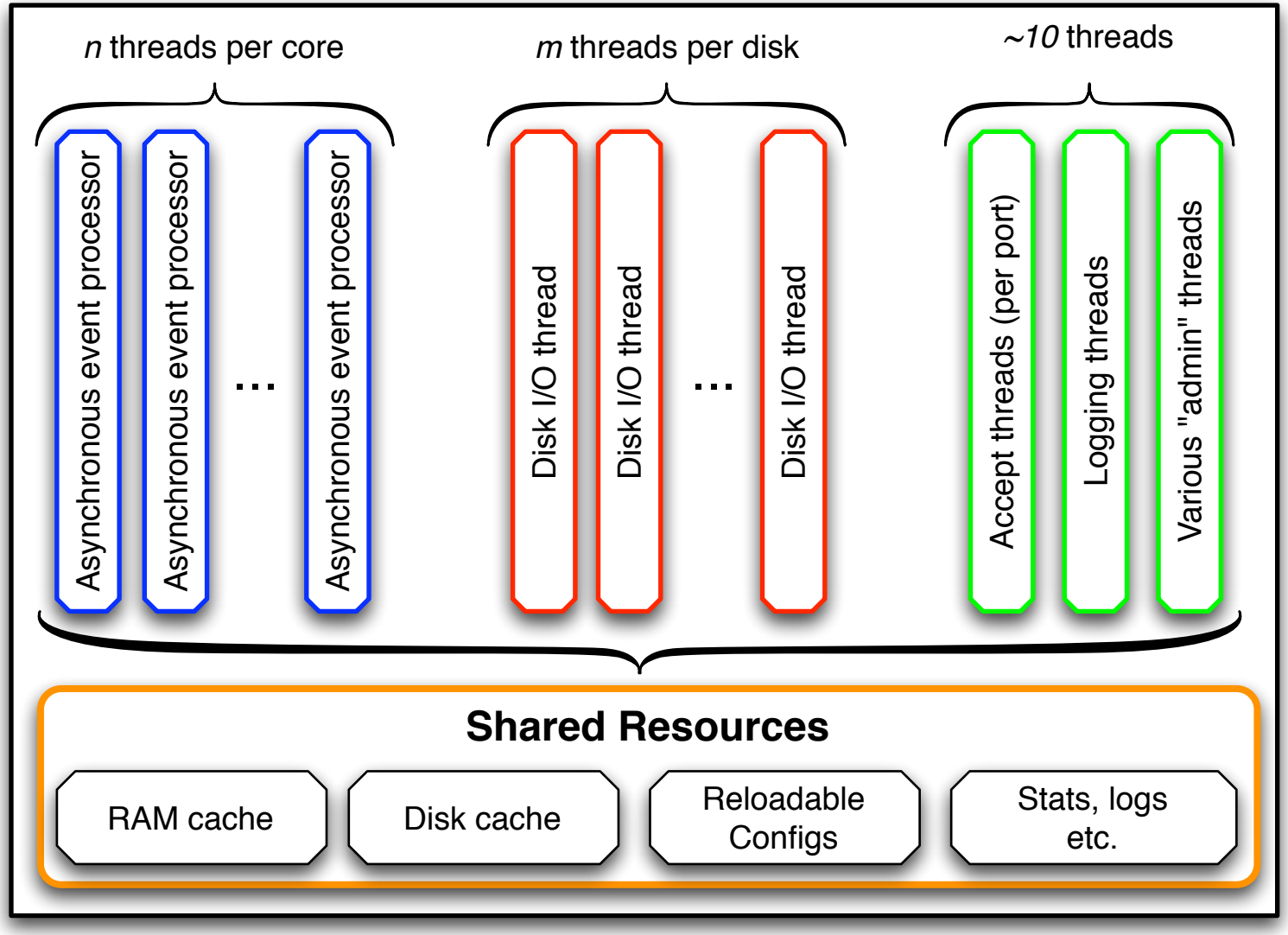
Solution 2: Event Processing



Problems with event processors



Traffic Server threads model



http://www.flickr.com/photos/stuartpilbrow/3345896050/

plugin.config

ip_allow.config

records.config

storage.config

partition.config

logs_xml.config

hosting.config

parent.config

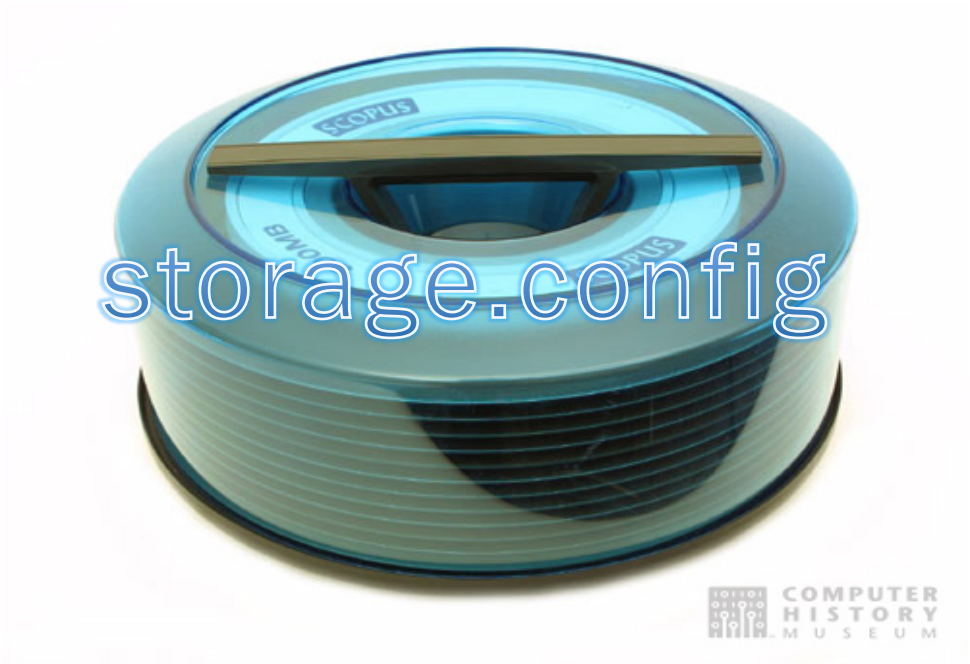
cache.config

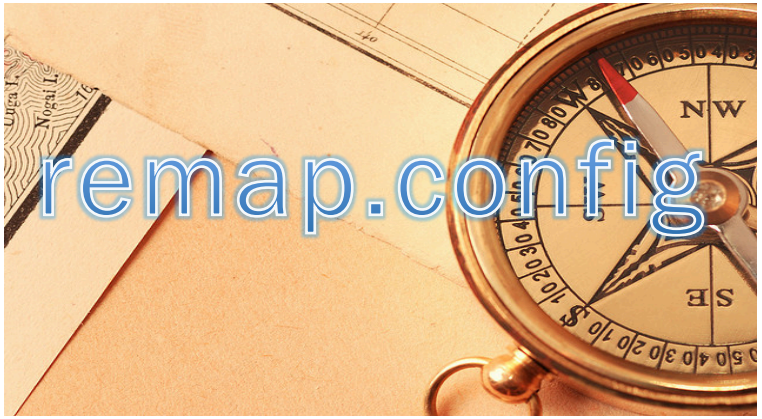
remap.config

update.config

icp.config

records.config


storage.config
COMPUTER HISTORY MUSEUM


remap.config

records.config for reverse proxy

CONFIG proxy.config.http.server_port INT 80

CONFIG proxy.config.cache.ram_cache.size INT 1G

CONFIG proxy.config.cache.ram_cache_cutoff INT 1M

CONFIG proxy.config.reverse_proxy.enabled INT 1

CONFIG proxy.config.url_remap.remap_required INT 1

CONFIG proxy.config.url_remap.pristine_host_hdr INT 0

CONFIG proxy.config.http.negative_caching_enabled INT 1

CONFIG proxy.config.http.negative_caching_lifetime INT 120

CONFIG proxy.config.http.cache.ignore_client_cc_max_age INT 1

CONFIG proxy.config.http.normalize_ae_gzip INT 1

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records.config for forward proxy

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```

remap.config examples

map http://www.example.com/css http://css.example.com

map http://www.example.com http://real.example.com

reverse_map http://real.example.com http://www.example.com

redirect http://example.com http://www.example.com

regex_map http://(.*)\.example.com http://o.example.com/$1

map / http://kitchensink.example.com

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map / http://kitchensink.example.com

Some interesting features

- RAM: Optional compression
  - Various compression levels supported
  - Very fast (virtually no overhead using the faster algo)
- RAM: Several cache eviction algorithms
  - CLFUS algorithm avoids the classic problem on an LRU during “scans”
- Disk: Supports various block sizes (SSD)
- Disk: Can be tuned for various object sizes
- Disk: No file system overhead (RAW disks)

Future directions

- Release early, and often
- Full IPv6 support
- NPN, SNI and other SSL improvements
- Improved memory management, support debug features in e.g. jemalloc and tcmalloc
- Optimizations for SSD (“stacked” caches)
- More focus on plugins, and plugin APIs
  - Hopefully a real load balancer plugin!

Was this a huge waste of time, or?

http://www.flickr.com/photos/simpologist/16734948/

A versatile tool

http://www.flickr.com/photos/airosan/2232394342/

Yes, it's fast, ridiculously fast

A vibrant community!

The Apache Software Foundation

http://www.apache.org/

Artur Bergman tells us if we're not using SSD drives, we're wasting our lives.

Artur Bergman tells us if we're not using SSD drives, we're wasting our lives.

I'd say, if you are not using a caching proxy, you're wasting your SSDs!

Go Daddy®
.COM
Domains, websites &
everything* in between!™

Contact me

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```

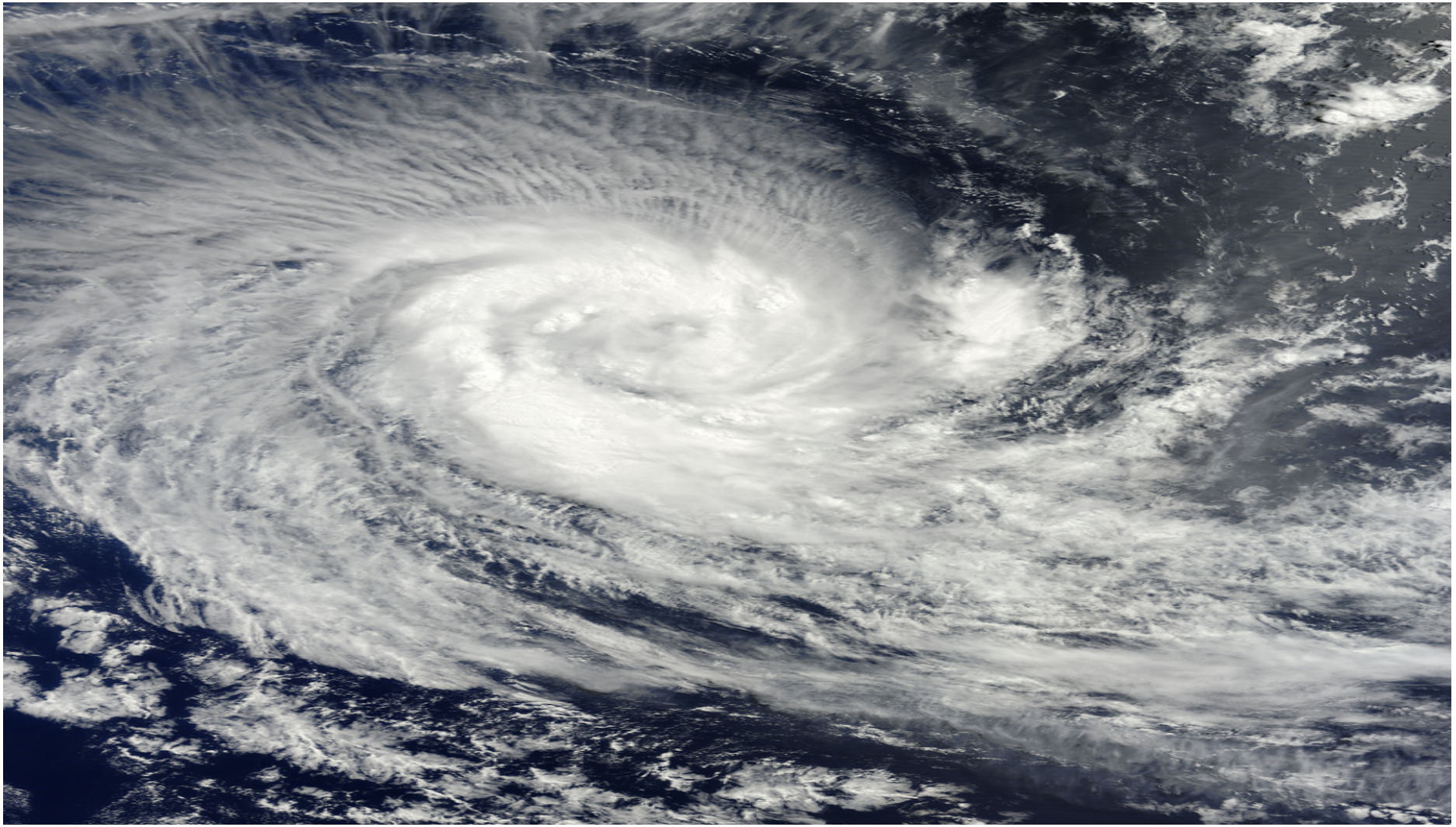
Four Horseman of Bad Performance

- Data copies
- Context Switches
- Memory allocation
- Lock contention

- Avoid these!

http://pl.atyp.us/content/tech/servers.html

Disk cache: “Cyclone”



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