

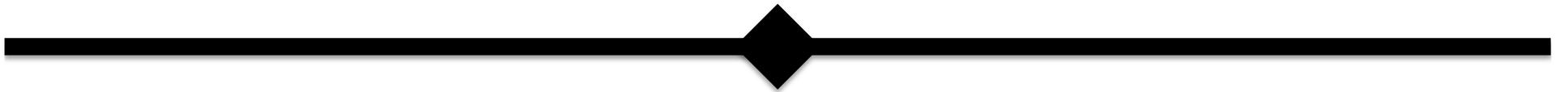
Caching Hypermedia APIs

By Tim Stokes

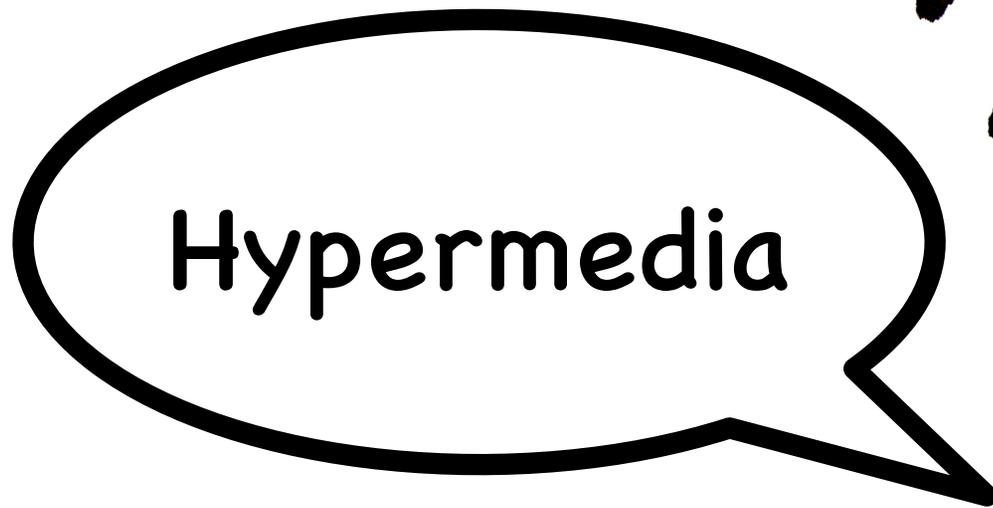
A very brief history of Hypermedia



The Big Bang, 13.75 Billion Years Ago



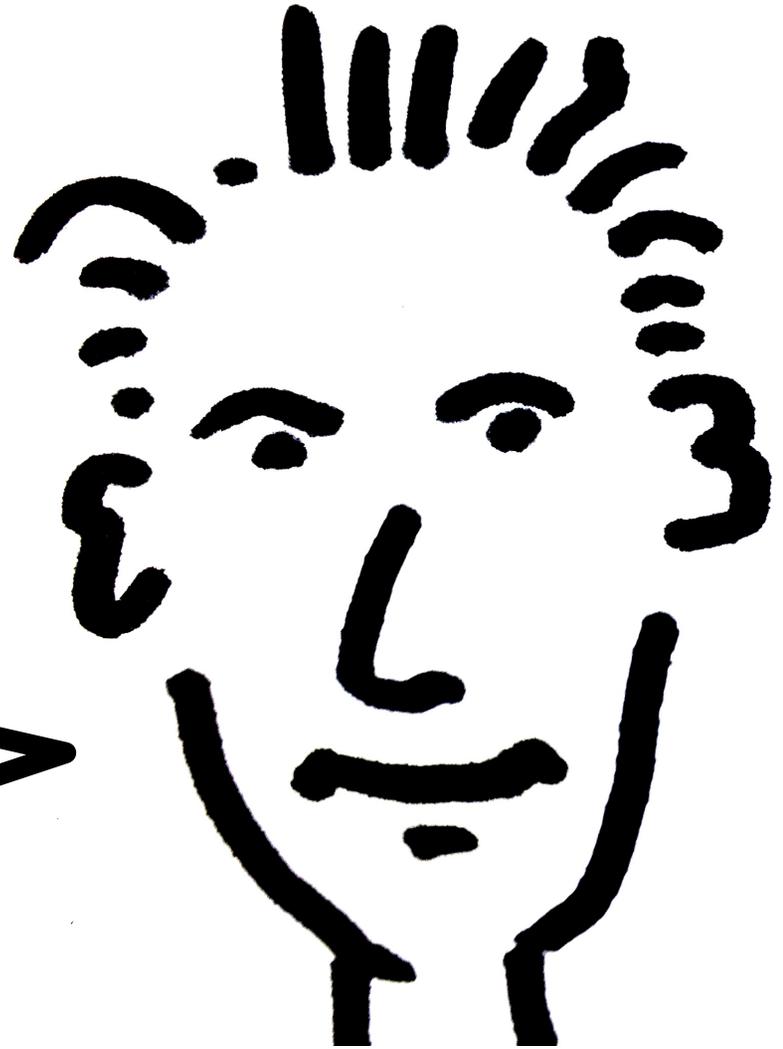
Various Events...



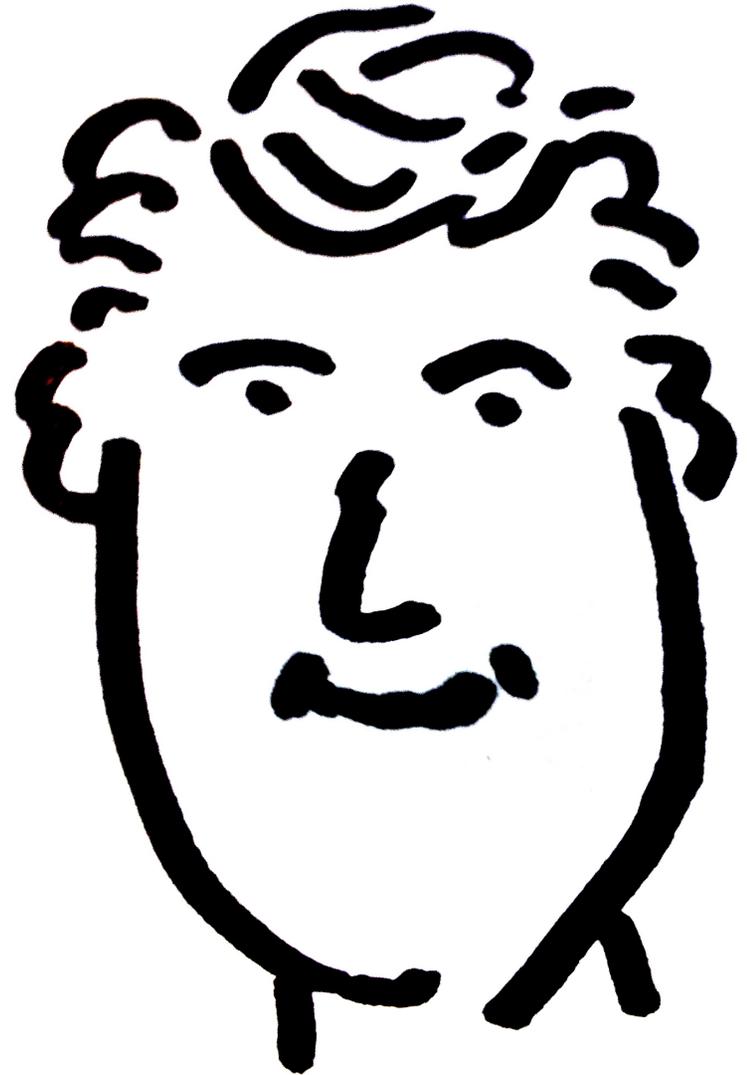
Ted Nelson, 1963

HTML

HTTP



Tim Berners-Lee (and friends), 1991



Roy Fielding (and his posse), 1999

By Paul Downey, <http://www.flickr.com/photos/psd/>

WS -



The Hypermedia Dark Ages, 2000–2005

POST /query HTTP/1.1
table=stick&status=thrown



The RESTful years, 2005-2009



Affordances

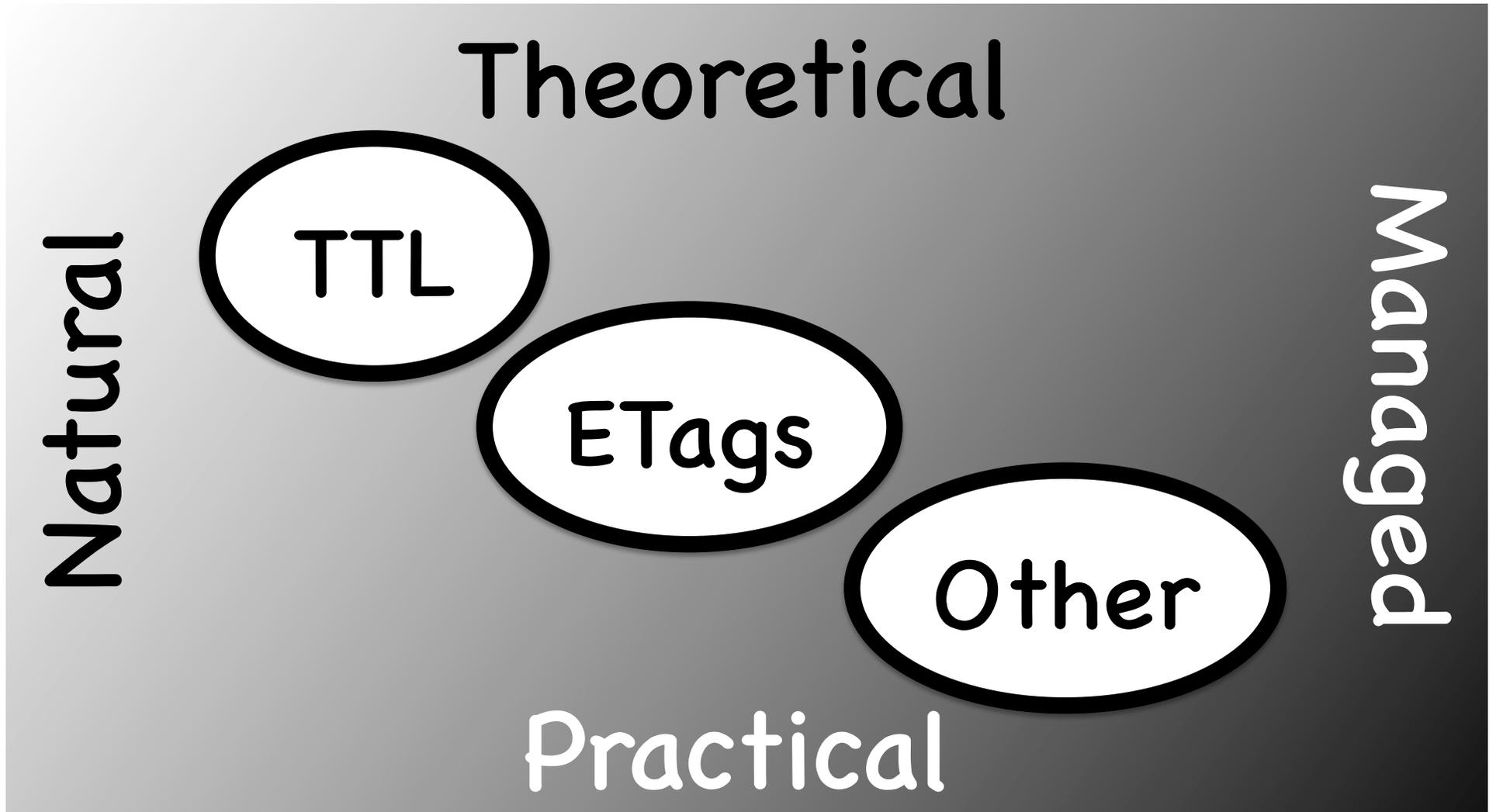


Mike Amundsen, circa 2010...

HTTP with
Hypermedia
+cachability



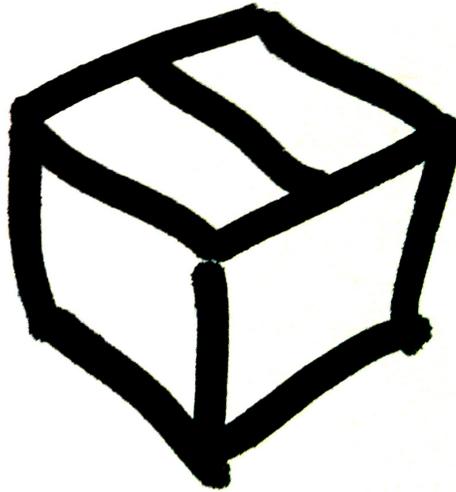
Choosing a Caching Strategy



Natural Caching Behavior 1

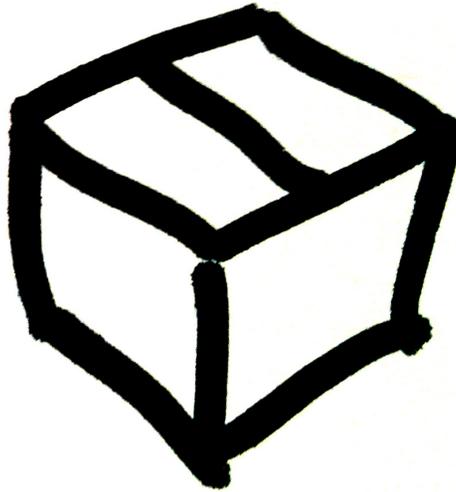
Transfer state in the
body not the URI

POST /box/open



GET /box

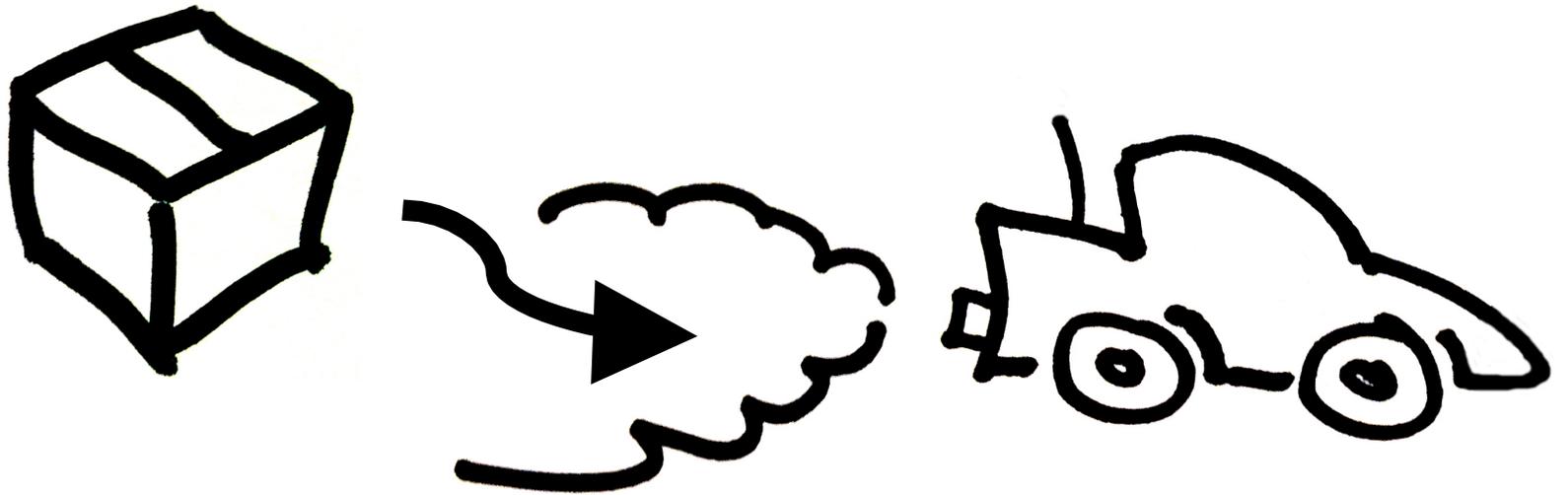
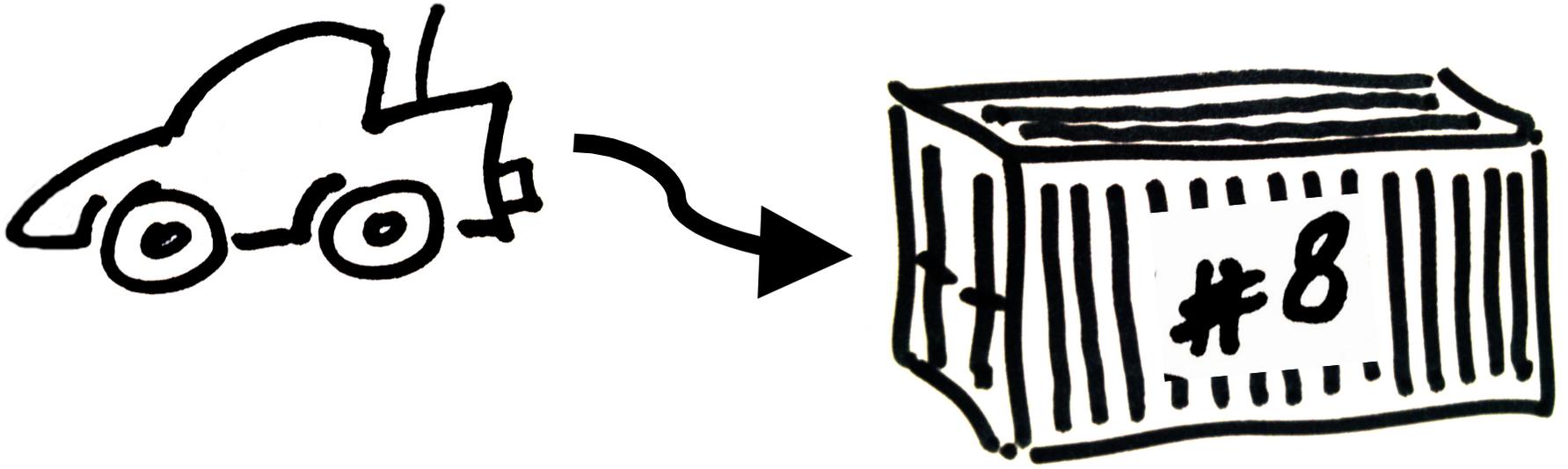
POST /box
state=open

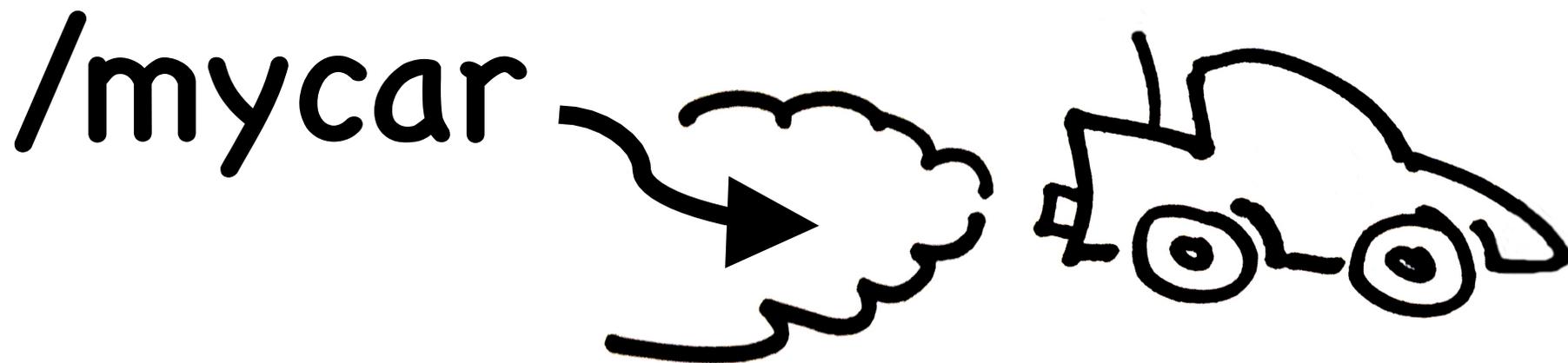
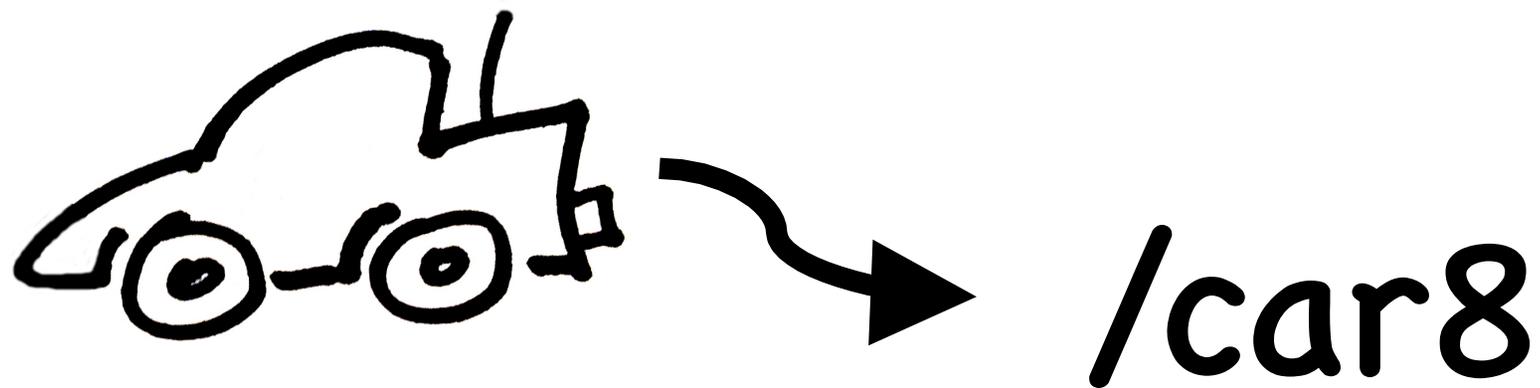


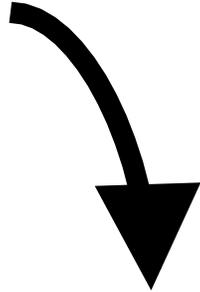
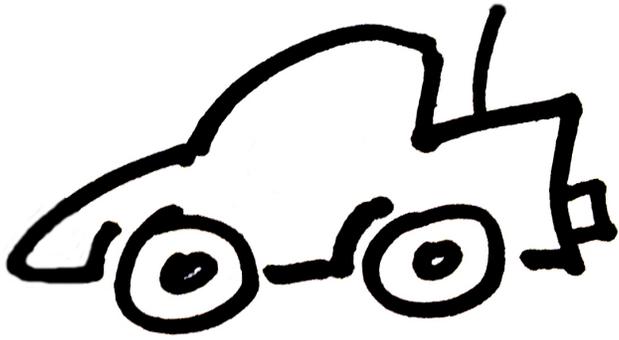
GET /box

Natural Caching Behavior 2

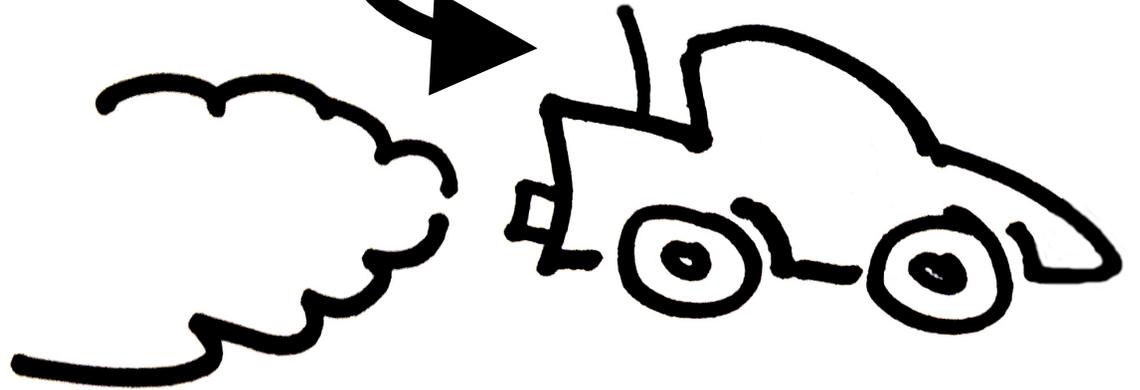
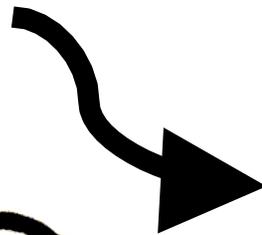
Un-Safe Requests
Invalidate Cache

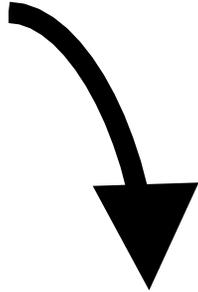
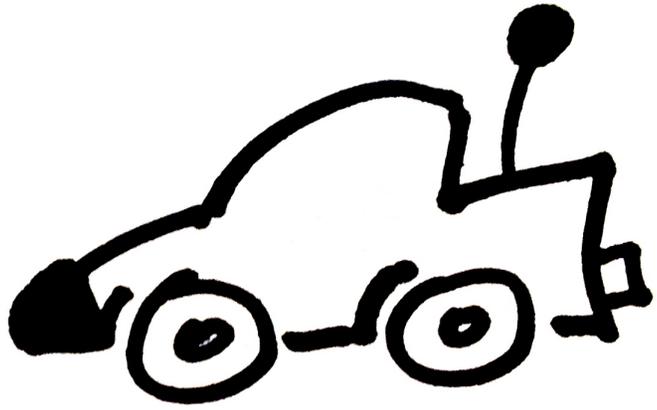




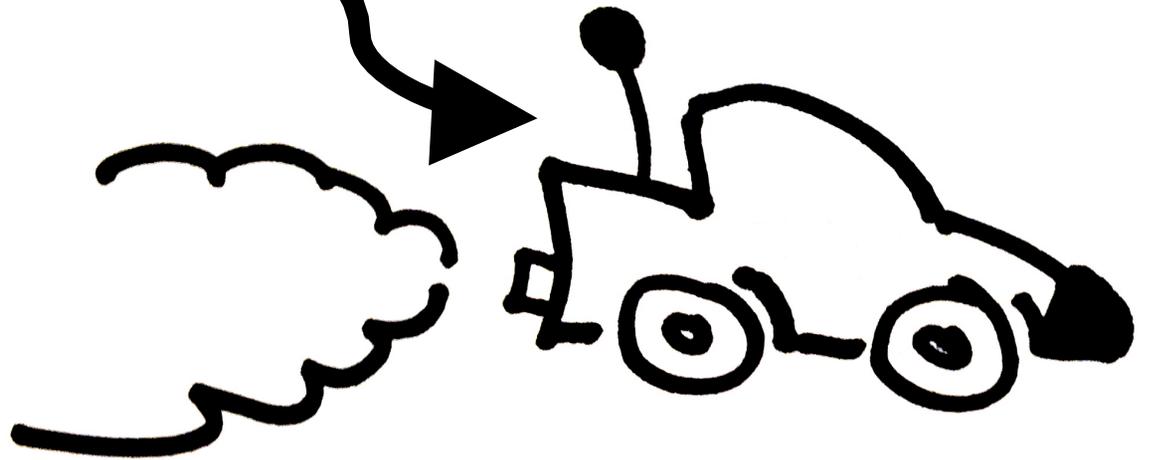
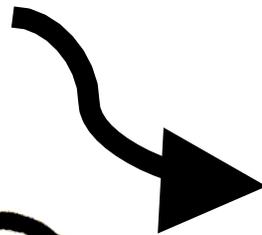


/car8





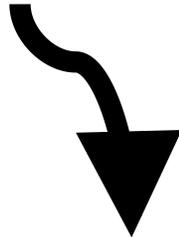
/car8



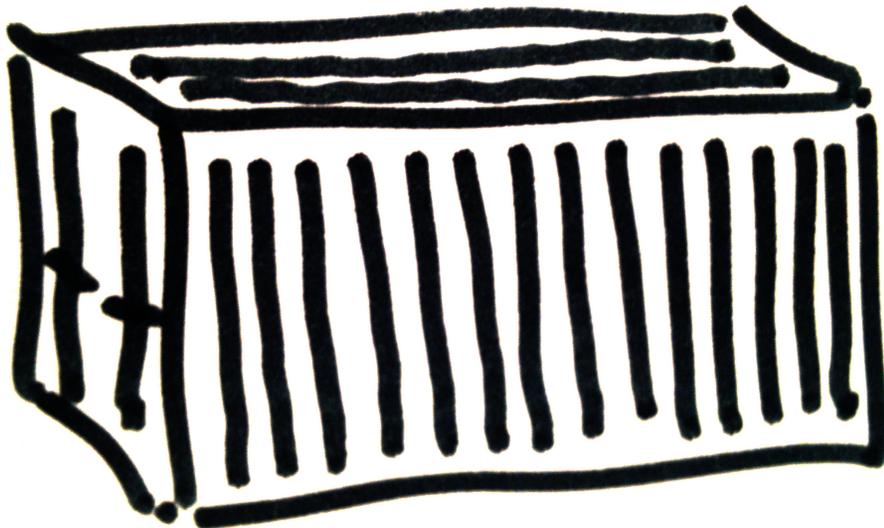
Natural Caching Behavior 3

Related resources can
be Invalidated.

POST



/container

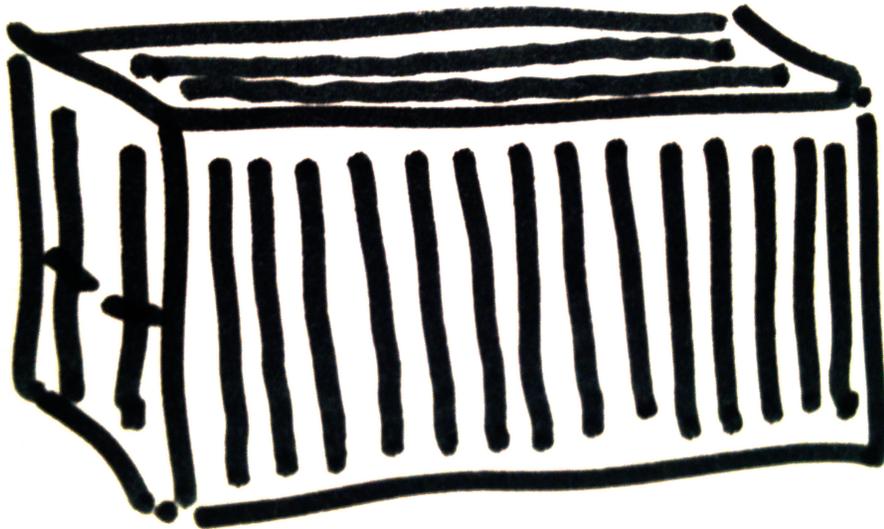
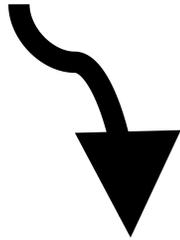


1. /container is invalidated
2. 303 + Location: /container/item8

or

2. Content-Location: /container/item8

DELETE
/container/item8



1. /container/item8
is invalidated



2. 303 + Location:
/container

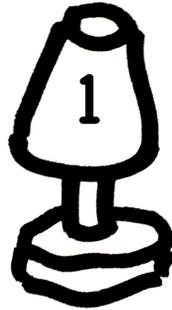
or

2. Content-Location:
/container

Natural Caching Behavior 4

**Beware of Summaries
and Bundles**

GET /lamp/1



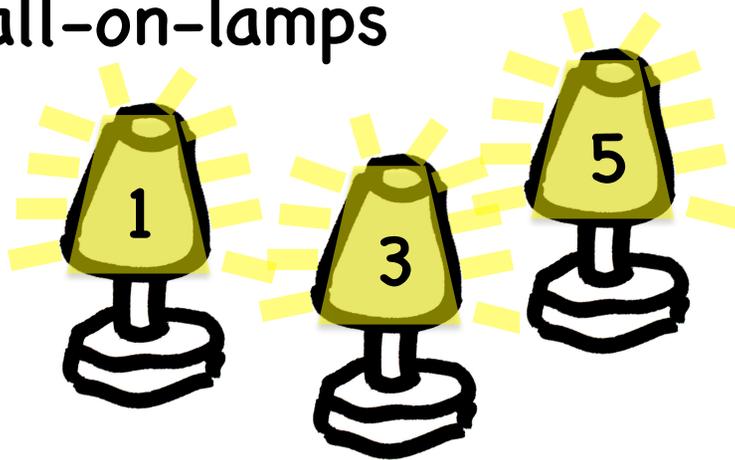
POST /lamp/1
power=on



GET /lamps

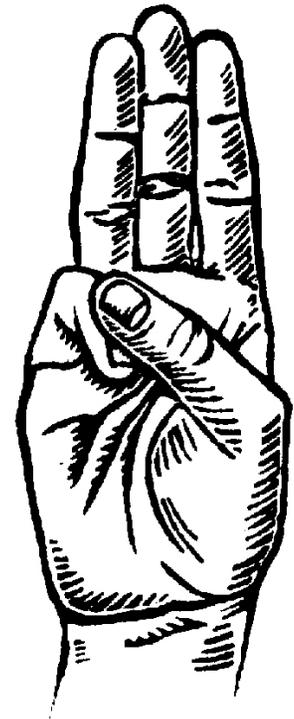
links... /lamp/1, /lamp/2, /lamp/3, /lamp/4,
/lamp/5, /lamp/6, etc...

GET /all-on-lamps



RESOURCE DESIGN NOTES:

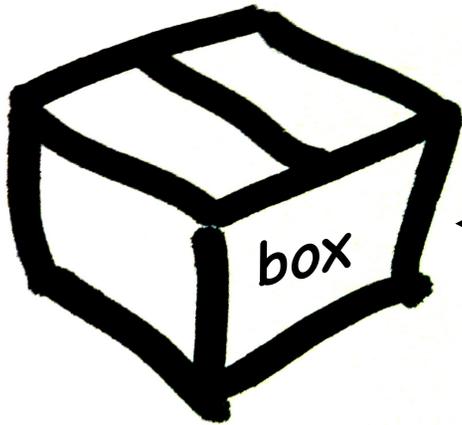
- The URI should not carry state
- Symmetry between state in and out
- One way to get each piece of state
- Beware of Summaries and Bundles



Natural Caching Behavior 5

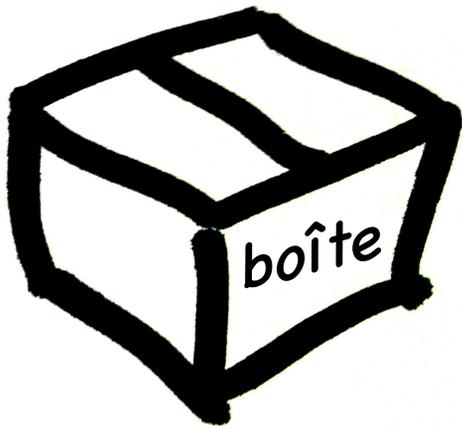
Cached responses can
be bound to specific
contexts beyond the
URI.

GET /box
Accept-Language: EN



Cache-Control: max-age=3600
Vary: Accept-Language

GET /box
Accept-Language: FR



Cache-Control: max-age=3600
Vary: Accept-Language

SYSTEM

Natural Caching Behavior 6

There is no guarantee
you will see the latest
representation

Relativity

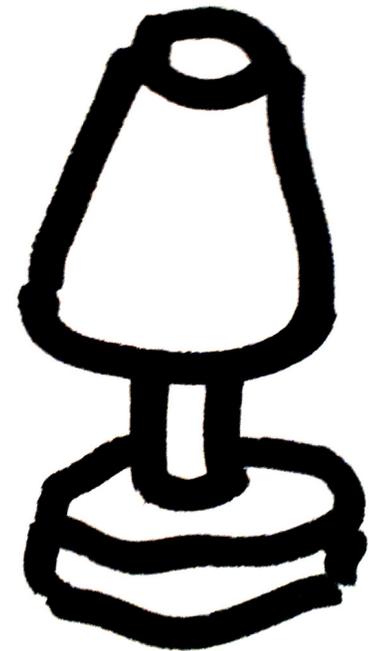


PUT /lamp

ON



OR



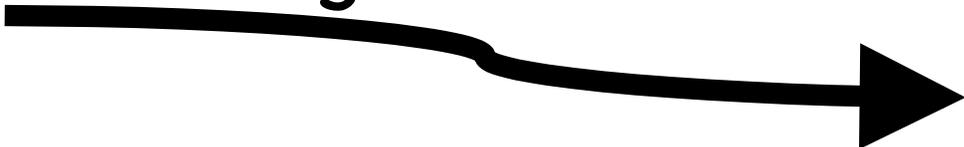
GET /lamp

Managed Caching Behavior 1

Use Etags with
conditional GETs



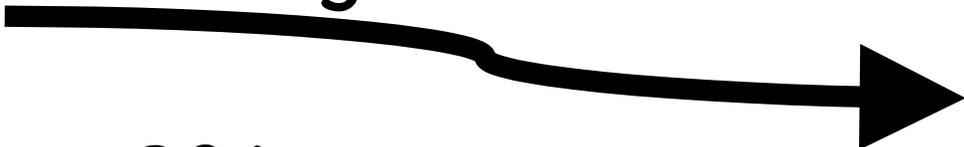
GET /dog



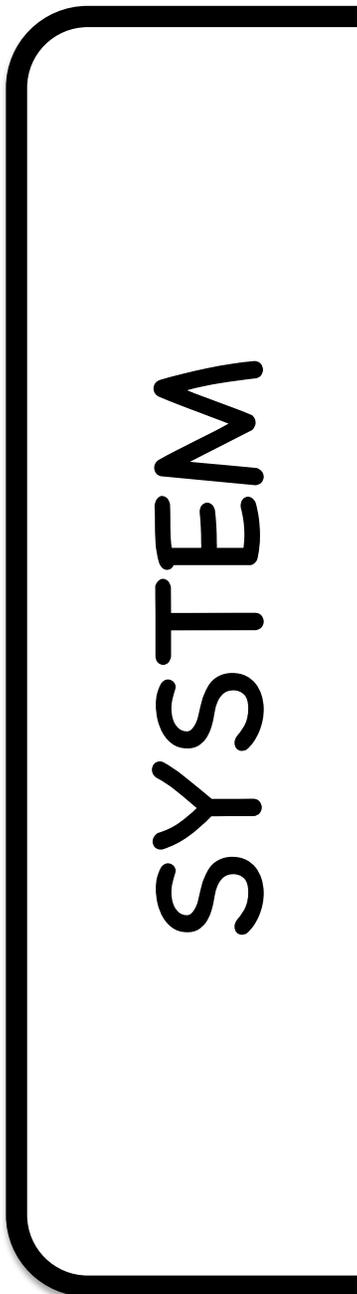
ETag: 6

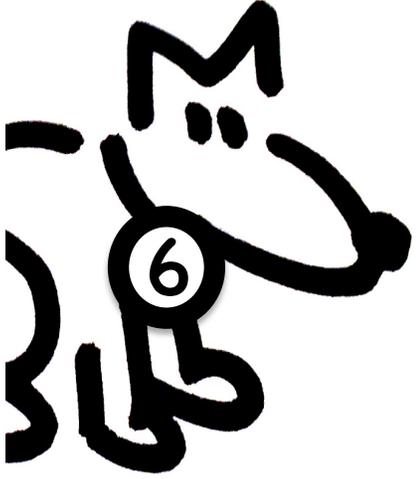


GET /dog If-None-Match: 6



304

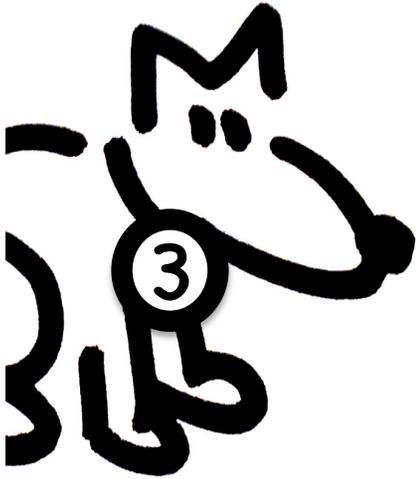




GET /dog



Etag: 6



GET /dog If-None-Match: 6



200 Etag: 3



Managed Caching Behavior 2
Let Caches know
about all resources
that are invalid in the
response to a state
change.

Mark Nottingham's Linked Cache Invalidation Draft

<http://tools.ietf.org/html/draft-nottingham-linked-cache-inv-03>

Relying on these Caching Behaviors in Practice

- Compliance to HTTP 1.1
- Interpretation of HTTP 1.1
- Implementation variance
- Intermediaries

Approach

- Design the shape and granularity of your resources carefully.
- Target TTL in the Agent first for best natural caching invalidation.
- Use, per request, Agent other request header to trigger caching strategies.
- ETags as second level after TTL.

What's Next?

HTTP 2.0

<http://tools.ietf.org/wg/httpbis/charters>



The
End