



Frontend performance with eZ Publish

eZ Winter Conference 2010
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Agenda



1. Frontend performance ?
2. Tools
3. Rules
4. How to with eZ Publish
5. Conclusion & questions



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Frontend performance ?



- How to speed up page loading time ?
- 80% of the end user response time is spent on front end
 - Small optimizations there can have great effects
 - Often easier than optimizing page generation
- Several studies show how important it is :
 - 25% to 50% of users say that they don't wait for a long page
 - With 100ms of latency, Amazon loses 1% of sales
 - With 500ms of latency, Google loses 20% of its traffic
- **Page loading time is really important in user experience**



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Tools



- Firefox extensions (in fact extensions of Firebug)
 - YSlow by Yahoo!
 - The former
 - Gives a rank to the tested page => useful to measure progress
 - Google Page Speed
 - Quite similar to YSlow
 - Some new tests (effectiveness of CSS rules, ...)
- External tools
 - <http://www.webpagetest.org>
 - Uses IE7 or IE8
 - Able to choose the location
 - Google Webmaster Tools for site wide stats



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Rules



- **Best practices by Yahoo!** : <http://developer.yahoo.com/performance/>
 - **The reference !**
 - 34 rules ordered by effectiveness
 - Most of them can be applied with a few efforts for great effects
 - Based on experiences and how browsers/HTTP work
- **General idea : « Less is better » :-)**
 - Less HTTP Requests
 - Less bytes to download
 - Less latency



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Fewer HTTP Requests



- **Rule 1 : Make fewer HTTP Requests**
 - The most important rule
 - Improve page loading time even if the browser's cache is empty
 - Each HTTP request implies a latency
 - Modern browsers can download 6 components per host at a time, others only 2 !
- **In practice**
 - For CSS/Javascript : ezjscore template operators
 - Others solutions
 - Merge files manually
 - Write a view that merge CSS depending on settings (bad)
 - CSS Sprites / image maps for images (not specific to eZ Publish)



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Far future Expires (1/2)



- **Rule 3 : Add an Expires or Cache Control header**
 - Purpose : maximize cache usage of browsers/proxies
 - Useful for regular visitors
 - Use a far future Expires header for external components
 - Possible issue : the browser does not download the new version of a file by using the one in its cache
- **In practice**
 - Web server configuration : mod_headers for Apache

```
ExpiresActive On
<Location /somewhere>
ExpiresByType image/png "access plus 6 months"
</Location>
```



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Far future Expires (2/2)



- URLs of the component is the key of the cache in the browser
 - Change the URL, the browser will download it again
- For design files (CSS, JS, img) many solutions :
 - Rename on change, for instance with a version number
 - Add a parameter in URL or with an operator if in templates
 - ezjscore : problem reported in issue #15811
- For images in /var/xxx/storage, the URL contains the version number

```
/var/x/storage/images/media/images/name/219971-3-fre-FR/name_variation.png
```



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Minify Javascript and CSS



- **Rule 10 : Minify Javascript and CSS**
 - Purpose : lower size of components
 - Faster to download
 - Important for Javascript because while downloading a JS file, the browser does not do anything else (will change in future release of Firefox)
 - More efficient Gzip compression if it is available (rule 4)
 - Some clients do not support Gzip components (due to some stupid Antivirus softwares or with IE6 behind a proxy !)
- **In practice**
 - Again ezjscore does it well !
 - Manual solution are also possible



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Configure ETags



- **Rule 13 : Configure ETags**
 - Purpose : indicates to the browser that the same files is served by many servers so it can use the same cache file
 - Useful in cluster mode with many front servers
- **In practice**
 - Web server configuration
 - By default, depends on the INode on the disk
 - for Apache, one line in apache2.conf :

```
FileETag Mtime Size
```



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Avoid 404



- *Rule 22 : No 404s*
 - Error pages (HTTP code 4XX) are not cached by browsers
 - Dynamic error pages are very slow compared to a static page
 - Can also be responsible of server side heavy load
- *In practice*
 - Look at your web server and eZ Publish log files !
 - Use Firebug network panel to track missing components
 - Usual missing files : /favicon.ico, images used in CSS or misspelled files linked with ezroot, ezdesign, ... operators.



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DNS lookup ? (1/2)



- *Rule 9 : Reduce DNS lookup*
- *Rule 20 : Split components accross domains*
- *Rule 24 : Use cookie-free domains for components*
 - Rules 9 and 20 are in conflict
- *In practice*
 - Compromise !
 - 3 DNS lookup for a page are acceptable
 - For instance :
 - www.domain.com for the page and images in contents
 - static.domain.com for design stuffs (CSS, Javascript, ...)
 - Another one for ads or for an external stats tools



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DNS lookup ? (2/2)



- Benefits :
 - Browsers can download more at a time (6 downloads/host)
 - static.domain.com can use a specific setup for static files (lighttpd, varnish,...) to reduce latency
 - No cookie are send/received on static.domain.com
- Basic setup is very easy to install
 - Set DNS entry + add a server alias in web server config
 - Change URL of CSS/JS in <head> and that's all !
- Google or Yahoo! CDN for popular JS framework (YUI, jQuery, ...)
 - Pros : possibly already in browser cache, good network latency all over the world
 - Cons : add another DNS lookup, no control on it
 - Conclusion : perhaps use it for international sites ? (ez.no ;-))



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Optimize images (1/4)



- **Rule 29 : Optimize images**
 - Purpose : again less bytes to download !
 - Two topics here :
 - Choose the right image type : PNG, JPG, GIF ?
 - Optimize each file !
- **Image types :**
 - PNG8 : for images with a low number (<256) of colors and possibly with full transparency
 - Low number of colors (<256)
 - Full transparency
 - Lossless compression
 - Common use : bullet, simple background, action icons, ...



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Optimize images (2/4)



- GIF never ! Except for 90's animations ;-)
 - PNG8 ~ GIF
 - Optimized PNG8 are almost everytime smaller and when it's not the case, there are only a few bytes of difference
 - Even Internet Explorer 6 renders **PNG8** correctly!
- PNG 24
 - High number of colors (16M)
 - Lossless compression
 - Alpha transparency
 - Some « hacks » to make it works with Internet Explorer 6
- JPG
 - Photos
 - With the right quality (compromise between sharpness and size)



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Optimize images (3/4)



- **Optimizations**
 - PNG in design
 - Some image processing softwares are bad when producing PNG files (Photoshop!)
 - PNG Optimization softwares : pngcrush, optipng, ...
 - Optimization with no graphical impact
 - Can be a huge gain, ex from 4Kb to 800b !
 - JPG in design
 - Choose the right quality for design images
 - Strip EXIF meta data if not needed
 - From 10kb to 50Kb on most photos taken with a digital camera
 - Can be automated with jpegtran



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Optimize images (4/4)



→ The same applies to images uploaded in eZ Publish

- `image.ini/[MIMETypeSettings]/Quality`
- Strip EXIF meta data
 - When using GD it is « automatically » done
 - When using ImageMagick 2 solutions
 - Strip EXIF meta data on all aliases

```
# in settings/override/image.ini.append.php
[ImageMagick]
PreParameters=-strip
```

- Strip EXIF meta data on some aliases by applying a filter

```
[ImageMagick]
Filters[]=optimize=-strip
[small]
Filters[]=optimize
```



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Forgotten rules ?



- I told about 9 rules, where are the others 25 ?
 - The others 25 are useful too, but 30 minutes it's definitely too short :)
 - You should pay attention to the others :
 - Rule 2 : Use a Content Delivery Network (if you can afford)
 - Rule 4 : Gzip components (some lines of configuration)
 - Rule 5 & 6 : position of stylesheets and javascript files in HTML code
 - ...



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Questions ?

