Advanced performance optimizations

By Peter Elmered

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About me

Peter Elmered

E-commerce / Web Developer
at Optimal Norge
(Mostly Magento, Wordpress & WooCommerce)
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Plugin developer

Big Wordpress and open source fan

Twitter & GitHub: pelmered

BTW: Oslo is a great place to live and work with web development
Contact me if you are interested. I'll help you get settled in.

AGENDA

Performance
Why? And **How?**

Why should I care about performance?

Why should I care about performance?

- User experience
- Conversion
- SEO
- Etc....

What makes a website REALLY fast?

http://homeautomateit.com

Tested from on March 5 at 10:14:36

Perf. grade	Requests	Load time	Page size
100/100	**15**	**365**ms	**173.5**kB

Your website is **faster than 98%** of all tested websites

DOWNLOAD HAR

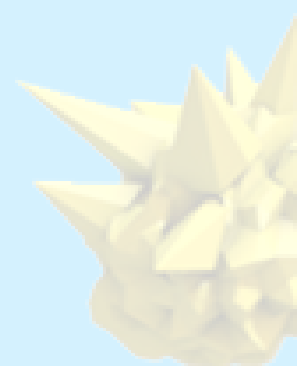🐦 Tweet   f Post to Timeline   ✉ Email

Norrköping 2014

25-27 april

Yes... it's

CACHING!

WordCamp

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What is cache?

To store frequently accessed data in a faster storage medium for faster access

Or to temporarly store data in a precomputed format that is faster to read or use

The important thing is:

It speeds things up.

Some principles of caching on the web

- Cache everything that is possible to cache
  (should probably be everything in one way or an other)

- Cache where it's fast for the user to access

  – Close to user (low latency)

  – On fast storage mediums

    - RAM is fast, HDD... not so much.

  – Store the data that requires as little processing as possible

    - Faster and saves server resources

Typical types of cache for a WP site

- Browser cache

- Opcode cache

- Object cache

- Database cache

- Database engine cache(query cache, buffer pool etc.)

- Full page cache (Generated HTML)

Full page cache

- Saves the generated pages(HTML)

- Serves subsequent request to the same page from cache

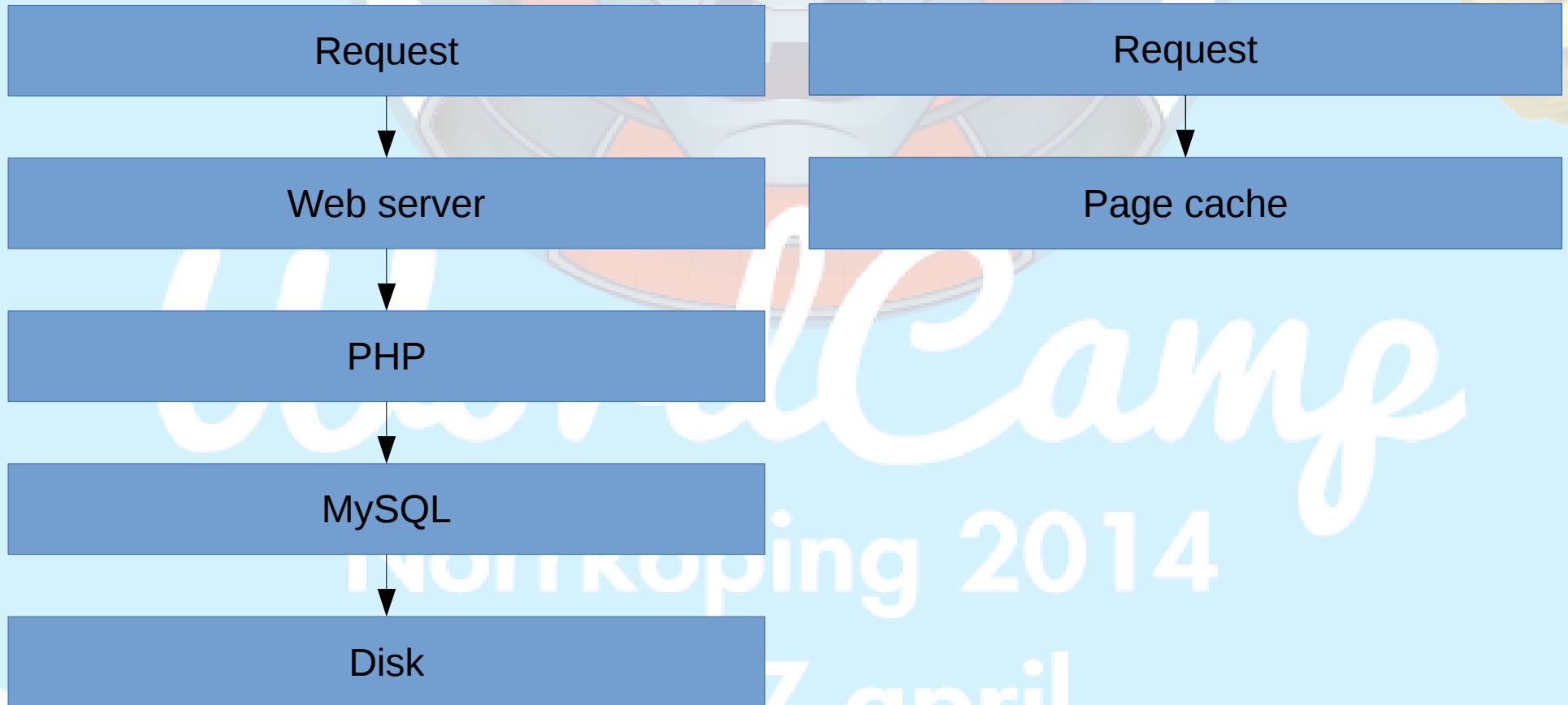- Expires after a set time (TTL) or when you update a post.

Normal request
0.5 – 5+ s

Request

↓

Web server

↓

PHP

↓

MySQL

↓

Disk

Full page cache
1 ms

Request

↓

Page cache

That was easy!

Just use page cache for everything

Right...?

Well... Almost

This is where it starts to get a bit more complicated

🙂

The problem with e-commerce sites
and other sites with user specific content

- You can't serve the exact same HTML to every customer

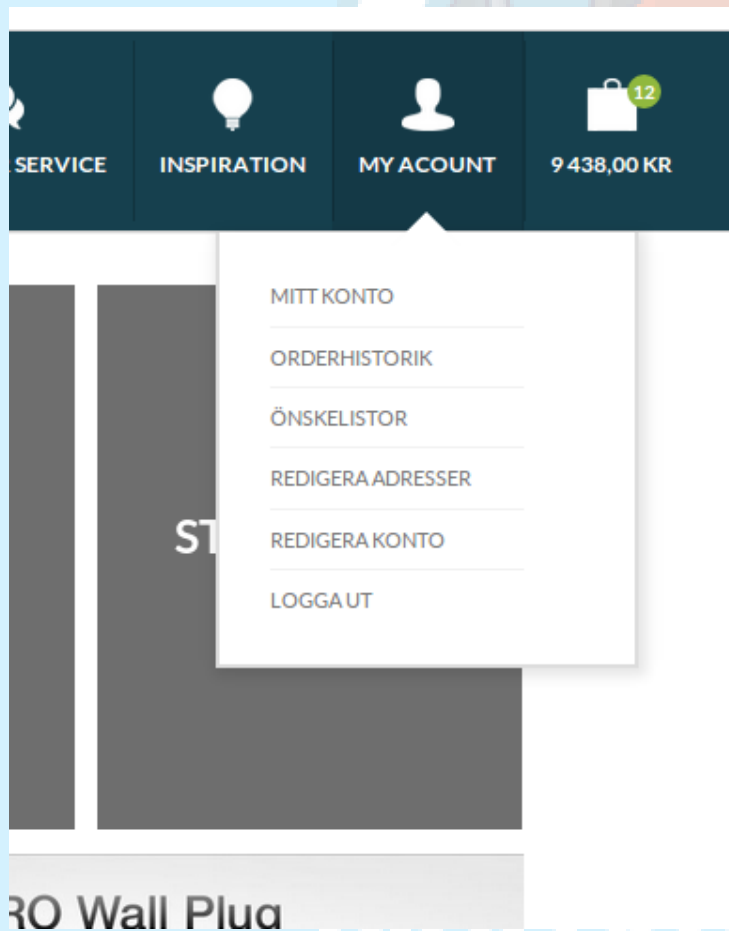- Carts

- Login / user details

- Personalized content

The problem with e-commerce sites

User logged in (left panel):
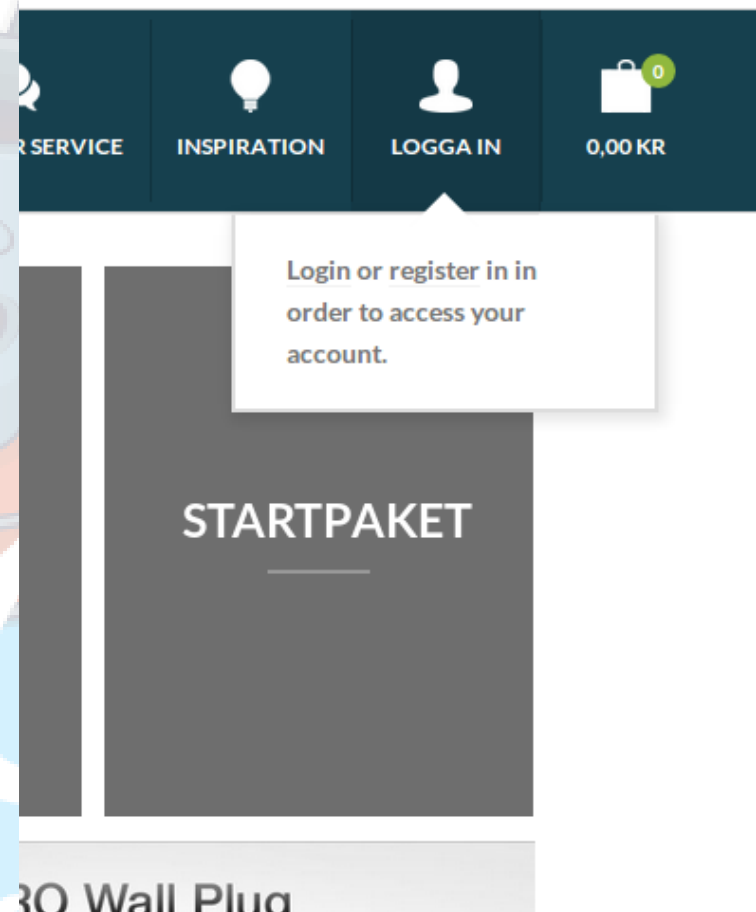
SERVICE   INSPIRATION   MY ACOUNT   9 438,00 KR   12

MITT KONTO

ORDERHISTORIK

ÖNSKELISTOR

REDIGERA ADRESSER

REDIGERA KONTO

LOGGA UT

ST...

RO Wall Plug

User logged out (right panel):

R SERVICE   INSPIRATION   LOGGA IN   0,00 KR   0

Login or register in in order to access your account.

STARTPAKET

RO Wall Plug

WooCommerce fragments to the rescue!

Browser

Page cache

1. Normal request served by page cache

2. AJAX request Served dynamically by WP. Updates HTML / DOM

Wordpress

3. Store user data in the browser's session storage

MY ACOUNT   7 135,00 KR

Local storage
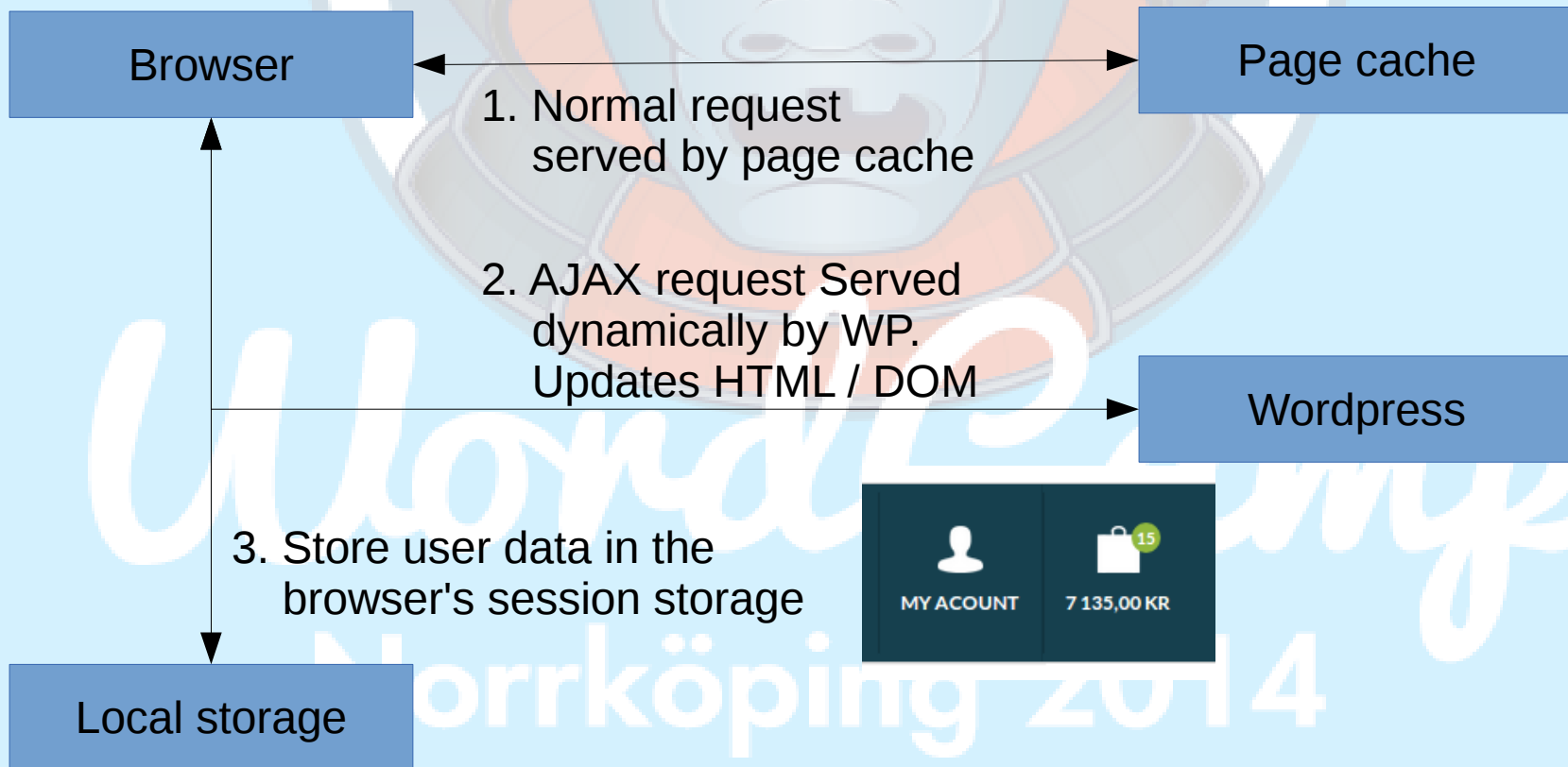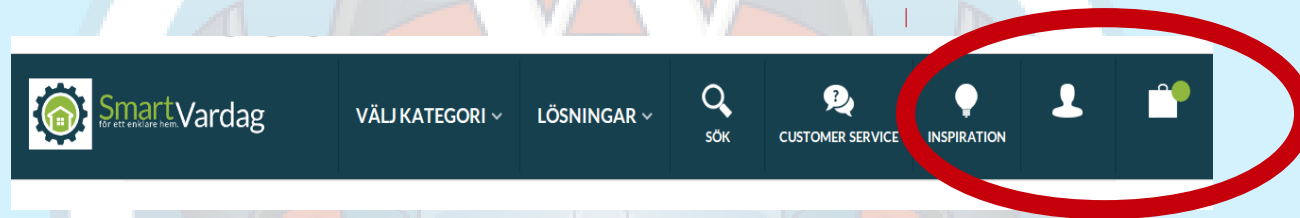
WooCommerce fragments

- AJAX request first page load of the session

- Loads user content straight from session storage in the browser for any subsequent page loads

- This is done in milliseconds after document.load() event and will not be noticable in most cases

WooCommerce fragments

- Included in WooCommerce by default

- Easy to use

```php
<?php
add_filter('add_to_cart_fragments', 'my_cart_fragment');

function my_cart_fragment( $fragments ) {
        global $woocommerce;

        ob_start();
        ?>
        <!-- Dynamic Cart HTML -->
        <?php
        $fragments['#header-cart'] = ob_get_clean();
        return $fragments;
}
```

Demo

WordCamp

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Session storage

- Browser support. All major browsers including IE8+.

- Covers more than 90% of the internet users.

- For unsupported browsers there will be an AJAX-request for every page load.

Typical load times

	First page load Page ready	Personalized content ready	Subsequent page loads	Personalized content ready
WC Fragment cache. Supported browser	0.5s	1.8s	0.5	0.5
WC Fragment cache. Unsupported browser	0.5s	1.8s	0.5	1.8s
No page cache	1.5s	1.5s	1.5s	1.5s

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Server performance and scalabilty

- Reduces server load greatly.
  - Instead of generating the full page for every request the server only need to generate selected parts once per session or on change.

- Easier and cheaper to scale.

Full page cache purging
With Nginx

- For purging the page cache when you save or publish a post you need two things:

  - the Nginx helper plugin
    https://wordpress.org/plugins/nginx-helper/

  - This Nginx module
    https://github.com/FRiCKLE/ngx_cache_purge

Cache is only fast
when its warm...

Cache is only fast when its warm

- Use a script to crawl you site to keep important pages in cache

- I use a modified version of Ramon Fincken's (MijnPress.nl) plugin "Warm Cache"

  – I will see if I can submit a pull request to this plugin. Otherwise I will just publish my code on GitHub.

  http://wordpress.org/plugins/warm-cache/

Don't forget to prevent this request from being cached

Nginx

```
if ($arg_warm_cache != "") {
    set $skip_cache 1;
}

...

location ~ .php$ {
    ...

    fastcgi_cache_bypass $skip_cache;
    fastcgi_no_cache $skip_cache;
}
```

Some additional performace tips

Change DB Engine to InnoDB

- Much better performance, especially if you have a lot of writes

- Increase InnoDB buffer pool
  Should be able to fit most of the database in the pool (Buy more RAM!)

- The only major drawback compared to MyISAM is the lack of full text index (effects search performance)
  Can be solved by adding software like Solr or ElasticSearch or 3rd-party serivices like loop54.com

Do not use bad plugins

- Find bad or misbehaving plugins
  - Divide and conquer
  - P3 - Plugin Performance Profiler
  - Profiling tools like Xdebug or New Relic
- Remove plugins that isn't used
- Many plugins can be replaced by smal code snipets or by external tools

Handling images

- Lossless compression of images on upload
    - EWWW Image Optimizer
      https://wordpress.org/plugins/ewww-image-optimizer/

- Are your clients uploading images straight from the camera?
    - Resize them to a sane size automatically with Imsanity
      http://wordpress.org/plugins/imsanity/

Questions?

This presentaion will be available later
I will also publish my Nginx config files

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