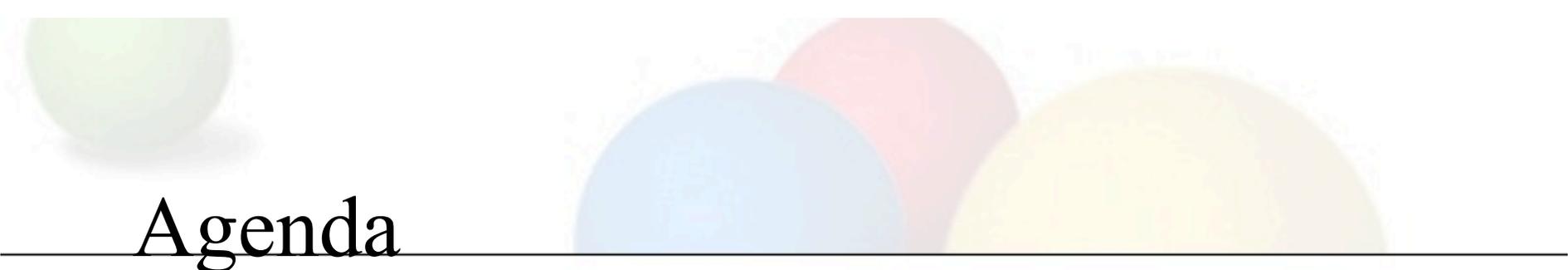# TCP Fast Open Draft Revision
draft-cheng-tcpm-fastopen-01.txt

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On behalf of Yuchung Cheng, Sivasankar
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Agenda

- Draft change/addition
- Performance numbers
- P-HTTP
- Next steps

Draft Changes

- Fine tuning the cookie protocol
  - Check system limit before validating cookies
    - To avoid cookie validation overhead when under attack
  - Allow differentiation between non-TFO capable server vs temporarily TFO-disabled services
  - Recommend client to cache negative response
  - Validate cookie by simply regenerate a valid one and compare (if regen can be done independently)
- Cost of AES encryption – negligible in our tests

Performance Numbers

- Data collected from both client (through Chrome browsers) and server sides

- 3WHS delay as percentage of total latency
  - 8-28% of cold requests
  - 5-7% of all requests including both cold and warm

- TFO improved PLT by 10-40%

- More details to be presented at ACM CoNext/2011
  http://research.google.com/pubs/pub37517.html

Persistent HTTP

- Only cold requests will suffer 3WHS delay
- Widely deployed and effective
  - 92% of HTTP requests are HTTP/1.1
- Persistency is limited
  - 33% of requests by Chrome over new connections
  - Yahoo! CDN sees only 2.4 requests per connection in average
    http://conferences.sigcomm.org/imc/2011/docs/p569.pdf
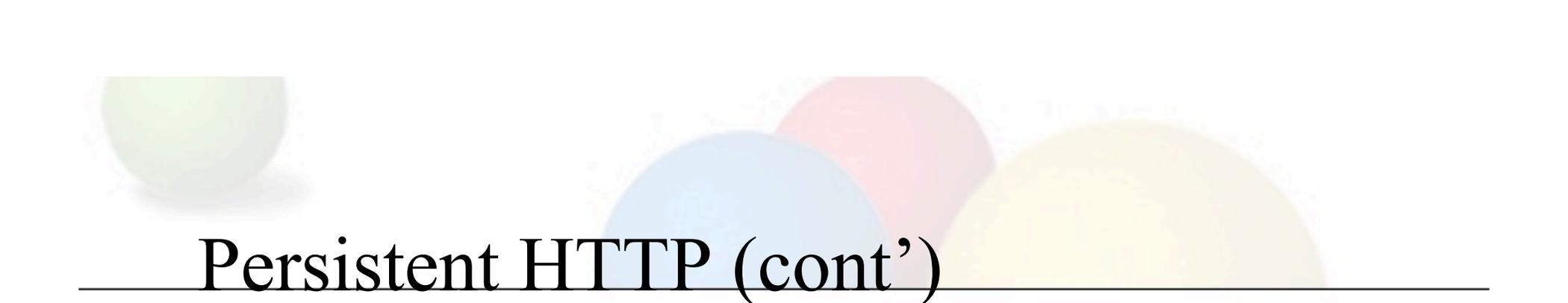
Persistent HTTP (cont')

- Limited persistency due to
  - Browser opening multiple concurrent connections
  - Domain sharding
  - Middlebox resource constraints
  - Power saving requirement from mobile devices
- Middlebox silently dropped unmapped pkts (TCP RST not required by RFC5382) problematic for browser user experience
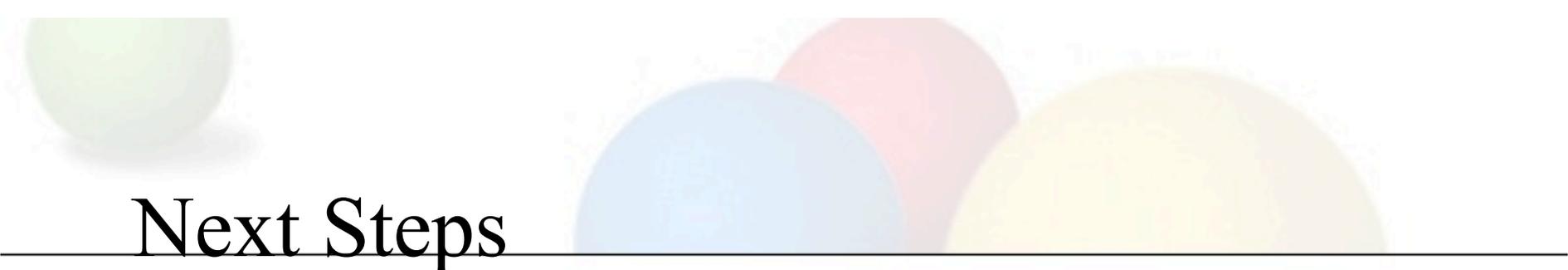
Next Steps

- WG adoption
- Implementation completion & testing
- Experimental deployment