

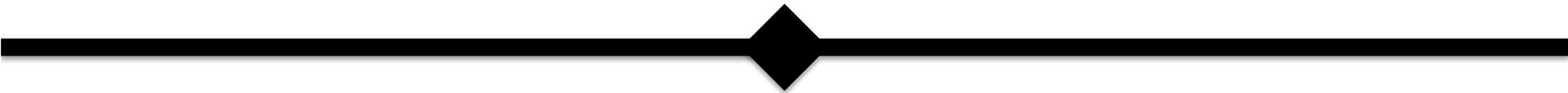
Caching Hypermedia APIs

By Tim Stokes

A very brief history of Hypermedia



The Big Bang, 13.75 Billion Years Ago

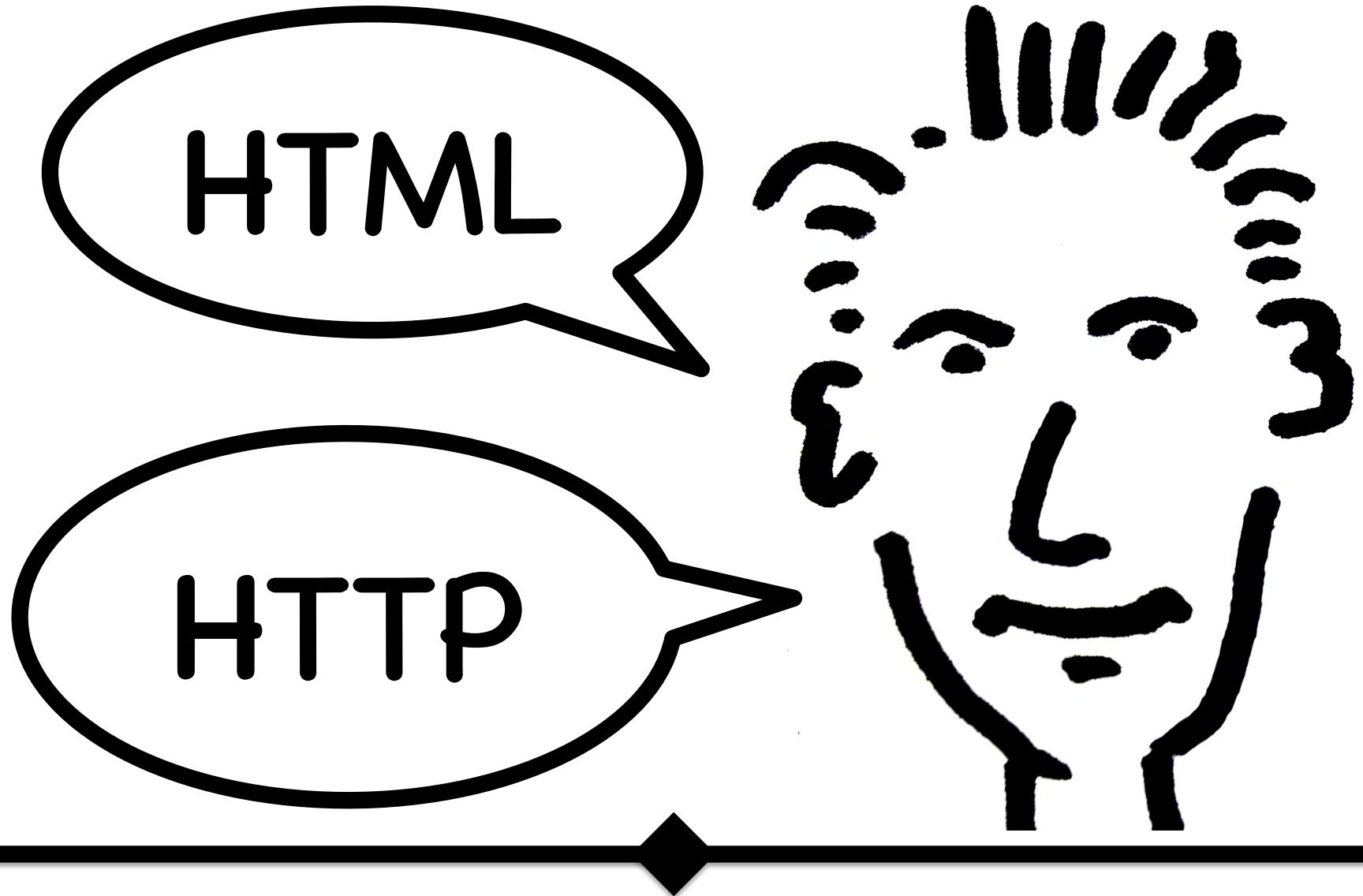


Various Events...

Hypermedia

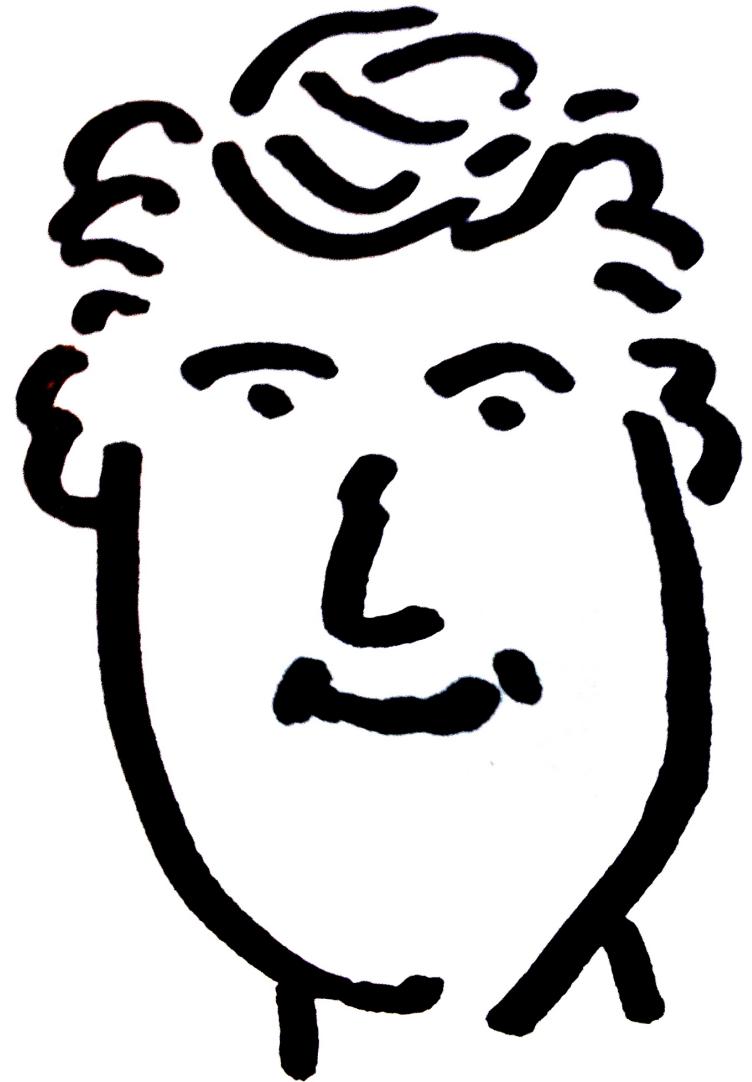


Ted Nelson, 1963



Tim Berners-Lee (and friends), 1991

REST
(HTTP 1.1)



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



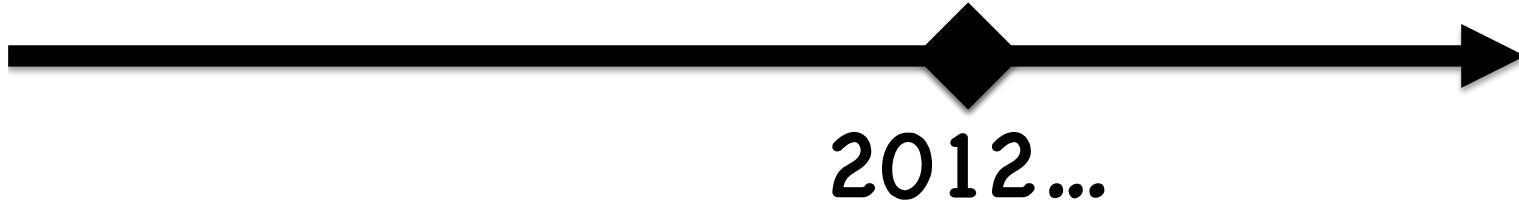
The RESTful years, 2005-2009



Affordances

Mike Amundsen, circa 2010...

HTTP with
Hypermedia
+cachability



Choosing a Caching Strategy

Natural

Theoretical



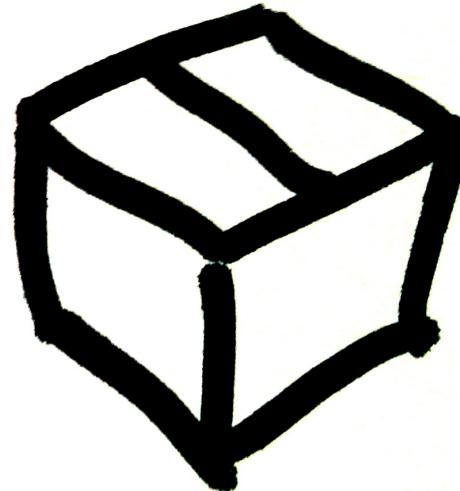
Practical

Managed

Natural Caching Behavior 1

Transfer state in the
body not the URI

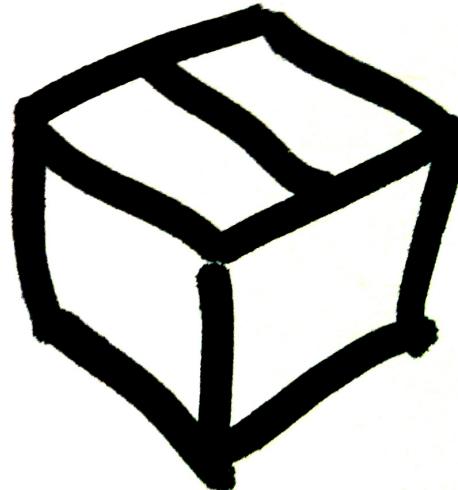
POST /box/open



GET /box

POST /box

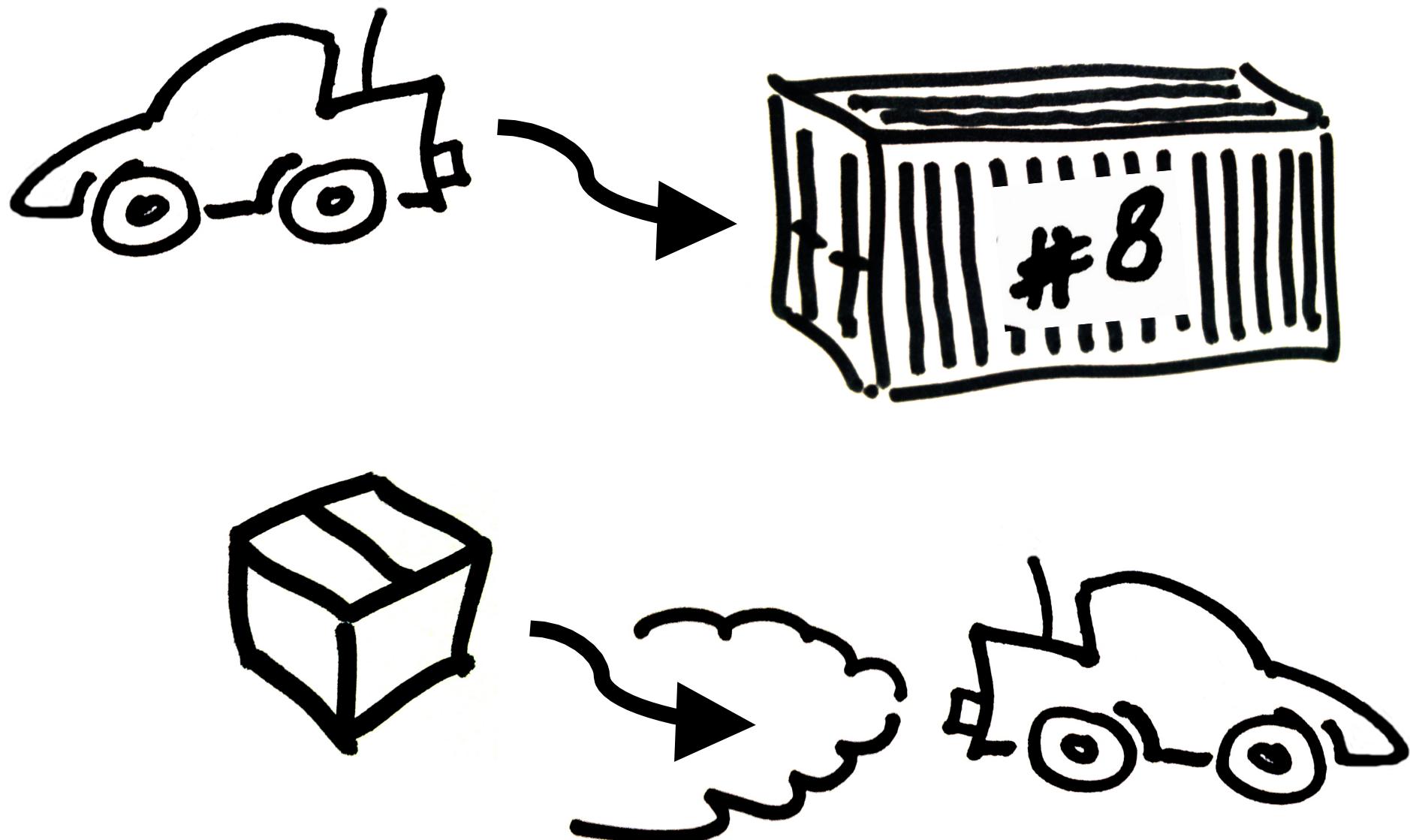
state=open

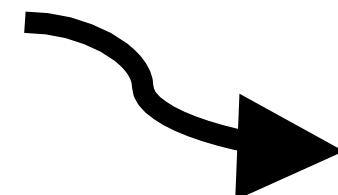
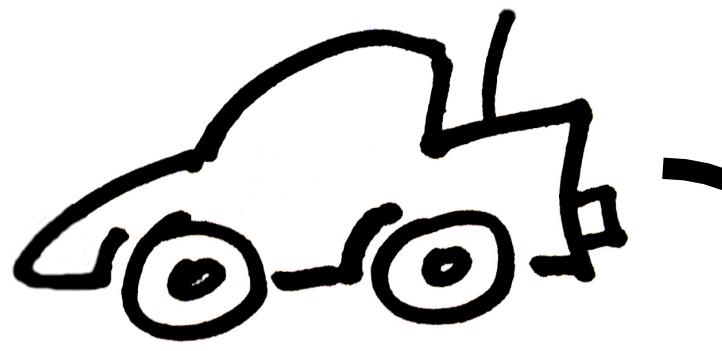


GET /box

Natural Caching Behavior 2

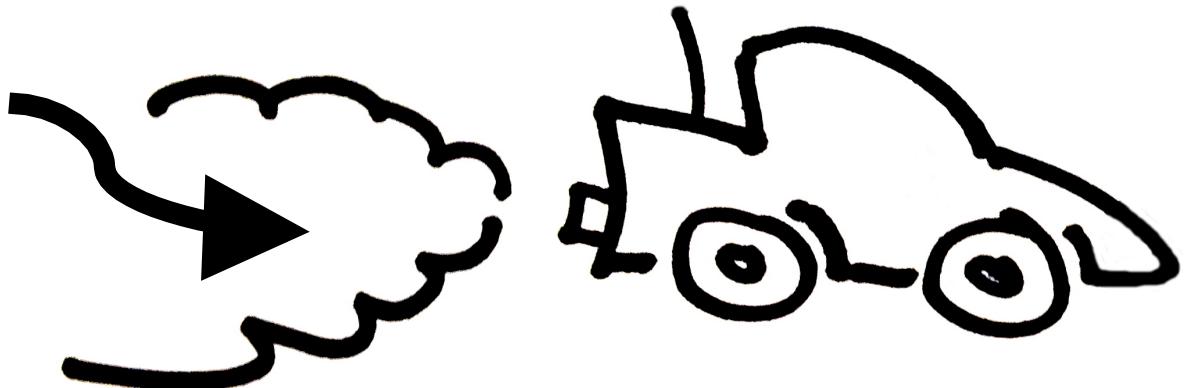
Un-Safe Requests
Invalidate Cache

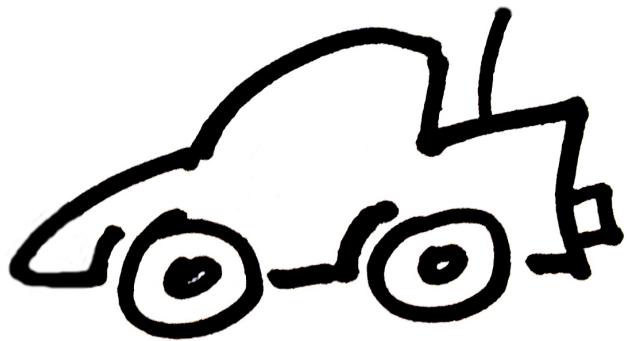




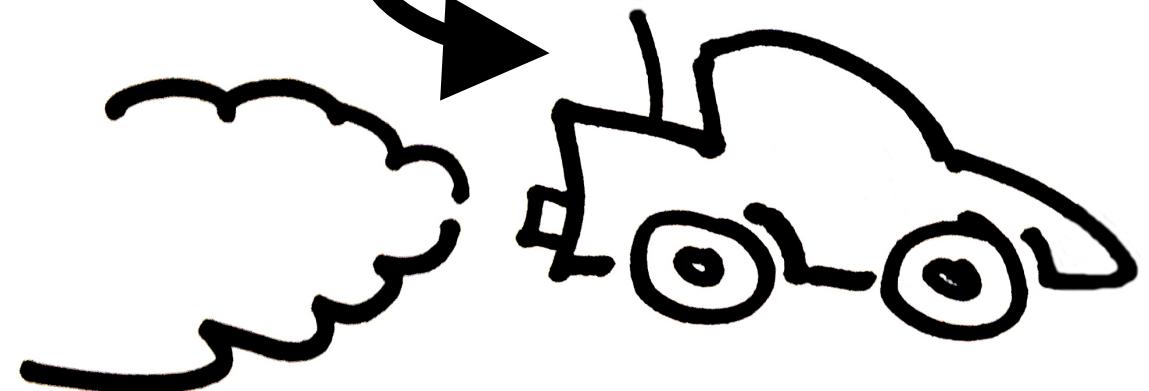
/car8

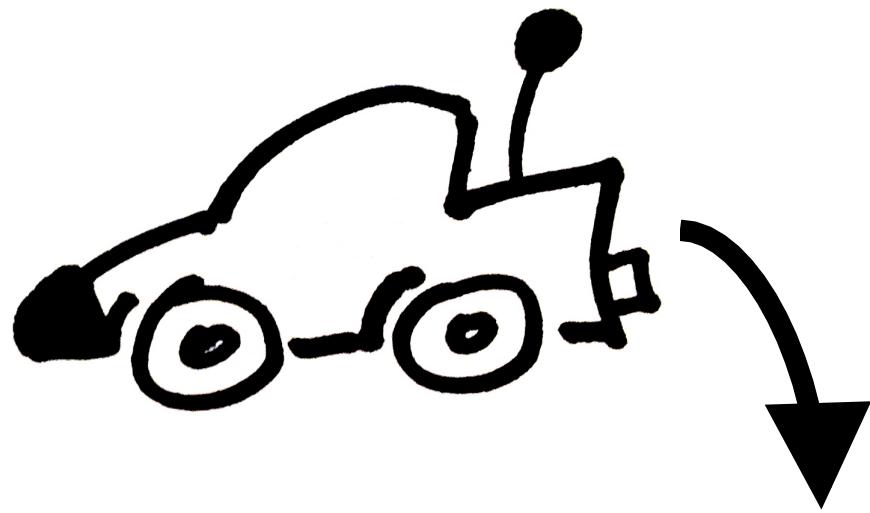
/mycar



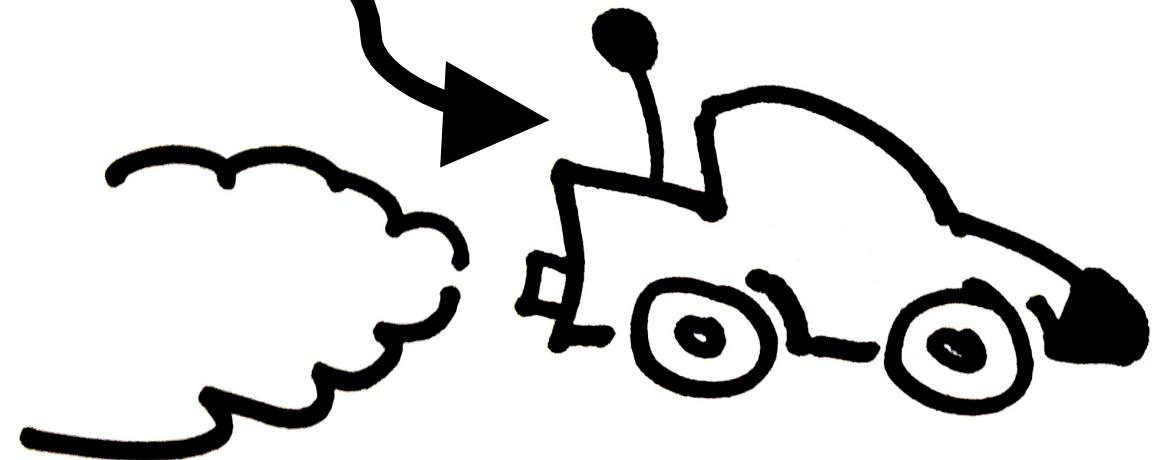


/car8





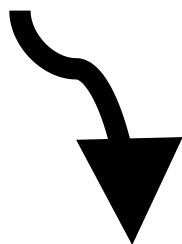
/car8



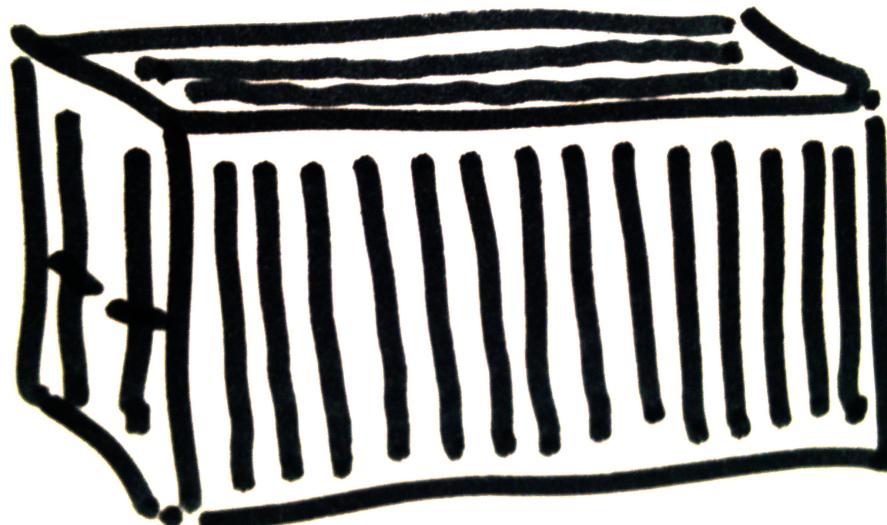
Natural Caching Behavior 3

Related resources can
be Invalidated.

POST



/container

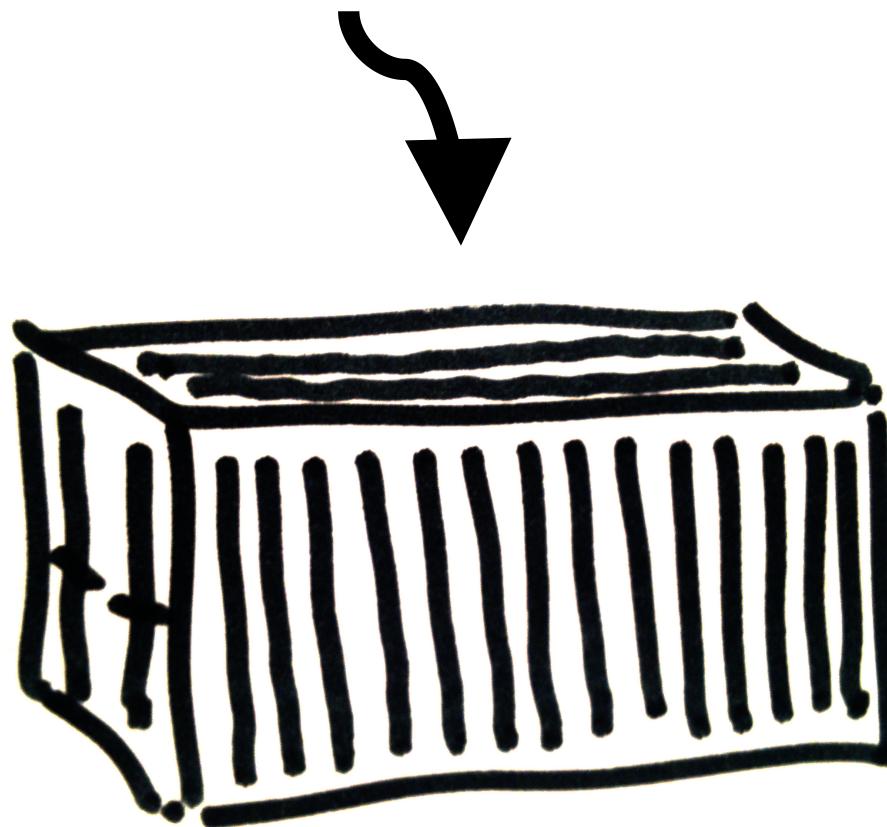


1. /container is invalidated
2. 303 + Location:
/container/item8

or

2. Content-Location:
/container/item8

DELETE
/container/item8



1. /container/item8
is invalidated

2. 303 + Location:
/container

or

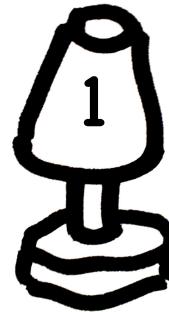
2. Content-Location:
/container



Natural Caching Behavior 4

Beware of Summaries and Bundles

GET /lamp/1



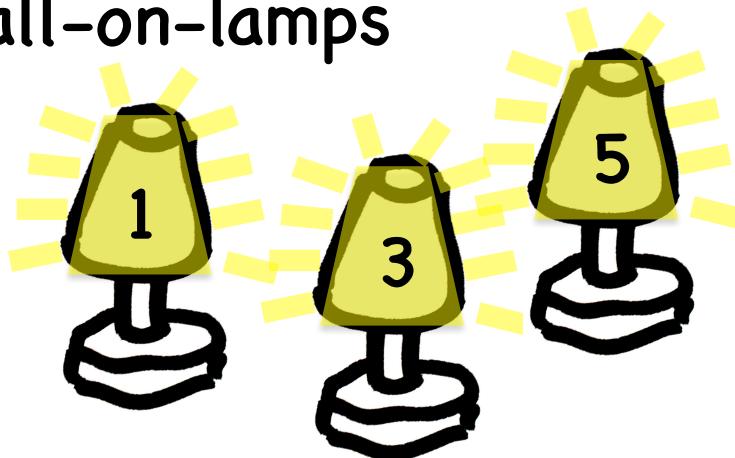
POST /lamp/1
power=on



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

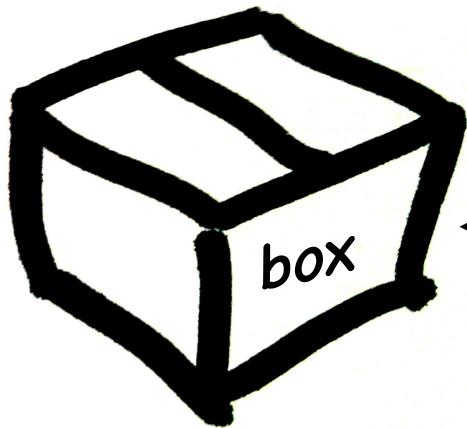


Natural Caching Behavior 5

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

GET /box

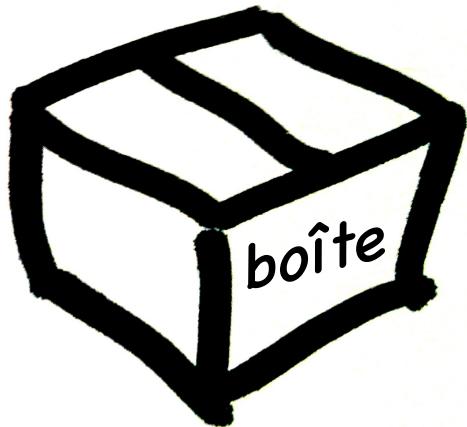
Accept-Language: EN



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

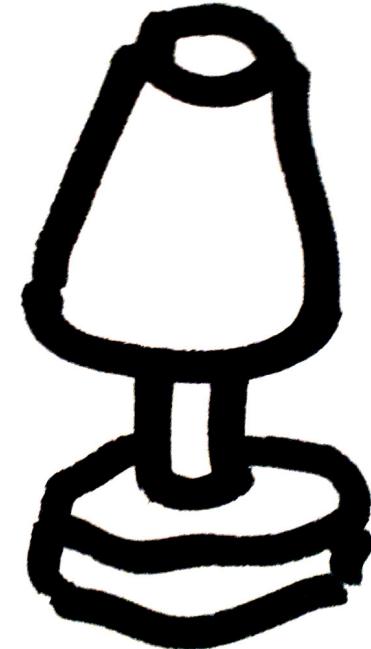
Relativity



**PUT /lamp
ON**



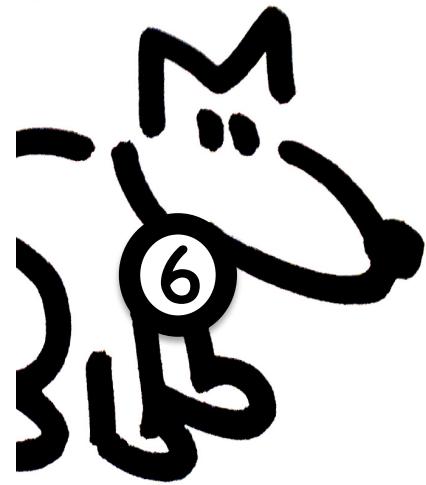
OR



GET /lamp

Managed Caching Behavior 1

Use Etags with
conditional GETs



GET /dog

ETag: 6

GET /dog If-None-Match: 6

304



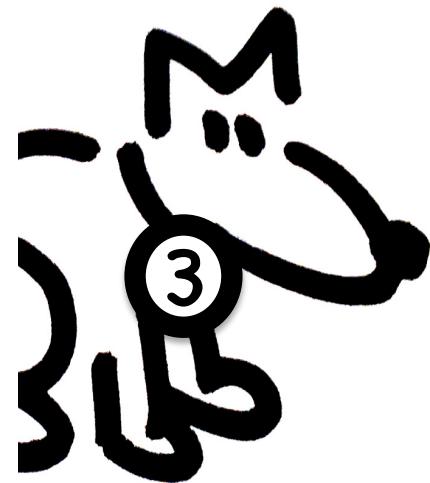
SYSTEM

SYSTEM



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/charter>



The
End