

Faster websites with Hugo

Michael Boelen

NLLGG

2024-09-21 - Utrecht, The Netherlands

In this talk

- About me
- Some history
- The need for speed
- Migration to Hugo
- Additional thoughts

Warning

Way too many slides incoming!

Long question, life story, discussion?

Please buffer them till the end

Short question?

Hand up, wait, go ahead

(syn, syn-ack, ask)

About Me

About Me

- Linux/Unix + Security
- Software development
 - **rkhunter** - malware scanner
 - **lynis** - security audit scanner
- Websites
 - **linux-audit.com** - Linux security (blog)
 - **linuxsecurity.expert** - Linux security
 - **meereco.nl** - DIY / energy / automation
 - **michaelboelen.com** - Personal
 - **nluug.nl** - NLUUG website

Some history

MeerECO



[Isolatie](#) [Ventilatie](#) [Alle onderwerpen](#) [Nuttige links](#) [Over ons](#) 

Energiebesparing en meer comfort

Een blog over het delen van ervaringen rondom klussen in huis en het verduurzamen ervan. De focus ligt op meer comfort, lager energieverbruik en een slimmere woning. Met voldoende tips hoe je dit zelf kan doen. Je kunt meer dan je denkt!

Mijn naam is [Michael Boelen](#) en ik ben [@mboelen](#) op Mastodon. Samen met partner en ons kind wonen we in het Brabantse dorp Vlijmen (regio Den Bosch). Verduurzamen en klussen is voor mij een ietswat uit de hand gelopen hobby en komt voort uit de werkzaamheden aan onze woning. Deze werkzaamheden hebben vooral het doel om de woning comfortabeler en energiezuiniger te maken. Inmiddels hebben we grote stappen gemaakt!

Terwijl ik nieuwe inzichten op doe tijdens de diverse klussen, maak ik foto's en werk ik ze uit tot volwaardige artikelen. Voor mij een archief van uitgevoerde klussen en voor een ander inspiratie om ook zelf aan de gang te gaan. Wil je feedback delen of heb je een vraag? Dan ontvang ik dat graag via [Contact](#). Meestal krijg je binnen een paar dagen antwoord.

VERDUURZAMING EN SLIMMERE WONING

Verduurzamen heeft voor iedereen een andere betekenis. Voor mij betekent het dat een woning meer comfort biedt tegen lagere (maandelijke) lasten. Een aantal onderwerpen binnen verduurzaming:

- Het verminderen van de energiebehoefte van de woning door middel van **isolatie**.
- Een beter binnenklimaat door goede **ventilatie** en slimmer omgaan met energie.
- Het dichtn van naden en kieren als onderdeel van **luchtdichtheid** van de woning, zo kunnen ongewenste luchtstromen verminderd worden.

Ook zal er steeds focus zijn in de artikelen op het slimmer maken van de woning. Dat kan bijvoorbeeld met domotica of home automation. Naast oplossingen in deze hoek zijn er ook genoeg andere tips te vinden over technieken en hulpmiddelen. Het doel is om er meer mensen bekend mee te maken.

BESPAARTIPS

Er zijn meerdere mogelijkheden om o.a. energie te besparen en te vinden in de categorie [besparen](#). De energie die je niet verbruikt hoeft je immers ook niet op te wekken.

ANDERE ONDERWERPEN

Wil je een vlugge blik op andere onderwerpen of snel een artikel terugzoeken? Dat kan gemakkelijk via het [overzicht](#) of de zoekfunctie bovenaan.

LAATSTE ARTIKELEN

- 2024-07-05: [Schimmel in de airco-unit](#)
- 2024-02-24: [Wiha elektricienshamer](#)
- 2024-02-24: [Gereedschap van Wiha](#)
- 2024-02-22: [Gereedschap van Wera](#)
- 2024-02-22: [Wera schroefbeitel](#)

NLUUG: 2008 snapshot



[home](#) [de vereniging](#) [onze activiteiten](#) [lidmaatschap](#) [contact](#)

 [English](#)

"... de toekomst is
Open ..."
(oude Chinese wijsheid)

Vereniging NLUUG

De NLUUG verenigt (professionele) gebruikers van Open Source en Open Standaarden in Nederland; een gemeenschap van systeembeheerders, programmeurs en netwerk-specialisten. Het doel van de NLUUG is de verbreiding van de toepassing en kennis over "Open" en UNIX/Linux.

Agenda

- ▶ 13 dec 2008: [BSD-communitydag](#) i.s.m. de NLLGG.
- ▶ 22 jan 2009: bijeenkomst "[Groen Computeren](#)" , Enschede.
- ▶ 24 mrt 2009: UKUUG [LISA Voorjaarsconferentie](#)  Abstracts voor 26 nov.
- ▶ 7 mei 2009: NLUUG Voorjaarsconferentie "[Filesystems and Storage](#)"
- ▶ Zie ook de uitgebreide [agenda van de NLLGG](#) voor een volledige lijst van UNIX en Linux gerelateerde activiteiten.

Nieuws

- ▶ 20 okt 2008: VU professor Andrew Tanenbaum ontvangt NLUUG award. [Persbericht](#)
- ▶ Ouder [nieuws](#) en [persberichten](#)

De NLUUG onderhoudt nauwe banden met onder andere [CACert](#), [NLnet](#), en de [NLLGG](#).

inloggen voor leden

lidnummer	<input type="text"/>
postcode	<input type="text"/>
	<input type="button" value="inloggen"/>

- ▶ lid worden
- ▶ Open Standaarden
- ▶ Open Systemen
- ▶ UNIX/Linux
- ▶ bedrijfslidmaatschap PLUS-leden

Linux Audit

Linux Audit

The Linux security blog about Auditing, Hardening, and Compliance

Search ...



[Home](#) [Linux Security](#) [Lynis](#) [About](#)

[The 101 of ELF files on Linux: Understanding and Analysis](#)

[OpenSSH security and hardening](#)

[How to secure a Linux system](#)

[How to become a Linux security expert?](#)



2020-06-09 (last updated at June 26th, 2020)

Michael Boelen

Lynis

2 comments

Major release: Lynis 3.x

After almost a year of work, we are excited to share news about the major 3.x release! It is major for multiple reasons, including the number of submissions from the community and some breaking changes. Some core functions have been rewritten and several new functions were added. Another important area for this release is security. Being a security tool, we want Lynis to be as safe as possible, even though shell script is not specifically known for that. So this [...]

[Read more](#)

2019-05-15 Michael Boelen Development 24 comments

The 101 of ELF files on Linux: Understanding and Analysis

Some of the true craftsmanship in the world we take for granted. One of these things is the common tools on Linux, like ps and ls. Even though the commands might be perceived as simple, there is more to it when looking under the hood. This is where ELF or the Executable and Linkable Format comes in. A file format that used a lot, yet truly understood by only a few. Let's get this understanding with this introduction tutorial! By reading [...]

[Read more](#)

2018-07-17 Michael Boelen Open source 10 comments

How to promote your open source project

Getting more out of your project (including more users) Do you have an open source project, yet you feel that it could more users? You are not alone! Many other open source projects have the same problem. The good news is that with only a few steps, you can new and more active users. Time to learn how promotion can be done without the pushy tricks that marketing and salespeople use. Traction is everything Traction in software projects is similar [...]

[Read more](#)

About Linux Audit



This blog is part of our mission: *help individuals and companies, to scan and secure their systems.* We simply love Linux security, system hardening, and questions regarding compliance.

Besides the blog, we have our security auditing tool Lynis. Open source, GPL, and free to use.

[Lynis project page](#)

For those with enterprise needs, or want to audit multiple systems, there is an Enterprise version.

"One security solution to audit, harden, and secure your Linux/UNIX systems."

Benefits:

- Perform audits within a few minutes
- Central management
- Powerful reporting
- Compliance checks (e.g. PCI DSS)
- Additional plugins and more tests



[Learn More](#)

Enjoy the articles!

Why a redesign?

- Modernization of technical components
- Migration to HTML5 / CSS3
- Performance (Time To First Byte)
- Mobile-friendly (responsive)
- New features
- Fixing some existing issues

Issues to tackle

- Organizational structure (URL/menu/directory/content)
- Duplicates
- Errors
- Not mobile-friendly
- Social media integration
- Discoverability
- Search Engine Optimization

Issues > Index



Why pages aren't indexed

Pages that aren't indexed can't be served on Google



Reason	Source	Validation	Trend	Pages
Duplicate without user-selected canonical	Website	Not Started		15,561
Excluded by 'noindex' tag	Website	Not Started		2,916
Not found (404)	Website	Not Started		909
Alternate page with proper canonical tag	Website	Not Started		564
Page with redirect	Website	Not Started		481
Blocked by robots.txt	Website	Not Started		98
Blocked due to access forbidden (403)	Website	Not Started		27
Soft 404	Website	Not Started		18
Blocked due to unauthorized request (401)	Website	Not Started		9
Crawled - currently not indexed	Google systems	Not Started		22,017
Discovered - currently not indexed	Google systems	Not Started		300

Issues ▷ Discoverability

- Navigation
- Scattered information
- No 'shortcut' to find information (e.g. search)

Solution?

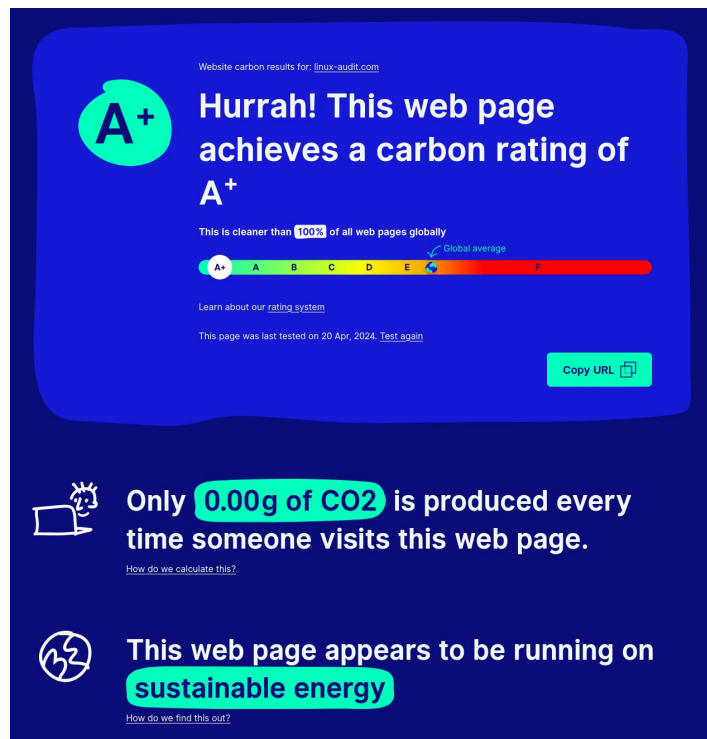
Speed and structure

The Need for Speed

Speed and Energy Usage

- Server
 - CPU
 - Memory
 - Disk
 - Network packets
 - Easier backups
- Client
 - Network traffic
 - Battery usage
 - Performance (initial/scrolling)

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



Website Performance

- Static generator (== less energy)
- Small(er) assets
- No JavaScript*
- Don't forget to test!

*only for internal search

Website Performance (Tools)

- [DebugBear](#)
- [GTmetrix](#)
- Lighthouse (Google)
- [PageSpeed Insights](#) (Google)
- [Pingdom](#)

Website Performance (DebugBear)

Timeline

FCP (1.0 s)

LCP (1.0 s)

All (1.6 s)



0 s 0.1 s 0.2 s 0.3 s 0.4 s 0.5 s 0.6 s 0.7 s 0.8 s 0.9 s 1.0 s 1.1 s 1.2 s 1.3 s 1.4 s

Full TTFB: 777 ms

First Contentful Paint: 965 ms

Largest Contentful Paint: 965 ms

Time to Interactive: 965 ms

Website health ▷ Performance (GTmetrix)



Latest Performance Report for: <https://nluug.nl/>



Report generated: Tue, Nov 7, 2023 4:22 AM -0800

Test Server Location: London, UK

Using: Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0

GTmetrix Grade ?

	Performance ? 100%	Structure ? 99%
--	---	--

Web Vitals ?

Largest Contentful Paint ? 206ms	Total Blocking Time ? 0ms	Cumulative Layout Shift ? 0
---	--	--

Website health ▷ Performance (PageSpeed)



Performance



Accessibility



Best Practices



SEO



Performance

Values are estimated and may vary. The [performance score is calculated](#) directly from these metrics. [See calculator.](#)

▲ 0–49

■ 50–89

● 90–100

A screenshot of the NLUUG website. At the top left is the NLUUG logo. To its right are navigation links: 'Organisatie', 'Eremerken', 'Lidmaatschap', 'Nieuws', 'Contact', a search icon, and a user icon. Below the navigation is a large green badge with the number '100' and the word 'Performance' underneath. The main content area contains text about NLUUG's mission and a list of dates under the heading 'Laatste nieuws'. At the bottom right, there is a small box with the text 'NLUUG is gecertificeerd door de NEN-ISO 27001' and 'Nieuw: Dinsdag 28 november 2023' and 'Laatste: Vrijdag 10 oktober 2023'.

Website health ▷ Performance (Pingdom)

Your Results:

 DOWNLOAD HAR

 SHARE RESULT

Performance grade

A 100

Page size

51.5 KB

Load time

138 ms

Requests

10

Images: WebP with fallback

- Created by Google
- Available since 2010
- JPEG: 39% smaller, PNG: 45% smaller

Migration to Hugo

Hugo

Positive

- Open source
- Healthy community
- Static output
- Easy to install
- No dependencies
- Batteries included

Negative

- Learning curve

About

The world's fastest framework for building websites.

gohugo.io

go static-site-generator cms hugo
documentation-tool blog-engine
content-management-system

📖 Readme

📄 Apache-2.0 license

🔒 Security policy

📊 Activity

📁 Custom properties

☆ 74.7k stars

👁 1.1k watching

🔗 7.5k forks

Report repository

Releases 288

📦 v0.134.2 (Latest)
yesterday

+ 287 releases

Benefits of static websites

Pro

- Clean templates = High performance¹
- Cheap hosting
- Simple software stack
- No fiddling with caching
- Good for Search Engine Optimization
- Great for security
 - No outdated plugins
 - No vulnerabilities
- No authentication/form spam
- Git usage (structure / content)
- Easy to migrate content between hosts

Con

- Slightly limited functionality
 - CMS
 - Plugins
 - Personal profiles
- Regeneration needed for content updates
- No interactive parts by default
 - Forms
 - Comments

¹ Performance of a website depends a lot on structure and loading of assets

Hugo in a Nutshell

Website recipe:

- Templates
- Content (often Markdown)
- Some YAML here, some JSON there
- Assets
- More templates!
- Errors

Do you want to see a presentation about Hugo?

Migration ▷ Focus areas

Website quality and health

- Performance
- Security
- Mobile First Design
- Up-to-date content
- Detect dead links
- Usage of webmaster tools
- Semantics: HTML5/CSS3
- Security

Discoverability

- Sitemap
- IndexNow
- Structured data
- Navigation
- Internal search
- Website “open”
- Integration with social media

Migration ▷ Virtual Hosts

nluug.nl

- Contains the new website
- Fallback for missing pages (→ archief-website)

archief-website.nluug.nl

- Contains the old website

leden.nluug.nl

- Contains a stripped version of the old website (*members only area*)
- Preparing for the future

Migration ▷ Magic (No indexing)

archieff-website.nluug.nl

Header injection:

```
add_header X-Robots-Tag "noindex, nofollow, nosnippet, noarchive";
```

Prevent website indexing by search engines

- Focus on new content instead of old
- Avoid duplicates during transition

Migration ▷ Magic (Rewrite map)

nluug.nl

```
map $request_uri $new_uri { include /etc/nginx/maps/website.map; }
```

/etc/nginx/maps/website.map

...

```
/activiteiten/events/vj23/abstracts/ab07.html /evenementen/nluug/voorjaarsconferentie-2023/  
talks/bjorn-wijers-kom-voor-de-hersenspoeling-en-help-in-de-digitale-spoelkeuken/;
```

...

```
if ($new_uri) { return 301 $new_uri; }
```

Migration ▷ Magic (Proxy)

nluug.nl

```
location / { try_files $uri $uri/index.html $uri/ @archie; }
```


Migration ▷ Magic (Proxy)

nluug.nl

```
location @archieff {
  # Host zetten we handmatig (ipv $host), target ook op deze machine staat in een andere virtuele host
  proxy_set_header Host archief-website.nluug.nl;
  proxy_pass https://archieff-website.nluug.nl;
  proxy_redirect https://archieff-website.nluug.nl https://$server_name;

  # Tussen servers geen compressie, zo kunnen we sub_filter toepassen
  proxy_set_header Accept-Encoding "";
  proxy_http_version 1.1;

  sub_filter_once on;
  sub_filter "<td class=\"content\">" "<td class=\"content\"><div
style=\"background-color:#6A2060;color:white;font-size:1.2em;font-weight:bold;margin-top:20px;padding:10px;\"><span
class=\"blink-soft\">Let op: Deze pagina komt uit ons archief.</span><br>Ga voor actuele informatie en nieuws naar onze <a
style=\"color:white;\" href=\"/\">vernieuwde website</a>.</div>";
}
```

(some lines snipped, let's zoom in)

Migration ▷ Magic (Proxy)

nluug.nl

...

```
# Host zetten we handmatig (ipv $host), target ook op deze machine staat in een andere virtuele host
```

```
proxy_set_header Host archief-website.nluug.nl;
```

```
proxy_pass https://archief-website.nluug.nl;
```

```
proxy_redirect https://archief-website.nluug.nl https://$server_name;
```

...

Migration ▷ Magic (Proxy)

nluug.nl

...

```
# Tussen servers geen compressie, zo kunnen we sub_filter toepassen
```

```
proxy_set_header Accept-Encoding "";
```

```
proxy_http_version 1.1;
```

...

Migration ▷ Magic (Proxy)

nluug.nl

...

```
sub_filter_once on;
```

```
sub_filter "<td class=\"content\">" "<td class=\"content\"><div
```

```
style=\"background-color:#6A2060;color:white;font-size:1.2em;font-weight:bold;margin-top:20px;padding:10  
px;\"><span class=\"blink-soft\">Let op: Deze pagina komt uit ons archief.</span><br>Ga voor actuele  
informatie en nieuws naar onze <a style=\"color:white;\" href=\"/\">vernieuwde website</a>.</div>";
```

...

```
<blink> 🥰
```

Let op: Deze pagina komt uit ons archief.

Ga voor actuele informatie en nieuws naar onze [vernieuwde website](#).

Website Quality

Quality: Semantics (HTML5/CSS3)

- Aim for best possible use of HTML tags
- Use CSS for styling
- `<style>` for performance (above-the-fold)
- Strip whitespace

Quality: Structured data

- HTML5
- Date / time values
- Schema.org
 - Article
 - BreadcrumbList
 - Event
 - Logo
 - Organization
 - Person
 - WebPage
 - WebSite

Quality: Schema.org

- Mission to create, maintain, and promote schemas for **structured data**
 - on the Internet
 - on web pages
 - in email messages
 - and beyond
- Founded by Google, Microsoft, Yahoo and Yandex
- Developed by an open community process

More information at schema.org

Quality: Schema.org

NGO

0 ERRORS 0 WARNINGS ^

ID: <https://nluug.nl/#organization>

@type	NGO
@id	https://nluug.nl/#organization
url	https://nluug.nl/
name	NLUUG
sameAs	https://nluug.social/@nluug
sameAs	https://twitter.com/nluug
sameAs	https://www.wikidata.org/wiki/Q2137723
logo	
@type	ImageObject
url	https://nluug.nl/afbeeldingen/logo/nluug-logo.png
height	134
width	300
contactPoint	
@type	ContactPoint
contactType	Bestuur
email	bestuur@nluug.nl
availableLanguage	en
availableLanguage	nl
contactPoint	
@type	ContactPoint
contactType	Buro
email	buro@nluug.nl
availableLanguage	en
availableLanguage	nl

Quality: Schema.org (tools)

- <https://validator.schema.org/>
- Google Search Console (webmaster tools)

Images: WebP with fallback

WebP image format - OTHER

Usage

% of all users  ?

Global

95.75% + 1.14% = 96.88%

Image format (based on the VP8 video format) that supports lossy and lossless compression, as well as animation and alpha transparency. WebP generally has better compression than JPEG, PNG and GIF and is designed to supersede them. [AVIF](#) and [JPEG XL](#) are designed to supersede WebP.

Current aligned Usage relative Date relative Filtered All 

Chrome	Edge [*]	Safari	Firefox	Opera	IE	Chrome for Android	Safari on iOS [*]	Samsung Internet	Opera Mini [*]	Opera Mobile [*]	UC Browser for Android	Android Browser [*]	Firefox for Android	QQ Browser	Baidu Browser	KaiOS Browser
4-8				10.1												
¹ 9-22		3.1-13.1		¹ 11.5								2.1-3				
² 23-31	12-17	³ 14-15.6	2-64	² 12.1-18			3.2-13.7					¹ 4-4.1				
32-118	18-118	16.0-17.0	65-118	19-102	6-10		14-17.0	4-22		12-12.1		4.2-4.4.4				2.5
119	119	17.1	119	103	11	119	17.1	23	all	73	15.5	119	119	13.1	13.18	3.1
120-122		17.2-TP	120-122				17.2									

Notes Test on a real browser Known issues (1) Resources (7) Feedback

¹ Partial support refers to not supporting lossless, alpha and animated WebP images.

² Partial support refers to not supporting animated WebP images.

³ Safari 14.0 – 15.6 has full support of WebP, but requires macOS 11 Big Sur or later.

Quality: Security

- Security headers (HTTP)
- Avoid JavaScript
- No forms (so far)

Quality: Accessibility improvements

- Initial work done
 - Set alt attribute on images
 - Color scheme
 - ARIA: aria-label attribute
- To be done
 - Tests by engines
 - Tests by real persons

Thanks!

Questions? Feedback?

- Ask now, or later
- Contact me