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Open Standards Everywhere

ICANN 68 DNSSEC/Security Workshop

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Once upon a time… (in March 2019)

Site	IPv6	DNSSEC	HTTPS	HSTS	Internet.nl	TLS 1.3	HTTP/2	Audit date
www.internetsociety.org	Y	Y	Y	Y	100%	N	Y	3/25/19
future.internetsociety.org	N	Y	Y	N	78%	N	N	3/25/19
assets.internetsociety.org	N	N	Y	Y	55%	N	Y	3/25/19
apps.internetsociety.org	Y	Y	Y	N	94%	N	N	3/25/19
inforum.internetsociety.org	N	Y	Y	Y	81%	Y	N	4/8/19
www.isocfoundation.org	N	N	Y	N	52%	N	Y	3/25/19
www.manrs.org	Y	N	Y	N	70%	N	Y	3/25/19
observatory.manrs.org	N	Y	Y	N	94%	N	N	3/26/19
www.internethalloffame.org	Y	Y	Y	Y	100%	N	N	3/26/19
www.afpif.org	Y	N	Y	N	70%	N	N	3/26/19
www.ndss-symposium.org	Y	N	Y	N	71%	N	Y	3/26/19
www.ietfjournal.org	Y	N	Y	N	70%	N	N	3/26/19
www.dnssec-deployment.org	Y	Y	Y	N	94%	N	N	3/26/19
www.internetac.org	Y	N	Y	N	70%	N	Y	3/26/19
www.ixptoolkit.org	Y	Y	Y	N	91%	N	N	3/26/19
www.iotsecurity2018.ca	N	N	Y	N	37%	N	N	3/26/19
www.iotsecurity.sn	Y	N	Y	N	70%	N	Y	3/26/19
www.worldipv6launch.org	Y	N	Y	N	68%	N	Y	3/25/19
Percentage compliant	67%	44%	100%	22%	76%	6%	44%	
The sites below are additional websites where changes may be made in the future.								
www.connect-smart.org	N	N	Y	N	52%	N	N	3/26/19
www.openwsis2015.org	Y	Y	Y	N	94%	N	N	4/8/19
www.otalliance.org	N	Y	Y	N	79%	N	N	4/8/19
Percentage compliant	33%	67%	100%	0%	76%	0%	0%	

“Oh, sure, we can fix those up!”

The Problem

Many website operators WANT their sites to to use the latest standards for security…

… but **they do not know HOW to do so!**

The Problem

And many website operators…

do not understand WHY they should care…

about the latest open standards**!**

Examples: HTTP/2, HSTS

The Challenge

- ***MANY*** sources of information about *individual* standards.

- But…
  - not any **single source** of “best practices” for standards for websites
  - many sources can be **very technical** and **NOT easy to understand**
  - sources may **not** be **up-to-date** with the latest standards and tools
  - **no agreement** within Internet community on what exactly makes a “secure server” based on open Internet standards
  - **no example / reference systems** that can **show** how all of these standards and protocols can work together successfully

- It is **difficult** to figure out how to set up your webserver!

“We need to make this easier for system administrators like me!”

Our Contribution – the **Open Standards Everywhere (OSE)** project

1. **BUILD a set of public demonstration web servers** available to all.

2. Provide **step-by-step DOCUMENTATION** and links to resources so that a website administrator can set up their own systems in a similar way.

3. **PROMOTE** this server ecosystem and documentation widely throughout the web, developer, and open source communities.

4. **LEAD BY EXAMPLE**, and ensure Internet Society websites follow our recommendations.

Open

- Based on agreed-upon, voluntary standards that anyone can use to connect with other systems

Globally-connected

- IPv6 – Native connections for new networks (especially mobile)
- HTTP/2 – Faster connections work better for low bandwidth, mobile

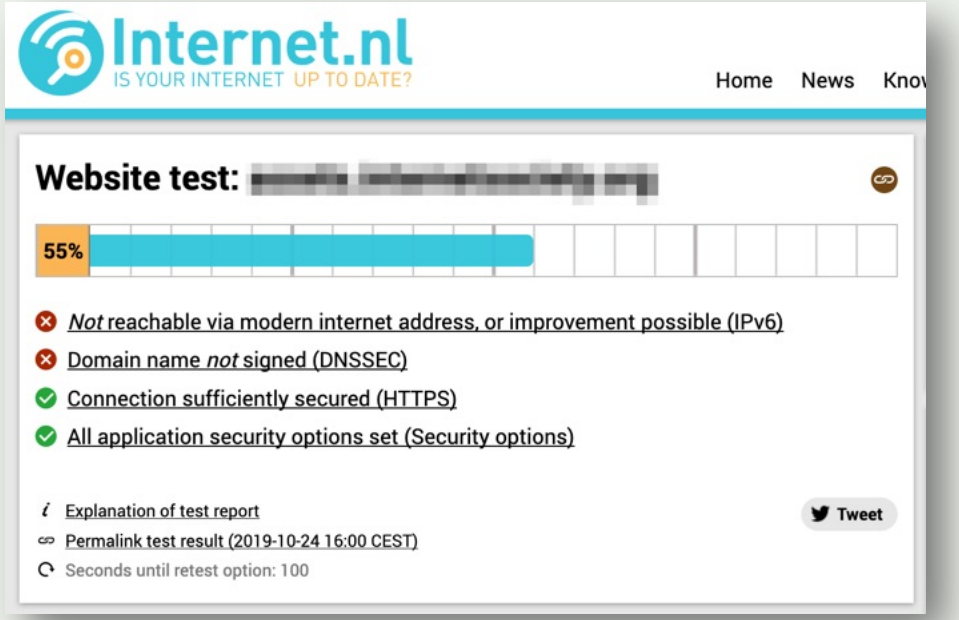
Secure and trustworthy

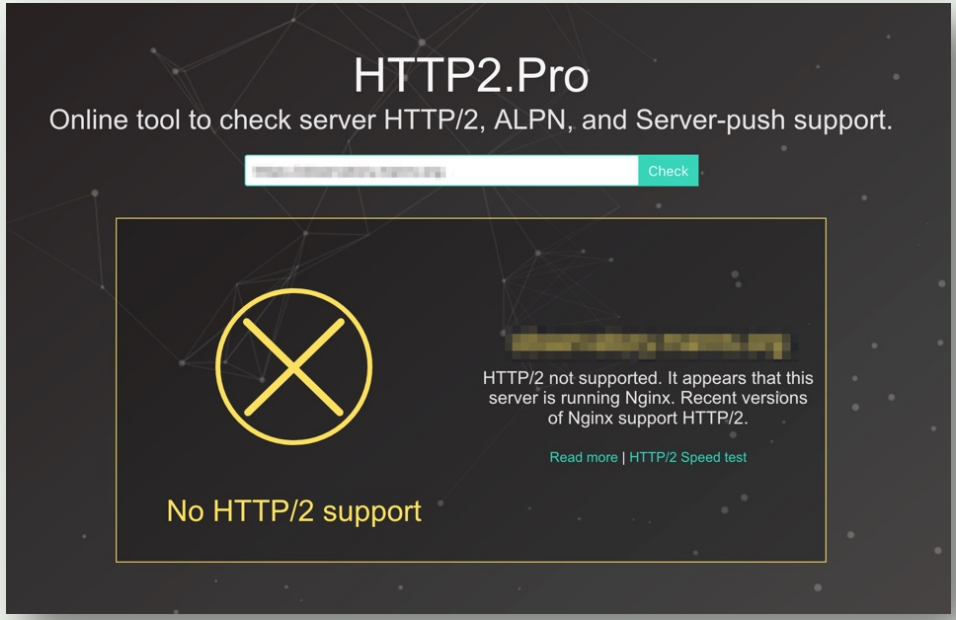
- DNSSEC
- TLS 1.3, HSTS, and more

Test framework – Internet.nl and http2.pro

- https://internet.nl/
  - IPv6, DNSSEC, HTTPS/TLS, including TLS 1.3, HSTS, more
  - Developed by NLNet Labs with support from many orgs, including ISOC and ISOC NL Chapter

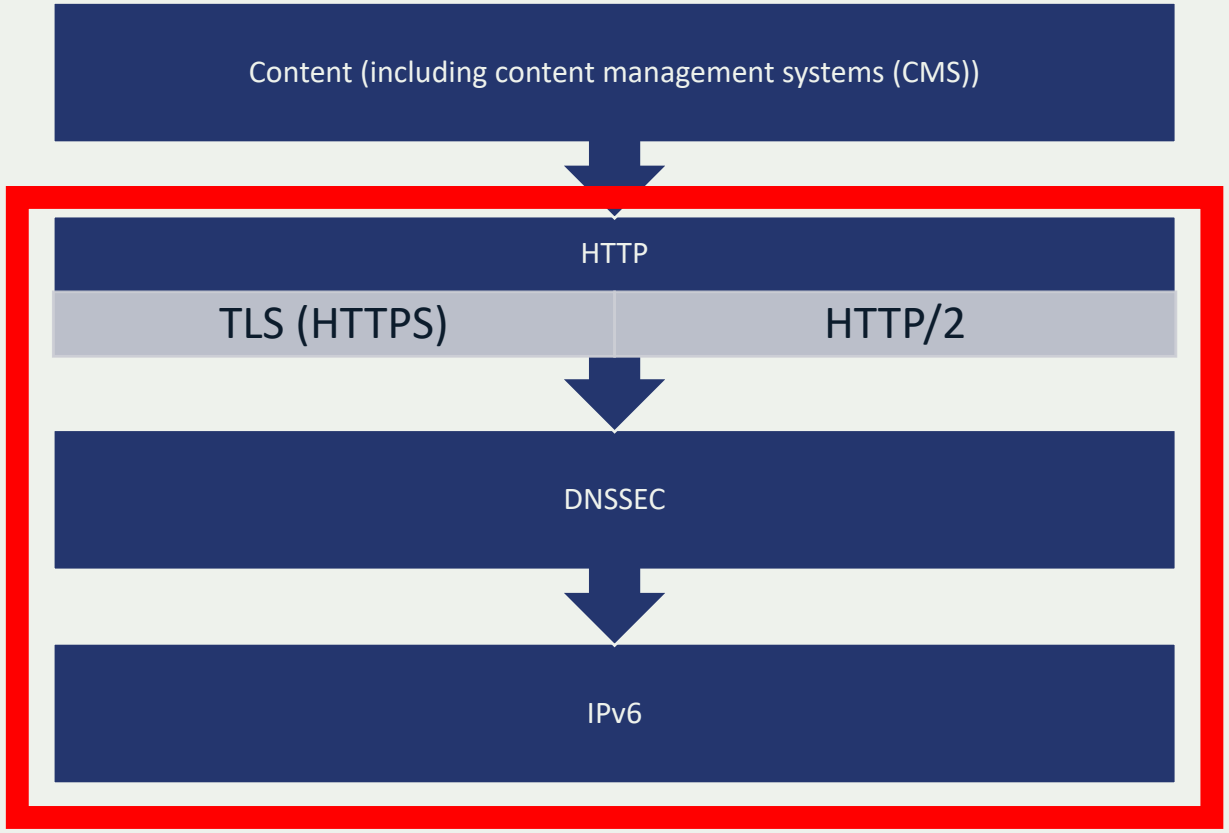
- https://http2.pro/
  - HTTP/2





Scope – Web servers

- OSE project is focusing on security and standards of **the connections to a web server**
- **NOT** focused on **content** of web sites.
- Out of scope:
  - Web site design, presentation
  - Content management systems
  - Accessibility
  - Mobile usability
  - Page speed performance



Three types of web servers

"Self-hosted" on a server or virtual machine

- You have command-line access and can configure files.

Hosted with a website hosting provider

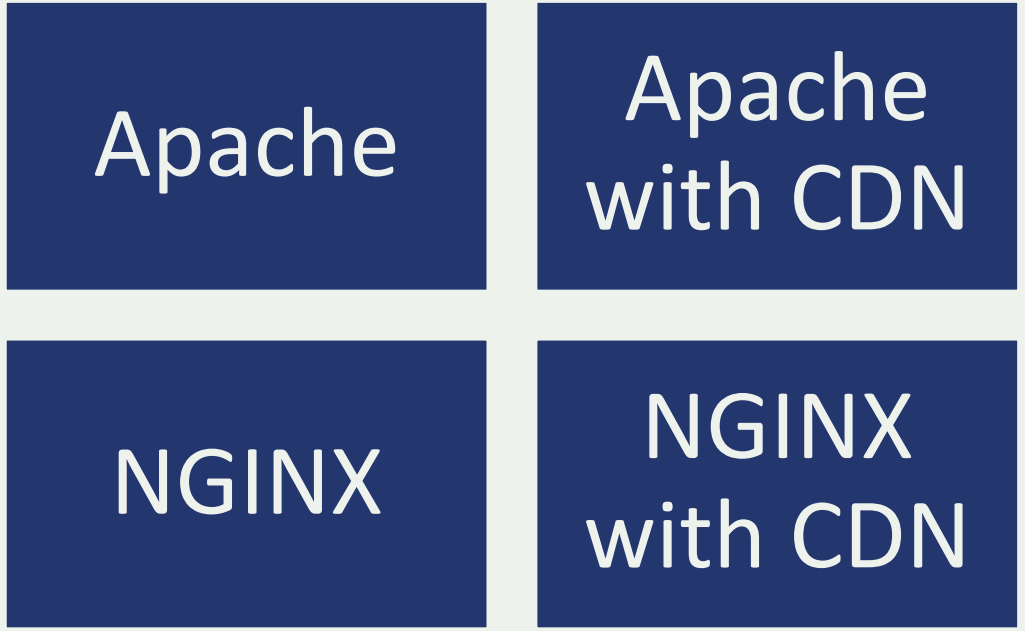
- You do NOT have command-line access. You typically use web admininistration forms and are limited in what you can do.

Content delivery networks (CDNs)

- You use a CDN in front of your self-hosted or hosted website.

BUILD reference servers

- https://ose-apache.internetsociety.org/
- https://ose-apache-cdn.internetsociety.org/
- https://ose-nginx.internetsociety.org/
- https://ose-nginx-cdn.internetsociety.org/



DOCUMENT how we set up the servers

- Easy-to-understand (and easy-to-find) documentation will be key.
  - Current plans include:
    - Web pages with step-by-step tutorials
    - Videos / ”screencasts” showing the precise configuration steps
    - Links to testing tools and environments
    - Links to more details on specific standards, protocols, and practices
    - Materials about why this is important, including business cases

DOCUMENTATION – an experiment using GitHub

- We are developing the documentation on GitHub:
  - **https://github.com/internetsociety/ose-documentation**

- Once complete, documentation will be moved to main ISOC website
- Will be published in English, French, and Spanish

LEAD BY EXAMPLE – our Internet Society sites

- We will “practice what we promote”
- Audit of all of our corporate sites
- Working on changes
- Working with our Chapters and Special Interest Groups (SIGs)

Site	IPv6	DNSSEC	HTTPS	HSTS	NOT TLS 1.0/1.1	Cipher Order	Internet.nl	TLS 1.3	HTTP/2
www.internetsociety.org	Y	Y	Y	Y	Y	N	97%	N	Y
future.internetsociety.org	Y	Y	Y	Y	Y	N	97%	N	Y
apps.internetsociety.org	Y	Y	Y	Y	N	N	97%	N	N
www.isocfoundation.org	Y	N	Y	Y	Y	N	70%	N	Y
news.internetsociety.org	Y	Y	Y	Y	Y	N	97%	N	Y
www.manrs.org	Y	Y	Y	Y	Y	N	97%	N	Y
observatory.manrs.org	Y	Y	Y	Y	N	N	92%	N	N
ose-apache.internetsociety.org	Y	Y	Y	Y	Y	Y	100%	Y	Y
ose-apache-cdn.internetsociety.org	Y	Y	Y	Y	Y	N	97%	Y	Y
ose-nginx.internetsociety.org	Y	Y	Y	Y	Y	Y	100%	Y	Y
ose-nginx-cdn.internetsociety.org	Y	Y	Y	Y	Y	N	97%	Y	Y
www.internethalloffame.org	Y	Y	Y	Y	N	N	97%	N	N
www.afpif.org	Y	N	Y	Y	Y	N	70%	N	Y
www.ndss-symposium.org	Y	N	Y	N	Y	N	69%	N	Y
www.ietfjournal.org	Y	N	Y	N	N	N	68%	N	Y
www.dnssec-deployment.org	Y	Y	Y	N	N	N	95%	N	Y
www.internetac.org	Y	Y	Y	Y	Y	N	97%	N	Y
www.internetcollaboration.org	Y	Y	Y	Y	Y	N	97%	N	Y
www.iotsecurity.sn	Y	N	Y	Y	Y	N	70%	N	Y
www.ixptoolkit.org	Y	N	Y	N	N	N	68%	N	Y
www.worldipv6launch.org	Y	N	Y	Y	Y	N	68%	Y	Y
Percentage compliant	100%	67%	100%	81%	71%	10%	88%	24%	86%

Future

- Expanding web server documentation as standards evolve:
  - **HTTP/3** (also known as QUIC)
  - **Website packaging standards**

- In the next years, possible ideas include:
  - **Mail servers**, embracing security standards such as DMARC, DKIM
  - **DNS servers**, promoting DNSSEC validation, DNS-over-HTTPS (DoH), and DNS-over-TLS (DoT)
  - **Time servers**, adding support for Network Time Security (NTS) to complement our Time Security project
  - **Communication servers**, embracing WebRTC and similar standards

How You Can Help

- **Test your site with Internet.nl** – and help spread the word about site
- **Review / comment on the documentation on GitHub:**
  - **https://github.com/internetsociety/ose-documentation**
- **Share** this info and encourage others to join in
  - **https://www.internetsociety.org/ose/**

We want **open standards** to be **everywhere**!

(Including our own sites and services)

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Thank you.

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