Controlling Items in Client Caches
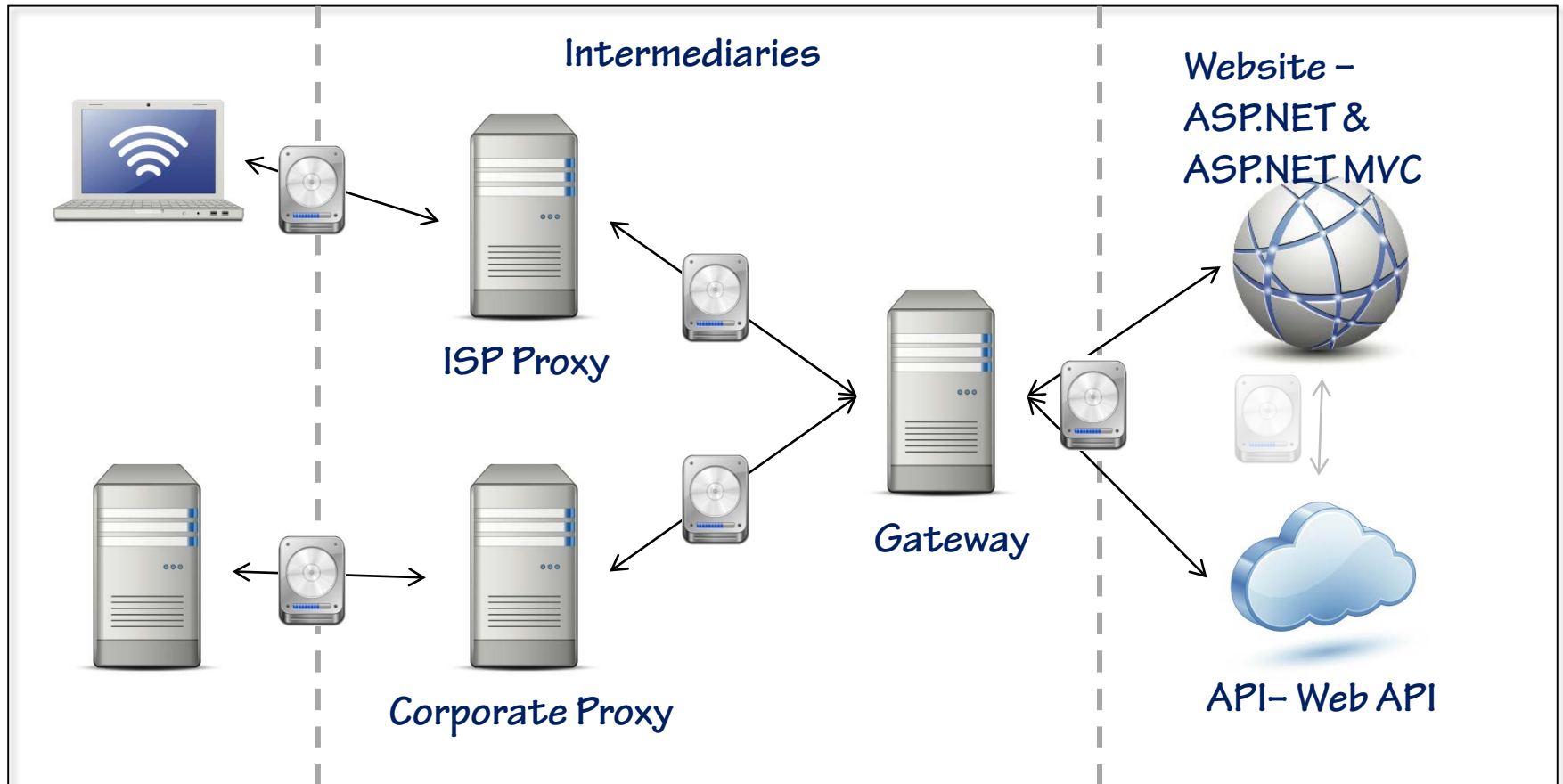
Elton Stoneman

elton@sixeyed.com

Outline

- **Client caches**
  - Private & public
- **Caching proxies**
- **Cache-Control**
  - Lifespan
  - Cache type
  - Validation
  - Disabling
- **Cache-busting**
  - Client-initiated
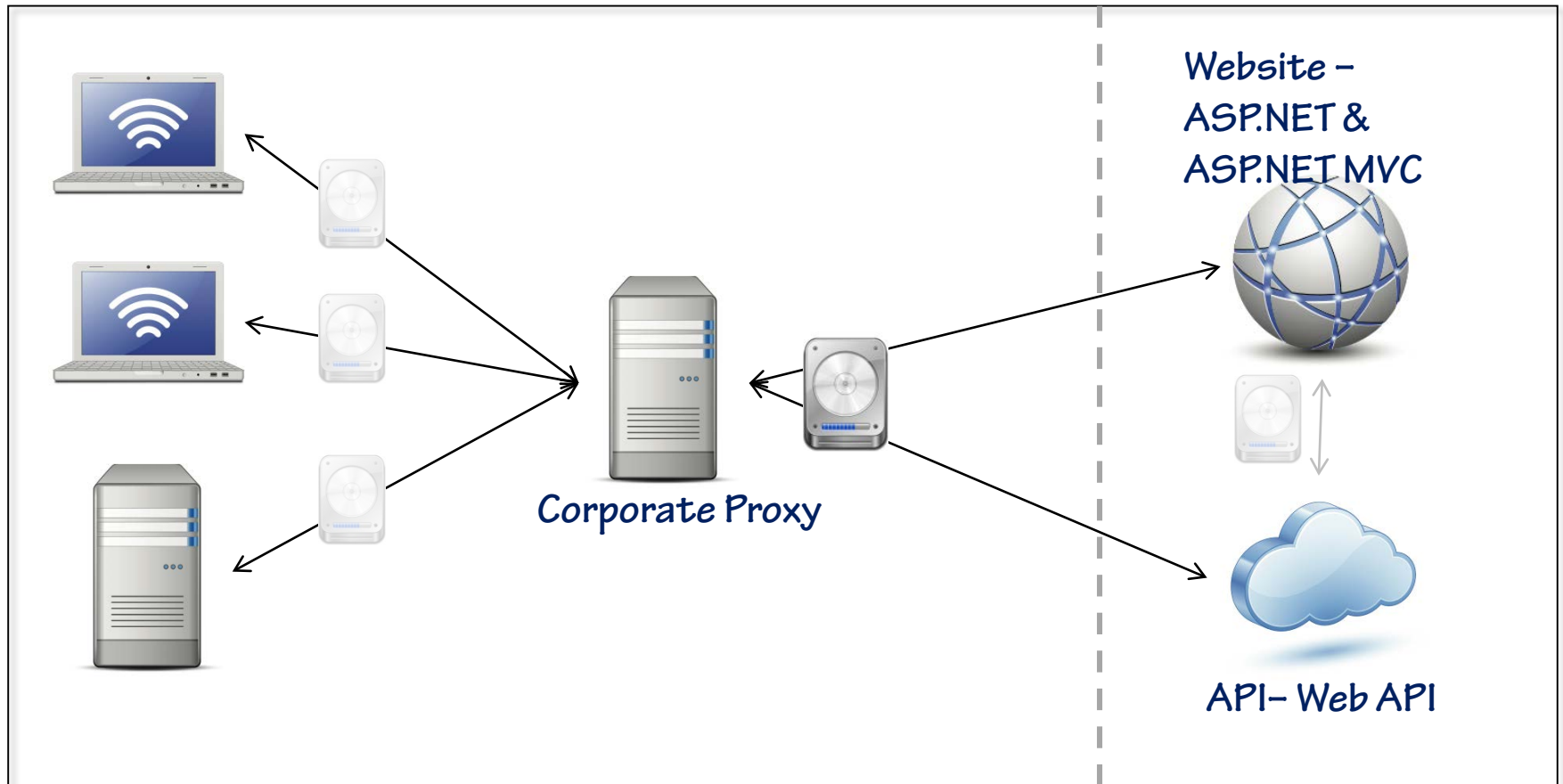 - Server-initiated
  - URL changes & versioning

Client Caches
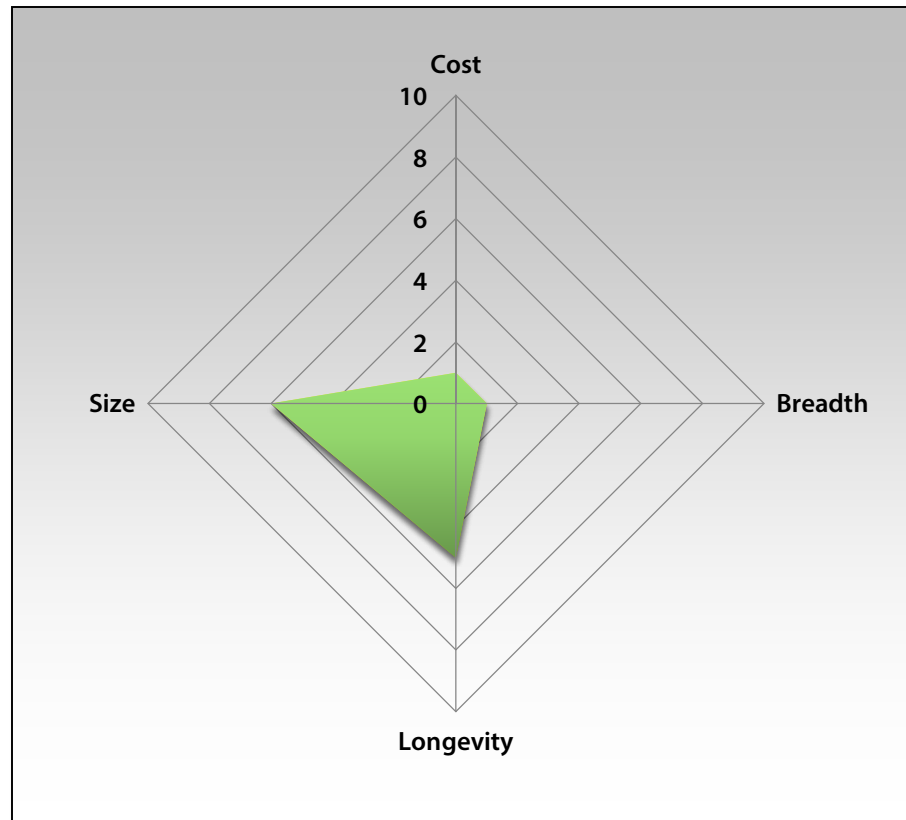
- **Private & public**
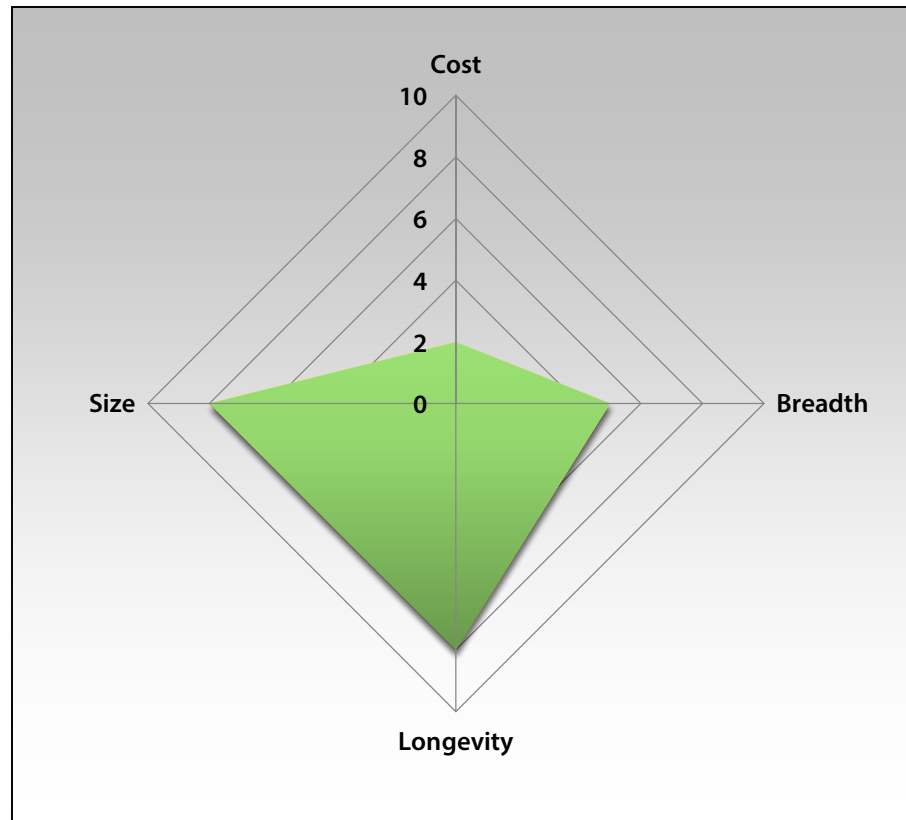
Client Caches

- **Public caches**

Client Caches

- **Private cache: fast for individuals; size & longevity variable**

Client Caches

- **Public cache: fast for community; breadth, size & longevity variable**

Caching Proxies

- **HTTP aware**
  - Expiration and invalidation

  > Expires: Thu, 01 Dec 2020 16:00:00 GMT

  > ETag: "737060cd8c284d8af7ad3082f209582d"

- **Variable implementations**
  - Configurable cache
  - Cache key = hash(Method, URL, Vary[])
  - Memory + disk store

Caching Proxies

- Demo

Caching Proxies

- **Squid**
  - Open source
  - Cross-platform
- **Standard configuration**
  - Proxy (reverse proxy possible)
    - Via
  - Caching
    - X-Cache, X-Cache-Lookup
  - Expiration
    - TCP_HIT, TCP_MEM_HIT
  - Validation
    - TCP_REFRESH_HIT
  - Use cache if origin unavailable
    - TCP_REFRESH_FAIL_HIT

Cache-Control

- **Expires**
  - Static expiration date & time
  - Same for public & private caches
  - GMT, clock synchronisation

  > Expires: Thu, 01 Dec 2020 16:00:00 GMT

- **Cache-Control response header**
  - Configurable options

  > Cache-Control: max-age=3600, s-maxage=1800, proxy-revalidate

Cache-Control

- **Lifespan**

  Cache-Control: max-age=3600

  Cache-Control: max-age=3600, s-maxage=1800

- **Cache type**

  Cache-Control: private

  Cache-Control: public

Cache-Control

- **Validation**

  Cache-Control: must-revalidate

  Cache-Control: proxy-revalidate

  Cache-Control: no-cache

- **Disable caching**

  Cache-Control: no-store

- **Combined**

  Cache-Control: max-age=3600, s-maxage=1800, proxy-revalidate

Cache-Control

- **Demo**

Cache-Control

- **Lifespan**
    - Seconds from response date
    - max-age and s-maxage
- **Cache type**
    - private
    - public
- **Validation**
    - no-cache
    - proxy-revalidate
- **Disabling**
    - no-store

Cache-busting

- **No remote cache reset**
- **Client-initiated**
  - Cache-control: max-age 0
  - Pragma: no-cache
- **Server-initiated**
  - Cache-control: no-cache
  - Break the cache key
- **URL changes & versioning**
  - logo_100.png, api-client_1.0.0.js
  - logo_100_v2.png, api-client_1.0.1.js
- **Filename hash**
  - logo_234abbb86.png
  - Automated build

Summary

- **Private and public caches**
  - Squid as a caching proxy
- **Cache-Control**
  - Computed lifespan
  - Different lifespan for public & private
  - Control validation workflow
  - Prevent caching
  - Client-initiated cache refresh
- **Cache-busting**
  - Breaking the cache key