

NAT64/DNS64 real life experiments and one useful tool – NAT64Check

...from go6lab.si and IPv6-lab.net

Brought to you by:



Internet
Society

Jan Žorž
zorz@isoc.org



Sander Steffann
sander@steffann.nl

steffann

Problem statement and real world status

(Six Degrees of Inner Turbulence)

IPv6 and IPv4 are incompatible on the wire.

- We need transition and translation mechanisms between the two protocols
- Mobile operators are massively switching devices to IPv6-only connectivity
 - millions of users
 - using 464XLAT (Android) or plain NAT64 (Apple) as a transition tool to access IPv4 content
- Some people do weird stuff while adding AAAA to their DNS records
- Important questions:
 - Do content providers know how their content will be seen from such environments?
 - Do connectivity providers know what their users' experience on IPv6-only would be?

Credits, acknowledgments and supporters



(Metropolis, Pt. 1: The Miracle and the Sleeper)

Projects like this and all the massive amount of work cannot be performed without great support of people and companies that we work with:

[Internet Society](#) - for Jan's working time and funding of the numerous travels where we got the idea of the IPv6 issues while talking to operators and also future travels where we'll talk about this topic (we are here, aren't we? :))

[Go6 Institute Slovenia](#) - for funding and running the Go6lab where we got connectivity, HW, SW and place to experiment with all this things IPv6

[SJM Steffann](#) for Sander's working time, coding skills, massive energy and also HW/SW in their ipv6-lab.net to make this tool redundant.

[Corinne Pritchard](#) for a lovely design of a tool's front-end. Hugs :))

Go6lab NAT64/DNS64 public test-bed

(The Test That Stumped Them All)

Aimed at everyone who would like to test NAT64/DNS64 functionality

4 different implementations, 4 different instructions how to direct traffic there

Used by operators

Testing the idea of providing NAT64/DNS64 and/or 464XLAT to their users

Used by application providers

To see how their apps works in NAT64/DNS64 environment

Used by HW/SW vendors

Testing their solutions against multiple NAT64 vendors

Gained quite some traction and momentum this days

Instructions: <https://go6lab.si/current-ipv6-tests/nat64dns64-public-test/>

Go6lab NAT64/DNS64 test-bed

<https://go6lab.si/current-ipv6-tests/nat64dns64-public-test/>

NAT64/DNS64 public test

Go6lab is hosting a variety of NAT64/DNS64 solutions, open for general Internet public for testing.

Disclaimer: This setup is not intended for performance testing, just to see how NAT64/DNS64 operates, what applications breaks and what are differences between different implementations. If you need to do performance testing of NAT64/DNS64 send email to [<zavod@go6.si>](mailto:zavod@go6.si) and schedule a test session in go6lab facility.

To test different NAT64/DNS64 setups you need to disable IPv4 on your device and set an IPv6 resolving DNS server, different one for each setup. Please **send us** your observations, specially about which applications breaks in IPv6-only/NAT64 environment. We would like to build a list of them.

A10 Networks NAT64 implementation: set your DNS to **2001:67c:27e4:15::6411**

NAT64 implementation is running on a A10 vThunder virtual appliance.

NAT64 routed prefix: 2001:67c:27e4:642::/64

Quick ping6 test if up&running: ping6 2001:67c:27e4:642::5bef:6015

PaloAlto Networks Firewall NAT64 with BIND9.9 DNS64: set your DNS to **2001:67c:27e4::64**

NAT64 implementation is running in PAN500 firewall box.

NAT64 routed prefix: 2001:67c:27e4:64::/64

Quick ping6 test if up&running: ping6 2001:67c:27e4:64::5bef:6015

Jool NAT64 with BIND9 DNS64: set your DNS to **2001:67c:27e4:15::64**

Jool NAT64 implementation is running in a virtual container on proxmox server.

NAT64 routed prefix: 2001:67c:27e4:1064::/64

Quick ping6 test if up&running: ping6 2001:67c:27e4:1064::5bef:6015

Cisco ASR1000 NAT64 with BIND9 DNS64: set your DNS to **2001:67c:27e4::60**

NAT64 implementation is running in Cisco ASR1001.

NAT64 routed prefix: 2001:67c:27e4:11::/64

Quick ping6 test if up&running: ping6 2001:67c:27e4:11::5bef:6015

Go6lab NAT64/DNS64 test-bed HW/SW

(Systematic Chaos)



Some DNS admins put “crap” in AAAA records

(The Enemy Inside)

Have you ever seen any of this values for AAAA record?

::

::1

::ffff:[IPv4_addr]

fe80::[some_value]

64:ff9b::[some_value]

2001:DB8::[some_value]

If you have seen something like this and you know who did it, talk to that people and tell them to fix it. This sort of thing isn't useful to anybody and severely impacts user experience.

More: <http://www.employees.org/~dwing/aaaa-stats/> (courtesy of Dan Wing)

Causing confusion with or without www

(Breaking All Illusions)

```
sander@MacPro:~$ host www.firstinsight.com
www.firstinsight.com is an alias for 160569.group19.sites.hubspot.net.
160569.group19.sites.hubspot.net is an alias for
cos2mdc.hubspot.net.mdc.edgesuite.net.
cos2mdc.hubspot.net.mdc.edgesuite.net is an alias for a1711.b.akamai.net.
a1711.b.akamai.net has address 88.221.254.18
a1711.b.akamai.net has address 88.221.254.10
```

```
sander@MacPro:~$ host firstinsight.com
firstinsight.com has IPv6 address ::
firstinsight.com mail is handled by 10 mx1.emailsrvr.com.
firstinsight.com mail is handled by 20 mx2.emailsrvr.com.
```

When deploying in real life you need “fixes”

(Build Me Up, Break Me Down)

So, what can we do about it?

We can figure out who these people are, contact them, warn them about the issue, educate them and ask them to fix the problem.

Remember: If you are not part of solution, you are part of the problem.

At the same time we can protect our users from bad user experience and set the “exclude” rules in our DNS64 servers. IANA allocated 2000::/3 as global unicast address pool, so whatever else is used in AAAA - it’s by default bogus and we can safely ignore that.

When deploying in real life you need “fixes”

(Stream of Consciousness)

BIND9 example of DNS64 configuration in go6lab:

```
dns64 2001:67c:27e4:64::/96 {  
    clients { any; };  
    mapped { !rfc1918; any; };  
    exclude { 0::/3; 4000::/2; 8000::/1; 2001:DB8::/32; };  
    break-dnssec yes;  
};
```

Explanation of “exclude” configuration parameter: If DNS64 server gets an AAAA record with a value of anything outside 2000::/3 - it ignores it and synthesizes the AAAA record from NAT64_prefix::IPv4_address

When deploying in real life you need “fixes”

(Moment Of Betrayal)

This fixes the most common errors and keeps your users relatively safe from bad user experience when using 464XLAT and NAT64

This also prevent issues when AAAA record contains an IPv6 documentation prefix, that is inside 2000::/3 block.

“Break-dnssec yes” configuration directive:

By default, DNS64 module does not process queries that request DNSSEC data (DO = 1) or that have DNSSEC RRs in the answer. Setting break-dnssec yes will override this default and cause policy processing on all DNSSEC queries. However, the constructed response will not have any DNSSEC records added and therefore cannot be verified by the client (it may have the unintended consequence of looking like a bogus response or even an injection attack to the client).

```
macbook# dig AAAA 4.go6.si @2001:67c:27e4:15::64 +dnssec
```

```
; <<> DiG 9.8.3-P1 <<> AAAA 4.go6.si @2001:67c:27e4:15::64 +dnssec  
;; global options: +cmd  
;; Got answer:  
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 13683  
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 0, AUTHORITY: 4, ADDITIONAL: 1
```

```
;; OPT PSEUDOSECTION:  
; EDNS: version: 0, flags: do; udp: 4096  
;; QUESTION SECTION:  
;4.go6.si. IN AAAA ???
```

```
;; AUTHORITY SECTION:
```

```
go6.si. 3502 IN SOA nsec1.go6lab.si. root.go6.si. 2017010300 86400 7200 3600000 3600  
go6.si. 3502 IN RRSIG SOA 8 2 3600 20170117190417 20170103072329 23274 go6.si. GeTWHLNS  
b1aAsVADyIxviIsZLq0SY AUcR364SWTzuS7vkghSlaubYHo/6HWjSCJ8N4LiZMBSbFUXUQrcsbN9J 27c5SF85/0de+Ty00TtNvL46ETjVIaIkDE  
T6DMHAn6uZ0ZDueful14C4PIoVqEGcCaNdxNm+LXQ0BZORELOGGe T8GzRuFJrYrxHo2YD83PERF7hYpb+zIV9IwOEMbznDi713I3gw3TNcwa V7a  
N80b6I84vfiqRZ6ZONU2jBuEQq yLWjJw==  
c0jvnruvo3s4v19heogvskgfvro8nvdP.go6.si. 3502 IN RRSIG NSEC3 8 3 3600 20170113072032 20161229220157 23274 go6.si.  
fJc+IJWZAET+CvMJww++8qz0yolq9T Qe3XoLb1l1900933mzeAYwaBqBHHJekwyFY0lYnlZ5UyDw7TS9FSL00 dlsEa6XYigy7JIN6wxyFZy+CJ  
ULtX WD37/HTS3uDxeit/s9zgPfltt0Qw3zXMoqWwa97CkLDvBfr0lzM8S0Kn zkdQuGIYrBJRRaWU9U65sJIIjJg0E0MtxuLgyzhrMu24NVyN6aX  
Z0Ec1Yo1TBpp0y3JWIedisGHpeITTZjGRcB 0gjMiQ==  
c0jvnruvo3s4v19heogvskgfvro8nvdP.go6.si. 3502 IN NSEC3 1 0 5 82EEE992264B06E4 C83N2GVQ3KBH0KUQRMBHUD63IDHLBVSU A
```

```
;; Query time: 51 msec  
;; SERVER: 2001:67c:27e4:15::64#53(2001:67c:27e4:15::64)  
;; WHEN: Tue Jan 3 09:59:11 2017  
;; MSG SIZE rcvd: 766
```

Without
break-dnssec yes;
(Enigma Machine)

```
macbook# dig AAAA 4.go6.si @2001:67c:27e4:15::64 +dnssec
```

```
; <<>> DiG 9.8.3-P1 <<>> AAAA 4.go6.si @2001:67c:27e4:15::64 +dnssec
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 45896
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 3, ADDITIONAL: 1
```

```
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags: do; udp: 4096
;; QUESTION SECTION:
;4.go6.si.                IN      AAAA
```

```
;; ANSWER SECTION:
4.go6.si.                3600   IN      AAAA    2001:67c:27e4:1064::5bef:603d
```

```
;; AUTHORITY SECTION:
go6.si.                  3600   IN      NS      nsec1.go6lab.si.
go6.si.                  3600   IN      NS      nsec2.go6lab.si.
go6.si.                  3600   IN      RRSIG   NS 8 2 3600 20170110170427 20161227211300 23274 go6.si. iWA2Cfu
uKS6Ve0PwY7WXUPclfQR vUWamHv1bagVxo6zp86WFAHDGuitdX3xHC3Klr+Ldi/5nLDJ1eFU9BJL fU4qe0FQjWaIY9zzv0MZjaIV8KK93GUD0
XL96BAIT6iDoSdYpbHBesk2//uxVzwQXJynRDgN75VM40FUU/Hj hTikI2D/2PenM6Lv17DNwxxFFM4gM1GG7W60/4L50j/4Ey3xE+xUV4BS m+
ZP1nhoWqNR0Bf/Rugjv/1t1Q5 qYAJCQ==
```

```
;; Query time: 384 msec
;; SERVER: 2001:67c:27e4:15::64#53(2001:67c:27e4:15::64)
;; WHEN: Tue Jan 3 10:06:24 2017
;; MSG SIZE rcvd: 406
```

With
break-dnssec yes;
(Enigma Machine)



When deploying in real life you need “fixes”

(Stream of Consciousness)

Unbound example of DNS64 configuration in go6lab:

server:

```
module-config: "dns64 validator iterator"
```

```
dns64-prefix: 2001:67c:27e4:64::0/96
```

```
private-address: 0::/3
```

```
private-address: 4000::/2
```

```
private-address: 8000::/1
```

```
private-address: 2001:DB8::/32
```

```
# private-address: 64:FF9B::/96
```

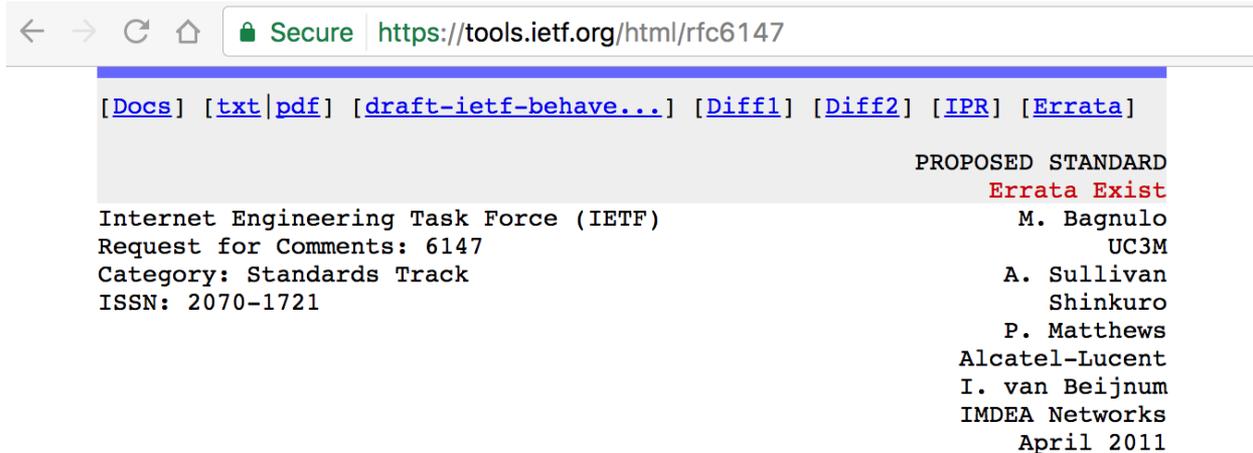
```
# private-address: ::ffff:0:0/96
```

```
# private-address: ::1/128
```

```
# private-address: ::/128
```

```
interface: 2001:67c:27e4::64
```

More reading on DNS64 and DNSSEC – RFC 6147



The screenshot shows a web browser window with the address bar displaying "Secure https://tools.ietf.org/html/rfc6147". Below the address bar, there are several navigation links: [Docs], [txt|pdf], [draft-ietf-behave...], [Diff1], [Diff2], [IPR], and [Errata]. The main content area is divided into two columns. The left column contains the text: "Internet Engineering Task Force (IETF)", "Request for Comments: 6147", "Category: Standards Track", and "ISSN: 2070-1721". The right column contains the text: "PROPOSED STANDARD", "Errata Exist", "M. Bagnulo", "UC3M", "A. Sullivan", "Shinkuro", "P. Matthews", "Alcatel-Lucent", "I. van Beijnum", "IMDEA Networks", and "April 2011".

DNS64: DNS Extensions for Network Address Translation from IPv6 Clients to IPv4 Servers

Abstract

DNS64 is a mechanism for synthesizing AAAA records from A records. DNS64 is used with an IPv6/IPv4 translator to enable client-server communication between an IPv6-only client and an IPv4-only server, without requiring any changes to either the IPv6 or the IPv4 node, for the class of applications that work through NATs. This document specifies DNS64, and provides suggestions on how it should be deployed in conjunction with IPv6/IPv4 translators.

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--	---	--	--	--

Top Selling Wireless Firewalls

--	--	--	--	--

IPv4

NAT64

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Save Up to 30% on your new firewall purchase!
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--	---	--	---	--

Top Selling Wireless Firewalls (View all wireless firewalls)

Still waiting for that timeout...

IPv4

NAT64

Oops: firewalls.com

The screenshot shows the Firewalls.com website. At the top, there is a navigation bar with links for Products, Renewals & Licensing, Services, Training Videos, Blog, Contact Us, and View Cart. Below the navigation bar, there are two promotional banners. The left banner is red and says "Find Your New Firewall Fast! Use the popular firewall tool to find your new firewall." It includes a form for "How many users on your network?" with a dropdown menu for "Number of Users" and a tip: "Tip: Be sure to include printers, tablets, phones...". The right banner is blue and says "Save Up to 30% on your new firewall purchase! Trade-in Your Old Firewall" with a "LEARN MORE" button.

Below the banners, there are two sections: "Top Selling Wired-Only Firewalls" and "Top Selling Wireless Firewalls". Each section contains a grid of product listings with images, logos, and specifications.

Product	Brand	Recommend Users	UTM Throughput	VPN Throughput	Site-to-Site VPN
Sophos SG 115	SOPHOS	25	120 Mbps	425 Mbps	145
SonicWALL TZ300	SONICWALL	25	100 Mbps	300 Mbps	10
Sophos SG 125	SOPHOS	35	200 Mbps	500 Mbps	175
SonicWALL NSA 2600	SONICWALL	300 Mbps	1.1 Gbps	75	
Firebox T50	WatchGuard	35	165 Mbps	270 Mbps	50

Indeed, very secure...

IPv4

NAT64

Oops: firewalls.com

The screenshot shows the homepage of firewalls.com. At the top, there is a navigation bar with the company logo, a search bar, and a phone number. Below the navigation bar are two promotional banners: one for finding a new firewall and another for a trade-in offer. The main content area is divided into two sections: 'Top Selling Wired-Only Firewalls' and 'Top Selling Wireless Firewalls'. Each section contains a grid of product cards with images, brand logos, and technical specifications.

Top Selling Wired-Only Firewalls				
 SOPHOS Sophos SG 115 = Recommend Users: 25 = UTM Throughput: 120 Mbps = VPN Throughput: 425 Mbps = Site-to-Site VPN: 145	 SONICWALL SonicWALL TZ300 = Recommend Users: 25 = UTM Throughput: 100 Mbps = VPN Throughput: 300 Mbps = Site-to-Site VPN: 10	 SOPHOS Sophos SG 125 = Recommend Users: 35 = UTM Throughput: 200 Mbps = VPN Throughput: 500 Mbps = Site-to-Site VPN: 175	 SONICWALL SonicWALL NSA 2600 = Recommend Users: 100 = UTM Throughput: 300 Mbps = VPN Throughput: 1.1 Gbps = Site-to-Site VPN: 75	 WatchGuard Firebox T50 = Recommend Users: 35 = UTM Throughput: 165 Mbps = VPN Throughput: 270 Mbps = Site-to-Site VPN: 50

Top Selling Wireless Firewalls				

Indeed, very secure, running on ::ffff:209.59.134.0...

IPv4

NAT64

Good DNS, bad server: notificaciones.060.es

The screenshot shows the website for the 'Servicio de Notificaciones Electrónicas' (Electronic Notification Service). At the top, there is a navigation bar with the logo 'administración.gob.es punto de acceso general' and 'Dirección Electrónica Habilitada'. Below this, the main heading reads 'Servicio de Notificaciones Electrónicas'. A message in the center states: 'Estáms procediendo a la actualización de nuestros sistemas. Disculpe las molestias.' (We are proceeding with the update of our systems. Excuse the inconvenience.) Below the message, it says '2016 - Ministerio de Hacienda y Administraciones Públicas'. The page also features a sidebar with links for 'Entrar al buzón', 'Registrarse', 'Requisitos de Acceso', and mobile app downloads for Android and iPhone/iPad. A three-step process is outlined: 1. DESE DE ALTA CON DNI O CERTIFICADO ELECTRÓNICO, 2. SUSCRÍBASE A PROCEDIMIENTOS, and 3. ENTRE AL BUZÓN DE NOTIFICACIONES. The footer contains 'Soporte' and 'Normativa' sections, along with logos for 'dni electrónico' and 'W3C WAI-1.0 WCAG 1.0'.

IPv4

IPv6 and NAT64

No AAAA, server still confused: uc.cn

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- UC Browser rolls out the biggest update to its Android brow... 2015-09-07
- Biggest update in two years, UC Browsers for iOS comes w... 2015-08-02
- New milestone on desktop market: UC Browser brings icon... 2015-07-13
- Be fast on Twitter to bring home brand new prize. 2014-09-30
- Discounts, Cashback and Chances to Win an iPhone 6 When... 2014-10-20
- "UC Summer Sale" for UC Browser Users in India 2014-06-13
- Win Rs. 1 Crore with UC Browser's World Cup Bonanza 2014-06-11

IPv4

Apache2 Ubuntu Default Page

ubuntu

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in `/usr/share/doc/apache2/README.Debian.gz`**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2-doc` package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/  
|-- apache2.conf  
|-- ports.conf  
|-- mods-enabled  
|   |-- *.load  
|   |-- *.conf  
|-- conf-enabled  
|   |-- *.conf  
|-- sites-enabled  
|   |-- *.conf
```

- `apache2.conf` is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.
- `ports.conf` is always included from the main configuration file. It is used to determine the listening ports for incoming connections, and this file can be customized anytime.
- Configuration files in the `mods-enabled/`, `conf-enabled/` and `sites-enabled/` directories contain particular configuration snippets which manage modules, global configuration fragments, or virtual host configurations, respectively.
- They are activated by symlinking available configuration files from their respective `*-available/` counterparts. These should be managed by using our helpers `a2enmod`, `a2dismod`, `a2ensite`, `a2dissite`, and `a2enconf`, `a2disconf`. See their respective man pages for detailed information.
- The binary is called `apache2`. Due to the use of environment variables, in the default configuration, `apache2` needs to be started/stopped with `/etc/init.d/apache2` or `apache2ctl`. **Calling `/usr/bin/apache2` directly will not work** with the default configuration.

Document Roots

By default, Ubuntu does not allow access through the web browser to any file apart of those located in

NAT64

Good server, bad content: ebay-kleinanzeigen.de

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IPv4 and NAT64

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Kategorien alle anzeigen

- Auto, Rad & Boot**
 - Autos
 - Fahrräder
 - Mehr ...
- Immobilien**
 - Gewerbeimmobilien
 - Häuser zum Kauf
 - Mietwohnungen
 - Mehr ...
- Dienstleistungen**
 - Auto, Rad & Boot
 - Babysitter & Kinderbetreuung
 - Haus & Garten
 - Mehr ...
- Familie, Kind & Baby**
 - Baby- & Kinderkleidung
 - Kinderwagen & Buggys
 - Mehr ...
- Freizeit, Hobby & Nachbarschaft**
 - Kunst & Antiquitäten
 - Sammeln
 - Mehr ...
- Haus & Garten**
 - Küche & Esszimmer
 - Wohnzimmer
 - Mehr ...
- Haustiere**
 - Hunde & Zubehör
 - Katzen & Zubehör
 - Mehr ...
- Jobs**
 - Gastronomie & Tourismus

Galerie Anzeige hier platzieren

- Eisegler DN Schlit... Boksee 5.300 € VB
- gebrauchte Reifen... Herne 15 € VB
- Esszimmerausstat... Schwäbing-West 3.099 € VB
- Mehrsprach. Haus... Bogenhausen

Neueste Anzeigen Neue Anzeige aufgeben

- Alesia xplorer 26 zo... Treptow Fahrräder 7 €
- Kommode Sideboar... Wesel Wohnzimmer 20 €
- Super verschmuste... Baunatal Katzen & Zubehör 150 € VB
- April/Mai Platz bei ... Süd Babysitter & Kinderbe... VB
- Gespann - Seitenw... Kirchham Motorräder & Motor... 12.000 € VB
- Möbeltransport Um... Hamburg Volksdorf Umzug & Transport 10 € VB
- ABC DESIGN TURB... Wolfburg Kinderwagen & Buggys 100 €
- Rattangarnitur Tisc... Hankensbüttel Garten & Pflanzen 15 €
- Schöne Wohnung L... 350 €
- Zuverlässige Winte... VB
- Damen edel Tasche! 30 €
- Schicht- und Teaml...

IPv6

Good server, bad content: thegatewaypundit.com

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Michelle Obama Says She's Never Heard Anything Like Trump - Rush Limbaugh Quickly Corrects Her
October 13, 2016 By Jim Hoff - 252 Comments

Breaking: After Tens of Thousands of Emails Leaked, Second HRC Email Regarding "Yoga" is Found
Oct 14th, 2016 1:39 pm by Jim Hoff
In March 2015 Hillary Clinton held a

Hillary Jokes With Ellen About When She's In White House - SHE THINKS IT'S OVER!
Oct 14th, 2016 11:54 am by Jim Hoff
Hillary Clinton is taking the next week off from campaigning. She will meet

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Poplačajte Obstoječe Kredite. Odplačine Dobe do 240 Mesecev!
sherbank.at

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popolna-pomnilca.com

Istria Football Youth Cup
od 13. do 16. listopada, U Istru dolazi Liga prvaka budućnosti!
coloursofistria.com

IPv4 and NAT64

The Gateway Pundit

Where Hope Finally Made a Comeback

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hillary-yoga-2



Breaking: After Tens of Thousands of Emails Leaked, Second HRC Email Regarding "Yoga" is Found

Oct 14th, 2016 1:39 pm by Jim Hoff

In March 2015 Hillary Clinton held a presser at the United Nations. She said she released all of her work ... [Leave a Comment](#)

In March 2015 Hillary Clinton held a presser at the United Nations. She said she released all of her work ...

Filed Under: [Uncategorized](#)

hillary-laugh-ellen-win-november



Hillary Jokes With Ellen About When She's In White House - SHE THINKS IT'S OVER!

Oct 14th, 2016 11:54 am by Jim Hoff

IPv6

Non working AAAA record = broken NAT64 😊

Secure <https://nat64check.go6lab.si/v6score/measurement-156228/>

Image match

NAT64



IPv4-only



IPv6-only



Resources match ▶

Fails because of broken IPv6

IPv6 web server broken!

DNS records

139.162.170.125

2a01:7e01::f03c:91ff:febb:c794

Ping

22.4	22.4	22.3	22.3	22.1
ms	ms	ms	ms	ms

22.1	21.5	21.4	21.4	21.4
ms	ms	ms	ms	ms

Working AAAA record and IPv4-only content

NAT64 84%

DEKO SVET
Delovanje svoj svet!

KONTAKT

DOM POROKA OTROCI ZABAVA EKO ZABAVA

3,50 €/1x
8,50 €/1x
2,50 €/1x
5,50 €/1x

od 5,50€

Pizdelki po naročilu

Dobrodošli v DEKO SVET-u – svetu polnem idej, inspiraciji in zabavnih artiklov za vaš dom, zabavo, poroko, rojstni dan ali preprost piknik s prijatelji.

Ker si želimo, da dekorirate vaš svet, bomo spletno trgovino neprestano posodabljali s trenutnimi trendi, idejami ter novimi izdelki, zato se že veselimo vaših rednih obiskov naše spletne trgovine.

Lepe pozdrave vaš DEKO SVET

Uporaba piškotkov

Spletno mesto uporablja piškotke z namenom zagotavljanja spletne storitve in funkcionalnosti, ki jih brez piškotkov ne bi mogli nuditi. Z obiskom in uporabo

IPv4-only

DEKO SVET
Delovanje svoj svet!

KONTAKT

DOM POROKA OTROCI ZABAVA EKO ZABAVA

Papirnate vrečke hartice in ščipalke

Dobrodošli v DEKO SVET-u – svetu polnem idej, inspiraciji in zabavnih artiklov za vaš dom, zabavo, poroko, rojstni dan ali preprost piknik s prijatelji.

Ker si želimo, da dekorirate vaš svet, bomo spletno trgovino neprestano posodabljali s trenutnimi trendi, idejami ter novimi izdelki, zato se že veselimo vaših rednih obiskov naše spletne trgovine.

Lepe pozdrave vaš DEKO SVET

Uporaba piškotkov

Spletno mesto uporablja piškotke z namenom zagotavljanja spletne storitve in funkcionalnosti, ki jih brez piškotkov ne bi mogli nuditi. Z obiskom in uporabo

IPv6-only 78%

DEKO SVET
Delovanje svoj svet!

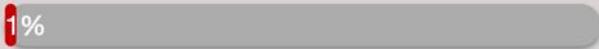
KONTAKT

DOM POROKA OTROCI ZABAVA EKO ZABAVA

Uporaba piškotkov

Spletno mesto uporablja piškotke z namenom zagotavljanja spletne storitve in funkcionalnosti, ki jih brez piškotkov ne bi mogli nuditi. Z obiskom in uporabo

Resources match ▼



URL	NAT64-only	IPv4-only	IPv6-only
GET http://deko-svet.si/	Moved	Moved	Moved
GET http://www.deko-svet.si/	Ok	Ok	Ok
GET http://frog.wix.com/bt?src=29&evld=3&pn=1&et=1&v=1.1939.13&msid=73fcc1f2-b6a4-4066-9548-5598c03d9b03&vsi=40da48dd-2df1-4f54-8951...	Ok		
GET http://frog.wix.com/bt?src=29&evld=3&pn=1&et=1&v=1.1939.13&msid=73fcc1f2-b6a4-4066-9548-5598c03d9b03&vsi=dd42d5c9-3d4d-40ef-9e0a...			Bad gateway
GET http://frog.wix.com/bt?src=29&evld=3&pn=1&et=1&v=1.1939.13&msid=73fcc1f2-b6a4-4066-9548-5598c03d9b03&vsi=d33a5027-aef3-4c98-96cc...		Ok	
GET https://static.parastorage.com/services/third-party/requirejs/2.1.15/require.min.js	Ok	Ok	-

Working AAAA record and IPv4-only content

URL	NAT64-only	IPv4-only	IPv6-only
GET http://deko-svet.si/	Moved	Moved	Moved
GET http://www.deko-svet.si/	Ok	Ok	Ok
GET http://frog.wix.com/bt?src=29&evid=3&pn=1&et=1&v=1.1939.13&msid=73fcc1f2-b6a4-4066-9548-5598c03d9b03&vsi=40da48dd-2df1-4f54-8951...	Ok		
GET http://frog.wix.com/bt?src=29&evid=3&pn=1&et=1&v=1.1939.13&msid=73fcc1f2-b6a4-4066-9548-5598c03d9b03&vsi=dd42d5c9-3d4d-40ef-9e0a...			Bad gateway
GET http://frog.wix.com/bt?src=29&evid=3&pn=1&et=1&v=1.1939.13&msid=73fcc1f2-b6a4-4066-9548-5598c03d9b03&vsi=d33a5027-aef3-4c98-96cc...		Ok	
GET https://static.parastorage.com/services/third-party/requirejs/2.1.15/require.min.js	Ok	Ok	-
GET https://static.parastorage.com/services/santa/1.1939.13/app/main-r.min.js	Ok	Ok	-
GET https://static.parastorage.com/services/santa/1.1939.13/static/css/viewer.css	Ok	Ok	-
GET https://static.parastorage.com/services/web/2.1229.56/javascript/wysiwyg/viewer/deprecatedbrowsers/UpgradeBrowser.js	Ok	Ok	-
GET http://frog.wix.com/ugc-viewer?c=1480946736314&evid=361&src=42&majorVer=3&server=app-jvm14c&did=98a027aa-433e-4874-8e6b-9197c3fa...	Ok		
GET https://static.wixstatic.com/sites/959e83_1685ea46e831627d8b2fee6a28075065_726.json.z?v=3	Ok	Ok	
GET http://frog.wix.com/ugc-viewer?c=1480946736315&evid=351&src=42&majorVer=3&server=app-jvm14c&did=98a027aa-433e-4874-8e6b-9197c3fa...	Ok		
GET http://frog.wix.com/bt?c=1480946736323&evid=3&src=29&pn=1&isp=1&url=deko-svet.si%2F&v=1.1939.13&dc=app-jvm14c&sid=98a027aa-433e-...	Ok		
GET http://frog.wix.com/ugc-viewer?c=1480946736130&evid=361&src=42&majorVer=3&server=app-jvm12a&did=98a027aa-433e-4874-8e6b-9197c3fa...		Ok	
GET http://frog.wix.com/ugc-viewer?c=1480946736131&evid=351&src=42&majorVer=3&server=app-jvm12a&did=98a027aa-433e-4874-8e6b-9197c3fa...		Ok	
GET http://frog.wix.com/bt?c=1480946736139&evid=3&src=29&pn=1&isp=1&url=deko-svet.si%2F&v=1.1939.13&dc=app-jvm12a&sid=98a027aa-433e-...		Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/wixCodelnit/wixCodelnit.min.js	Ok	Ok	
GET https://static.parastorage.com/services/third-party/lodash/3.10.1/lodash.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/coreUtils/coreUtils.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/skins/skins.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/components/components.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/core/core.min.js	Ok	Ok	
GET https://static.parastorage.com/services/third-party/tweenmax/1.18.2/minified/TweenMax.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/animations/animations.min.js	Ok	Ok	
GET https://static.parastorage.com/services/third-party/react/0.14.3/react-with-addons.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/layout/layout.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/wixappsCore/wixappsCore.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/wixappsClassics/wixappsClassics.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/wixappsBuilder/wixappsBuilder.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/tpa/tpa.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/dataFixer/dataFixer.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/siteUtils/siteUtils.min.js	Ok	Ok	
GET https://static.parastorage.com/services/santa/1.1939.13/packages-bin/translationsUtils/translationsUtils.min.js	Ok	Ok	
GET https://static.parastorage.com/services/third-party/hammerjs/2.0.8/hammer.min.js	Ok	Ok	

How to test for all of these things?

(The Looking Glass)

There are many things to test:

Test on NAT64

Test on IPv6-only

Did all resources (images, stylesheets, scripts) load ok?

Does it look good to the user?

Do we see any pMTUd issues?

One service to test them all: **NAT64Check !!!**

(Caught in a web)

nat64check

Check:

Internet Society
 go6
 steffann

NAT64
IPv6
Poor
Mediocre
Good

	URL	When	NAT64	IPv6-only
Details	http://dehumida.si	Nov. 27, 2016, 10:27 p.m.	100%	Unreachable
Details	http://osvelikadolina.si	Nov. 27, 2016, 10:27 p.m.	100%	Unreachable
Details	http://puhar.si	Nov. 27, 2016, 10:27 p.m.	100%	Unreachable
Details	http://vkf-renzel.si	Nov. 27, 2016, 10:27 p.m.	100%	Unreachable
Details	http://domstarejsihidila.si	Nov. 27, 2016, 10:27 p.m.	100%	Unreachable
Details	http://mirza.si	Nov. 27, 2016, 10:27 p.m.	100%	Unreachable
Details	http://program-za-trgovino.si	Nov. 27, 2016, 10:27 p.m.	100%	Unreachable
Details	http://fitness-epicenter.si	Nov. 27, 2016, 10:27 p.m.	100%	Unreachable
Details	http://vrtuoz.si	Nov. 27, 2016, 10:27 p.m.	100%	Unreachable
Details	http://chill.si	Nov. 27, 2016, 10:27 p.m.	100%	Unreachable

(Caught in a web)

nat64check

Check:



- NAT64
- IPv6
- Poor
- Mediocre
- Good

	URL	When	NAT64	IPv6-only
Details	http://www.sdeval.si	Nov. 27, 2016, 10:25 p.m.	100%	100%
Details	http://myunikat.si	Nov. 27, 2016, 10:21 p.m.	100%	100%
Details	http://korsic.si	Nov. 27, 2016, 10:19 p.m.	100%	100%
Details	http://igraj-tenis.si	Nov. 27, 2016, 10:16 p.m.	100%	97%
Details	http://www.vrtecosbos.si	Nov. 27, 2016, 10:08 p.m.	100%	100%
Details	http://69.si	Nov. 27, 2016, 10:06 p.m.	100%	100%
Details	http://renovatio.si	Nov. 27, 2016, 10:02 p.m.	100%	100%
Details	http://ki-ki-do.si	Nov. 27, 2016, 10:02 p.m.	100%	100%
Details	http://projekt-it.si	Nov. 27, 2016, 9:58 p.m.	100%	100%
Details	http://lenstime.si	Nov. 27, 2016, 9:56 p.m.	100%	97%

nat64check

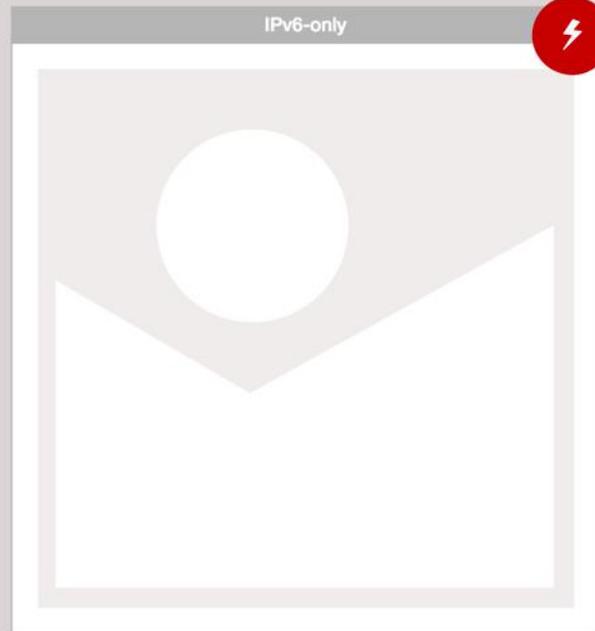
(The Shattered Fortress)

www.netbk.co.jp



Last test finished: 23 November 2016, 01:21 CET

Image match



Resource match

We don't "fix" brokenness

(Lines in the Sand)

For NAT64/DNS64 implementations in go6lab, we try to avoid AAAA bogus records and all our DNS64 configs are tuned like we have shown in previous slides.

For NAT64 Check tool, however, we don't exclude anything. We are trying to show how it is in reality and not mask problems. Those people, causing problems needs to find out the situation and fix it.

<https://nat64check.go6lab.si/>
<https://nat64check.ipv6-lab.net/>

How does this work?

(Illumination Theory)

Four servers:

Management server and web interface

Server with only IPv4

Server with only IPv6

Server with NAT64

Go6lab specific: All servers are virtual machines (LIX) on Proxmox 4.2 virtualization cluster

IPv6-lab.net specific: All running on virtual machines (Ubuntu) on a VMware cluster

Using phantomjs as a command-line browser

Keep track of all loaded (or not) resources

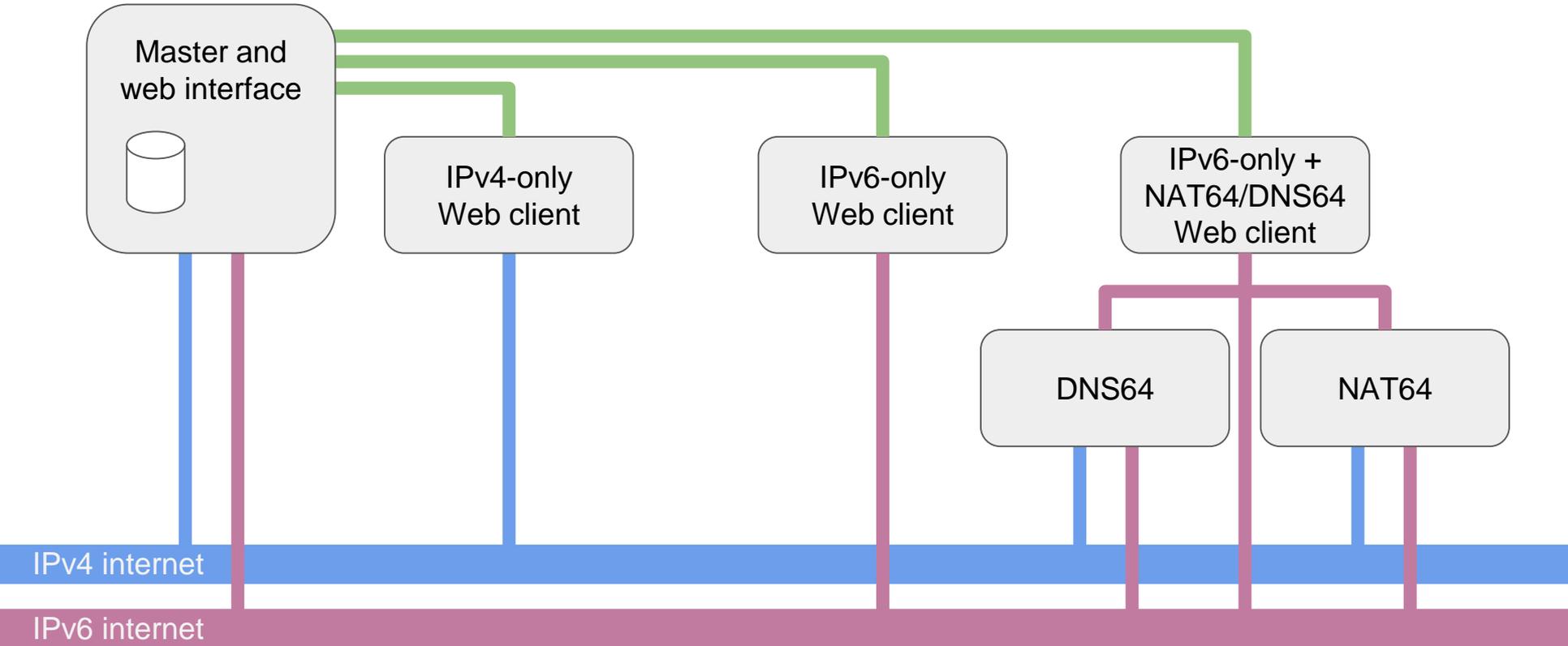
Make a screenshot when the page has loaded

Compare images with each other

Check for resources that could not be loaded

How does this work?

(Images and Words)



Run the test and calculate the score

(Take the Time)

Enter the domain name or URL that you would like to test and submit it to the system.

nat64check

The process of starting all needed browsers, get the results, grab the screen and calculate/compare all the results takes some time, so please be patient.

Run the test and calculate the score

(Take the Time)

You'll see something like this for some time after you start the measurement...



The system will show you when the test was requested, when test was started and will also show you the result in the same page after some time.

No need to hit the “Back” button, it will happen, just give it some time. We promise. Scout’s word of honor. :)

Wash, rinse and repeat

(Lifting Shadows of a Dream)

- Test your website

Are you sure all the images, analytics scripts etc. load over IPv6?

If you don't have IPv6 on your server:

Did you hard-code any IPv4 addresses in your HTML code? In this case NAT64/DNS64 will fail. You might get away with it on 464XLAT, but don't count on it.

Why you don't have IPv6 on your server yet?

If things fail - make sure you are persistent enough to find the issues. There are millions of potential viewers of your content on IPv6-only connection at this precise moment, make sure you don't mess it up and that our tool shows the 100% good result.

- Test again

- Repeat until your website is no longer broken

- If you are fixing a DNS misconfiguration - it might take some time before our tool gets and sees the new and fixed AAAA value. DNS propagation is slow.

NAT64Check code available on GITHUB

(In Constant Motion)

- All code is free and open and it lives on GitHub.
- Feel free to use it and/or contribute:

<https://github.com/sjm-steffann/nat64check>

91 commits

1 branch

0 releases

1 contributor

Branch: master ▾

New pull request

Create new file

Upload files

Find file

Clone or download ▾



steffann Make message more accurate

Latest commit 7b5bc7e on 5 Dec 2016

nat64check	Running tests on the actual workers	a month ago
old	Major styling and functionality update	2 months ago
v6score	Make message more accurate	a month ago
.gitignore	Running tests on the actual workers	a month ago
manage.py	Update manage.py	4 months ago
requirements.txt	Running tests on the actual workers	a month ago

NAT64Check v.2

(Act II: Scene Eight: The Spirit Carries On)

- Version 2 of the tool
- Developed by the same team (Sander, Corrine, Jan)
- Sponsored by Internet Society
- 3-tier architecture (Marvin, Trillian, Zaphod)
- Globally distributed Marvin/Trillian combos running in docker containers
- As many instances as possible to see the same server from different vantage points



Conclusions, questions, suggestions?

(Act II: Scene Eight: The Spirit Carries On)

If you are content provider: test how people sees your content from different environments

If you are connectivity provider: test how IPv6-only and 464XLAT/NAT64-DNS64 users sees content

If both: all of the above 😊

You might be surprised. Well, you probably will be surprised.

<https://nat64check.go6lab.si/>

<https://nat64check.ipv6-lab.net/>



Internet
Society

Jan Žorž
zorz@isoc.org



Sander Steffann
sander@steffann.nl

steffann