ZIPKIN

A distributed tracing framework

Why Zipkin?
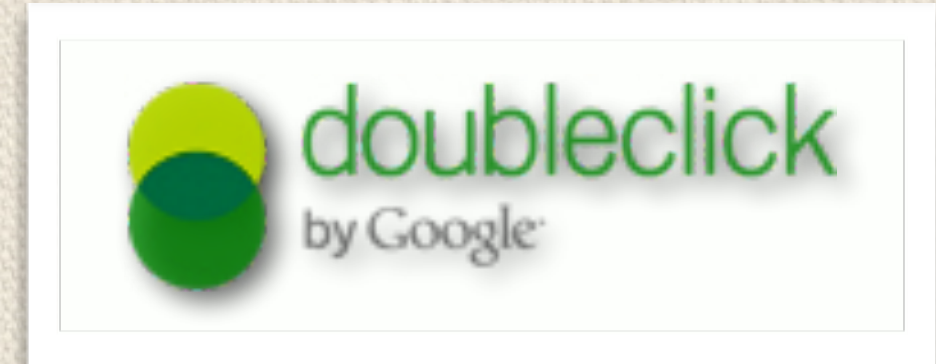
0.5 sec slower

↓

20% traffic drop

1.5 sec faster

↓

CTR up 12%

Front end

Back end

Stories ›

Activity ›

Who to follow ›

Find friends ›

Browse categories ›

Trends · Change

Stories

Americans Are as Likely to Be Killed by Their Own Furniture as by Terrorism

Terrorist attacks killed 17 U.S. civilians last year and 15 the year before.

theatlantic.com/international/...

Tweeted by **Isaac Hepworth**

| | Elements | Resources | Network | Scripts | Timeline | Profiles | Audits | Console | | 🔍 Search Network |

Name Path	Method	Status Text	Type	Initiator	Size Content	Time Latency	Timeline 1.30s	1.94s	2.59s	3.24s	3.89s	4.53s	5.18s
discover /i	GET	200 OK	text/html	Other	0B 204.52KB	967ms 955ms							
t1_core.bundle.css twimg0−a.akamaihd.net/a/134184843	GET	304 Not Modified	text/css	discover:11 Parser	319B 121.84KB	12ms 6ms							
t1_more.bundle.css twimg0−a.akamaihd.net/a/134184843	GET	304 Not Modified	text/css	discover:13 Parser	319B 138.74KB	13ms 6ms							
01457d1a0f0e533062cd0d1033fb4d twimg0−a.akamaihd.net/profile_images	GET	200 OK	image/png	discover:401 Parser	(from cache)	109ms 90ms							
IMG_0026_2_normal.jpg twimg0−a.akamaihd.net/profile_images	GET	200 OK	image/jpeg	discover:404 Parser	(from cache)	109ms 91ms							
4zbhy2jm5xiflnqvy8bw_normal.jpeg twimg0−a.akamaihd.net/profile_images	GET	200 OK	image/jpeg	discover:410 Parser	(from cache)	109ms 91ms							
lisa_avatar_normal twimg0−a.akamaihd.net/profile_images	GET	200 OK	image/jpeg	discover:416 Parser	(from cache)	108ms 92ms							
5853643591_f87872e069_b_normal.j twimg0−a.akamaihd.net/profile_images	GET	200 OK	image/jpeg	discover:419 Parser	(from cache)	109ms 92ms							
prereqs.1a057f2e2c17cf5c21435693	GET	304	applicatio...	discover:176	507B	281ms							

6
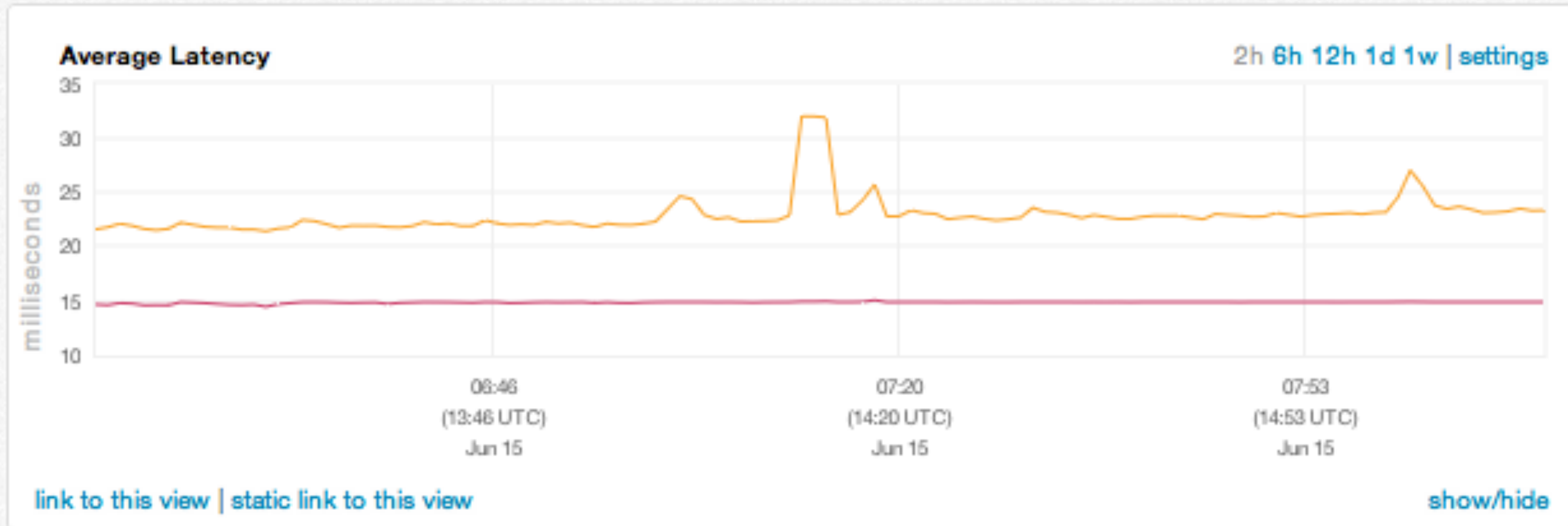
- Collects traces from production requests
- Low overhead
- Minimum of extra work for developers

dapper-2010.pdf

Finagle

"Finagle is an asynchronous network stack for the JVM that you can use to build asynchronous Remote Procedure Call (RPC) clients and servers in Java, Scala, or any JVM-hosted language."
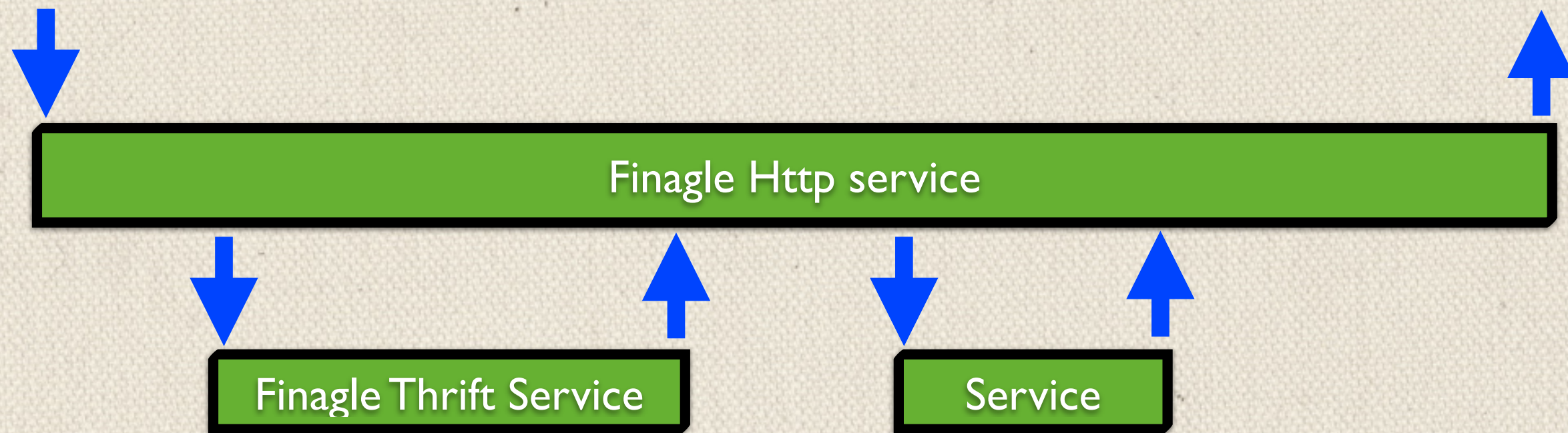
github.com/twitter/finagle

What to capture?

Zipkin terminology

- **Annotation**: string data associated with a particular timestamp, service, and host

Time

time: 2012-01-21 22:37:01
value: "something happened"
server: 135.34.53.2
service: "timelineservice"
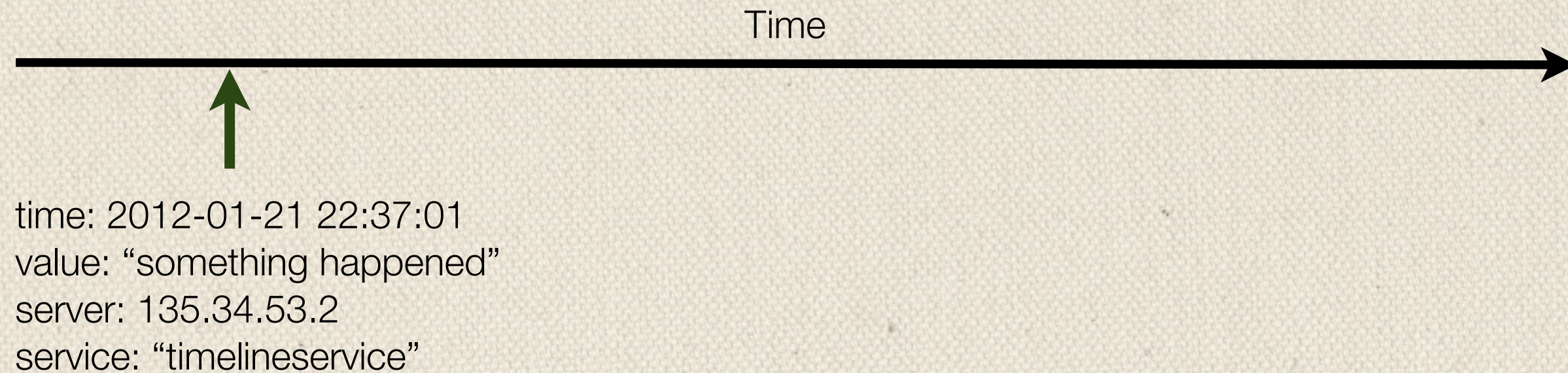
- **Span**: represents one specific method call; made up of a set of annotations. Has a name and an id.

Time

T:0ms Client Send   T:100ms Client Receive

Span

T:20ms Read 30 kbytes from file

T:10ms Server Receive   T:90ms Server Send
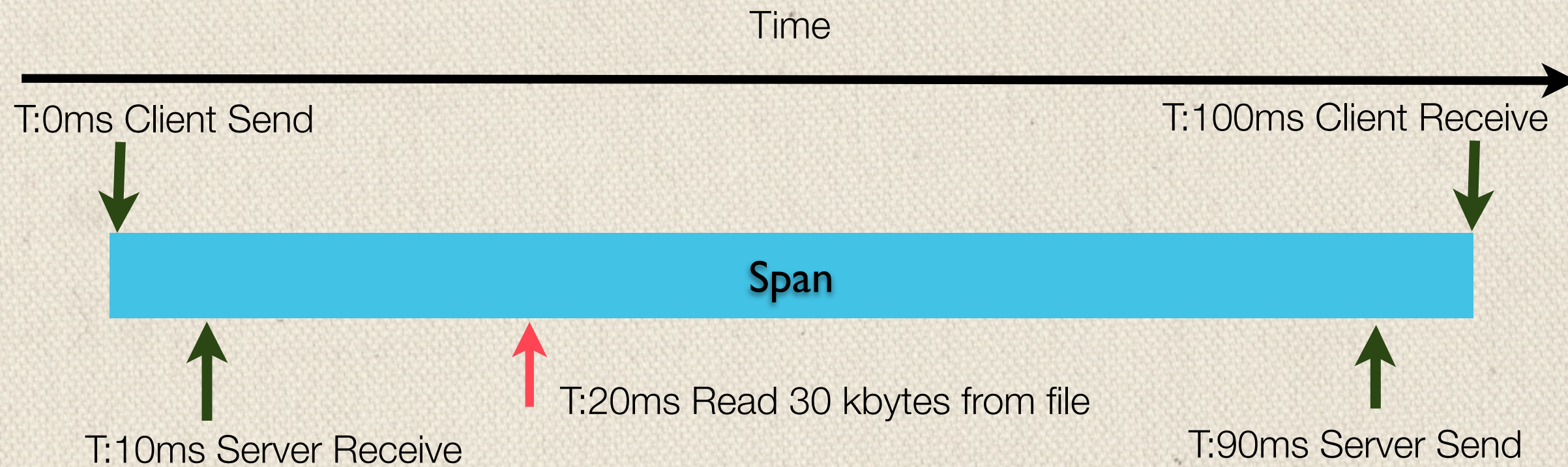
- **Trace**: a set of spans all associated with the same request
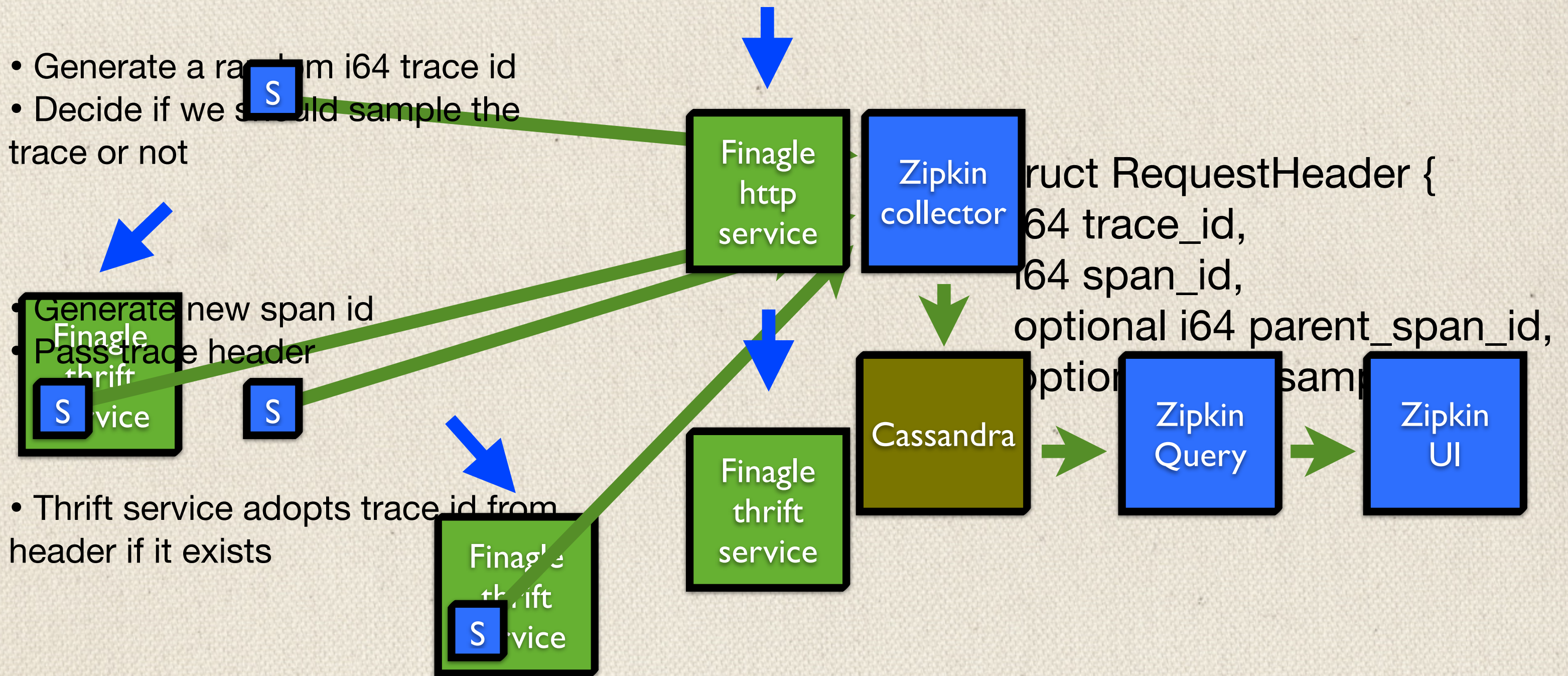
Finagle Thrift server

```
ServerBuilder()
.bindTo(address)
.codec(ThriftServerFramedCodec())
.name("servicename")
.build(someService)
```

```
ServerBuilder()
  .bindTo(address)
  .codec(ThriftServerFramedCodec())
  .name("servicename")
  .tracerFactory(ZipkinTracer())
  .build(someService)
```

```
ClientBuilder()
  .cluster(hosts)
  .codec(ThriftClientFramedCodec())
  .name("clientname")
  .tracerFactory(ZipkinTracer())
  .build(someService)
```
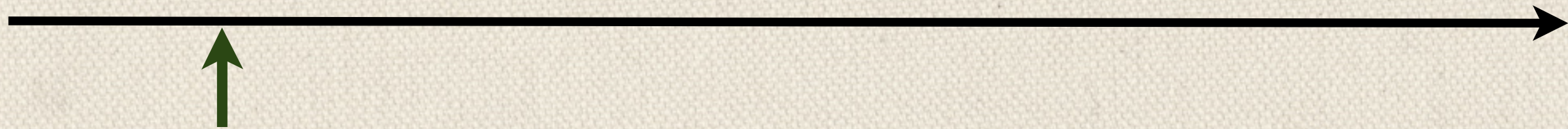
Trace.record("doing stuff")

time: 2020.02.27...
value: "doing stuff"
server: 135.34.53.2
service: "timelineservice"

`Trace.recordBinary("key", data)`

*...

Key	Value
response.status code	500
cache:somekey	Hit
sql.query	select *...

Platform	Protocol	Client	Server
Finagle	Thrift	Yes	Yes
Finagle	HTTP	Yes	Yes
Finagle	Memcache	Yes	No
Finagle	Redis	Yes	No
Cassie	Thrift	Yes	No
Querulous	JDBC	Yes	No
Ruby	Thrift	Yes	Yes

Zipkin UI

Overview $\quad$ Timeline $\quad$ Dependencies

Search term (service)

Expand all

3131.482 ms

about 6 hours ago

	0ms	500ms	1000ms	1500ms	2000ms	2500ms	3000ms

LOAD BALANCER $\quad$ 3131.482 GET

MONORAIL, TWITTER $\quad$ 3130.784 GET

COLLAPSED: 40 spans $\quad$ 47.908

TWEET SERVICE $\quad$ 46.498 get2

COLLAPSED: 14 spans $\quad$ 0.743

DATABASE $\quad$ 10.160 get

COLLAPSED: 153 spans $\quad$ 12.835

COLLAPSED: 45 spans $\quad$ 31.483

TWEET SERVICE $\quad$ 48.356 get2

COLLAPSED: 74 spans $\quad$ 25.933

COLLAPSED: 60 spans $\quad$ 4.410

COLLAPSED: 45 spans $\quad$ 33.663

TWEET SERVICE $\quad$ 86.091 get2

COLLAPSED: 15 spans $\quad$ 0.992

DATABASE $\quad$ 10.533 get

COLLAPSED: 78 spans $\quad$ 11.086

PHOTO SERVICE $\quad$ 52.415 getMediaInfo

COLLAPSED: 33 spans $\quad$ 6.922

COLLAPSED: 45 spans $\quad$ 39.775

TWEET SERVICE $\quad$ 43.903 get2

COLLAPSED: 114 spans $\quad$ 26.517

COLLAPSED: 45 spans $\quad$ 33.129

TWEET SERVICE $\quad$ 19.051 get2

COLLAPSED: 20 spans $\quad$ 15.140

COLLAPSED: 462 spans $\quad$ 457.405

MEMCACHED/MAGIC $\quad$ 395.826 get_multi

COLLAPSED: 074 spans $\quad$ 344.985
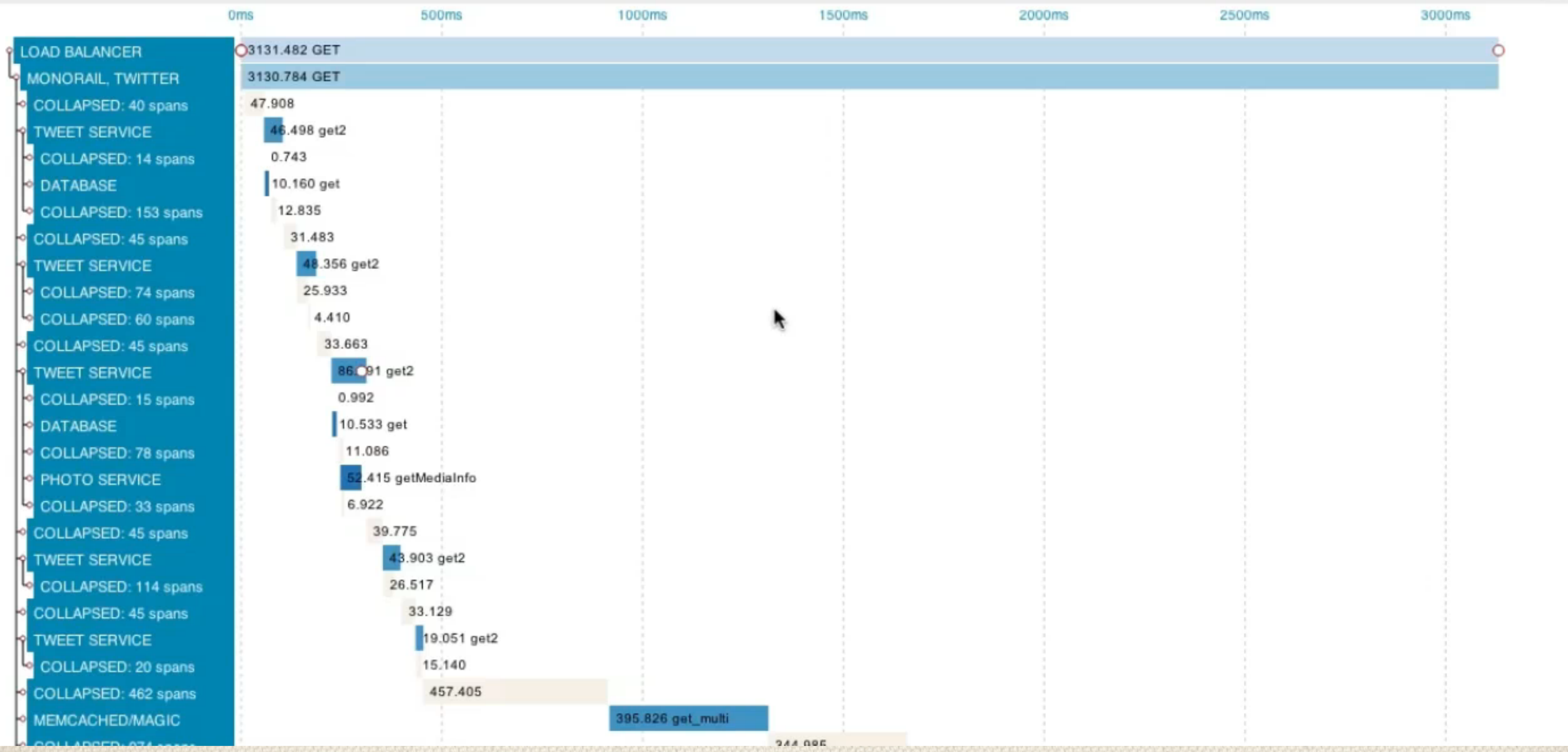
What did we find?

ZIPKIN

github.com/twitter/zipkin
@zipkinproject