



.....
Assembleur de cocktails digitaux 100% indépendant

**Quelques solutions facilitant la bonne
mise en œuvre des images responsives**

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Co-fondateur
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CLEVER AGE



@nhoizey



France
(6 agences)



Suisse



Hong Kong



Singapour



Montréal

A blacksmith with a long white beard is working in a workshop. He is using a hammer to shape a piece of metal on an anvil. The workshop is filled with various tools and equipment, including a large wheel on the left and a sign that says "KANTOOR" on the wall. The scene is dimly lit, with light coming from a window on the left.

Choisir les bons outils

Choisir les bons outils
Les Compressive Images

Les Compressive Images

Daan Jobsis, « Retina Revolution »

<https://www.netvlies.nl/tips-updates/design-interactie/retina-revolution>

Scott Jehl, « Compressive Images »

<https://www.filamentgroup.com/lab/compressive-images.html>

Prendre une image de très grande taille (au moins x2) et la compresser fortement, même si des artefacts sont visibles à 100%

Le poids est ainsi très réduit, mais le visuel reste satisfaisant grâce à la réduction dans le navigateur

Les Compressive Images

Base resolution

(300 x 200 px)

Retina resolution

(600 x 400 px)



Jpg compression 80 / 21 kb



Jpg compression 31 / 16 kb

(75% of base)

Les Compressive Images

Sauf que tout ceci nécessite pas mal de ressources, notamment CPU, mais surtout mémoire !

Tim Kadlec, « Compressive Images Revisited »

<https://timkadlec.com/remembers/2018-03-22-compressive-images-revisited/>

« The memory impact for both the original image and compressive image in Filament Group's post:

Resized image: $400 \times 300 \times 4 = 480,000$ bytes

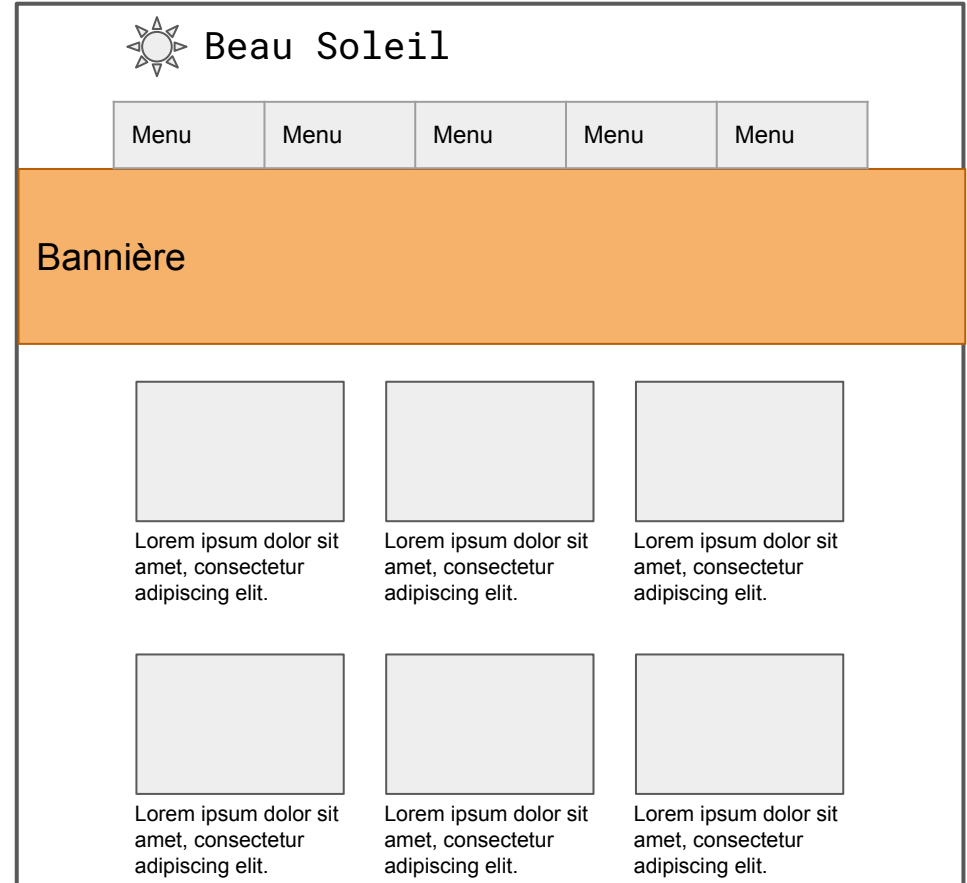
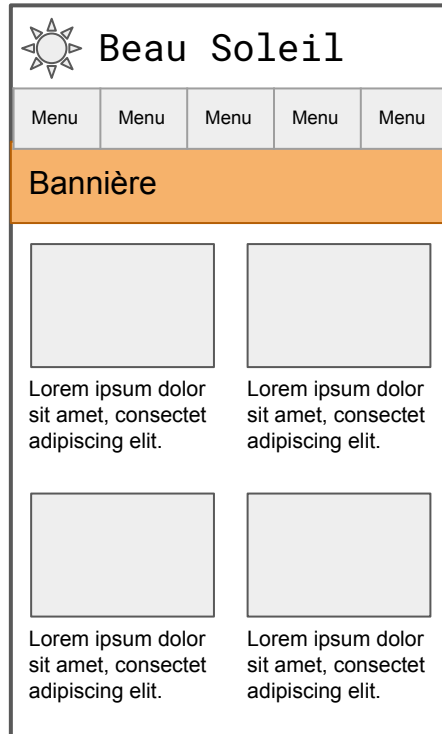
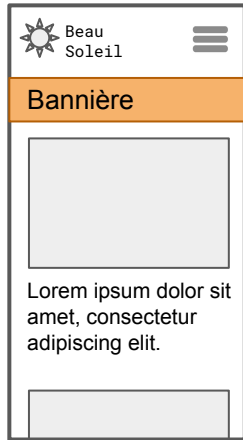
Compressive image: $1024 \times 768 \times 4 = 3,145,728$ bytes »



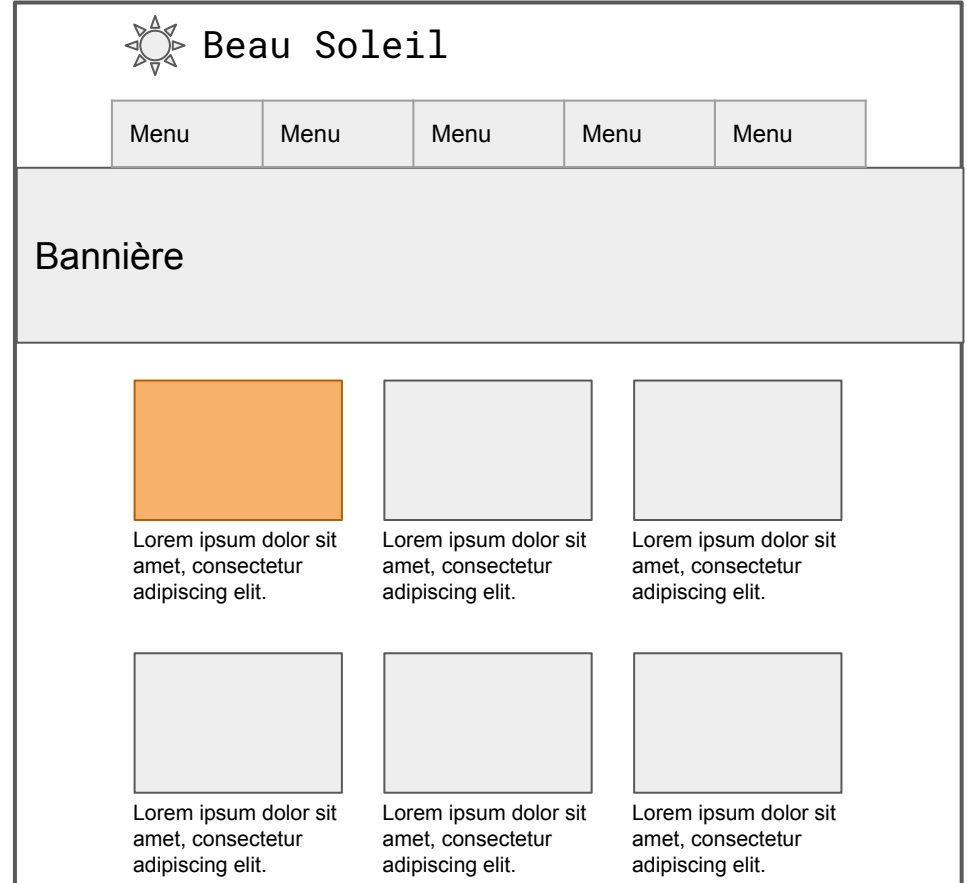
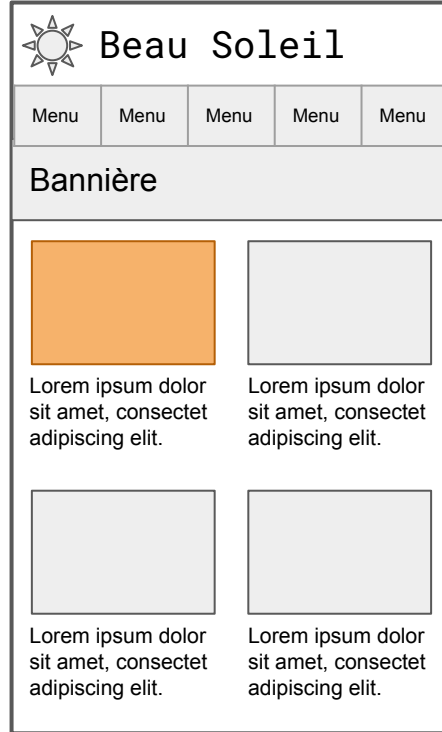
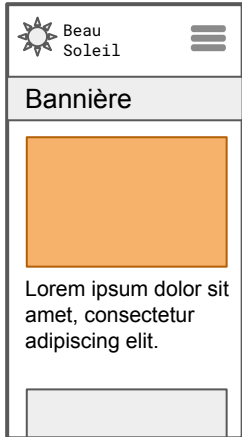
Choisir les bons outils
Le standard Picture

Un standard => plusieurs usages

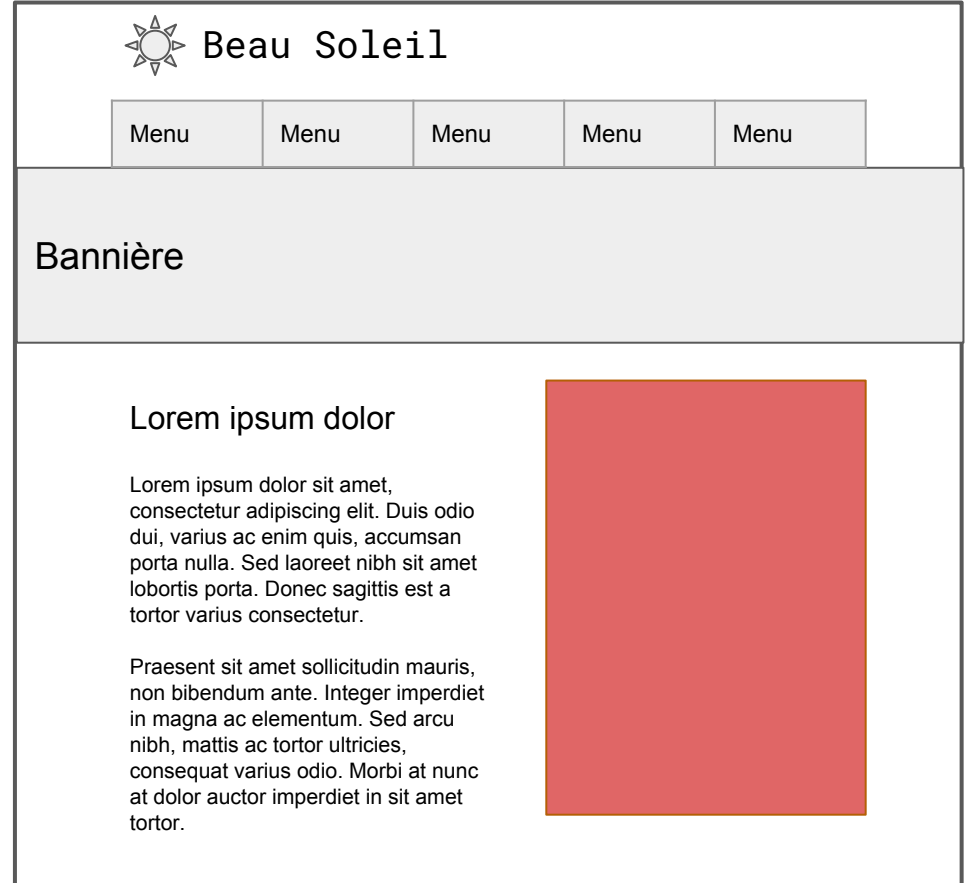
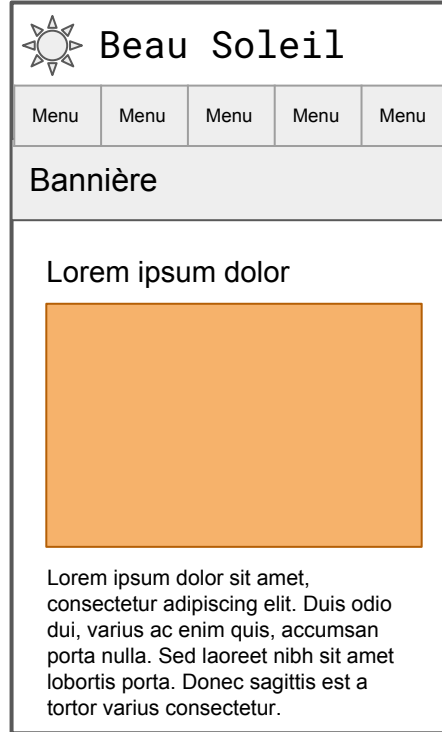
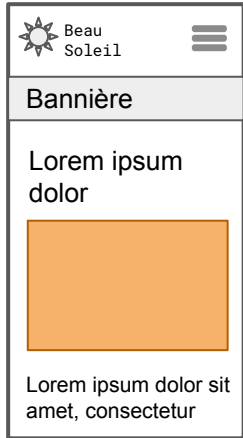
- Le standard « Picture » porte mal son nom
- Il apporte bien une nouvelle balise `<picture>` (et `<source>` déjà connue avec `<video>/<audio>`)
- Mais aussi des attributs `srcset` et `sizes` utilisables directement sur `<img>`
- Ce qui nous permet de gérer différents cas...



srcset-w et sizes

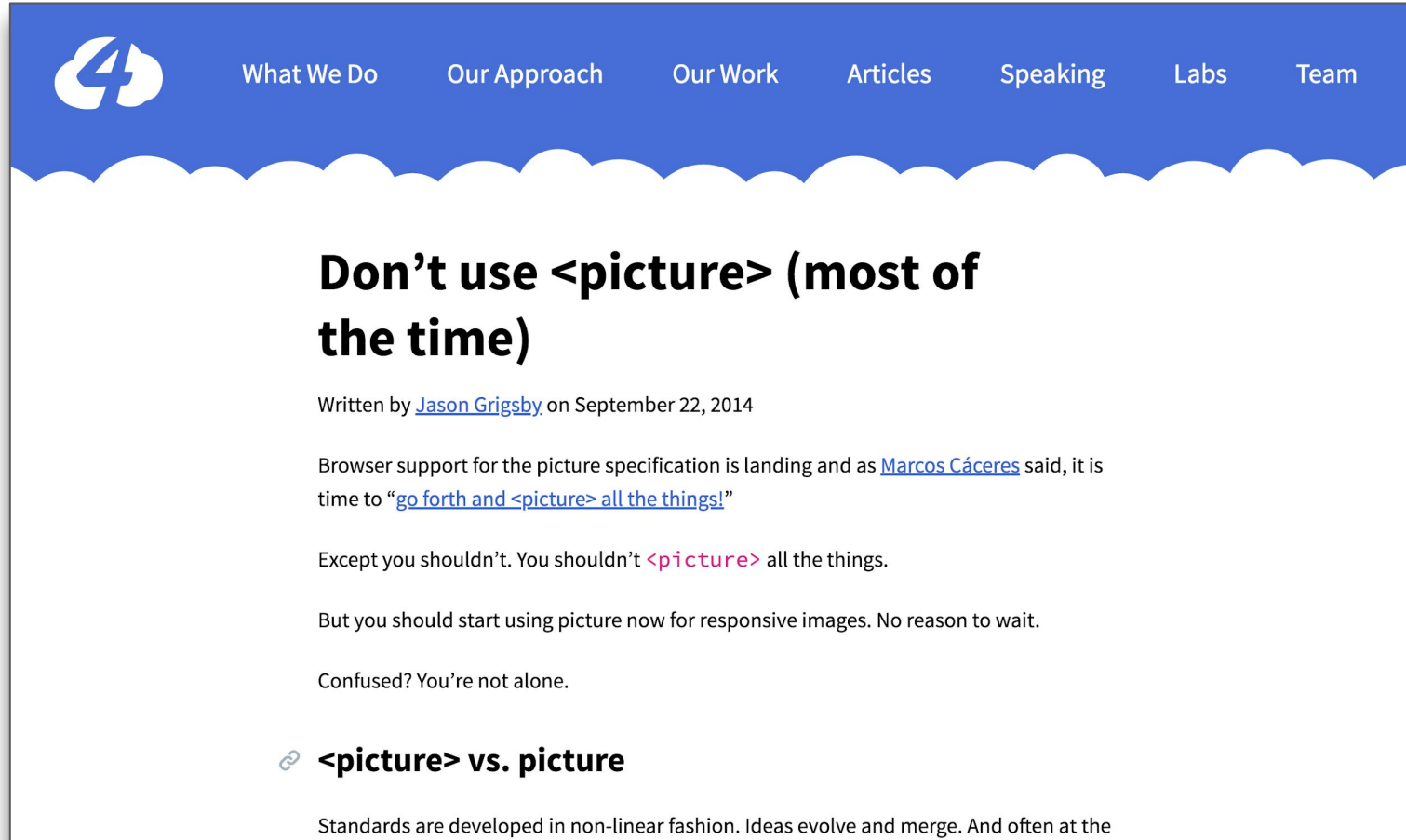


picture, source, srcset-w et sizes



Don't use `<picture>` (most of the time)

<https://cloudfour.com/thinks/dont-use-picture-most-of-the-time/>



The screenshot shows the CloudFour website with a blue header containing the logo and navigation links: What We Do, Our Approach, Our Work, Articles, Speaking, Labs, and Team. The main content area has a white background with a blue scalloped border at the top. The article title is 'Don't use `<picture>` (most of the time)' in bold black text. Below the title, it says 'Written by [Jason Grigsby](#) on September 22, 2014'. The text continues: 'Browser support for the picture specification is landing and as [Marcos Cáceres](#) said, it is time to “[go forth and <picture> all the things!](#)”'. Then, 'Except you shouldn't. You shouldn't `<picture>` all the things.' followed by 'But you should start using picture now for responsive images. No reason to wait.' and 'Confused? You're not alone.' At the bottom, there is a link icon followed by the section title '`<picture>` vs. picture' and the start of a paragraph: 'Standards are developed in non-linear fashion. Ideas evolve and merge. And often at the'.

CloudFour logo

What We Do Our Approach Our Work Articles Speaking Labs Team

Don't use `<picture>` (most of the time)

Written by [Jason Grigsby](#) on September 22, 2014

Browser support for the picture specification is landing and as [Marcos Cáceres](#) said, it is time to “[go forth and <picture> all the things!](#)”

Except you shouldn't. You shouldn't `<picture>` all the things.

But you should start using picture now for responsive images. No reason to wait.

Confused? You're not alone.

[<picture> vs. picture](#)

Standards are developed in non-linear fashion. Ideas evolve and merge. And often at the



**Choisir les bonnes
tailles d'images**

Choisir les bonnes tailles d'images

Quelles tailles d'images mettre dans les `srcset` ?

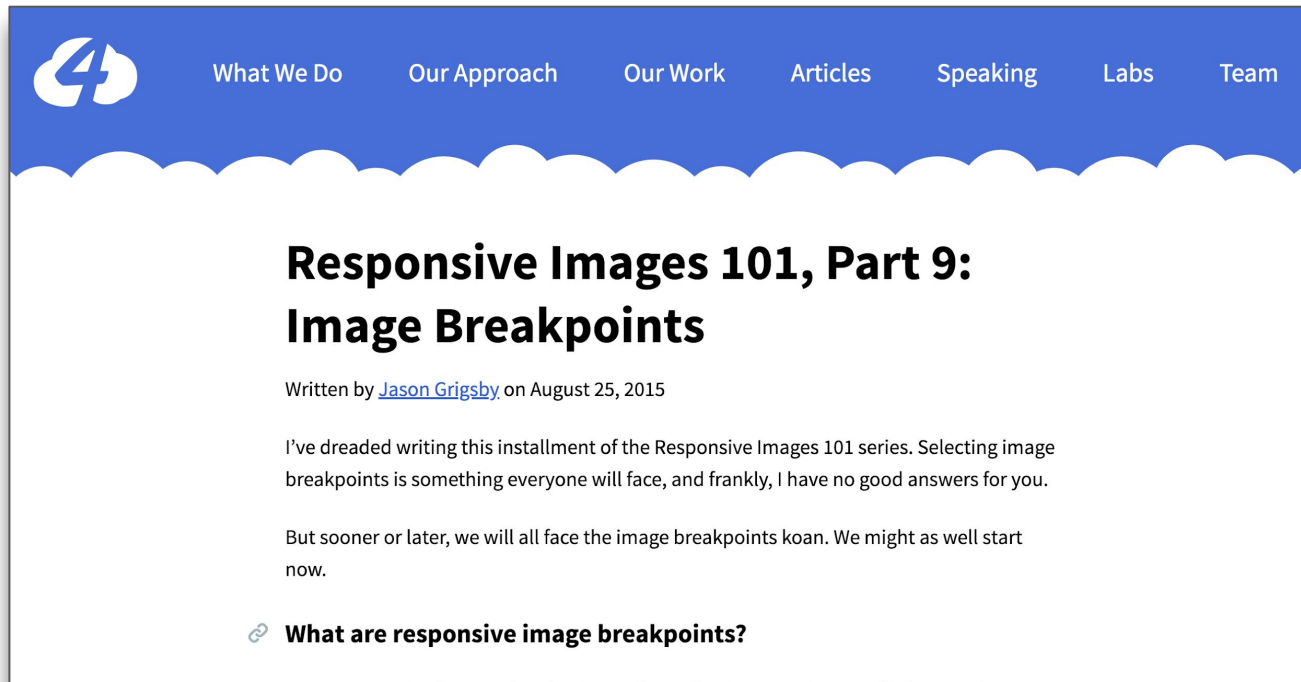
Il faut éviter les tailles arbitraires, identiques pour toutes les images :

- Toutes les images n'occupent pas le même espace dans les pages
- Un vrai responsive est fluide, s'adapte à toutes les largeurs de viewport, qui varient dans le temps

Les breakpoints d'images

Jason Grigsby (Cloudfour) évoque la notion de breakpoints d'images

<https://cloudfour.com/thinks/responsive-images-101-part-9-image-breakpoints/>





Choisir les bonnes tailles d'images
Le budget de performance

Les breakpoints d'images

- Le budget de performance

Setting image breakpoints based on a performance budget

What if we applied the idea of a performance budget to responsive images? What would that look like?

We'd start by defining a budget for the amount of wasted bytes that the browser would be allowed to download above what is needed to fit the size of the image in the page.

So say that we decided that we had a performance budget of 20K for each responsive image. That would mean that we would need to make sure that the various sources that we've defined for the image are never more than 20K apart.

Responsive Image Breakpoints Generator

Un outil pour définir les tailles selon un budget de performance, développé par Cloudinary suite aux billets de Jason Grigsby, et disponible via une interface ou via l'API :

<http://www.responsivebreakpoints.com/>

Paramètres :

- Différence de poids entre variantes
- Nombre total d'images
- Prise en compte de la densité x2
- Direction Artistique

Responsive Image Breakpoints Generator



Responsive Image Breakpoints Generator v2.0

Like 190 Share

Tweet

Partager

in Share

Easily generate the optimal responsive image dimensions

One image for all screen resolutions and different devices is not enough. An image per pixel is too much - so how can someone automatically choose the optimal responsive image sizes? [Learn more...](#)

UPLOAD FILE

Or select one of the predefined images



Breakpoints generation settings

Resolution ? From 320 To 1200
50 200 480 1080 2180 3840

Size step ? Size (KB) 50
5KB 25KB 45KB 65KB 85KB

Maximum images ? Quantity 5
3 10 18 25 33 40

Retina resolution

☒ Include double resolution (DPR 2.0) images

Art-direction - Image aspect-ratio and view-port ratio

Desktops	Small laptops	Tablets	Smartphones
Original	16:9	4:3	1:1
40%	60%	70%	100%

REGENERATE

Responsive Image Breakpoints Generator

ORIGINAL ASPECT RATIO



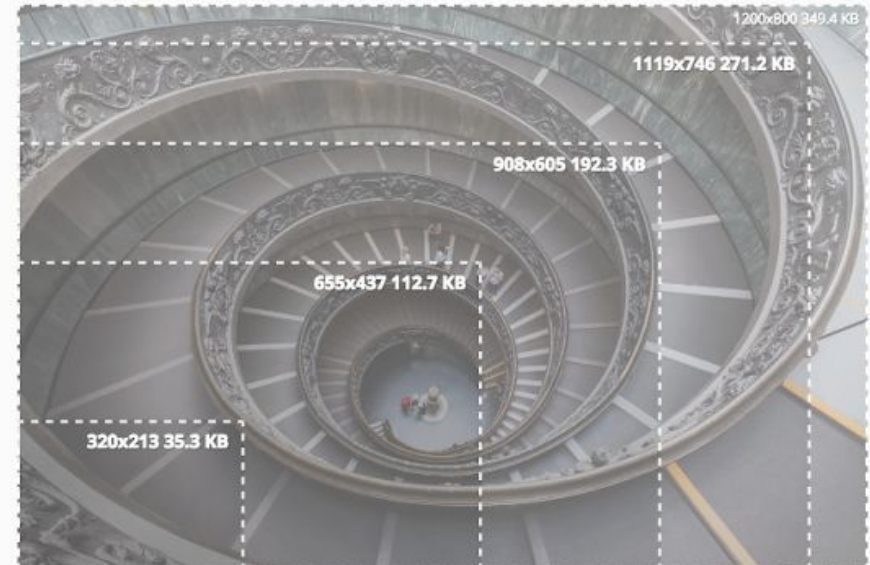
* Try and resize the browser window to see responsive behavior

HTML5 img tag example

```

```

Nº	Width	Height	File size	
1	320	213	35.3 KB	View image
2	655	437	112.7 KB	View image
3	908	605	192.3 KB	View image
4	1119	746	271.2 KB	View image
5	1200	800	349.4 KB	View image



Choisir les bonnes tailles d'images
Les dimensions les plus courantes

Les breakpoints d'images

- Les requêtes les plus fréquentes

Setting image breakpoints based on most frequent requests

At a recent [Responsive Images Community Group \(RICG\)](#) meeting, [Yoav Weiss](#) and [Ilya Grigorik](#) discussed a different way of picking image breakpoints based on the most frequently requested image sizes.

For both Yoav, who works at Akamai, and Ilya, who works at Google, one of the problems they see with multiple image sources is storing all of those sources on [edge servers](#) where storage is usually more limited and costs are higher.

Les dimensions les plus courantes

Une mise en œuvre très artisanale chez des clients, emplacement par emplacement, sur les principales images.

Nécessite des données statistiques, et beaucoup de calculs.

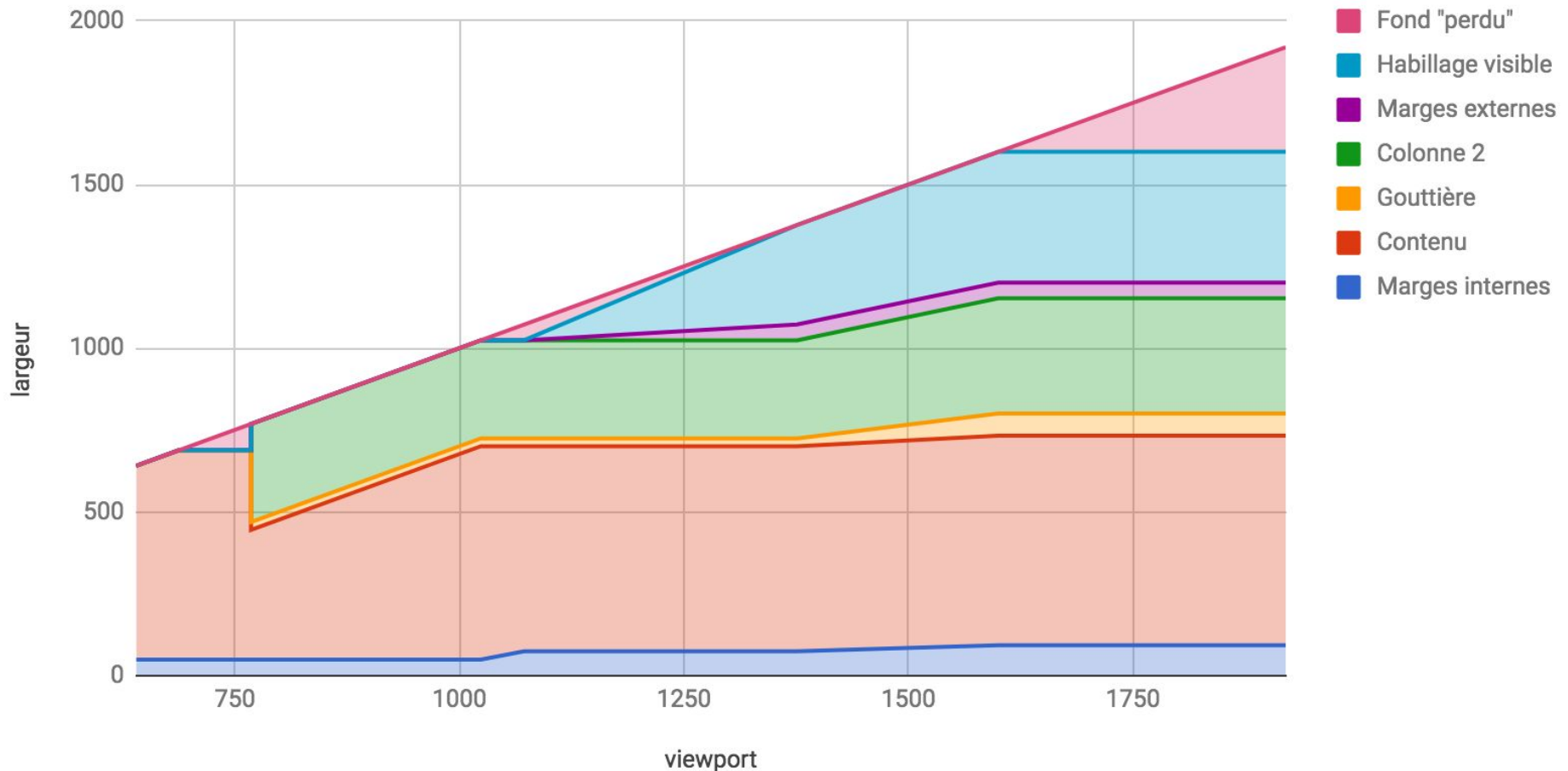
Les dimensions les plus courantes

Étape 1 : établir le graphe de variation théorique de largeur des éléments du layout selon la largeur de viewport

Contenu global	Viewport	Marges internes	Contenu	Gouttière	Colonne 2	Marges externes	Habillage visible	Fond "perdu"	max-width sur contenu + marges	
640	640	48	592	0	0	0	0	0		
688	688	48	640	0	0	0	0	0		
688	767.99	48	640	0	0	0	0	79.99		
768	768	48	396	24	300	0	0	0		Breakpoints
1024	1024	48	652	24	300	0	0	0		Tweakpoints
1024	1072	73	627	24	300	0	0	48	1024px	
1024	1376	73	627	24	300	48	304	0		
1152	1600	92	640	68	352	48	400	0	1152px	
1152	1920	92	640	68	352	48	400	320		

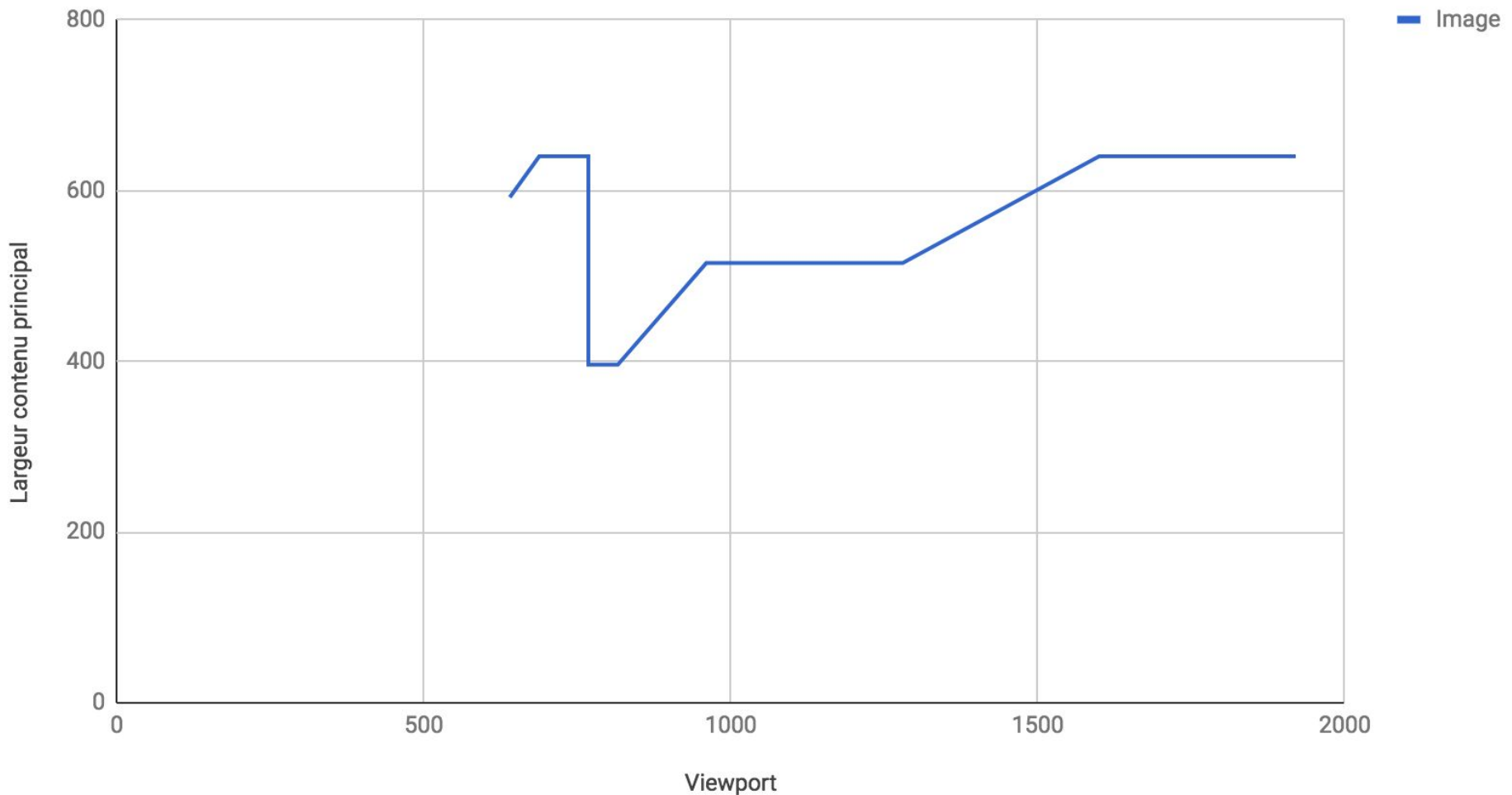
Les dimensions les plus courantes

Étape 1 : établir le graphe de variation théorique de largeur des éléments du layout selon la largeur de viewport



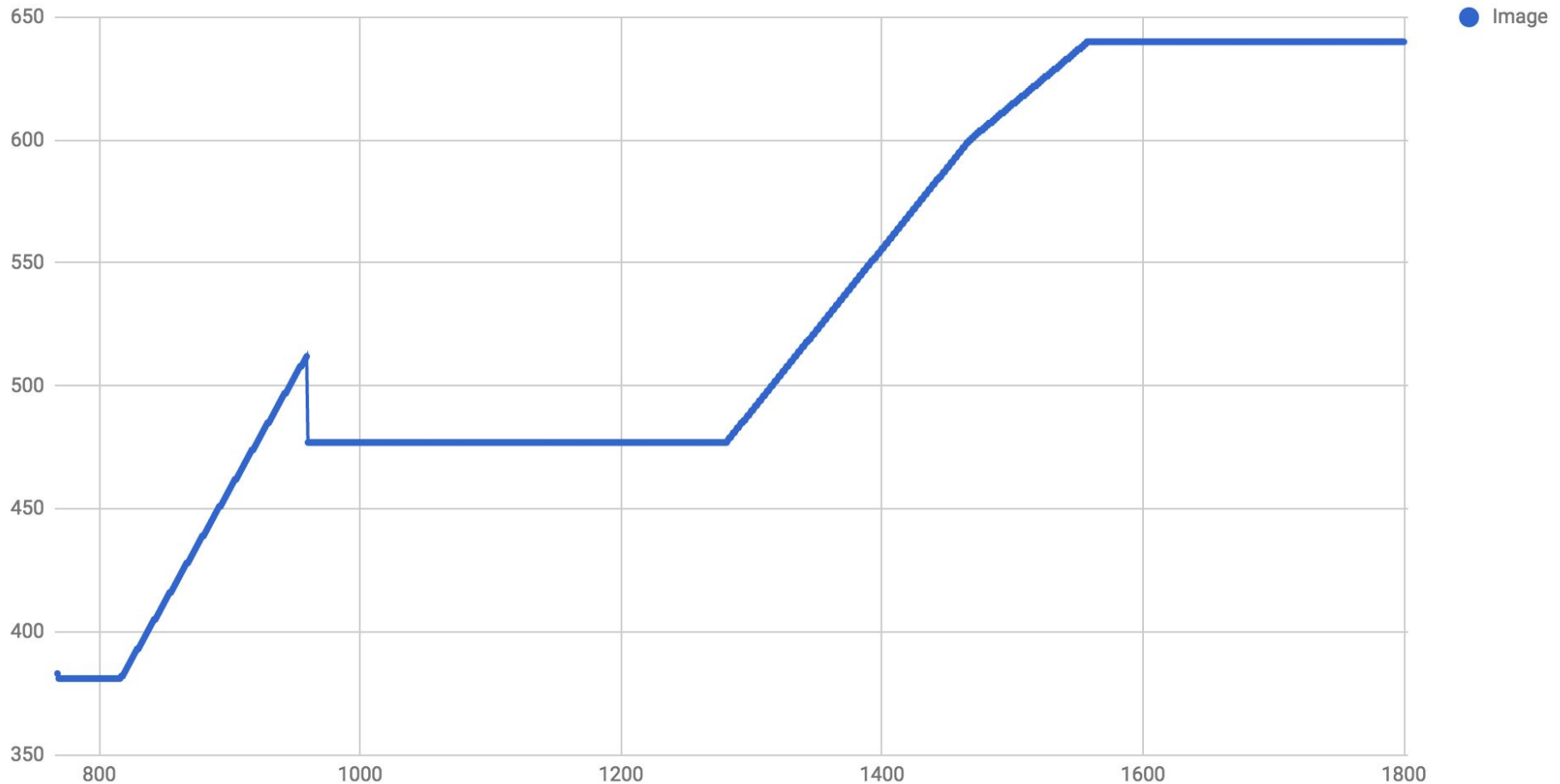
Les dimensions les plus courantes

Étape 2 : extraire la variation théorique de la largeur d'image selon le viewport



Les dimensions les plus courantes

Étape 3 : vérifier la variation réelle de la largeur d'image selon le viewport



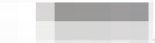
Les dimensions les plus courantes

Étape 4 : collecter les statistiques de viewports et densité d'écran des visiteurs pendant quelque temps

	A	B	C	D
1	Dppx	Viewport	Pages vues	
2	1	1920		
3	1	1366		
4	1	1280		
5	1	1600		
6	1	1680		
7	2	1024		
8	1	1440		
9	1	1024		
10	1.25	1536		
11	2	768		
12	1.5	1280		
13	2	1280		
14	1.25	1280		

Les dimensions les plus courantes

Étape 5 : normaliser ces statistiques par paliers de 50px pour le viewport, et de 10px pour les images

	A	B	C	D	E	F	G	
1	Viewport	Dppx	Pages vues			Taille affichée	Taille native souhaitée	
2	1950	1		16.79%		640	640	
3	1400	1		10.26%		556	560	
4	1300	1		10.18%		490	490	
5	1600	1		7.45%		640	640	
6	1700	1		6.38%		640	640	
7	1050	2		4.07%		477	960	
8	1450	1		3.80%		589	590	
9	1050	1		3.52%		477	480	
10	1550	1.3		1.82%		637	830	
11	800	2		1.26%		381	770	
12	1300	1.5		1.18%		490	740	
13	1300	2		0.79%		490	980	
14	1300	1.3		0.63%		490	640	
15	1400	1		0.55%		556	560	
16	1750	1.2		0.51%		640	770	
17	1000	2		0.49%		477	960	

Les dimensions les plus courantes

Étape 6 : consolider

	A	B	C
1	Image	Portion	
2		sum	
3	640	35.66%	
4	490	11.43%	
5	560	11.37%	
6	480	8.82%	
7	960	5.19%	
8	590	4.69%	
9	580	3.28%	
10	770	2.21%	
11	830	2.02%	
12	630	1.60%	
13	0	1.54%	
14	740	1.51%	
15	530	1.50%	
16	980	0.92%	
17	720	0.77%	
18	390	0.75%	
19	680	0.63%	
20	620	0.61%	
21	710	0.60%	
22	670	0.54%	
23	540	0.47%	
24	520	0.42%	
25	1180	0.30%	

Les dimensions les plus courantes

Étape 7 : identifier des valeurs cibles pertinentes

	A	B	C	D	E	F	G	
1	Image	Portion		"Pixel Perfect"	Proche	Surplus	Part concernée	
2		sum						
3	640	35.66%		640			0.00%	
4	490	11.43%		490			0.00%	
5	560	11.37%			590	5.08%	0.58%	
6	480	8.82%			490	2.04%	0.18%	
7	960	5.19%		960			0.00%	
8	590	4.69%		590			0.00%	
9	580	3.28%			590	1.69%	0.06%	
10	770	2.21%			830	7.23%	0.16%	
11	830	2.02%		830			0.00%	
12	630	1.60%			640	1.56%	0.03%	
13	0	1.54%					0.00%	
14	740	1.51%			830	10.84%	0.16%	
15	530	1.50%			560	5.36%	0.08%	
16	980	0.92%			960	-2.08%	0.02%	
17	720	0.77%			830	13.25%	0.10%	
18	390	0.75%			490	20.41%	0.15%	
19	680	0.63%			830	18.07%	0.11%	
20	620	0.61%			640	3.13%	0.02%	
21	710	0.60%			830	14.46%	0.09%	
22	670	0.54%			830	19.28%	0.10%	
23	540	0.47%			590	8.47%	0.04%	
24	520	0.42%			590	11.86%	0.05%	
25	1180	0.30%			960	-22.02%	0.07%	

Les dimensions les plus courantes

Étape 8 : valider

	A	B	C	D	E	F	G	H	I	J
1	Image	Portion		"Pixel Perfect"	Proche	Surplus	Part concernée		Image	Audience couverte
2		sum								
3	640	35.66%		640			0.00%		490	21.77%
4	490	11.43%		490			0.00%		590	20.48%
5	560	11.37%			590	5.08%	0.58%		640	37.95%
6	480	8.82%			490	2.04%	0.18%		830	8.87%
7	960	5.19%		960			0.00%		960	5.88%
8	590	4.69%		590			0.00%		960 trop petit	2.03%
9	580	3.28%			590	1.69%	0.06%			
10	770	2.21%			830	7.23%	0.16%			
11	830	2.02%		830			0.00%			
12	630	1.60%			640	1.56%	0.03%			
13	0	1.54%					0.00%			
14	740	1.51%			830	10.84%	0.16%			
15	530	1.50%			560	5.36%	0.08%			
16	980	0.92%			960	-2.08%	0.02%			
17	720	0.77%			830	13.25%	0.10%			
18	390	0.75%			490	20.41%	0.15%			
19	680	0.63%			830	18.07%	0.11%			
20	620	0.61%			640	3.13%	0.02%			
21	710	0.60%			830	14.46%	0.09%			
22	670	0.54%			830	19.28%	0.10%			
23	540	0.47%			590	8.47%	0.04%			
24	520	0.42%			590	11.86%	0.05%			
25	1180	0.30%			960	-22.92%	0.07%			

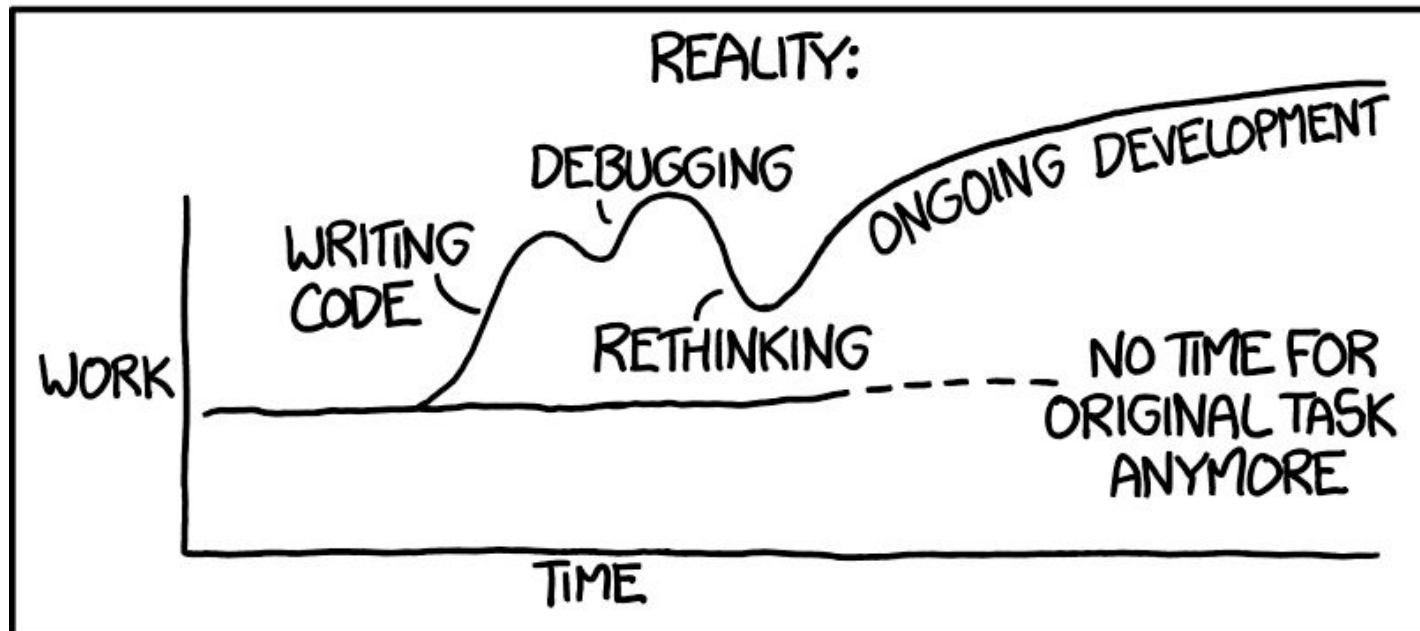
Les dimensions les plus courantes

Étape 9 : recommencer régulièrement

Les breakpoints d'images

🔗 Humans shouldn't be doing this

I believe that in a few years time, no one will be talking about how to pick responsive image breakpoints because no one will be doing it manually.



A photograph of a city street under construction. In the foreground, a man in a dark suit walks away from the camera. To his right, several construction workers in orange safety vests and hard hats are working. A large orange and white cement truck is parked on the street. In the background, there are tall city buildings and trees. A red stop sign is visible on the left side of the road.

Optimiser le poids des images



Optimiser le poids des images
Le bon choix de format

Diffuser les bons formats d'images

Selon la nature de l'image, le meilleur format ne sera pas le même.

Historiquement :

- petit logo/picto avec transparence simple : **GIF**
- tracé, graphe, logo, screenshot : **PNG**
- photo : **JPEG**
- image animée : **GIF**

Diffuser les bons formats d'images

Aujourd'hui :

- logo/picto, tracé, graphe : **SVG**
- ~~image animée~~ vidéo muette : **H.264** ou **Ogg**
- photo : **JPEG, WebP, JPEG-XR, JPEG-2000, etc.**

PNG 6 Ko



JPEG 38 Ko



SVG 2,5 Ko
(1,3 Ko gzipé)



PNG 171 Ko



JPEG 33 Ko



WebP 13 Ko



Diffuser les bons formats d'images

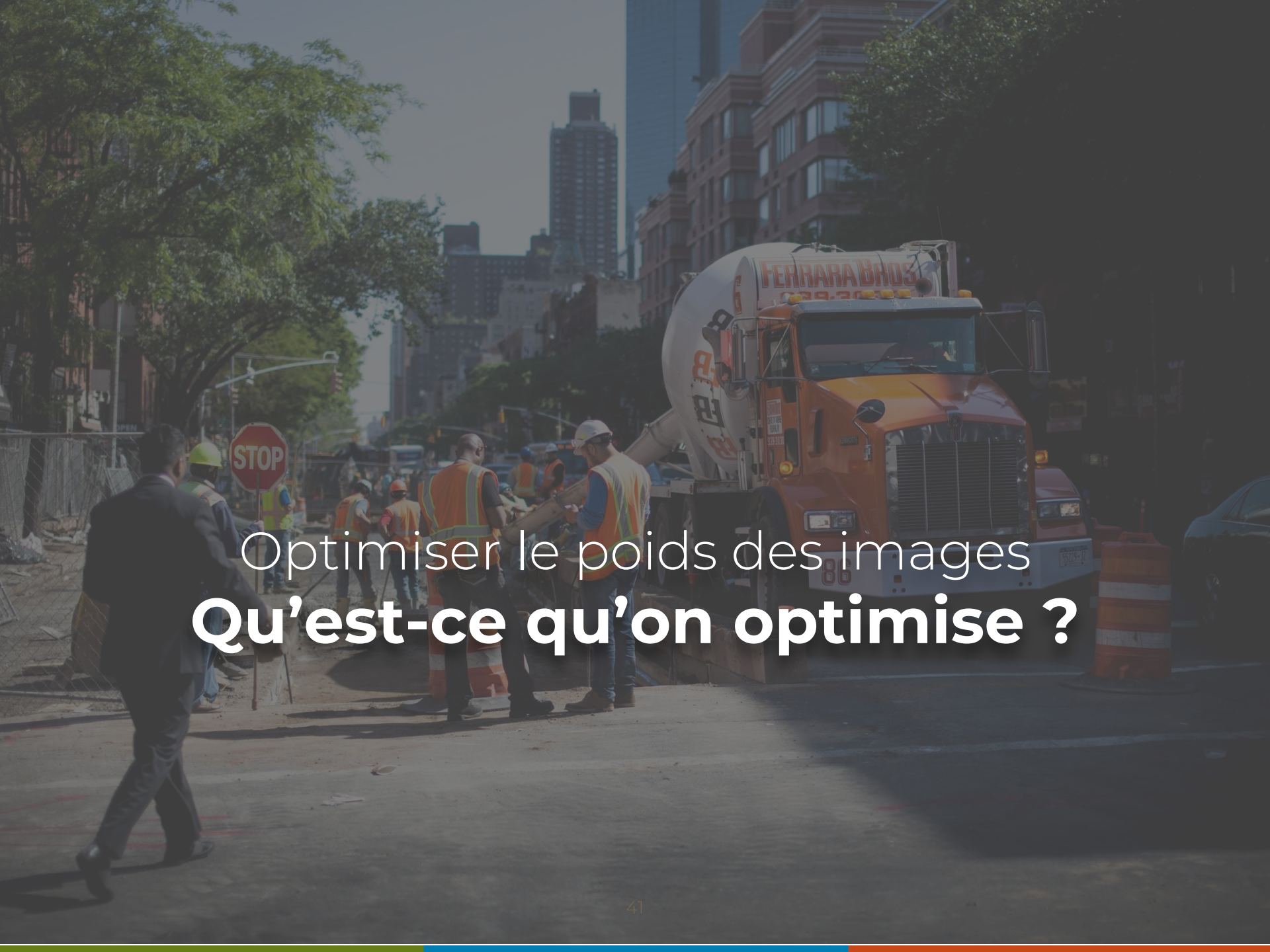
JPEG vs WebP vs JPEG-XR

<https://calendar.perfplanet.com/2013/browser-specific-image-formats/>

	WebP	JPEG XR
Chrome	>= 23	NO
Firefox	NO	NO
Internet Explorer	NO	>= 10
Safari	NO	NO
Opera	>= 12.1	NO

Sur plus de 2000 images issues de sites du top 100 :

		DSSIM		
		0.15	0.10	0.05
Average improvement over JPEG file size	WebP	%56.57	%51.58	%40.11
	JPEG XR	%26.74	%29.10	%27.67



Optimiser le poids des images
Qu'est-ce qu'on optimise ?

Qu'est-ce qu'on optimise ?

L'amélioration des algorithmes de compression

- Poids, durée de compression, de décompression

<http://www.gstatic.com/b/brotlidocs/brotli-2015-09-22.pdf>

LZMA

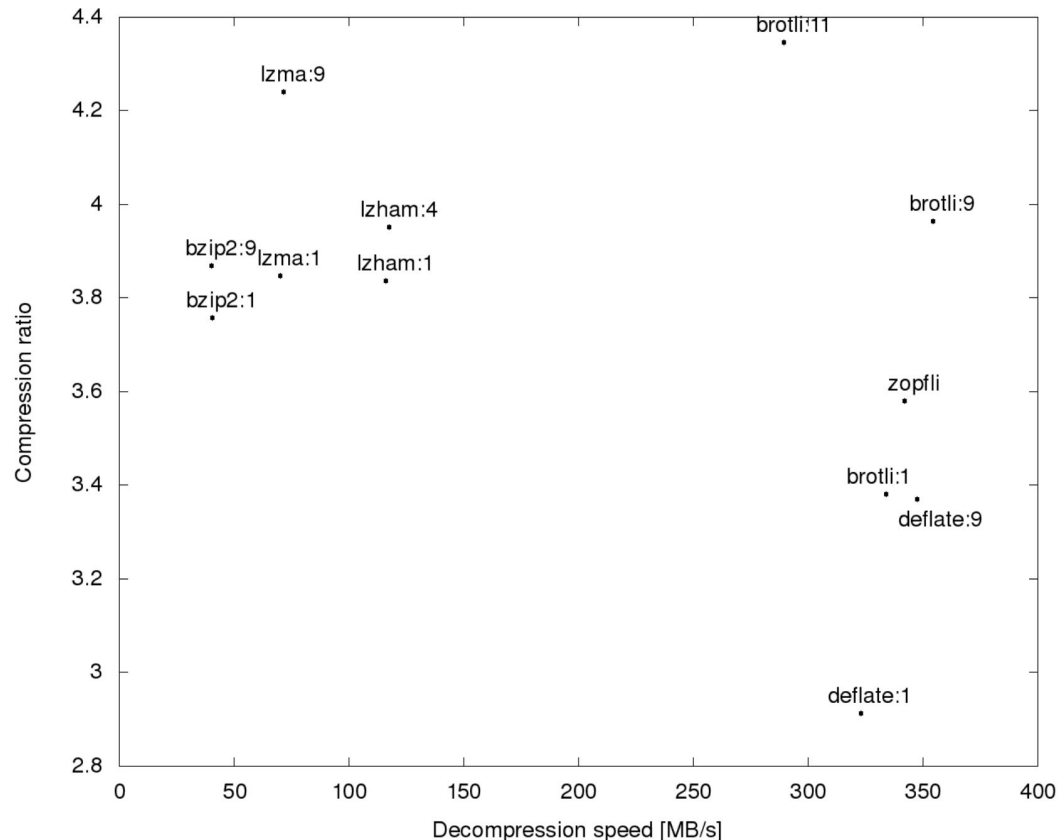
DEFLATE

Zopfli

Brotli

MozJpeg

...



Qu'est-ce qu'on optimise ?

Des optimisations « sans perte », en tout cas qui préservent le visuel de l'image

- Suppression de meta-données IPTC, EXIF
 - notamment la vignette en JPEG
 - préserver éventuellement le copyright
- Réduction sans perte de la palette de couleurs
- ...

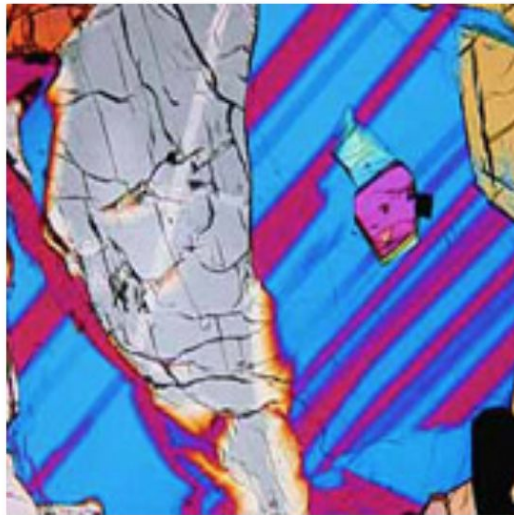
Qu'est-ce qu'on optimise ?

Des optimisations qui altèrent le visuel de l'image

- Réduction avec perte de la palette de couleurs

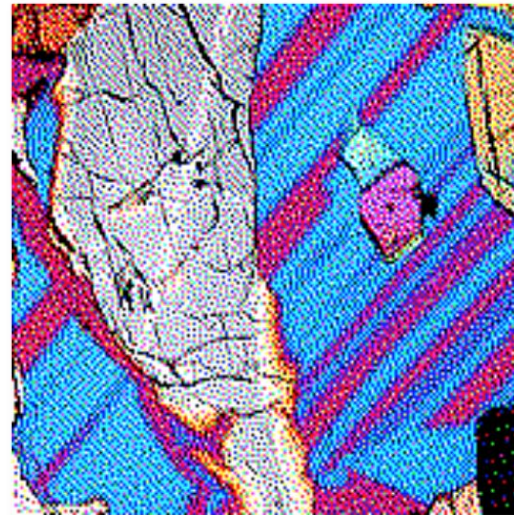
<https://www.olympus-lifescience.com/en/microscope-resource/primer/java/digitalimaging/processing/colorreduction/>

Specimen Image



23884 Colors

Color-Reduced Image

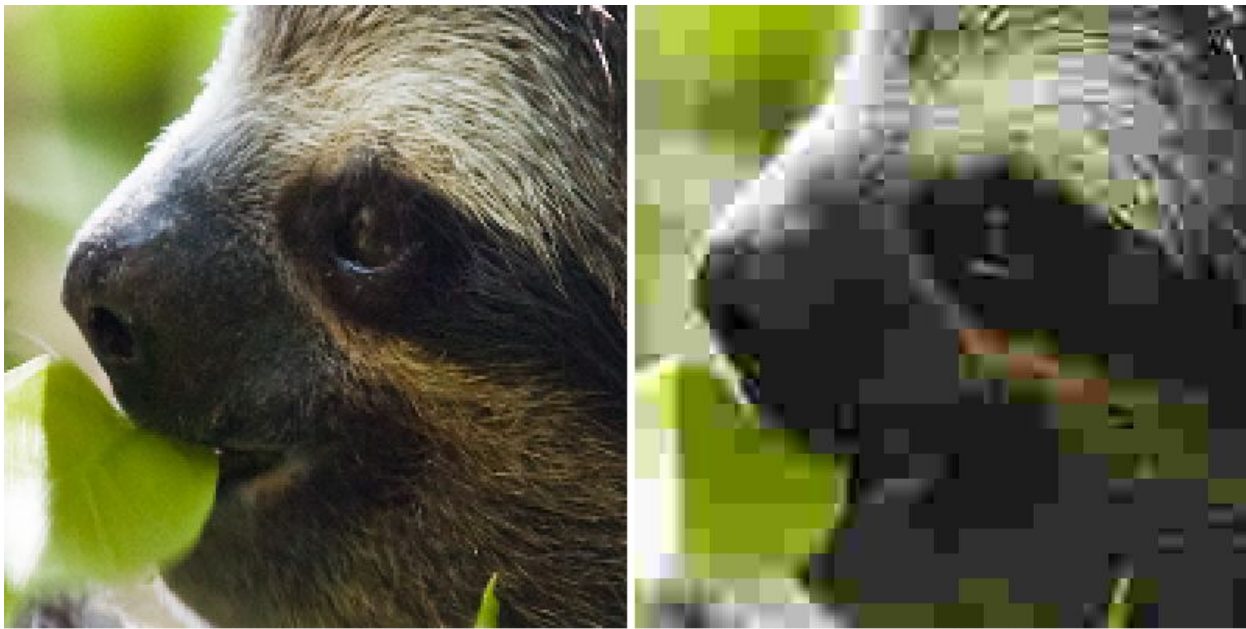


8 Colors

Qu'est-ce qu'on optimise ?

Des optimisations qui altèrent le visuel de l'image

- Augmentation du facteur de compression avec perte des formats bitmap



Original

JPEG (quality 5, DSSIM 0.6064)



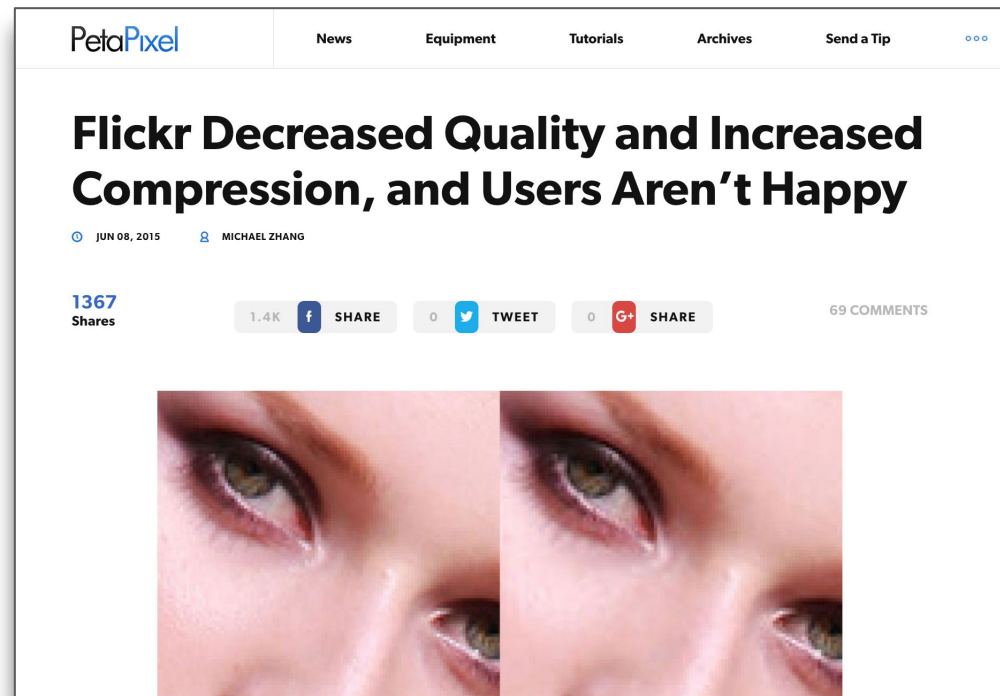
Optimiser le poids des images
Quel taux de compression ?

Quel taux de compression ?

Le but est de réduire au maximum le poids de l'image

Mais le rendu doit être suffisamment « propre »

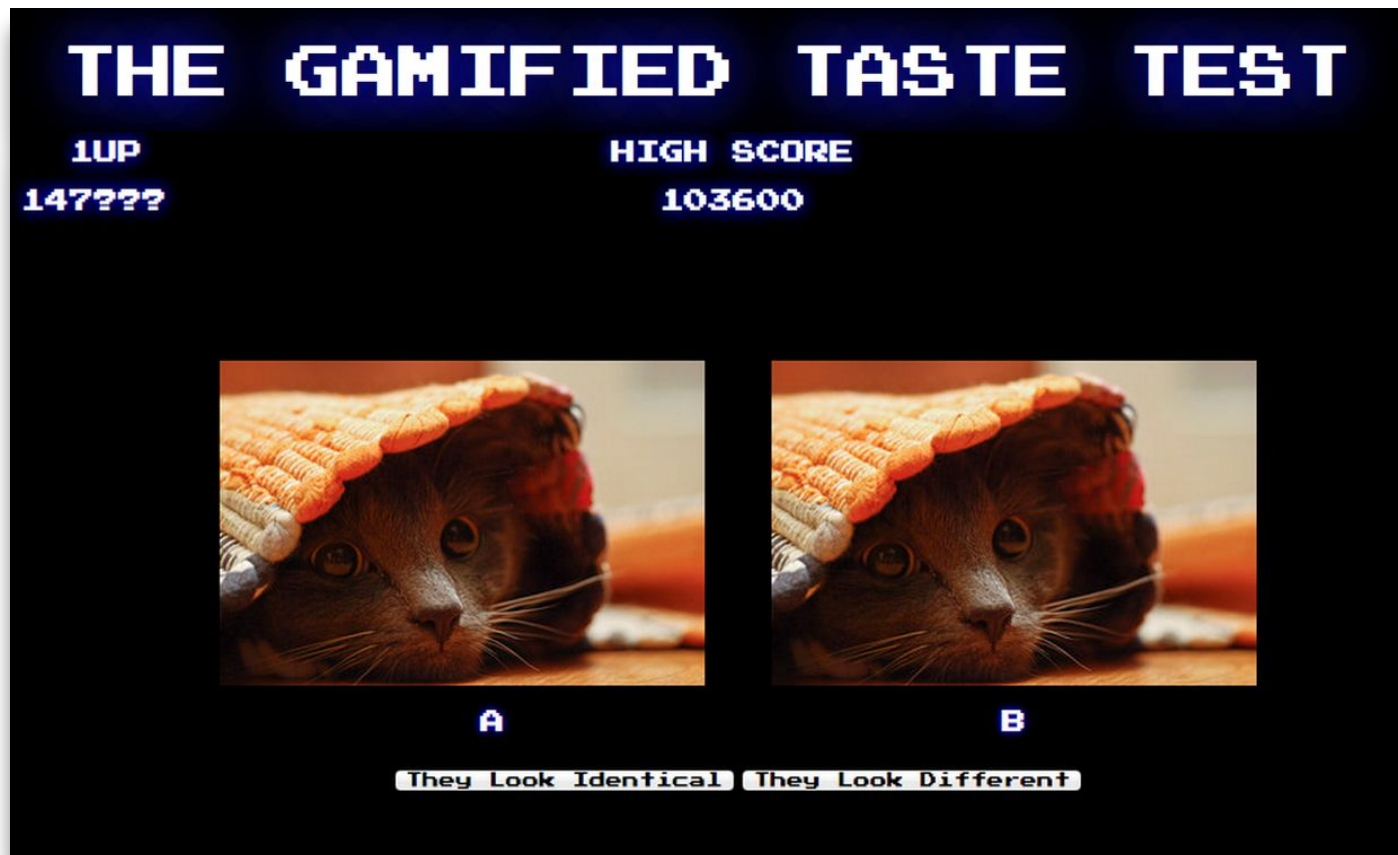
- Pour le respect de la source : image de marque
- Pour le confort de l'utilisateur : lisibilité, perception de qualité



Quel taux de compression ?

Certains font appel à des humains pour juger de la plus forte compression applicable

<http://code.flickr.net/2015/09/25/perceptual-image-compression-at-flickr/>



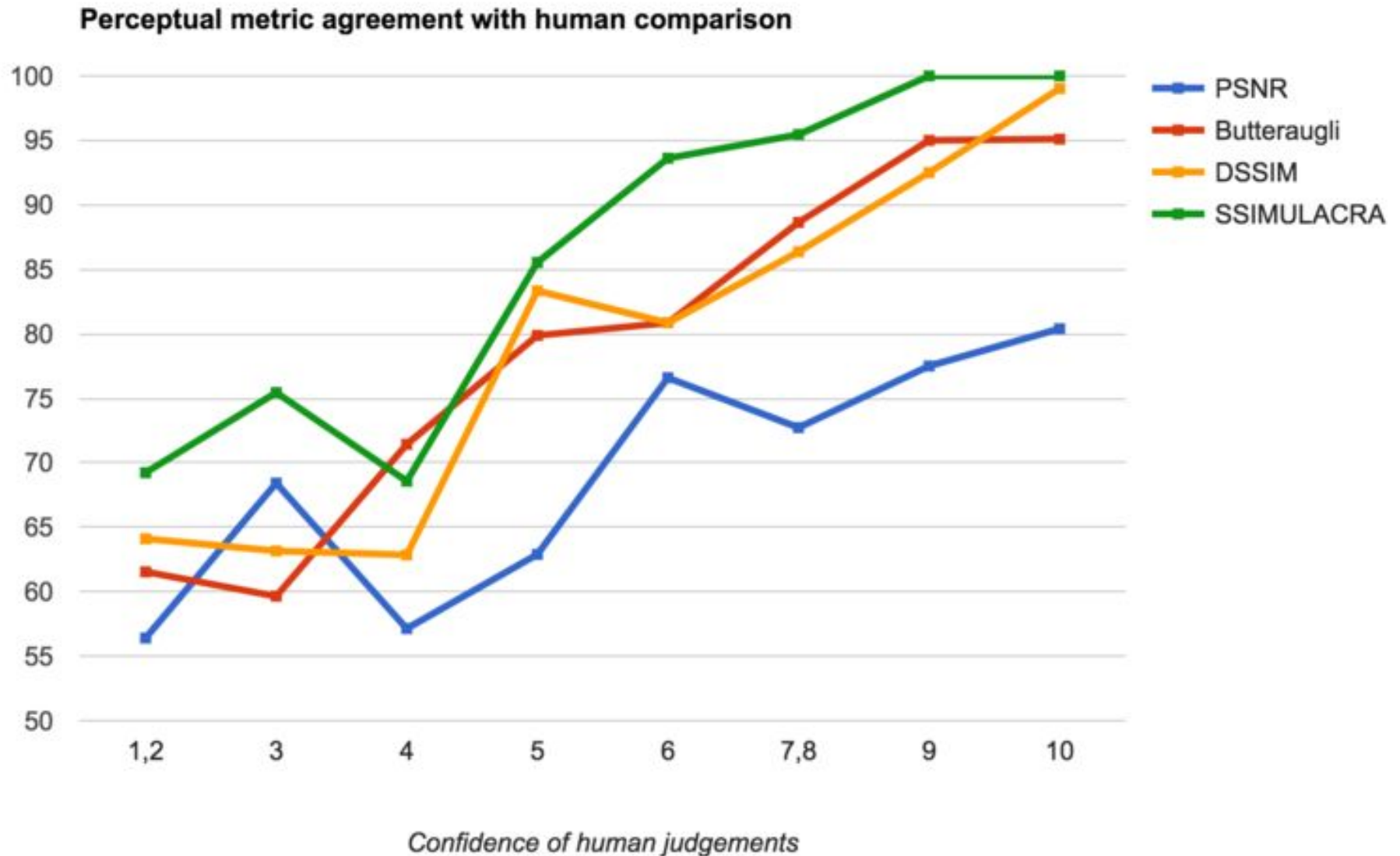
Quel taux de compression ?

D'autres élaborent des algorithmes donnant un score de qualité perçue :

- PSNR : Peak Signal-to-Noise Ratio
- Butteraugli, par Google
- MSSIM : Multi-Scale Structural Similarity
- SSIMULACRA, par Cloudinary

https://cloudinary.com/blog/detecting_the_psychovisual_impact_of_compression_related_artifacts_using_ssimulacra

Quel taux de compression ?



A photograph of a city street under construction. In the foreground, a man in a dark suit walks away from the camera. To his right, several construction workers in orange safety vests and hard hats are standing near a red stop sign. A large orange and white cement truck is parked on the right side of the road. The background shows tall city buildings and trees. The text "Optimiser le poids des images" is written in white, and "Optimiser les SVG" is written in a larger, bold white font, both centered over the image.

Optimiser le poids des images
Optimiser les SVG

Optimiser les SVG avec SVGO(MG)

SVGO

Un outil NodeJS en ligne de commande, qui permet de combiner de multiple optimisations

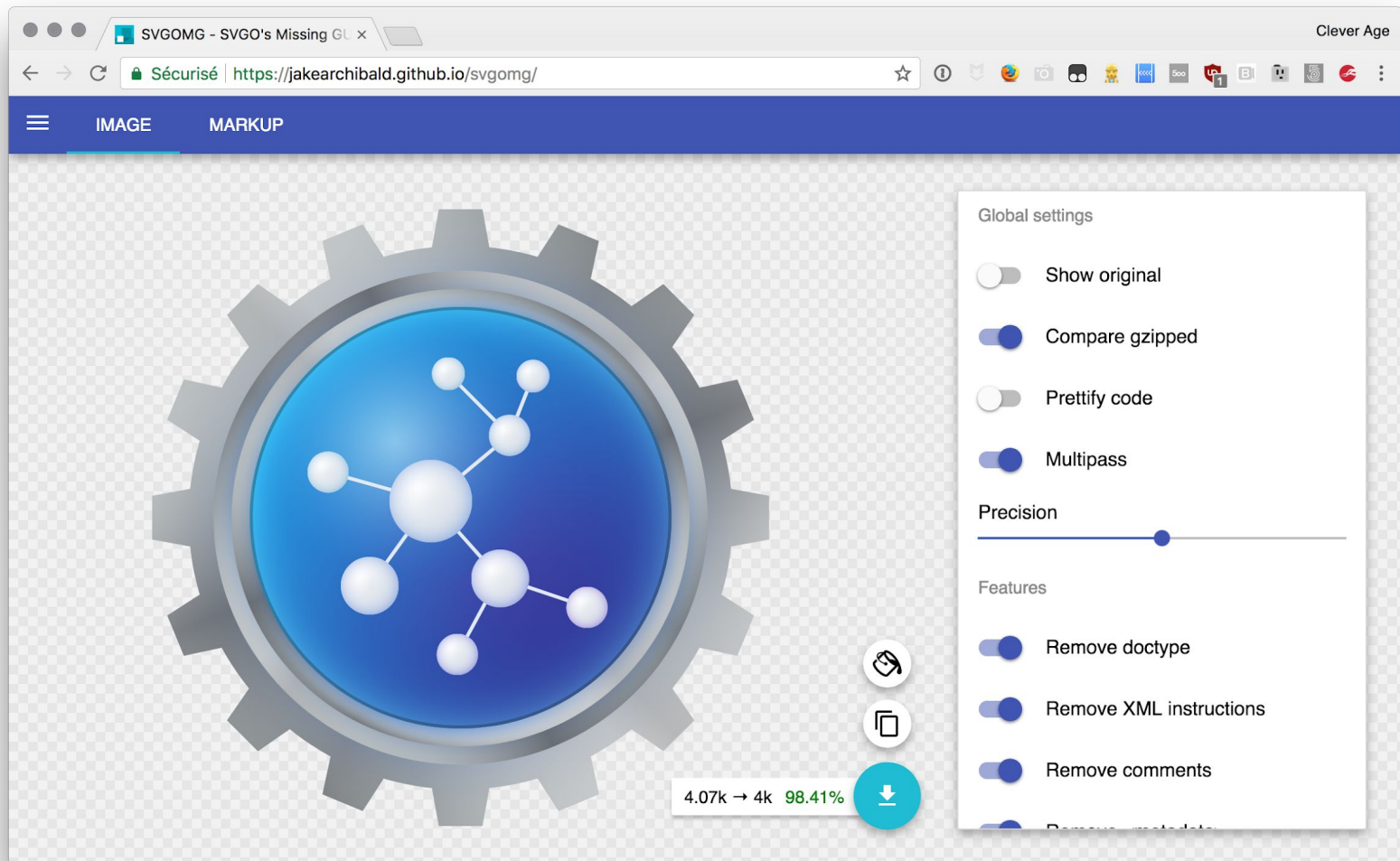
<https://github.com/svg/svgo>



Optimiser les SVG avec SVGO(MG)

SVGOMG : une interface Web utilisant SVGO

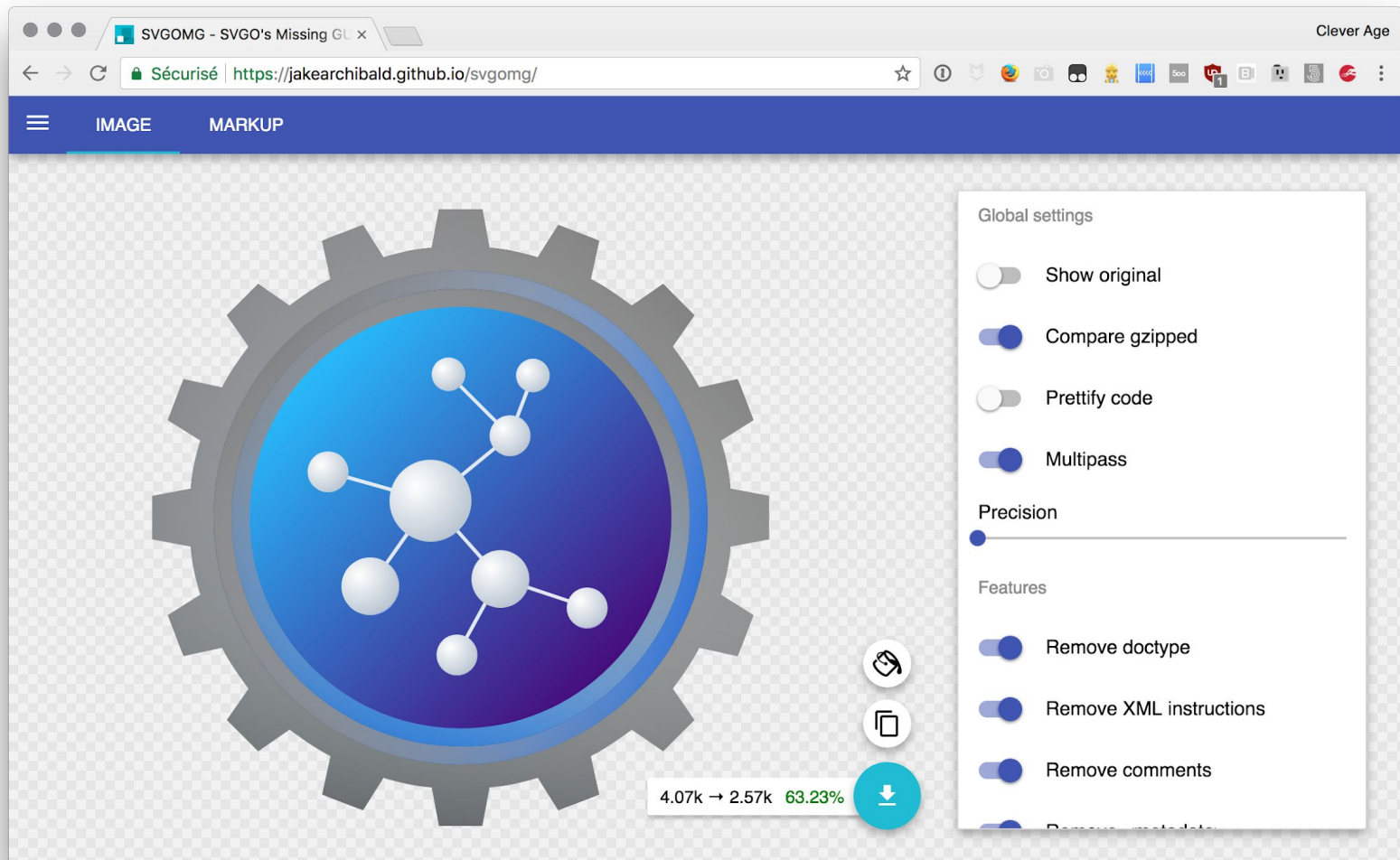
<https://jakearchibald.github.io/svgomg/>



Optimiser les SVG avec SVGO(MG)

Attention aux optimisations avec perte

- Réduction du nombre de points, de la précision



A photograph of a city street scene, likely in New York City, featuring a large orange and white cement truck with 'FERRARA BROS' and '88' on its side. Several construction workers in orange safety vests and hard hats are standing near the truck. A man in a dark suit is walking in the foreground, away from the camera. A red octagonal 'STOP' sign is visible on the left. The background shows tall city buildings and trees. The image is dimmed to serve as a background for text.

Optimiser le poids des images **Optimiser les images bitmap**

Utiliser un outil local

Les outils dédiés à un format :

- PNG
 - Zopfli-png, PNGOUT, OptiPNG, AdvPNG, PNGCrush, PNGQuant, ImageAlpha
- JPEG
 - JPEGOptim, MozJPEG, Jpegtran, Guetzli, JPEGmini (Pro/Server)

Utiliser un outil local

Les outils multi formats (sur poste client) :

- Windows
 - FileOptimizer
- Mac
 - ImageOptim
 - ImageOptim-CLI : ImageOptim + JPEGmini + ImageAlpha
- Linux
 - Trimage

Utiliser un outil serveur

Thumbor est un projet OSS créé par Globo, un grand média brésilien.

thumbor.

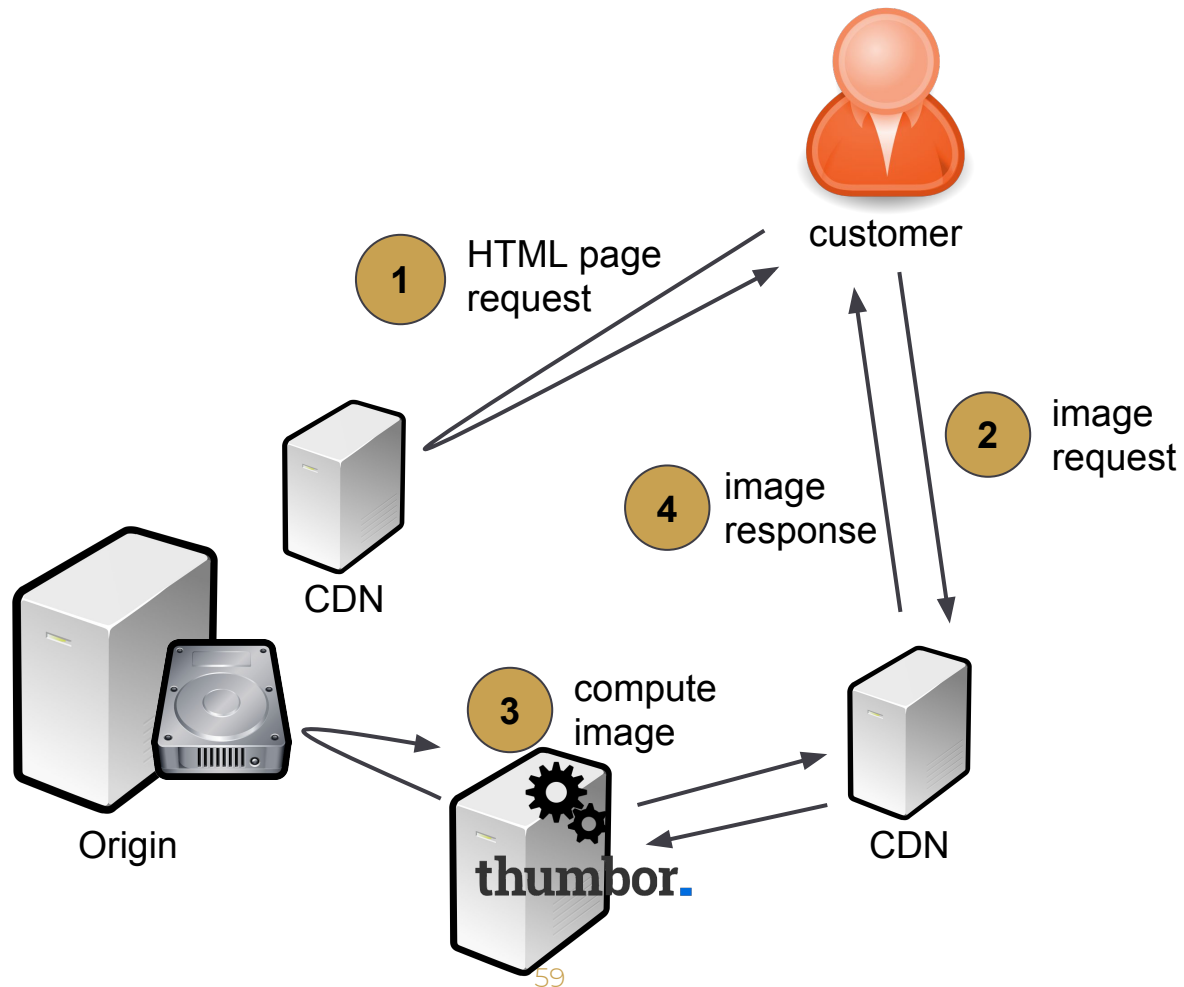
<http://thumbor.org/>

Thumbor génère des images redimensionnées à l'aide de simples paramètres d'URL et sait exploiter les optimisateurs jpegtran et gifv.

Il sait fournir du WebP à Chrome et Opera.

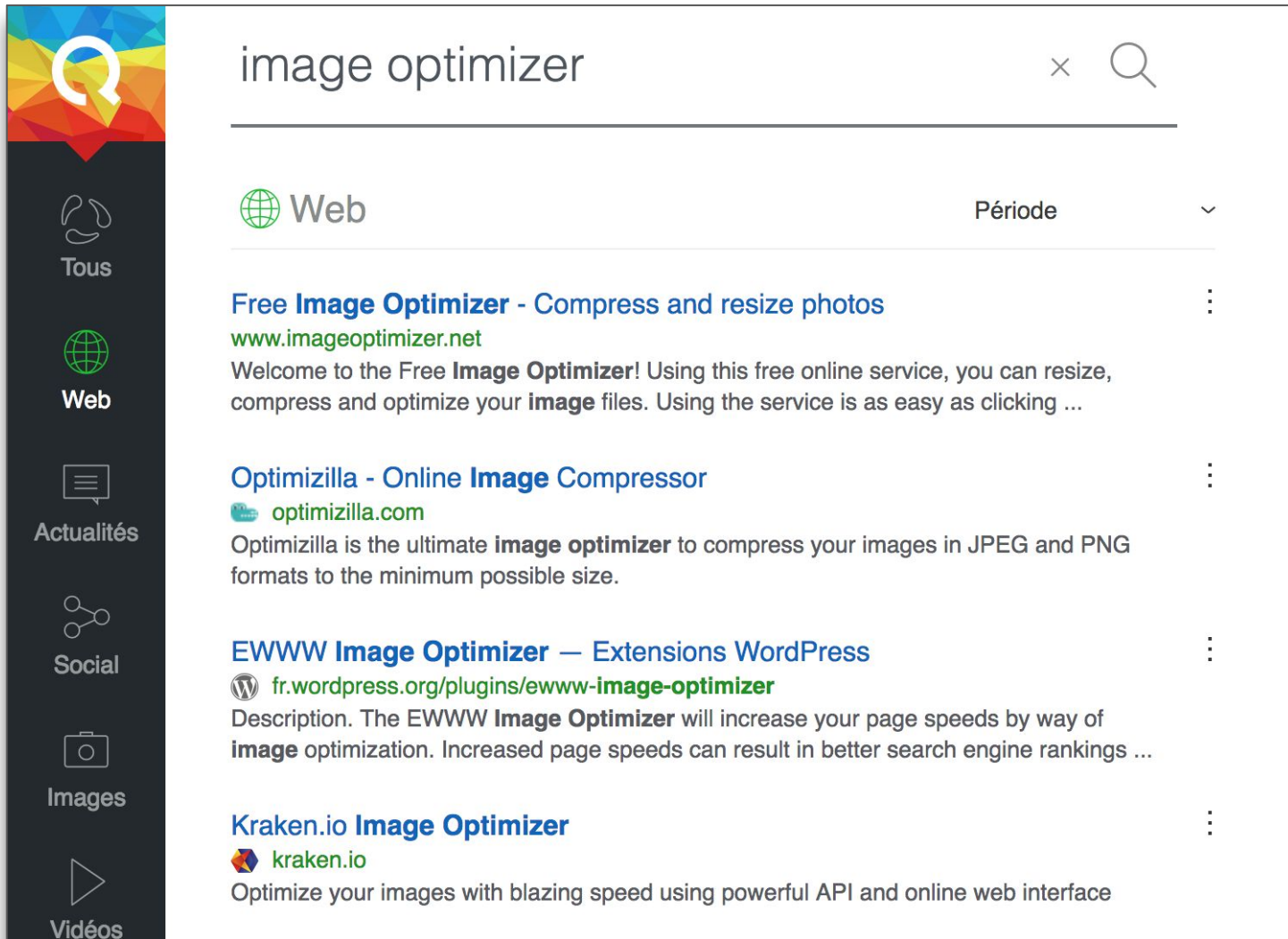
Utiliser un outil serveur

thumbor.



Utiliser un outil SaaS

Des tonnes de solutions en ligne...



The screenshot shows a search engine interface with a sidebar on the left and search results on the right. The sidebar has a search bar with a magnifying glass icon and a list of categories: Tous, Web, Actualités, Social, Images, and Vidéos. The search results are for the query 'image optimizer' and are filtered by 'Web'. The results list four tools: Free Image Optimizer, Optimizilla, EWWW Image Optimizer, and Kraken.io Image Optimizer. Each result includes a title, a URL, and a brief description.

image optimizer

Web Période

Free Image Optimizer - Compress and resize photos

www.imageoptimizer.net

Welcome to the Free **Image Optimizer**! Using this free online service, you can resize, compress and optimize your **image** files. Using the service is as easy as clicking ...

Optimizilla - Online Image Compressor

optimizilla.com

Optimizilla is the ultimate **image optimizer** to compress your images in JPEG and PNG formats to the minimum possible size.

EWWW Image Optimizer — Extensions WordPress

fr.wordpress.org/plugins/ewww-image-optimizer

Description. The EWWW **Image Optimizer** will increase your page speeds by way of **image** optimization. Increased page speeds can result in better search engine rankings ...

Kraken.io Image Optimizer

kraken.io

Optimize your images with blazing speed using powerful API and online web interface

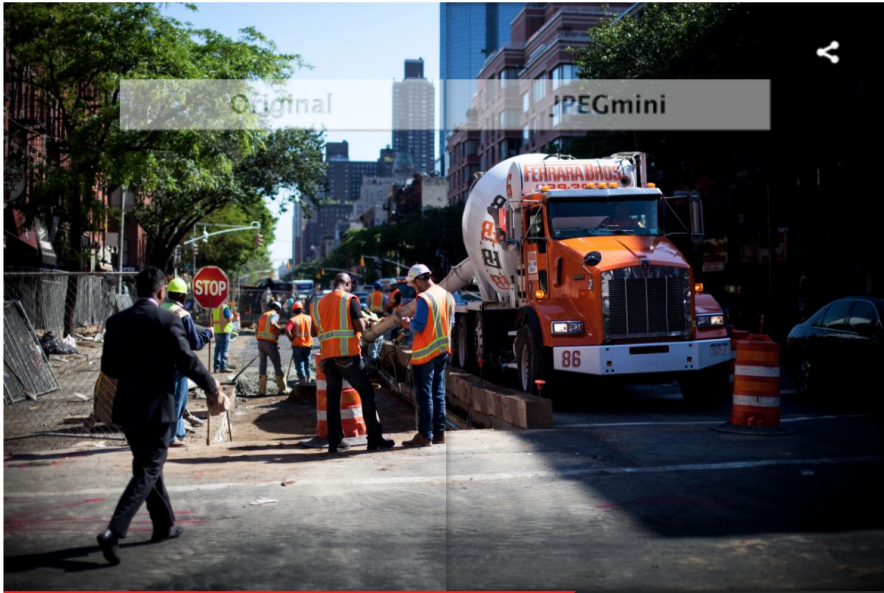
Utiliser un outil SaaS

JPEGmini web

http://www.jpegmini.com/main/shrink_photo

JPEGmini by BEAMR
 Products ▾ Blog Sign In

SEEMS YOUR PHOTO LOST SOME WEIGHT!
 Compare quality, size and download your photo



Original

JPEGmini

JPEGmini 2721 KB

Original 3504 KB

Download Full Res. (5116 X 3411)

PHOTO REDUCED BY **1.3X**

Choose Your JPEGmini Version

JPEGmini


- Desktop (Mac & PC)
- Unlimited 28MP photos

[Learn More →](#)

JPEGmini Pro


- Desktop (Mac & PC)
- Unlimited 50MP photos
- Up to 8x faster
- Lightroom® Plug-in
- Photoshop® Extension

[Learn More →](#)

JPEGmini Web

- Upload full albums
- Completely free!

[FREE SIGN UP](#)

Utiliser un outil SaaS par API

Cloudinary est une solution SaaS de gestion d'images et vidéos

<https://cloudinary.com/>



Cloudinary permet de redimensionner les images, les découper, les transformer, et les optimiser

https://cloudinary.com/documentation/image_transformations

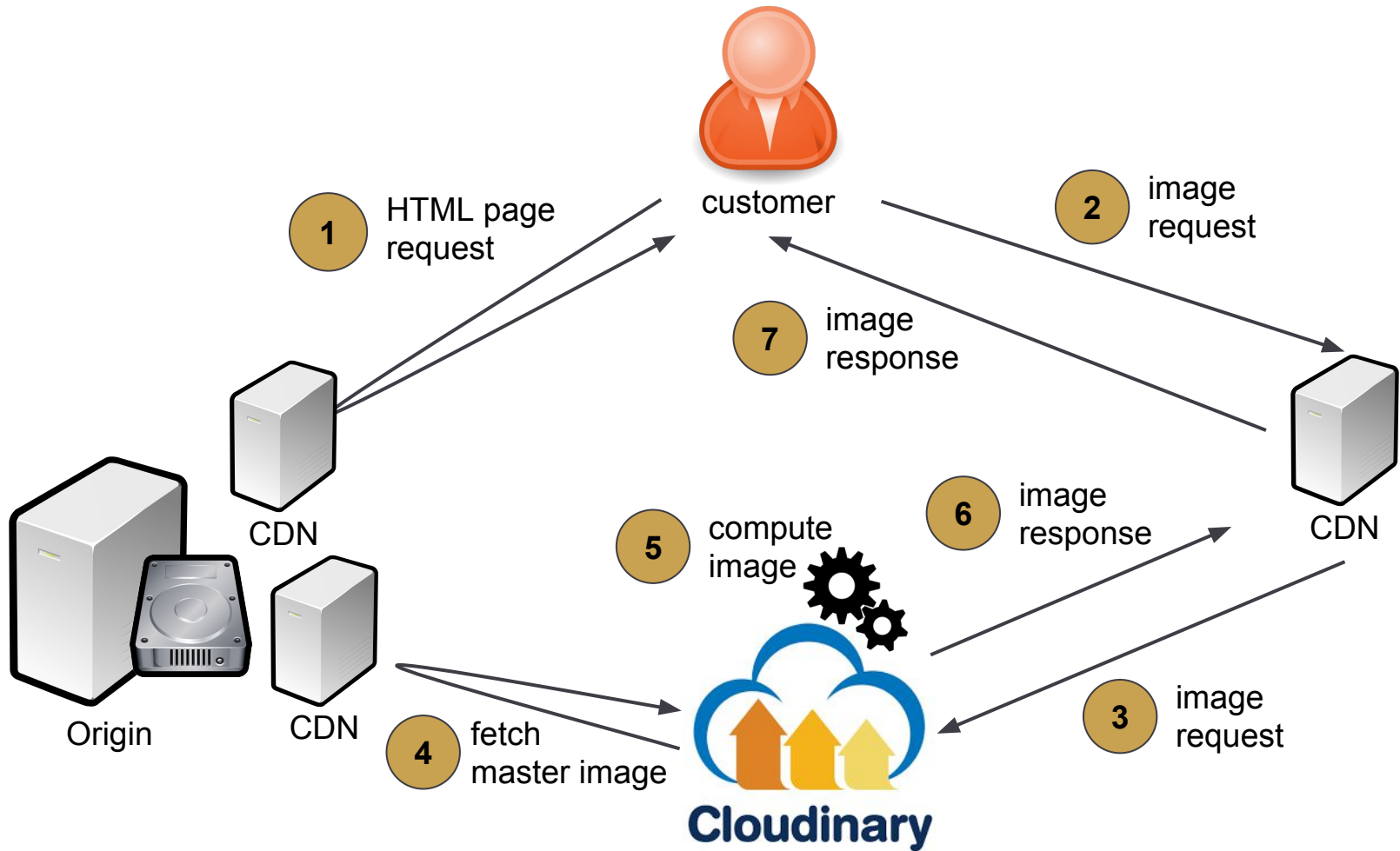
Utiliser un outil SaaS par API

Cloudinary sait déterminer le meilleur taux de compression sans rien perdre visuellement

https://cloudinary.com/blog/the_holy_grail_of_image_optimization_or_balancing_visual_quality_and_file_size

Cloudinary sait aussi envoyer des WebP à Chrome et Opera, et des JPEG-XR à Edge

Utiliser un outil SaaS par API



Utiliser un outil SaaS par API

imgix est aussi une solution SaaS de gestion d'images



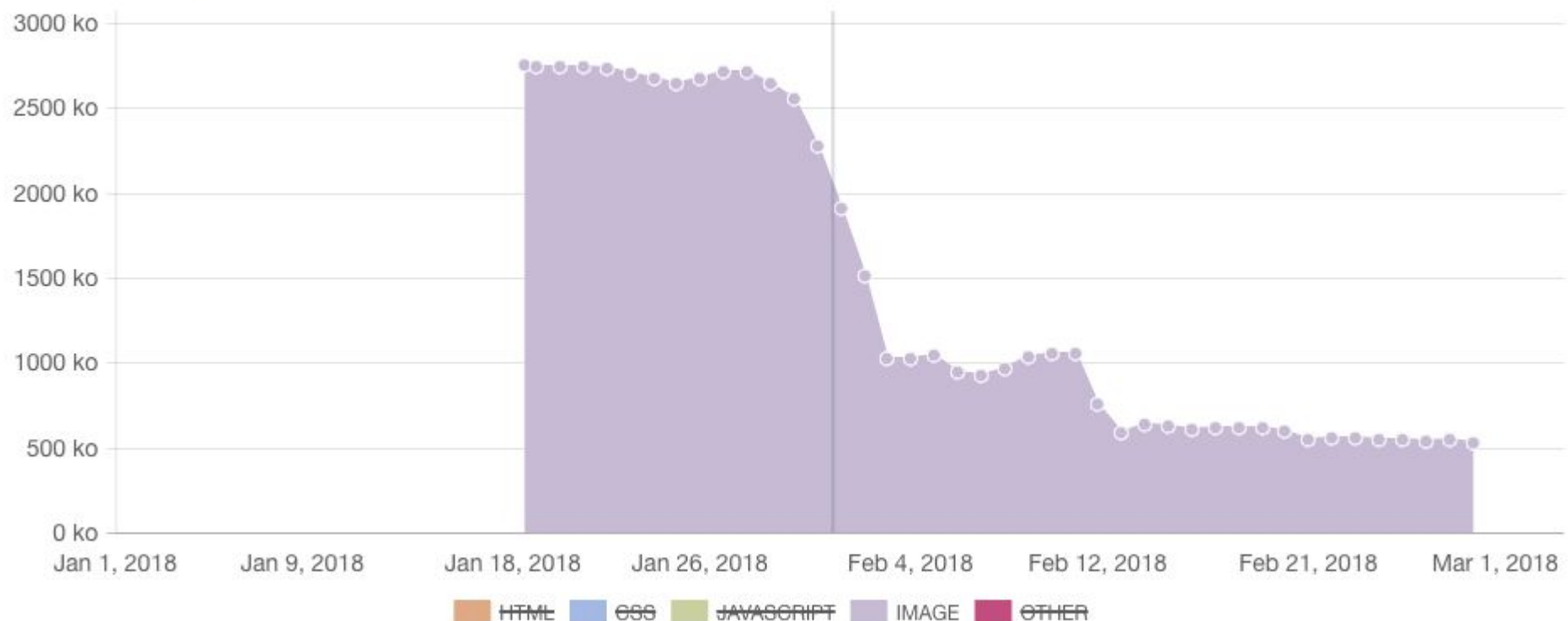
<https://www.imgix.com/>

imgix offre les mêmes services de base que Cloudinary, redimensionnement, découpe et optimisation, mais moins de fonctionnalités avancées de transformation.

Retour d'expérience imgix

Graphe d'évolution du poids de la page (adblock actif) sur <http://www.dossierfamilial.com/> au moment de la mise en œuvre de imgix, avec les optimisations de base du service, sans aucune autre optimisation côté HTML, CSS, JS

■ Poids de la page





Vérifier la qualité de l'implémentation

RespImgLint

<https://ausi.github.io/respimagelint/>

Charge la page dans une iframe et la redimensionne

RespImageLint - Linter for Responsive Images

RespImageLint is a bookmarklet that checks images of a webpage against a list of **common mistakes and best practises**. Just run the bookmarklet and see if it detects any problems with your images. You can find more information on the [Project page on GitHub](#).

Lint Images

Drag this link to your bookmarks or right click and bookmark it.

- Descriptors must be unique
- Malformed descriptor
- X and W descriptors must not be mixed in one srcset attribute
- Sizes attribute must be set if W descriptors are used
- W descriptor doesn't match the image size
- X descriptor doesn't match the image size
- X descriptor must not be used if sizes attribute is set
- Missing **src** attribute
- Images in **srcset** attribute must not be different
- Images in **srcset** attribute must not have different aspect ratios
- A fitting image source should be available for all screen sizes
- Images in different **<source>** elements shouldn't be the same
- The **sizes** attribute has to match the width of the image
- Multiple **** elements are not allowed
- Only **<source>** and **** tags are allowed inside of **<picture>**
- The **** element must not be omitted inside of **<picture>**
- The **src** attribute has no effect on a **<source>** element
- The **<source>** element must not appear after an **** element

Supporte le lazy load

Responsive Images Report for <http://www.lemonde.fr/>

Image #1



A fitting image source should be available for all screen sizes

At a viewport of 1280x720 the image was displayed 642 pixels wide, but the closest provided image has a width of 1288 which is 50% off. The affected viewports are 300x169-3000x4000.

Loading a large image and display it much smaller should be avoided to save bandwidth. Loading a small image and display it much larger should be avoided to prevent pixelated artifacts.

```
<img
  data-lazyload="false"
  data-item-type="article"
  src="http://img.lemde.fr/2017/12/01/420/0/4928/2464/1288/644/60/0/8fc3684_14614-4rhonp.pko61.jp
  alt="Les assises de la maternelle se tiennent mardi et mercredi à Paris, avec pour objectif de
  title="MARTIN BUREAU / AFP"
  class="lazy-retina"
  data-no-hd-src="http://img.lemde.fr/2017/12/01/420/0/4928/2464/644/322/60/0/8fc3684_14614-4rhon
```

ResplmgLint

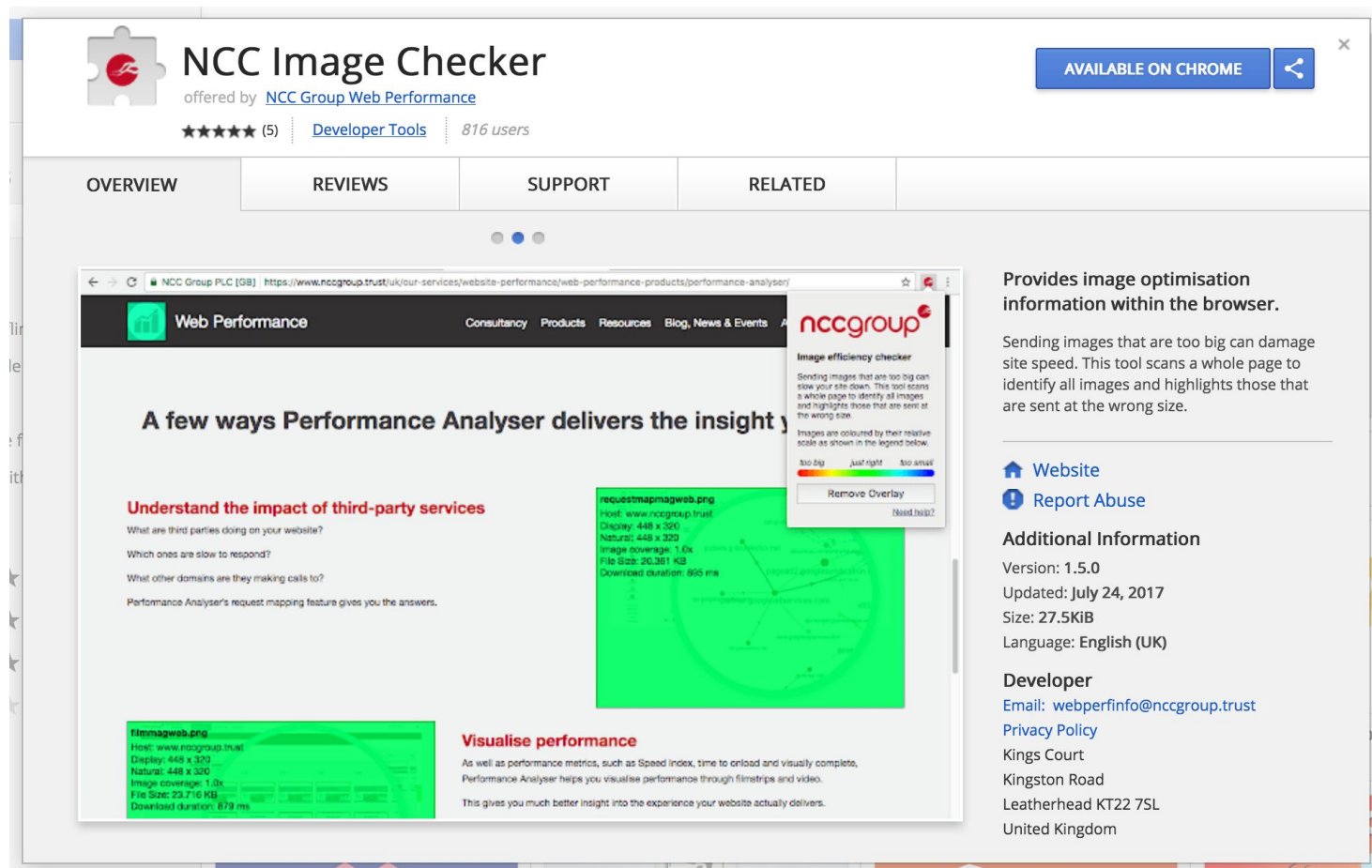
Ne tient malheureusement pas compte d'un écran haute densité, les images x2 sont considérées comme mauvaises.

Les autres contrôles sont tout de même intéressants.

NCC Image Checker

Extension pour Chrome

<https://github.com/nccgroup/image-checker>



NCC Image Checker
 offered by [NCC Group Web Performance](#)
 ★★★★★ (5) | [Developer Tools](#) | 816 users

AVAILABLE ON CHROME

OVERVIEW | REVIEWS | SUPPORT | RELATED

Web Performance
 Consultancy | Products | Resources | Blog, News & Events

A few ways Performance Analyser delivers the insight

Understand the impact of third-party services
 What are third parties doing on your website?
 Which ones are slow to respond?
 What other domains are they making calls to?
 Performance Analyser's request mapping feature gives you the answers.

requestmapimgweb.png
 Host: www.nccgroup.trust
 Display: 448 x 320
 Natural: 448 x 320
 Image coverage: 1.0x
 File Size: 20,381 KB
 Download duration: 665 ms

Visualise performance
 As well as performance metrics, such as Speed index, time to onload and visually complete, Performance Analyser helps you visualise performance through firestrips and video.
 This gives you much better insight into the experience your website actually delivers.

Image efficiency checker
 Sending images that are too big can slow your site down. This tool scans a whole page to identify all images and highlights those that are sent at the wrong size.
 Images are coloured by their relative scale as shown in the legend below.
 too big | just right | too small
 Remove Overlay
 Need help?

Provides image optimisation information within the browser.
 Sending images that are too big can damage site speed. This tool scans a whole page to identify all images and highlights those that are sent at the wrong size.

[Website](#)
[Report Abuse](#)

Additional Information
 Version: 1.5.0
 Updated: July 24, 2017
 Size: 27.5KiB
 Language: English (UK)

Developer
[Email: webperfinfo@nccgroup.trust](#)
[Privacy Policy](#)
 Kings Court
 Kingston Road
 Leatherhead KT22 7SL
 United Kingdom

NCC Image Checker

Met en évidence la pertinence des tailles d'images avec un overlay coloré



Bons plans 01
Services
For

VIDÉOS
ACTUALITÉS
TESTS
ASTUCES
TELECHARGER.COM
JEUX VIDÉO

Produits
Applis, Logiciels
Jeux
Technos
Sécurité
Buzz, société
Télécoms
Culture, médias
Politique, Droits
Science, recherche

01net > Actualités > Technos

Technos

608d56e2aab51002ddd08034ff8a.jpeg
Host: img.bfmtv.com
Display: 378 x 280
Natural: 500 x 370
Image coverage: 0.7x
Device pixel ratio: 2
File size unavailable
Download duration: 193 ms

Accident mortel : Waymo charge Uber et indique que sa voiture autonome aurait évité le piéton

Le patron de la filiale d'Alphabet affirme que son système de conduite autonome aurait évité le piéton tué la semaine...

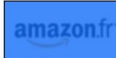
26/03 - 14h38

9b7e42830e0a6d04b638d4c01504b.jpg
Host: img.bfmtv.com
Display: 378 x 280
Natural: 500 x 370
Image coverage: 0.7x
Device pixel ratio: 2
File size unavailable
Download duration: 191 ms

Ces batteries dopées à l'air deviennent un peu plus séduisantes

Des chercheurs ont développé une nouvelle technique pour allonger la durée de vie des batteries Lithium-air, dont...

LES BONNS PLANS


Bon plan : jusqu'à 15% valide sur vos produits du quotidien...


Découvrez tous les codes promo Webdistrib


Réduction : -48% sur le disque dure externe LACIE

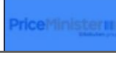

Livraison Offerte sur une sélection d'articles



Image efficiency checker

Sending images that are too big can slow your site down. This tool scans a whole page to identify all images and highlights those that are sent at the wrong size.

Images are coloured by their relative scale as shown in the legend below.

too big
just right
too small

Remove Overlay

[Options](#)
[Contribute](#)
[Need help?](#)

NCC Image Checker

Attention, des bugs sur écrans Retina

<https://github.com/nccgroup/image-checker/issues/52>

⌘

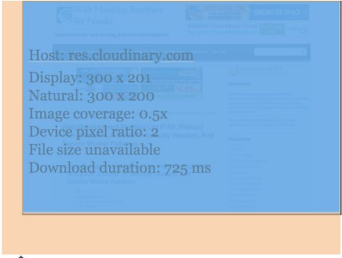
<http://www.webhostingreviewsbynerds.com/web-development-reading-list-16-ad-with-webpack-a-guide-to-security-headers-and-service-worker-fallacies/>

03 February 2017 | Source



pierre choffe

How Much Data Should My Service Worker Put Ufront In The Offline Cache



Host: res.cloudinary.com
Display: 300 x 201
Natural: 300 x 200
Image coverage: 0.5x
Device pixel ratio: 2
File size unavailable
Download duration: 725 ms

img.webmention_source_screenshot.u-photo | 300x200.66

Elements Console Sources Network Performance Memory Application Security Audits

Filter

Styles Computed Event Listeners DOM Breakpoints Properties

element.style {

@media (min-width: 40em)

[data-webmention-types='replies']

.webmention_source_screenshot {

float: right;

margin: 0 0 2em 1em;

[data-webmention-types='replies']

.webmention_source_screenshot {

html body main div article div aside div ol #webmention-419040 article div.webmention_source a.u-url img.webmention_source_screenshot.u-photo

Console

top

Filter

Default levels Group similar

5 hidden

[img.webmention_source_screenshot.u-photo]

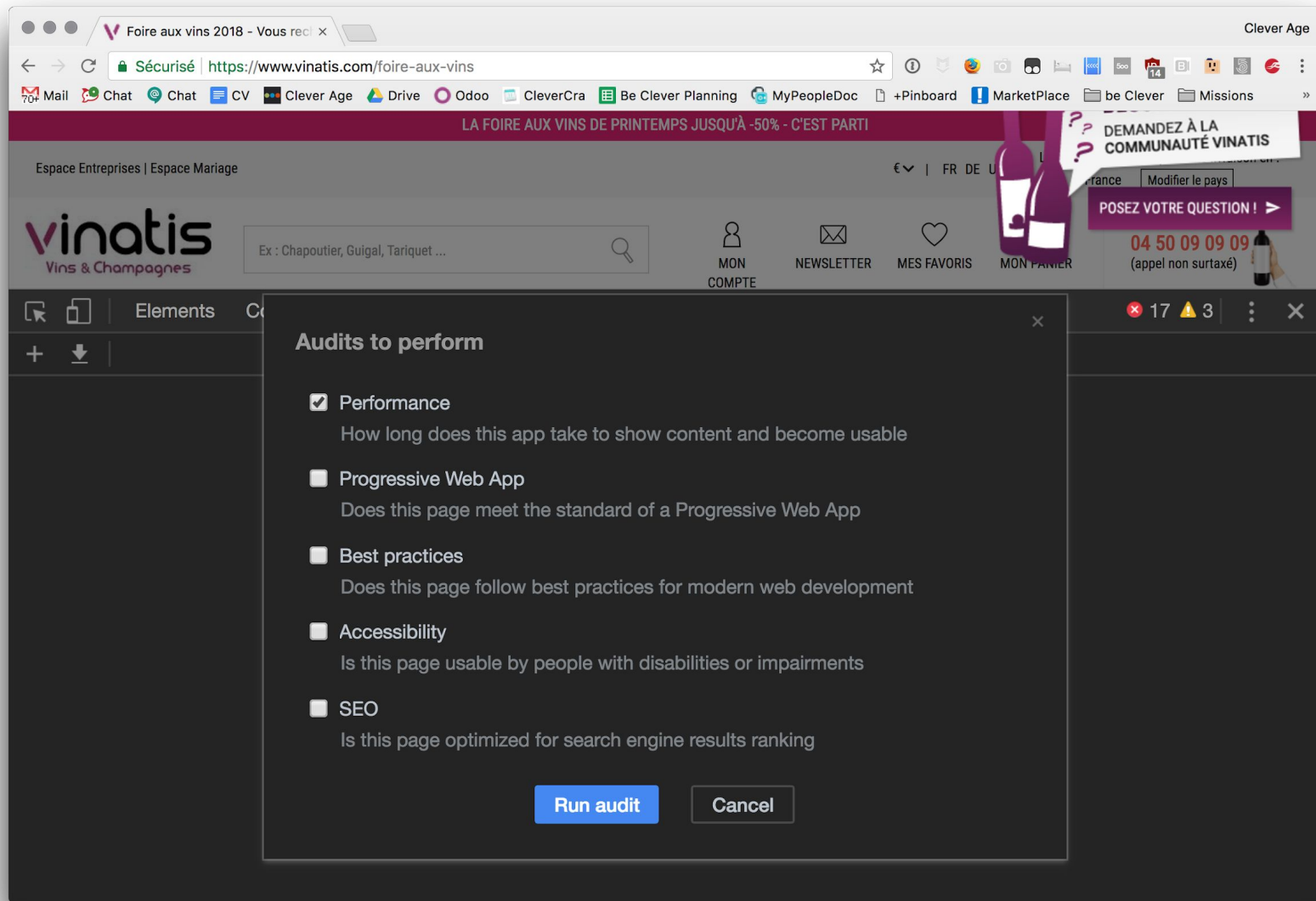
\$('webmention-419040 > article > div.webmention_source > a.u-url > img')

\$('webmention-419040 > article > div.webmention_source > a.u-url > img').currentSrc

"https://res.cloudinary.com/nho/image/fetch/c_fill,f_auto,q_auto,w_600,h_400-ad-with-webpack-a-guide-to-security-headers-and-service-worker-fallacies/"

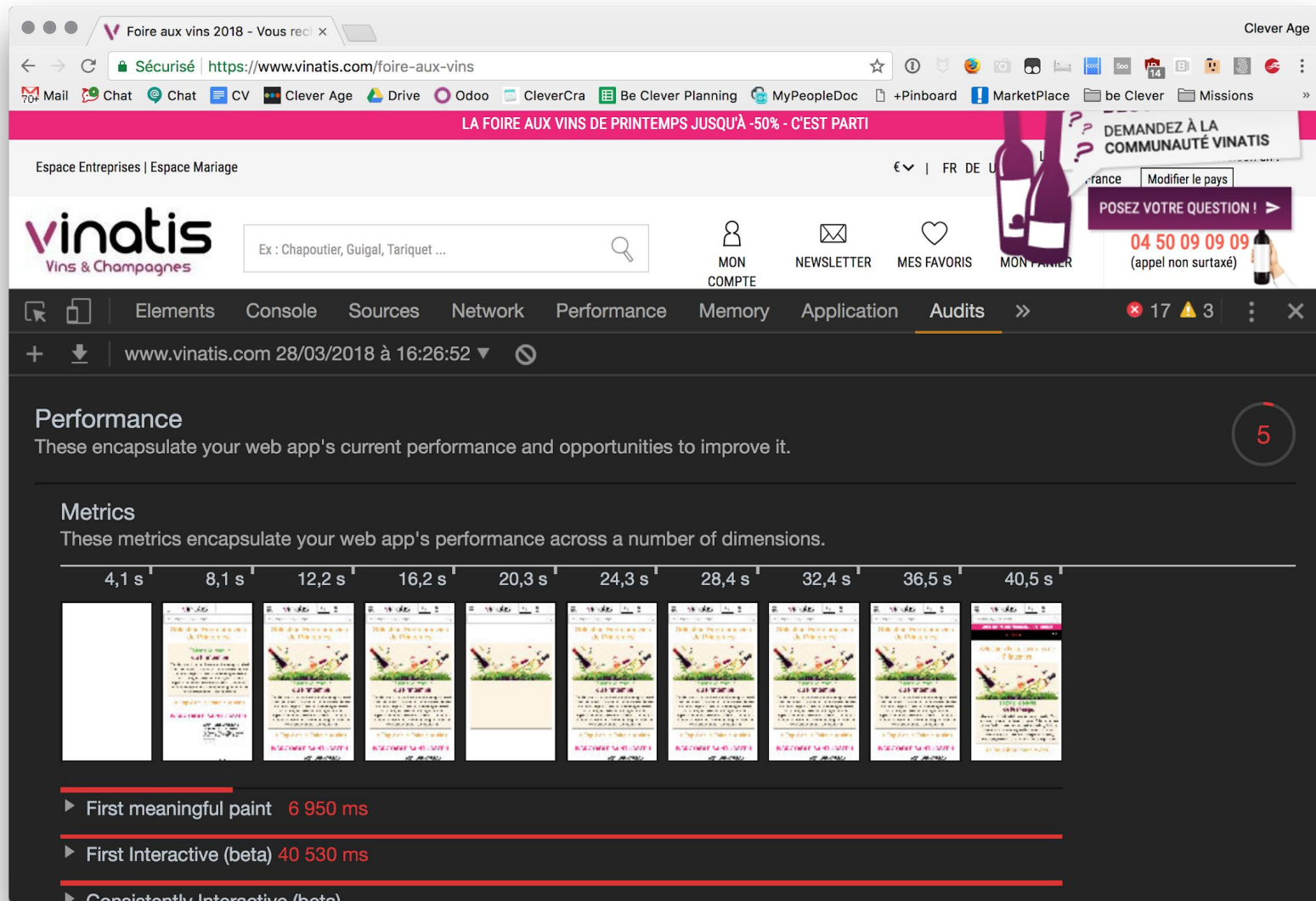
Google Lighthouse

Historiquement extension Chrome, maintenant intégrée aux devtools



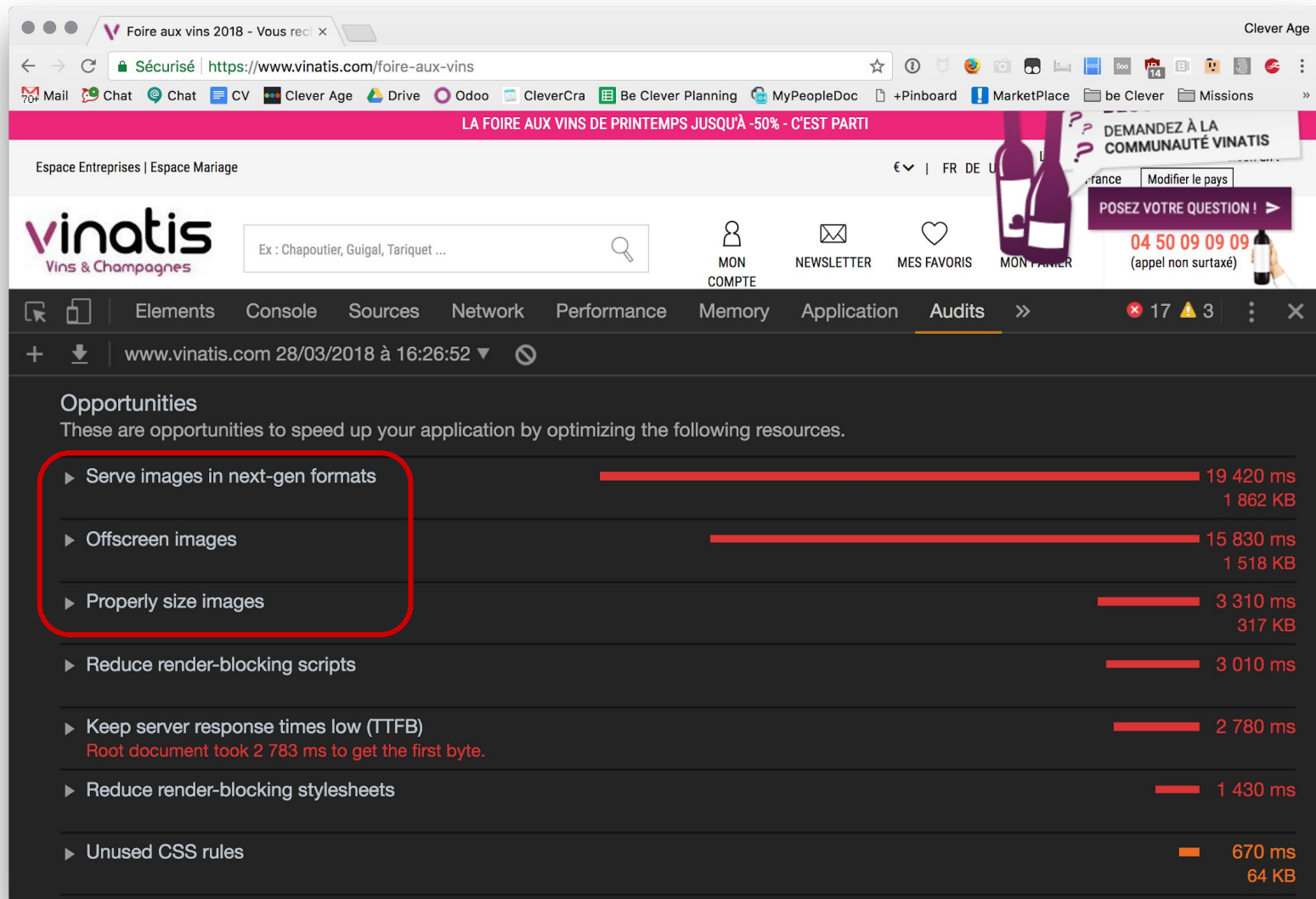
Google Lighthouse

Donne une note, différents indicateurs, et des recommandations



Google Lighthouse

Des recommandations particulièrement sur les images



imaging-heap

Outil basé sur Puppeteer (Chrome headless) :

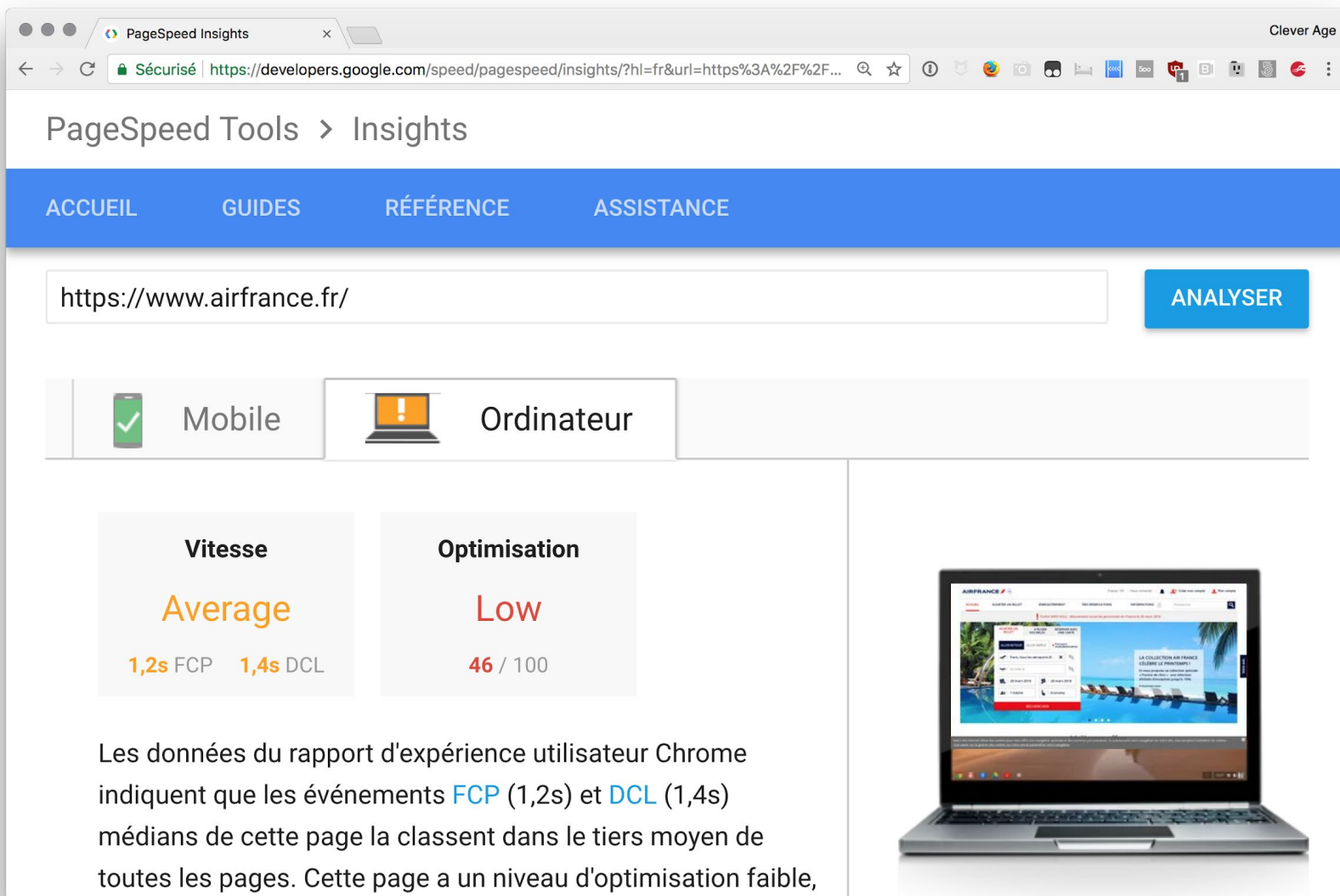
<https://github.com/filamentgroup/imaging-heap>

Génère un tableau listant pour différents viewports et densités comment une image couvre le besoin :

Viewport	Image Width in Layout	@1x Image Width	@1x Percentage Match	@2x Image Width	@2x Percentage Match
320px	161px	301px	187.0%	301px	93.5%
480px	241px	301px	124.9%	601px	125.2%
640px	321px	601px	187.2%	601px	93.6%
800px	401px	601px	149.9%	901px	112.6%
960px	480px	600px	125.0%	900px	93.8%
1120px	560px	600px	107.1%	1200px	107.1%
1280px	640px	900px	140.6%	1200px	93.8%

Google PageSpeed Insight

<https://developers.google.com/speed/pagespeed/insights/>

A screenshot of the Google PageSpeed Insights website. The browser address bar shows the URL 'https://developers.google.com/speed/pagespeed/insights/?hl=fr&url=https%3A%2F%2Fwww.airfrance.fr/'. The page title is 'PageSpeed Tools > Insights'. A blue navigation bar contains links for 'ACCUEIL', 'GUIDES', 'RÉFÉRENCE', and 'ASSISTANCE'. Below this is a search bar with the URL 'https://www.airfrance.fr/' and a blue 'ANALYSER' button. Two tabs are visible: 'Mobile' (with a green checkmark icon) and 'Ordinateur' (with a laptop icon and an exclamation mark). The 'Mobile' tab is active, showing two performance metrics: 'Vitesse' (Speed) with an 'Average' rating and 'Optimisation' (Optimization) with a 'Low' rating. The speed metrics show '1,2s FCP' and '1,4s DCL'. The optimization score is '46 / 100'. A paragraph of text explains that Chrome User Experience Report data places the page in the middle tier. To the right, a laptop displays the Air France website.

PageSpeed Tools > Insights

ACCUEIL

GUIDES

RÉFÉRENCE

ASSISTANCE

https://www.airfrance.fr/

ANALYSER



Mobile



Ordinateur

Vitesse

Average

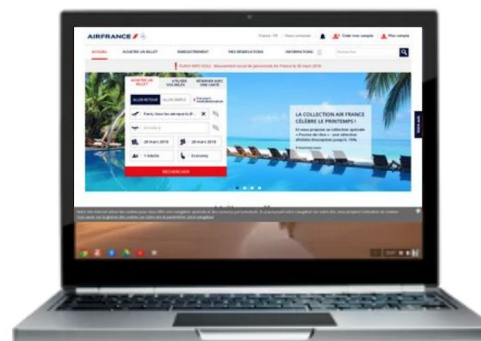
1,2s FCP 1,4s DCL

Optimisation

Low

46 / 100

Les données du rapport d'expérience utilisateur Chrome indiquent que les événements **FCP** (1,2s) et **DCL** (1,4s) médians de cette page la classent dans le tiers moyen de toutes les pages. Cette page a un niveau d'optimisation faible,



Google PageSpeed Insight

PageSpeed Insights

Sécurisé | <https://developers.google.com/speed/pagespeed/insights/?hl=fr&url=https%3A%2F%2F...>

PageSpeed Tools > Insights

ACCUEIL GUIDES RÉFÉRENCE ASSISTANCE

Suggestions d'optimisation

Optimiser les images

En choisissant un format approprié pour vos images et en les compressant, vous pouvez libérer de nombreux octets de données.

Optimisez les images suivantes afin de réduire leur taille de 964,9 Ko (réduction de 66 %).

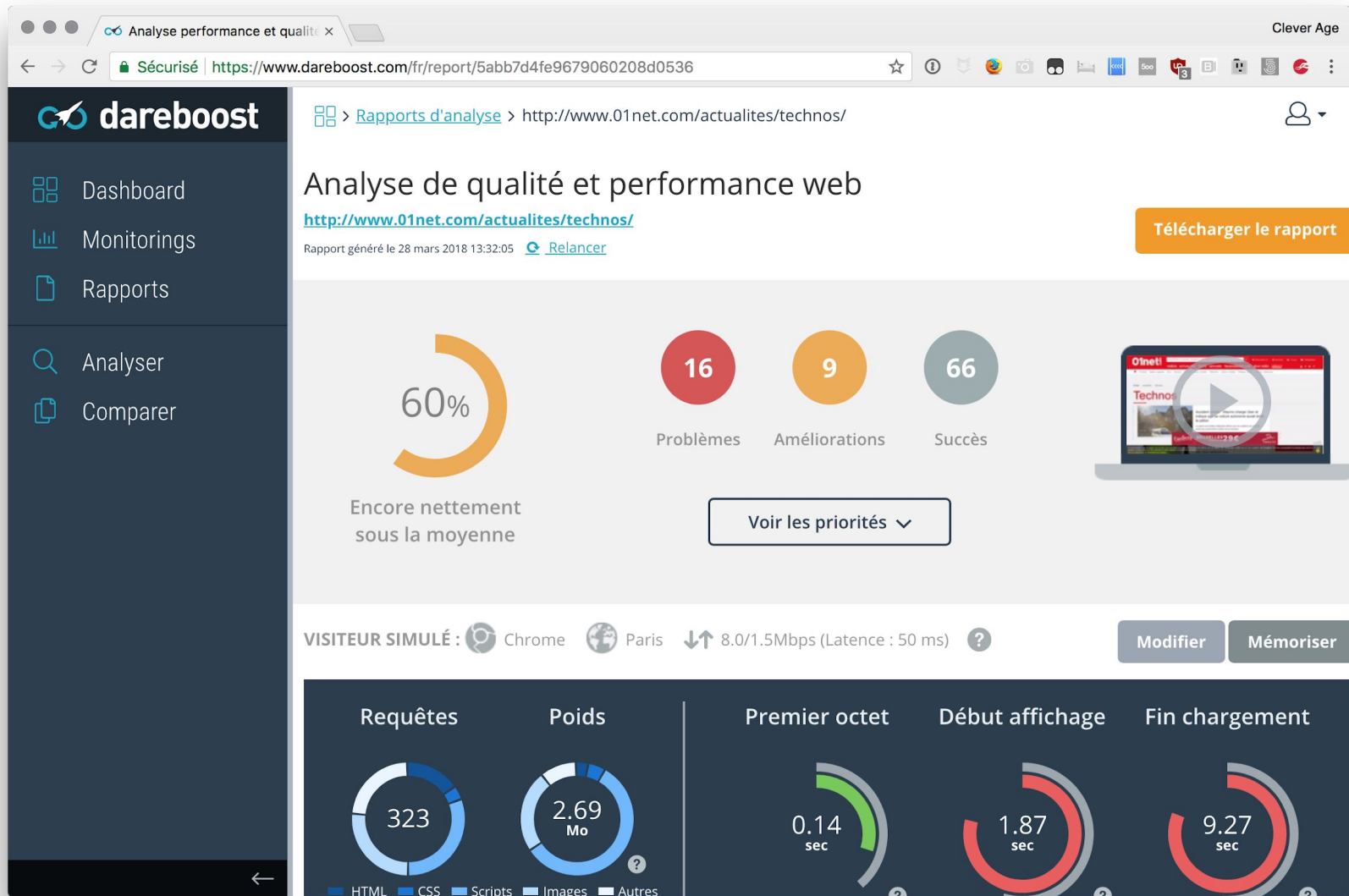
La compression de <https://objects.airfrance.com/...kground/special/AF-Shopping-1280x470.jpg> pourrait libérer 173,8 Ko (réduction de 84 %).

La compression et le redimensionnement de l'image https://objects.airfrance.com/...baf/destinations/SHA/SHA-1_1-768x768.jpg permettraient de gagner 172,2 Ko (88 % de réduction).

La compression et le redimensionnement de l'image https://objects.airfrance.com/...baf/destinations/MOW/MOW-1_1-



<https://www.dareboost.com/>



Volume de données

90/100

 [Signaler une erreur](#)

✓ Optimisez vos images sans perte de qualité

En choisissant un format approprié pour vos images et en les compressant, vous pouvez libérer de nombreux octets de données.

[Optimisez les images suivantes](#) afin de réduire leur taille de 1.2 Ko (réduction de 29%).

Les ressources suivantes sont hébergées par un parti tiers, il se peut donc qu'elles ne soient pas sous votre responsabilité. Vous devriez cependant considérer toute alternative possible à ces fichiers pour rester en accord avec la bonne pratique.

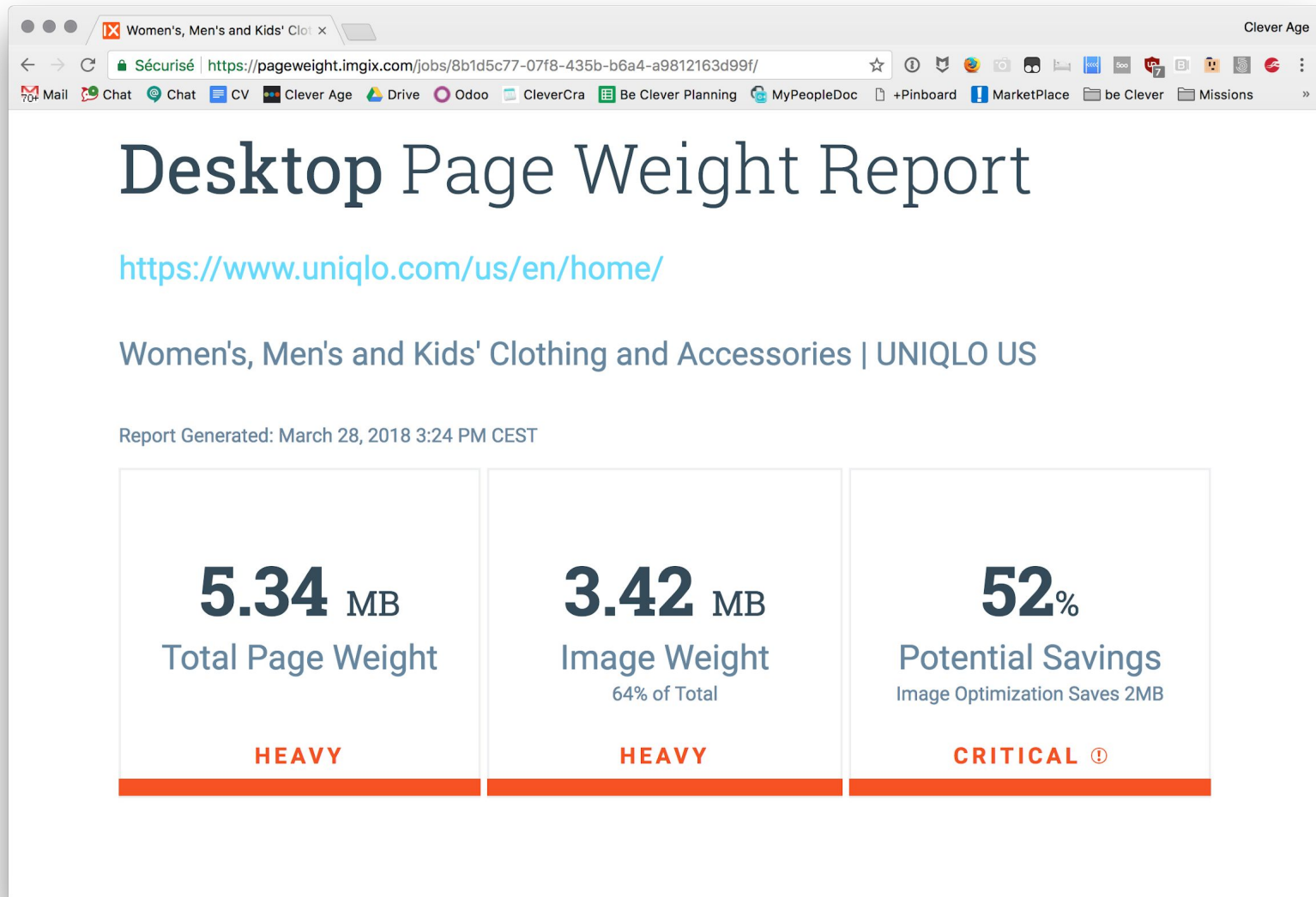
- La compression sans perte de [static.bfmtv.com/r\[...\].t.png](#) pourrait libérer 1.2 Ko (réduction de 29%).

Les images peuvent comporter des données inutiles à leur utilisation sur le web, ce qui peut augmenter considérablement leur poids. Des outils existent pour supprimer automatiquement ces données, sans perte de qualité, et ainsi réduire le poids de vos images.

Nous vous conseillons donc de supprimer les données inutiles grâce par exemple à [jpegtran](#) (format JPEG), [OptiPNG](#) (format PNG) ou [ImageRecycle](#).

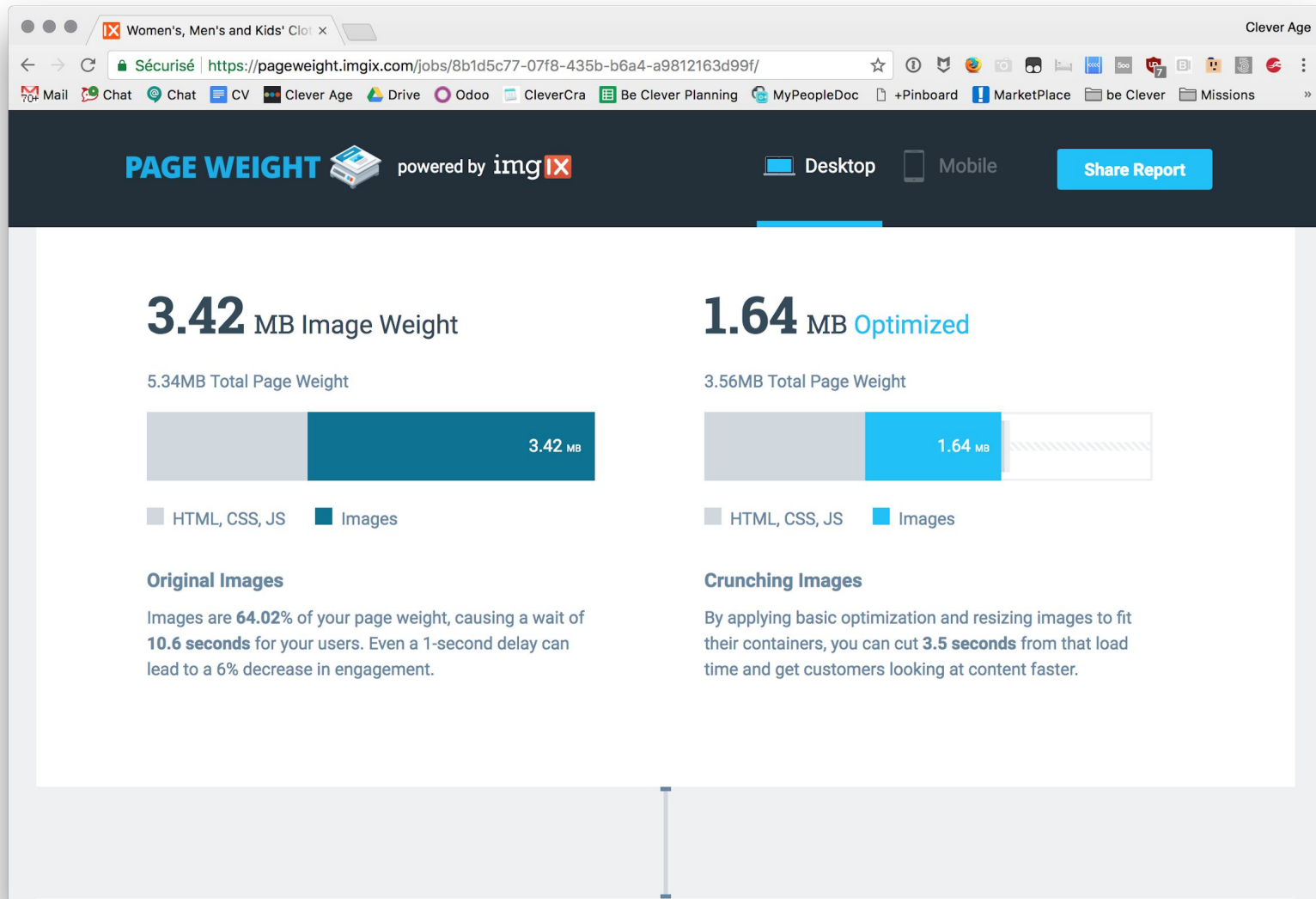
imgix Page Weight

<https://pageweight.imgix.com/>



imgix Page Weight

Indication du gain global de poids, desktop et mobile



imgix Page Weight

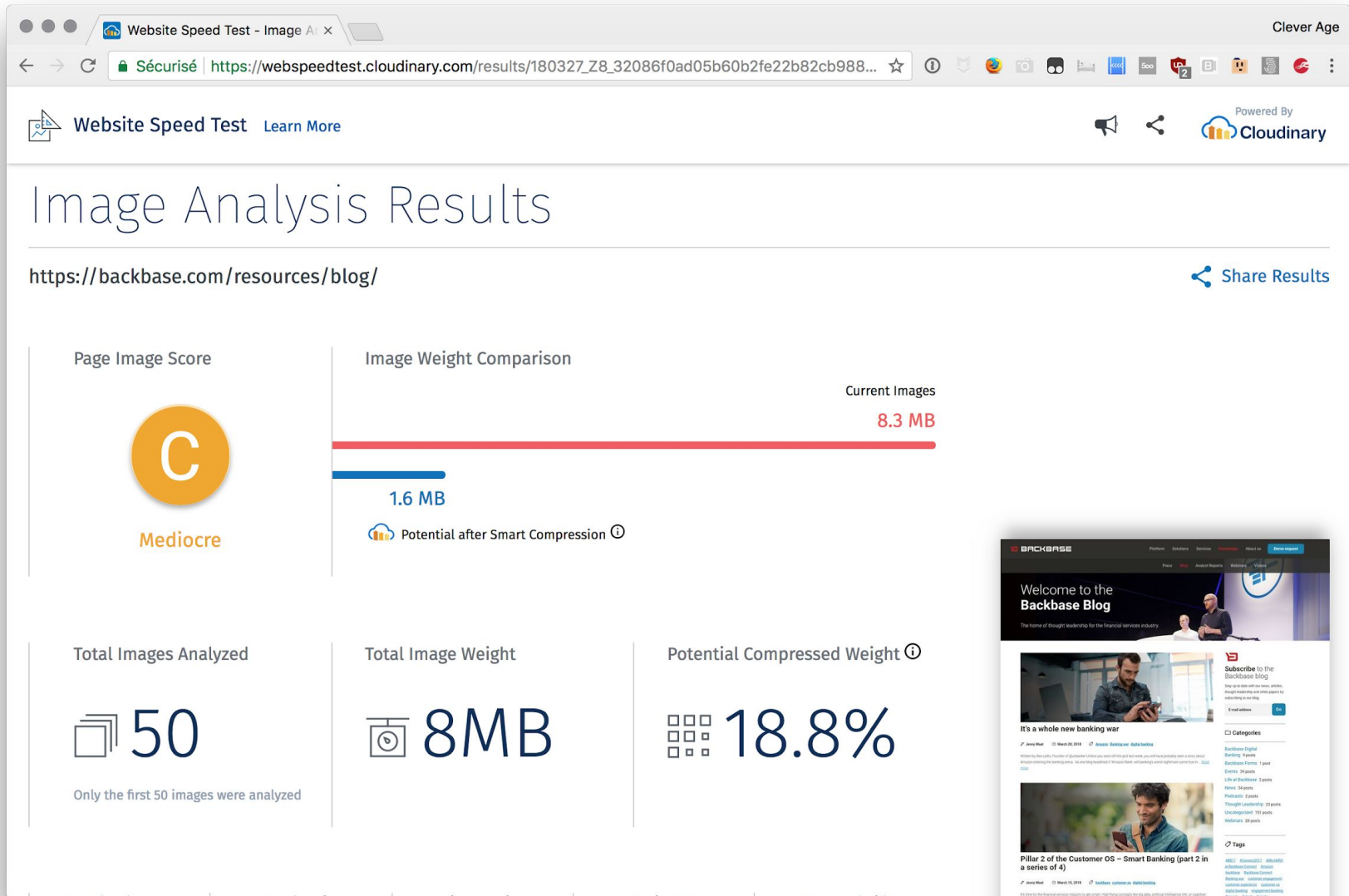
Détail des optimisations pour chaque image

Ordered By Image Weight Savings

Image ID	Original Image Size	imgix Size	Original Dimensions	imgix Dimensions	Original Load Time	imgix Load Time
US-PC-180226-FEATUREDSTORY-SWIMWEAR-02...	95 KB	24.5 KB	640x423 pixels	390x258 pixels	130ms, 3G 750kb/s	33.4ms, 3G 750kb/s
TOC00_032618_AMERICAN?\$jpgMQ\$	133.9 KB	65.9 KB	741x440 pixels	679x403 pixels	183ms, 3G 750kb/s	89.9ms, 3G 750kb/s
US-180312-UTGRAPHICTEES-RAMEN?\$prod\$	82.1 KB	22.6 KB	380x380 pixels	225x225 pixels	112ms, 3G 750kb/s	30.9ms, 3G 750kb/s
US-PC-012218-JW-ANDERSON-FEATURED-NEW...	69.2 KB	15.9 KB	640x423 pixels	390x258 pixels		
US_SP_031418_TOMAS_MAIER-FEATURED_NE...	68.5 KB	17.7 KB	640x423 pixels	390x258 pixels		
US-180312-UTGRAPHICTEES-STUDIO-SANDERS...	56.5 KB	15.5 KB	380x380 pixels	225x225 pixels		

Cloudinary Website Speed Test

<https://webspeedtest.cloudinary.com/>



Cloudinary Website Speed Test

Gain potentiel selon les formats, la mise à l'échelle et la compression

Website Speed Test - Image A x

Clever Age

[Sécurisé https://webspeedtest.cloudinary.com/results/180327_Z8_32086f0ad05b60b2fe22b82cb988...](https://webspeedtest.cloudinary.com/results/180327_Z8_32086f0ad05b60b2fe22b82cb988...)


[Website Speed Test](#)
[Learn More](#)





roadtrip-fall-2015-1024x768.png

PNG		1.3 MB	Current
-----	-------------	--------	---------

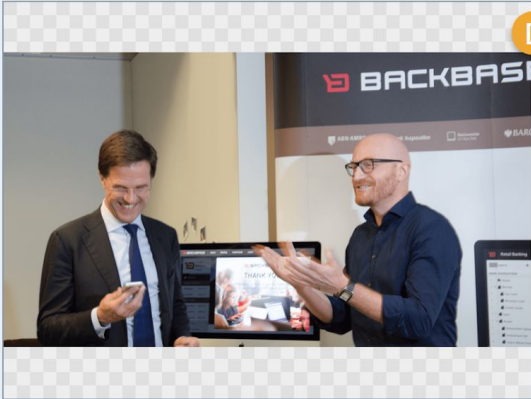
Potential Smart Compression

PNG		296.1 KB	(22.8%)
WEBP		69.8 KB	(5.4%)
JPEG		75.1 KB	(5.8%)

5.4%

1024x768 → 800x600

See More



mark-rutte-at-backbase-1024x569.png

PNG		653.0 KB	Current
-----	-------------	----------	---------

Potential Smart Compression

PNG		132.4 KB	(20.3%)
WEBP		19.4 KB	(3.0%)
JPEG-XR		26.5 KB	(4.1%)

3.0%

1024x569 → 800x445

See More

Cloudinary Website Speed Test

Analyse 6 critères d'optimisation de l'image source et les alternatives

Website Speed Test - Image A x

Clever Age

Sécurisé

https://webspeedtest.cloudinary.com/results/180327_Z8_32086f0ad05b60b2fe22b82cb988...

JPEG

75.1 KB

(5.8%)

Website Speed Test

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Current	Optimized Image	Format Alternatives
PNG 1024 x 768 1.3 MB	PNG 800 x 600 22.8% 296.1 KB	WEBP JPEG 800 x 600 5.4% 69.8 KB
F C F A A A Format Fit Compression Color Space Color Depth Metadata Average D Current image is a lossless PNG, but a lossy WEBP yields a better result. The current image size (1024x768) is larger than the effective rendered size (800x600) and is being scaled down by the browser. The current image weight (1.24 MB PNG) is 1760.86% larger than the optimal image weight (68.2 KB WEBP). The image color space is optimal. The image color depth is optimal.	Scaled down to 800x600. Encoded as PNG. Image is almost definitely a photograph. Tested a lossy format, but lossless yields better results.	Scaled down to 800x600. Encoded as Lossy WebP with a quality score of 75/100. Image is almost definitely a photograph. Using a lossy format. Selected lossy WebP, which uses 4:2:0 chroma subsampling.

Clouldinary Website Speed Test

Attention :

Le résultat global n'est pas toujours pertinent :

- Certaines images sont optimales en WebP
- D'autres images sont optimales en JPEG-XR
- Les deux formats ne sont pas supportés par les mêmes navigateurs

Le test n'est fait que sur un viewport de 1366x718px et une densité de 1dppx.

An aerial night view of a city skyline, likely Hong Kong, with numerous illuminated skyscrapers and a harbor in the background. The text "Pour aller plus loin..." is overlaid in white, bold, sans-serif font in the center of the image.

Pour aller plus loin...

Pour aller plus loin...

Dareboost :

<https://blog.dareboost.com/fr/2017/10/optimiser-les-images-et-reduire-leur-poids-formats-outils-et-rwd/>

Google :

<https://developers.google.com/web/fundamentals/performance/optimizing-content-efficiency/automating-image-optimization/>

Cloudinary :

<https://cloudinary.com/visualweb/>

Slides disponibles sur
<https://speakerdeck.com/nhoizey>
<https://fr.slideshare.net/nhoizey>

Des questions ?



@nhoizey

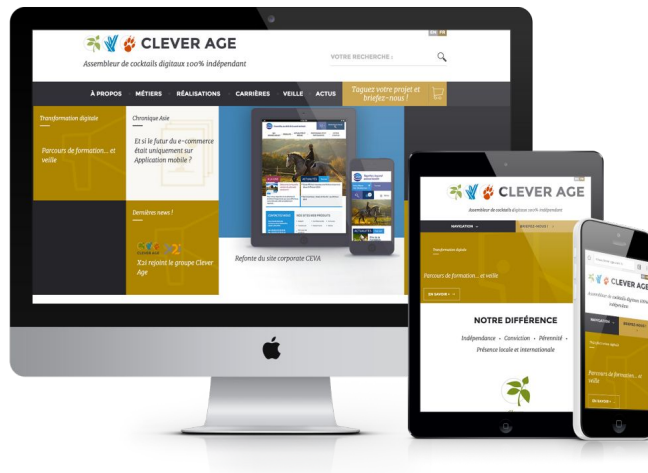


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Gardons le contact !

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