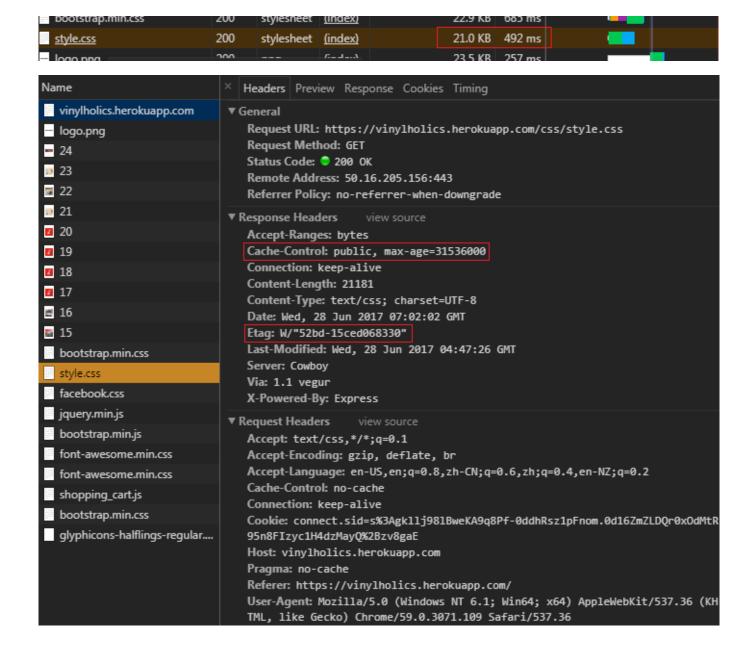# 1. Public Resources

- css, scripts, fonts, static images like favicon or logo
- Cache for 1 year, public, weak ETag, stale resource allowed.
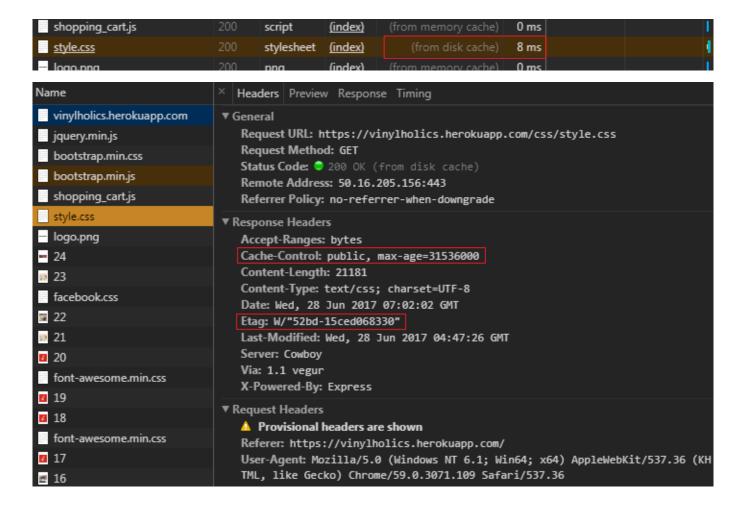- Header example:

```
Cache-Control: public, max-age=31536000

ETag: W/"368d-15cc3a03146"
```

- Expected result:
  - ✓ status 200
  - ✓ from local cache
  - ✓ have Cache-Control: public, max-age=31536000
  - ✓ have ETag

- Test result (screenshot):
  a) First load of style.css

b) Reload of `style.css`

The resource is retrieved from disk cache, so there is no bandwidth use.

Significantly reduced the loading time from 492ms to 8ms.

2. Relatively Static Resources

- Images for albums or artists

  Not-so-dynamic pages (browse artists, artist page, 404)
- Cache for 1 day, public, weak ETag, stale resource allowed.
- Header example:

```
Cache-Control: public, max-age=86400

ETag: W/"1885-jF9p9OVGhOjPGOXRlQu9TnQ+l0c"

Expires: Thu, 29 Jun 2017 02:45:31 GMT
```

- Expected result:
  - ✓ status 200
  - ✓ from local cache
  - ✓ have Cache-Control: public, max-age=86400
  - ✓ have Expires: ... (only for old browser compatibility)
  - ✓ have ETag

- Test result (screenshot):
  a) First load of https://vinylholics.herokuapp.com/artist/4

b) Reload of `https://vinylholics.herokuapp.com/artist/4`

The resource is retrieved from disk cache, so there is no bandwidth use.

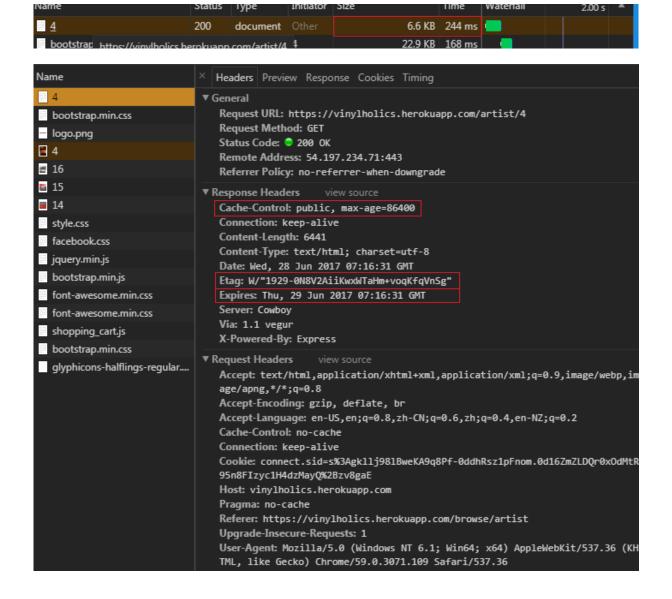Significantly reduced the loading time from 244ms to 2ms.

3. Dynamic Pages

- Index, browse albums, album page
- Re-validate before using cached resource, public, weak ETag, stale resource not allowed.
- Header example:

```
Cache-Control: public, no-cache, must-revalidate
ETag: W/"1d97-t1Wdzs8mP0OTMek25jjTJosI/QY"
```

- Expected result:
  - ✓ if not modified, status 304; if Modified, status 200.
  - ✓ if not modified, from local cache; if Modified, from server.
  - ✓ have Cache-Control: public, no-cache, must-revalidate
  - ✓ have ETag

- Test result (screenshot):
  a) First load of https://vinylholics.herokuapp.com/browse/page/1

b) Reload of `https://vinylholics.herokuapp.com/browse/page/1`

The browser has to re-validate with server due to `no-cache`. Server replied with status `304 Not Modified`, which means local cache can be used. Therefore, the resource is retrieved from disk cache which was saved in step a. There is a roundtrip for revalidation that consumes 258B of bandwidth.

c) Log in to change the page content, then reload of
`https://vinylholics.herokuapp.com/browse/page/1`
The browser tried to re-validate cached resource, but the server replied that the content has changed (ETag was different). Therefore, the new content was freshly retrieved from server.

Name	Status	Type	Initiator	Size	Time	Waterfall	500.00 ms
1	200	document	Other	11.2 KB	281 ms		
facebook.css	200		1	(memory cache)	0 ms		

Name
- 1
- facebook.css
- jquery.min.js
- bootstrap.min.css
- bootstrap.min.js
- font-awesome.min.css
- font-awesome.min.css
- shopping_cart.js
- logo.png
- 24
- 23
- style.css
- 22
- 21
- 19
- bootstrap.min.css
- 9
- 8
- 10
- 1
- 2
- glyphicons-halflings-regular....
- fontawesome-webfont.woff2...
- icon_cart_close.svg
- icon_arrow_next.svg

Headers Preview Response Cookies Timing

▼ General
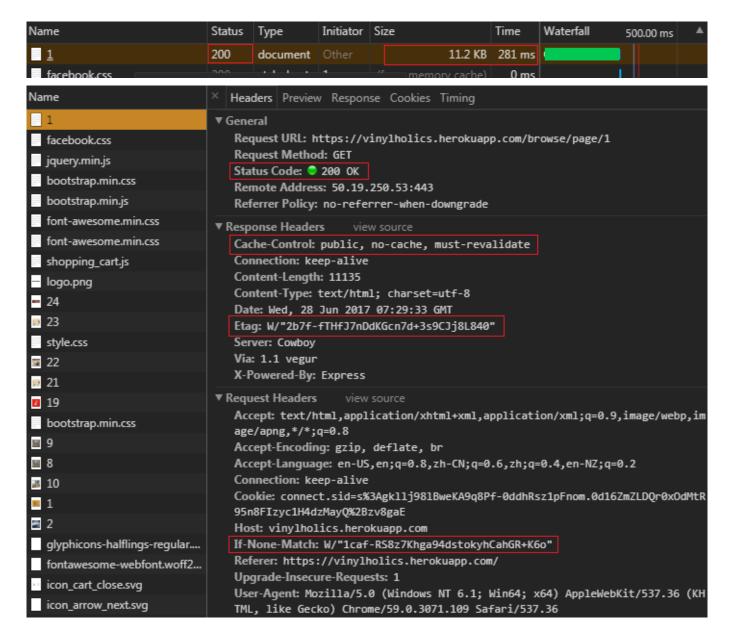   Request URL: https://vinylholics.herokuapp.com/browse/page/1
   Request Method: GET
   Status Code: ● 200 OK
   Remote Address: 50.19.250.53:443
   Referrer Policy: no-referrer-when-downgrade

▼ Response Headers   view source
   Cache-Control: public, no-cache, must-revalidate
   Connection: keep-alive
   Content-Length: 11135
   Content-Type: text/html; charset=utf-8
   Date: Wed, 28 Jun 2017 07:29:33 GMT
   Etag: W/"2b7f-fTHfJ7nDdKGcn7d+3s9CJj8L840"
   Server: Cowboy
   Via: 1.1 vegur
   X-Powered-By: Express

▼ Request Headers   view source
   Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8
   Accept-Encoding: gzip, deflate, br
   Accept-Language: en-US,en;q=0.8,zh-CN;q=0.6,zh;q=0.4,en-NZ;q=0.2
   Connection: keep-alive
   Cookie: connect.sid=s%3Agkllj981BweKA9q8Pf-0ddhRsz1pFnom.0d16ZmZLDQr0xOdMtR95n8FIzyc1H4dzMayQ%2Bzv8gaE
   Host: vinylholics.herokuapp.com
   If-None-Match: W/"1caf-RS8z7Khga94dstokyhCahGR+K6o"
   Referer: https://vinylholics.herokuapp.com/
   Upgrade-Insecure-Requests: 1
   User-Agent: Mozilla/5.0 (Windows NT 6.1; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/59.0.3071.109 Safari/537.36

d) Reload of `https://vinylholics.herokuapp.com/browse/page/1`

This process is similar to step b. The only difference is that the cache in this step is from step c.

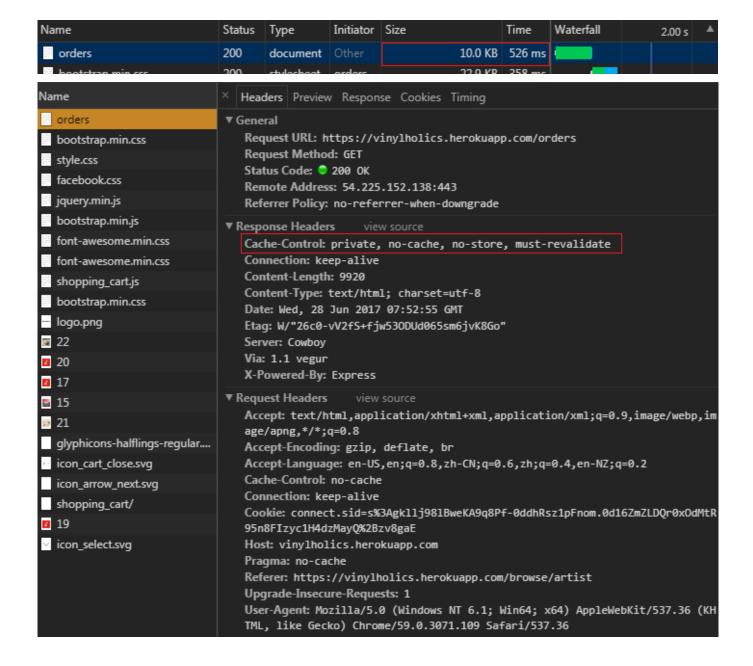| Name	Status	Type	Initiator	Size	Time	Waterfall	500.00 ms
1	304	document	Other	258 B	281 ms		
bootstr-- --- ---	200	--- --- 1	(from memory cache)		0 ms		

Name | ✕ | Headers Preview Response Cookies Timing

1
bootstrap.min.css
style.css
facebook.css
jquery.min.js
bootstrap.min.js
font-awesome.min.css
font-awesome.min.css
shopping_cart.js
logo.png
9
24
23
8
10
1
22
2
21
19
glyphicons-halflings-regular....
fontawesome-webfont.woff2...
icon_cart_close.svg
icon_arrow_next.svg

▼ General
    Request URL: https://vinylholics.herokuapp.com/browse/page/1
    Request Method: GET
    Status Code: ● 304 Not Modified
    Remote Address: 50.19.250.53:443
    Referrer Policy: no-referrer-when-downgrade

▼ Response Headers   view source
    Cache-Control: public, no-cache, must-revalidate
    Connection: keep-alive
    Content-Length: 0
    Date: Wed, 28 Jun 2017 07:31:00 GMT
    Etag: W/"2b7f-fTHfJ7nDdKGcn7d+3s9CJj8L840"
    Server: Cowboy
    Via: 1.1 vegur
    X-Powered-By: Express

▼ Request Headers   view source
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8
    Accept-Encoding: gzip, deflate, br
    Accept-Language: en-US,en;q=0.8,zh-CN;q=0.6,zh;q=0.4,en-NZ;q=0.2
    Connection: keep-alive
    Cookie: connect.sid=s%3Agkl1j981BweKA9q8Pf-0ddhRsz1pFnom.0d16ZmZLDQr0xOdMtR95n8FIzyc1H4dzMayQ%2Bzv8gaE
    Host: vinylholics.herokuapp.com
    If-None-Match: W/"2b7f-fTHfJ7nDdKGcn7d+3s9CJj8L840"
    Referer: https://vinylholics.herokuapp.com/browse/artist
    Upgrade-Insecure-Requests: 1
    User-Agent: Mozilla/5.0 (Windows NT 6.1; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/59.0.3071.109 Safari/537.36

4. Private content

- Orders page, checkout page, user information
- No cache, no store, private, stale resource not allowed
- Header example:

```
Cache-Control: private, no-cache, no-store, must-revalidate
```

- Expected result:
  - ✓ status 200
  - ✓ always from server
  - ✓ have Cache-Control: private, no-cache, no-store, must-revalidate

- Test result (screenshot):
  a) First load of https://vinylholics.herokuapp.com/orders (user logged in)

b) Reload of `https://vinylholics.herokuapp.com/orders` (user logged in)

The browser cannot cache this resource due to `no-cache, no-store`. The content has to be fresh every time.