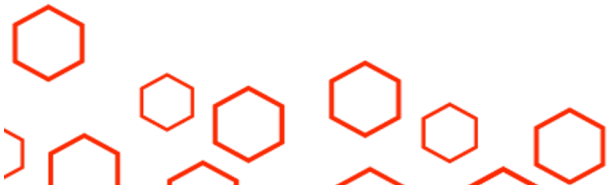


Improving headless / PWA performance

Pradip Shah | Co-Founder

luoConnect
Managed Hosting Platform



Did you register at luroconnect.fm?

Magento Open Source is at a cross roads today - it is not clear if Adobe will continue to support or there will be forks (such as MageOS) to the main source. Will Hyva be the saviour it appears to be? What do merchants want in a platform? What do they not want from one?

The luroConnect podcast will interview agency owners, developers, plugin vendors and merchants. Our aim is to see what is explore how Magento Open Source can be the preferred platform for eCommerce.

Register and we will inform you when the first episode goes live.





Meet Magento
#MM23IN

The promise

*Blazing fast performance that
legacy technologies cannot give*

The delivery



Meet Magento
#MM23IN



The myth of legacy

Legacy UI technology was not at standstill



Adam Wathan
authored
tailwindcss



Willem Wigman
authored
Hyva



Caleb Porzio
authored
alpine.js



- Replaced Magento Luma Theme
- Improved Google Page Speed scores
- Componentized UI development



On the fly page reorganization

- Advanced JS bundling (aka magepack) and Critical CSS inline / bundling
 - Offline check to decide the bundle size
 - Config file added to build
- On the fly page reorganization
 - Analyze each page on the fly and reorganize the page for inlining / bundling
 - Simple ideas earlier were to put js in footer (cloudflare rocketloader)
 - Later ideas (nitrogen) do even more so LCP improves
 - First cache miss may take more time
 - Add a Full Page Cache and you get amazing results



THE
NITROGEN
PLATFORM



STYLE

See All Salwar Kameez
Ready to Ship
Sharara Suits
Anarkali Suits
Palazzo Suits
Designer Salwar Kameez
Kurta Set With Dupatta
JumpSuits
Dhoti Suits

OCCASION

Wedding Salwar Kameez
Haldi Salwar Kameez
Party Wear Salwar Kameez
Engagement Salwar Kameez
Festive Salwar Kameez

FABRIC

Silk Salwar Kameez
Georgette Salwar Kameez
Cotton Salwar Kameez
Bandhani Salwar Kameez

QUICK LINK

Salwar Suits under USD 200
Dupatta
Plus Size Salwar Kameez
Salwar Kameez Sale
Best Sellers Salwar Kameez

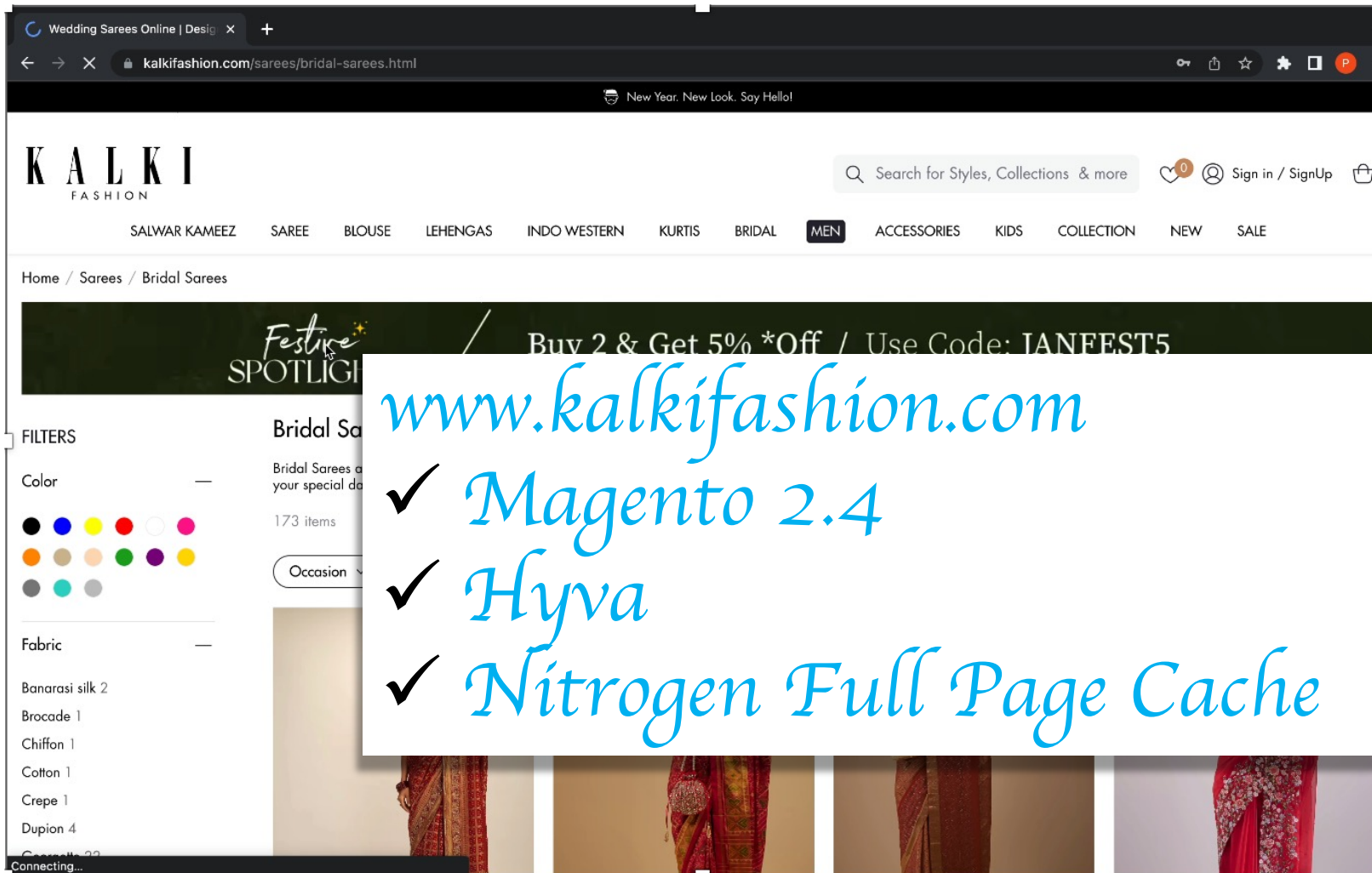
COLOR

Yellow Salwar Kameez
Black Salwar Kameez
White Salwar Kameez
Pink Salwar Kameez



SHOP NOW





www.kalkifashion.com

✓ Magento 2.4

✓ Hyva

✓ Nitrogen Full Page Cache



But ...



- Cache miss does too many things
- Hard to personalize
 - Need a framework even to throw a custom message
 - Custom content is even more difficult

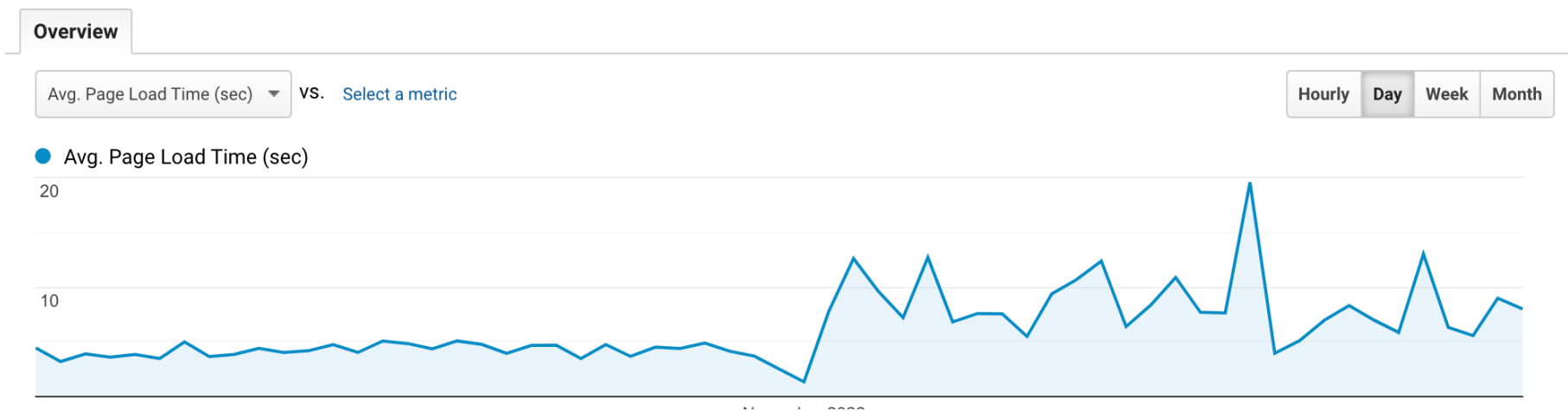


New PWA Promise

A Platform to do more with less



But how do you fix this?



And this ...

INDIA IN

* Try our SKIN ANALYSER now * Up to 50% Off Get Free Makeup Wipes on every order worth more than BDT 350.

LAFZ

SALE SKIN ANALYZER MAKEUP SKINCARE FRAGRANCE HAIRCARE HALAL SUPERF

Buy 1 Get 1 free on Anti hairfall range !
Select products only. Limited offer, Hurry now

SALE

Combo Deals
Winter Care Sale

- Stock
☐ In Stock

- Price
☐ BDT 0 - BDT 1,000
☐ BDT 1,000 - BDT 2,000
☐ BDT 2,000 - BDT 3,000

30% OFF

ANTI-HAIRFALL COMBO

BDT 1,034 ~~BDT 1,477~~

★★★★★

ADD TO CART

18% OFF

INSTANT GLOW DAY COMBO

BDT 1,598 ~~BDT 1,950~~

★★★★★

ADD TO CART

12% OFF

ILLUMINATE BRIGHTENING COMBO

BDT 2,597 ~~BDT 2,950~~

★★★★★

ADD TO CART

ScandiPWA

9 products in the list

Lesson : PWA is not magic

- Just because the information about PWA is it is “lightning fast” it is not magic. It has the potential of being lightning fast
- All your basic rules apply
 - Make sure you know your screen layout and do not insert odd sized banners to make the screen move up and down
 - LCP is the largest paint you do on the screen – do it early
 - Use as few fonts as possible
- And then a few more
 - Think of landing page AND navigation
 - Think of how google search console and google analytics will perceive your speed



Understand underlying technology

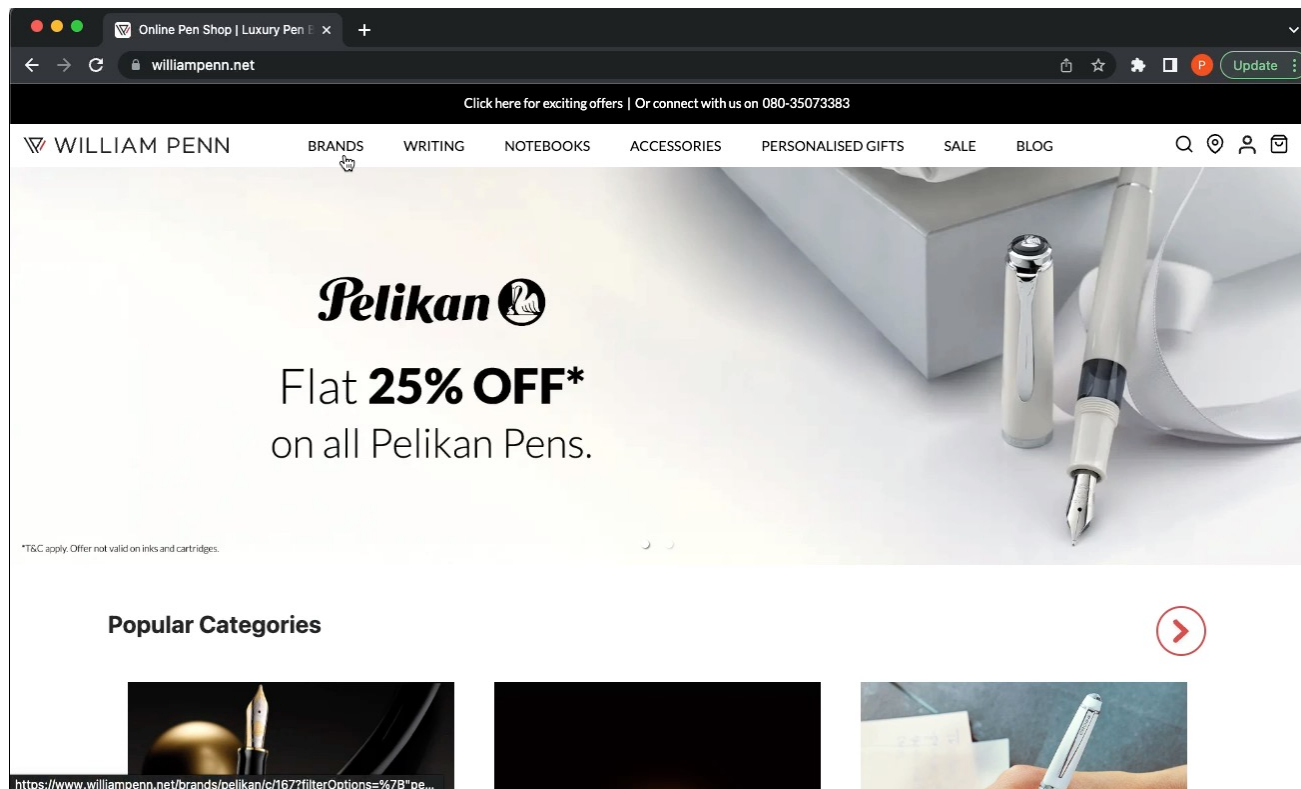
- Are you depending on REST or GraphQL?
- REST (in Magento) does not send back cacheable results
 - REST may send back far bigger data than you want
 - May need to write custom REST calls to add pagination, etc
 - You can cache the results only based on TTL
 - Will not automatically invalidate



Custom React
Magento REST API
Custom REST API calls

REST Results cached in
middleware with no
automatic invalidations

rendertron SSR



Magento has adopted GraphQL

- ScandiPWA and PWASstudio use graphql
- Magento GraphQLs (until 2.4.5)
 - Are in user session
 - Follow same rules for varnish caching as frontend urls
 - Can be extended for custom queries by writing php



POST vs GET graphql

- 2 POST graphqls with the same parameters
- Getting cart info to show in minicart
- Comes before important UI for home page
- POST urls cannot be cached and are locked by session
- Each graphql takes 3.5 seconds – but chained so take 7 seconds
Before any content is displayed
- Use POST for queries – only for mutations

Name	Status
<input type="checkbox"/> graphql?hash=1102694445&_currency=%22%22	200
<input type="checkbox"/> graphql?hash=1102694445&_currency=%22%22	200
<input checked="" type="checkbox"/> graphql	200
<input type="checkbox"/> graphql	200
<input type="checkbox"/> graphql?hash=2832062463&identifiers_1=[%22homepage_sale_small%22...	200
<input type="checkbox"/> graphql?hash=600508575&identifier_1=%22new-main-menu%22&_curre...	200
<input type="checkbox"/> graphql?hash=600508575&identifier_1=%22new-main-menu%22&_curre...	200
<input type="checkbox"/> graphql?hash=2832062463&identifiers_1=[%22homepage_sale_small%22...	200
<input type="checkbox"/> graphql?hash=1658919525&identifier_1=%22home%22&_currency=%2...	200
<input type="checkbox"/> graphql?hash=2832062463&identifiers_1=[%22Newsletter%22]&_curre...	200
<input type="checkbox"/> graphql?hash=2832062463&identifiers_1=[%22FOOTER_BLOCK%22]&_...	200
<input type="checkbox"/> graphql?hash=1676776048&id_1=2&_currency=%22%22	200
<input type="checkbox"/> graphql?hash=1676776048&id_1=4&_currency=%22%22	200

<input type="checkbox"/> graphql	query: "query(\$guestCartId_1:String){cartData:getCartForCustomer(guestCartId:\$guestCartId_1){
<input type="checkbox"/> graphql	▼ variables: {guestCartId_1: "gS0mJImK6KwyMpIjkdPEJFchpyOYQF0e"}
<input type="checkbox"/> graphql?hash=2832062463&i...	guestCartId_1: "gS0mJImK6KwyMpIjkdPEJFchpyOYQF0e"



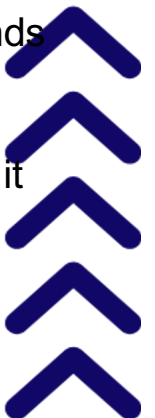
Magento GraphQL are not all cacheable

- PWAStudio generates many non cacheable graphql calls

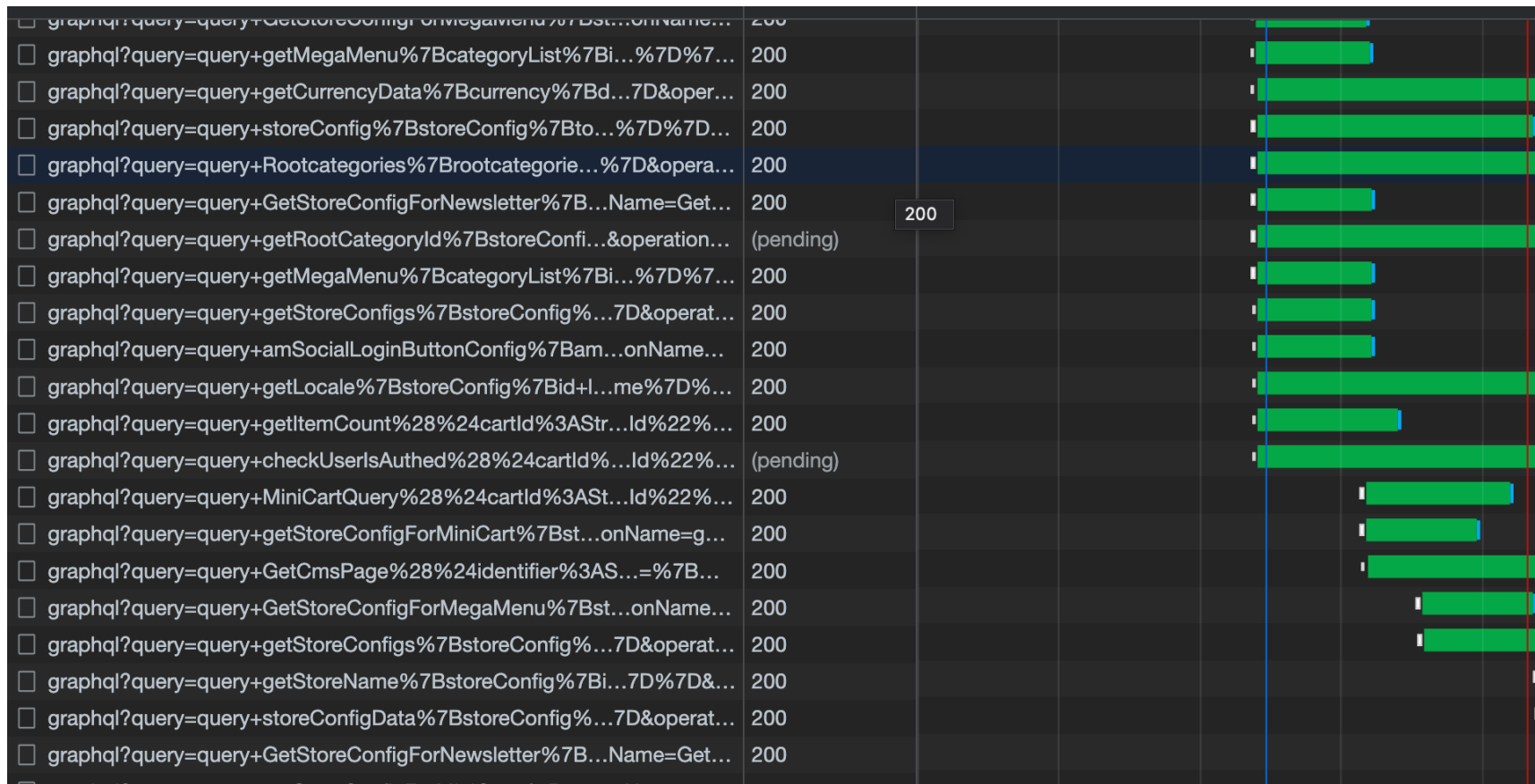
Name	Status	Waterfall
graphql?query=query+cmsBlocks%28%24identifiers%3A%...%7B%2...	200	
graphql?query=query+cmsBlocks%28%24identifiers%3A%...les=%7...	200	
graphql?query=query+cmsBlocks%28%24identifiers%3A%...ables=...	200	
graphql?query=query+getRootCategoryId%7BstoreConfi...&operation...	200	
graphql?query=query+getLocale%7BstoreConfig%7Bstor...me%7D%...	200	
graphql?query=query+getItemCount%28%24cartId%3AStr...Id%22%...	200	
graphql?query=query+checkUserIsAuthed%28%24cartId%...Id%22%...	200	
graphql?query=query+cmsBlocks%28%24identifiers%3A%...iables=...	200	
graphql?query=query+GetCartDetails%28%24cartId%3AS...Id%22%...	200	
graphql?query=query+getStoreConfigForMiniCart%7Bst...onName=g...	200	
graphql?query=query+GetCmsPage%28%24identifier%3AS...age&va...	200	
graphql?query=query+cmsBlocks%28%24identifiers%3A%...%7B%2...	200	
graphql?query=query+GetStoreConfigForCarouselEE%7B...Name=Ge...	200	
graphql?query=query+getStoreConfigData%7BstoreConf...operationN...	200	

Non cacheable graphql

- Magento (php) sends a header to varnish to hint if a graphql is cacheable
- If the ttl is set to 0 or Cache control header says “no-store, no-cache” varnish will not cache
- If cacheable, Magento sends tags that will be used for invalidation – if content of the graphql would change it will be automatically removed from cache



PWA Studio : many graphqls per component



Cache more in varnish : what is “not cacheable”

- Review each non varnish cacheable by default request
 - Hint : If varnish does not cache, the graphql will have set-cookie
- Decide if and for how long it can be cached in varnish
- Check the url, Payload and the response



Thanks to
Siddharthsinh Rathod
Cinovic

Example :

GET

graphql?query=query+getRootCategoryId%7BstoreConfig%7Bid+root_category_id+__typename%7D%7D&operationName=getRootCategoryId&variables=%7B%7D



Cache more in varnish : what is “not cacheable”



Thanks to
Siddharthsinh Rathod
Cinovic

```
× Headers Payload Preview Response Initiator Timing Cookies
▼ {data: {storeConfig: {id: 1, root_category_id: 2, __typename: "StoreConfig"}}}
  ▼ data: {storeConfig: {id: 1, root_category_id: 2, __typename: "StoreConfig"}}
    ▼ storeConfig: {id: 1, root_category_id: 2, __typename: "StoreConfig"}
      id: 1
      root_category_id: 2
      __typename: "StoreConfig"
```

```
▼ Query String Parameters view source view URL-encoded
query: query getRootCategoryId{storeConfig{id root_category_id __typename}}
operationName: getRootCategoryId
variables: {}
```



Cache more in varnish : what is “not cacheable”

```
sub vcl_backend_response {  
  
    ...  
  
    if (bereq.url ~ "(GetStoreConfigForMegaMenu|getPageSize|GetFilterInputsForCategory|amSocialLoginButtonConfig|getMegaMenu|amsociallogin_general_enabled|GetStoreConfigForNewsletter|getStoreConfigForMiniCart|GetFilterInputsForModal|storeConfigData.*copyright|7Btop textsec_general_enable|CategoriesById|getStoreName|getRootCategoryId|Rootcategories|getPriceData|getLocale|GetStoreConfigDataForGalleryCE)" && beresp.ttl <= 0s){  
        set beresp.ttl = 86400s;  
        set beresp.http.Cache-Control = "max-age=86400, public, s-max-age=86400";  
    }  
}
```

o
Rathod



Caching in varnish? Cache warmer for important graphqls



Analyze slow graphqls

- Many custom graphqls can have bad mysql queries
- How to analyze a graphql query
 - Step 0 : make sure mysql query cache is turned off (mariadb, mysql 5.7)
 - Step 1 : Identify the query graphql
 - Step 2 : enable db debug
 - Step 3 : access the graphql
 - Step 4 : delete the log file
 - Step 5 : access the graphql again
 - Step 6 : disable db debug
 - Step 7 : Analyze the db debug log



Thanks to
Siddharthsinh Rathod
Cinovic



Analyze slow graphqls (contd)

- Fresh Arrivals products graphql was analyzed
 - Result set :
425108 rows for 10k products and took 17 seconds
21MB dataset size
- A Category (graphql was custom)
 - Result set :
259361 rows for 7488 products and took 4 seconds
13MB dataset size
- In each case, the result set returned by graphql was much smaller
- Graphql has pagination and range – the query should also carry this info



Thanks to
Siddharthsinh Rathod
Cinovic



Magento GraphQL : 2.4.5 upgrade will help

- JWT Tokens for authorization
- Disable graphql session for authorization
- Session usage has been removed from http header

No more chaining, but

- varnish will not cache requests with authorization headers
- Analyzing what can be cached will be important
- Yet don't use POST when you can use GET



Cache graphql in browser

- So, if a graphql result is unlikely to change, why not cache in browser?
- Varnish allows such manipulation of the headers
- Identify the graphqls that can be cached in the browser and the ttl
- Note : if you cache in browser, you cannot clear the cache

```
sub vcl_deliver {  
    ...  
    if (req.url ~ "(GetStoreConfigForMegaMenu|getPageSize|GetFilterInputsForCategory  
|amSocialLoginButtonConfig|amsociallogin_general_enabled|GetStoreConfigForNewslette  
r|getStoreConfigForMiniCart|GetFilterInputsForModal|storeConfigData.*copyright|7bto  
ptextsec_general_enable|getStoreName|getRootCategoryId|Rootcategories|CategoriesByI  
d|getPriceData)" ){  
        set resp.http.Pragma = "cache";  
        unset resp.http.Expires;  
        set resp.http.Cache-Control = "max-age=300, public, s-max-age=0";  
    }  
}
```



Cache graphql in browser (contd)

- Fancier Candidates
 - Mega Menu graphql – 86400 (1 day)
 - Category (PLP) graphql – 300 (5 minutes) – so if from PDP a back button will be faster
Risk : what if currency changes? It does not vary on cookies or headers
Better such logic is kept in frontend
- Graphqls that are not good candidates for caching in browser
 - Cart
 - Currency



UI Build

- Webpack : ids should be hashes not version
(Standard builds already do this)
- Decide on the bundle size and number of bundles

Less bundles => small change results in large invalidation

✎ main_style.9fc8d4cf.chunk.css	88.0 kB
✎ products_style.5918d943.chunk.css	21.2 kB
✎ cart_style.b105d03e.chunk.css	6.8 kB
✎ account_style.90e2821f.chunk.css	6.8 kB
✎ widget_style.6e5439ad.chunk.css	2.7 kB



UI Build

<input type="checkbox"/> ⚙ 2.0f4b70a2b14de502d263.js	11.0 kB
<input type="checkbox"/> ⚙ 20.7e50f699a5665cc90397.js	22.2 kB
<input type="checkbox"/> favicon.ico	8.1 kB
<input type="checkbox"/> ⚙ 21.031eedb5f5825a2b94ee.js	5.2 kB
<input type="checkbox"/> ⚙ 22.ae20df01d5fda26f7392.js	13.2 kB
<input type="checkbox"/> ⚙ 23.a89be9848aab308c441f.js	8.4 kB
<input type="checkbox"/> ⚙ 24.3fe4369775c40a10c1d9.js	19.0 kB
<input type="checkbox"/> ⚙ 25.d45ce4f3078710ffe439.js	7.8 kB
<input type="checkbox"/> ⚙ 26.c112bdfd2551d0992038.js	17.0 kB
<input type="checkbox"/> ⚙ 27.b789de2ab126e67ea178.js	18.1 kB
<input type="checkbox"/> ⚙ 28.b3fb5fc00c25b12899f5.js	10.3 kB
<input type="checkbox"/> ⚙ 29.59eea594ba4fb9b90638.js	7.1 kB
<input type="checkbox"/> ⚙ 3.6d6f9abb3039880b993e.js	5.4 kB
<input type="checkbox"/> ⚙ 30.f915aeb160a971f12b41.js	10.5 kB
<input type="checkbox"/> ⚙ 31.931caa299259518fa628.js	9.6 kB
<input type="checkbox"/> ⚙ 32.38f394fbda6709f76cc8.js	9.8 kB
<input type="checkbox"/> ⚙ 33.448dc2f177537cccf2b9.js	6.8 kB
<input type="checkbox"/> ⚙ 34.1fcaa09dc8fe9366c209.js	7.0 kB
<input type="checkbox"/> ⚙ 35.e6b3d87e573745ca9214.js	11.5 kB



UI Build : Cookie free domains

- Simple change in webpack can load static resources from a cookie free domain
- Cookie free domains mean you don't need to pass entire site through a CDN

```
output: {  
  path: path.resolve(__dirname, '../../dist'),  
  publicPath: 'https://static.samyakk.com/dist/',  
  filename: '[name].[hash].js'  
},  
resolveLoader: {
```



samyakk.com
Vue Storefront (vsf1)



Thanks

Pradip Shah

Co-Founder, luroConnect

pradip@luroconnect.com | @luroconnect

luro Connect
Managed Hosting Platform

