Cache Digests for HTTP/2

Kazuho Oku
Fastly

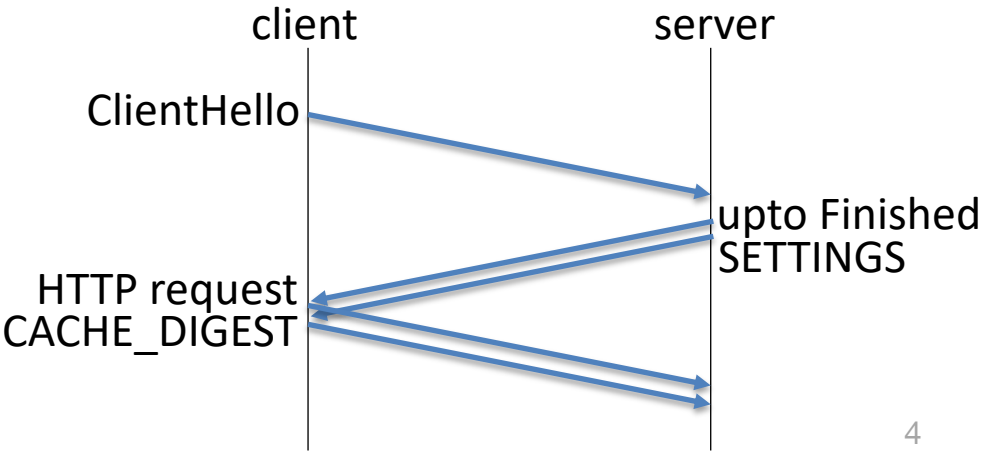
Changes from draft-02

- switch to Cuckoo Hash
- open issues:
  - negotiating the use #410
  - remove etag / stale support #516

Negotiating the Use #410

Current approach: use SETTTINGS

- SENDING_CACHE_DIGEST:
  - indicates client-support
- ACCEPT_CACHE_DIGEST:
  - indicates server-support
  - sent in 0.5 RTT in TLS 1.3 full handshake
  - client can remember



Current approach: issues

- server's indication is per-connection
  - need to be per-origin?
    - use ORIGIN frame?
- require clients to cache the info?
  - currently it's a MAY

remove etag / stale support #516

Current approach: four types of digests

digest key / cache state	server's strategy	
	match found	match not found
SHA(URL) / fresh	do not push	push
SHA(URL) / stale	push Etag only[1,3]	push
SHA(URL + Etag)[2] / fresh	do not push	push[3]
SHA(URL + Etag)[2] / stale	push Etag only[4]	push

*1: either potentially wastes bandwidth or one RT, since server cannot tell if it should push response body or just Etag

*2: hard to use unless h2 endpoint and cache (that store's the Etag value) exist on a single machine (impl. issue)

*3: clients do not adopt pushed response if it has a fresh cache (H2 issue)

*4: up-to-date value of the Etag needs to be transferred, but how? (H2 issue)

Proposal: remove etag / stale support

- i.e. concentrate on *SHA(URL) / fresh* case
  - since majority of the resources that block rendering are long-term cacheable
  - see http://bit.ly/crit-res-cacheability by Yoav