

Dutch Internet Standards Platform - Internet.nl

RIPE 86, Cooperation Working Group

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Who are we?

- **Dutch Internet Standards Platform** is the organization behind the test tool Internet.nl
- Parties from the Internet community and the Dutch government (public / private)



Ministry of Economic Affairs
and Climate Policy



Dutch Cloud
Community



Dutch Standardisation Forum



National Cyber Security Centre
Ministry of Justice and Security





Goal and rational

Goal

“Jointly increase the use of modern Internet standards to make the Internet more accessible, safer and more reliable for everyone.”

Rational

“The incentive is necessary because adoption is faltering due to market failure and the adoptions of multiple standards in the Netherlands is lagging behind various (surrounding) countries.”



Market failure was investigated by the CPB

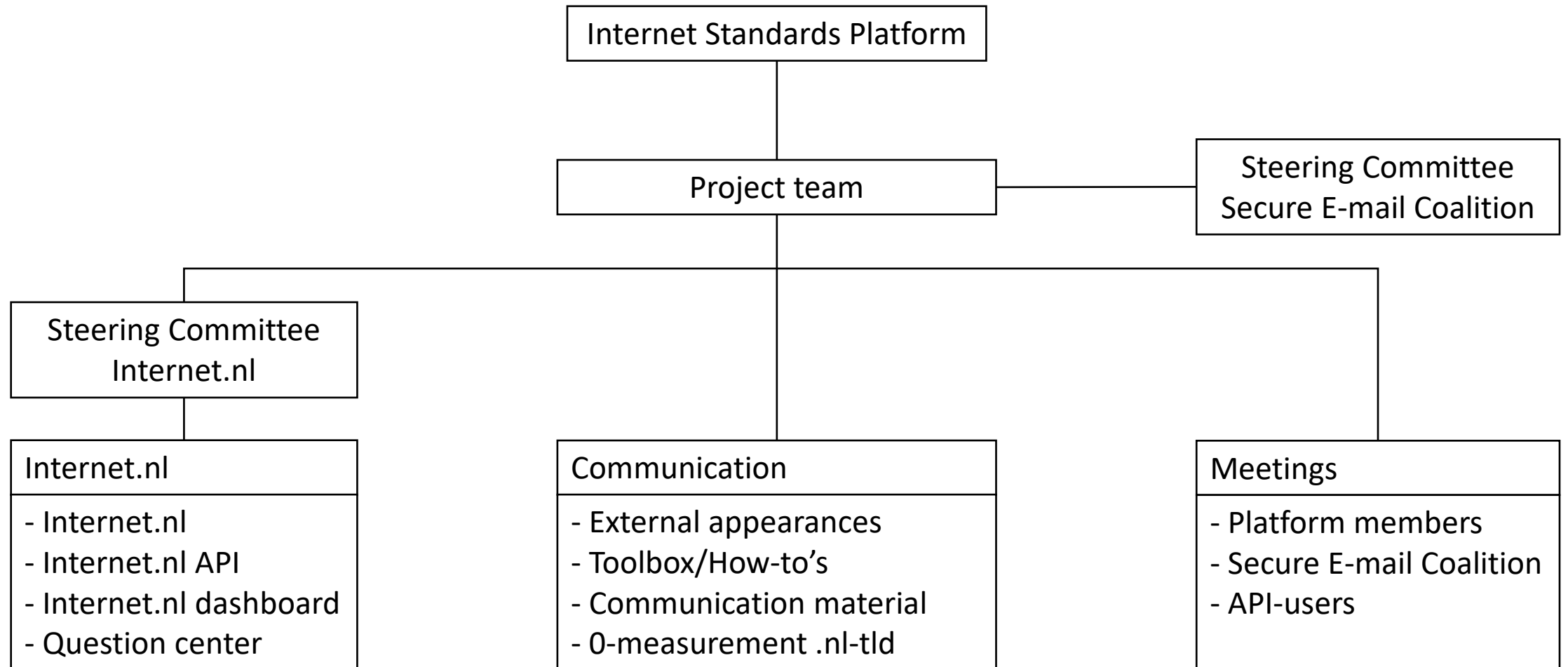
Causes of market failures: asymmetric information (how to identify reliable market partners), coordination failure (how to get safer Internet standards adopted), and first-mover disadvantages

More information:

- “Cyber Security Risk Assessment for the Economy”, p.28, CPB together with NCSC-NL (https://www.cpb.nl/sites/default/files/omnidownload/CPB-Security-Risk-Assessment-for-the-economy-July2016_3.pdf)
- “Economic aspects of Internet security”, p. 8, 16, 21 CPB (<https://www.cpb.nl/sites/default/files/publicaties/download/ad-kox-straathof-economic-aspects-internet-security.pdf>)



Project organization





External appearances

- **Day of the Domain name 2022** (13 Sept, Haarlem)
- **GFCE Triple-I Day @INSIG2022** (25 Sept, Hyderabad, India)
- **One Conference** (18 Okt, The Hague)
- **ECP Annual festival** (17 Nov, The Hague)
- **MESSEU** (22 Nov, Lisbon, Portugal)
- **IGF 2022** (30 Nov, Addis Ababa, Ethiopia)

Network: government, business, science, international



- University of Amsterdam
- ICANN
- Géant
- Ministry of General Affairs
- Digital Trust Center
- GFCE
- VNG Realisatie
- Global Cyber Alliance
- De Volksbank
- IETF (DMARC Working Group)
- Center for Information Security and Privacy Protection (CIP)
- Microsoft
- Privacy by Design (IRMA)
- Open-Xchange (ID4me)
- Cisco
- European Commission (Next Generation Internet, EU cybersecurity strategy for the digital age)
- KPN
- Proofpoint
- Digicy.cloud
- Ministry of Justice and Security (Strategic Supplier Management Microsoft, Google Cloud and Amazon Web Services Rijk; Directorate-General for Administration of Justice and Law Enforcement (DGRR))
- Soverin
- Freedom Internet
- eco - Verband der Internetwirtschaft e.V.
- Ziggo
- PCextreme
- Delft University of Technology
- Fortinet
- Mimecast
- ABN AMRO
- Certified Senders Alliance
- DK Hostmaster (Sikkerpånettet.dk)
- Barracuda
- Flowmailer
- Netherlands Enterprise Agency (RVO)
- Statistics Netherlands (CBS)
- Dutch Authority for Digital Infrastructure (RDI)
- Netherlands Organization for Applied Scientific Research (TNO)
- NEN
- Waag



Promoting modern Internet standards

- **IPv6** (modern address) → further growth of internet
- **DNSSEC** (signed domain) → integrity of domain data
- **HTTPS** (secure website connection) → web confidentiality
- **HTTP security headers+security.txt** (security enhancements)
- **DMARC+DKIM+SPF** (authenticity marks) → anti mail spoofing
- **STARTTLS+DANE** (secure mail server connection) → mail confidentiality
- **RPKI** (routing security) → prevention of route hijacks

In 2022, RPKI has been added in collaboration with NCSC-NL, and security.txt with DTC.



Internet.nl - single scan version

- Transparency and guidance
- Hall of Fame (web, email, champions)
- Hall of Fame for Hosters
- Our test baseline is based on:
 - Internet Standards on the 'comply-or-explain' list of the Dutch Standardisation Forum
 - Security advices of the Dutch NCSC
 - Relevant RFC's of IETF
- Number of tests in 2022: 690,391

The screenshot displays the Internet.nl website interface. At the top, there is a navigation bar with the logo and the tagline "IS YOUR INTERNET UP TO DATE?". The main content area is divided into three columns for testing: "Test your website", "Test your email", and "Test your connection". Each column contains a form with input fields and a "Start test" button. Below the testing section, there are three columns of information: "News" with a list of recent updates, "Hall of Fame" featuring a list of domains with a 100% success rate, and "Tests in numbers" showing statistics for web domains, mail domains, and connections. The footer contains a disclaimer and social media links.

Internet.nl IS YOUR INTERNET UP TO DATE? English Nederlands

Home News Knowledge base Hall of Fame About Internet.nl

Modern Internet Standards provide for more reliability and further growth of the Internet. Are you using them?

Test your website Modern address? Signed domain? Secure connection? Route authorisation? [about the test](#)

Your website domain name: **Start test**

Test your email Modern address? Anti-phishing? Secure transport? Route authorisation? [about the test](#)

Your email address: **Start test**

Test your connection Modern addresses reachable? Domain signatures validated? [about the test](#)

News

- Improved tests for CSP and security.txt on Internet.nl
- Universal Acceptance Day - #Internet4all
- Internet.nl adds test for security.txt
- New Internet.nl release adds RPKI test
- Maintenance and bugfix release of Internet.nl
- New Internet.nl with improved tests for TLS and CSP

[to the news overview](#)

Hall of Fame 3372 domains with 2 x 100% Latest entry: 20-05-2023

- return-path.dk
- cyberpro.club
- hlr.xyz
- weert.nl
- papendrecht.nl
- magazines.ncsc.nl
- english.ncsc.nl
- bovanyanevsky.com
- beterbeveiligd.com
- mail.return-path.dk

[to hall of fame - champions!](#)

Tests in numbers

542212 unique web domains

- 100%: 27492
- 0-99%: 514720

233444 unique mail domains

- 100%: 10598
- 0-99%: 222846

25115 unique connections

- 100%: 8922
- 0-99%: 16193

Internet.nl is an initiative of the Internet community and the Dutch government. v1.7.1

Report vulnerability Privacy statement Copyright Accessibility Mastodon LinkedIn Twitter



Website test: example.nl

Congratulations, your domain will be added to the **Hall of Fame** soon!



- ✓ [Reachable via modern internet address \(IPv6\)](#)
- ✓ [Domain name signed \(DNSSEC\)](#)
- ✓ [Connection sufficiently secured \(HTTPS\)](#)
- ✓ [All security options set \(Security options\)](#)
- ✓ [Authorised route announcement \(RPKI\)](#)

[Explanation of test report](#)
[Permalink test result \(2023-05-21 13:12 UTC\)](#)
[Rerun the test](#)



Email test: internet.nl

Congratulations, your domain will be added to the **Hall of Fame** soon!



- ✓ [Reachable via modern internet address \(IPv6\)](#)
- ✓ [All domain names signed \(DNSSEC\)](#)
- ✓ [Authenticity marks against email phishing \(DMARC, DKIM and SPF\)](#)
- ✓ [Mail server connection sufficiently secured \(STARTTLS and DANE\)](#)
- ✓ [Authorised route announcement \(RPKI\)](#)

[Explanation of test report](#)
[Permalink test result \(2023-05-21 13:07 UTC\)](#)
[Rerun the test](#)



Connection test



- ✓ [Modern addresses reachable \(IPv6\)](#)
- ✓ [Domain signatures validated \(DNSSEC\)](#)

[Explanation of test report](#)

✓ Modern addresses reachable (IPv6)

Well done! Your internet provider has provided you with a modern internet address ([IPv6](#)). Therefore you can reach other computers with modern addresses.

[Show details](#)

✓ Secure mail server connection (STARTTLS and DANE)

Well done! Sending mail servers supporting secure email transport ([STARTTLS and DANE](#)) can establish a secure connection with your receiving mail server(s). STARTTLS prevents passive attackers from reading emails in transit to you. DANE protects against active attackers stripping STARTTLS encryption by manipulating the mail traffic.

[Show details](#)

TLS

- ✓ [STARTTLS available](#)
 - ✓ [TLS version](#)
 - ⚠ [Ciphers \(Algorithm selections\)](#)
 - ✓ [Cipher order](#)
 - ✓ [Key exchange parameters](#)
 - ✓ [Hash function for key exchange](#)
 - ✓ [TLS compression](#)
 - ✓ [Secure renegotiation](#)
 - ✓ [Client-initiated renegotiation](#)
 - ✓ [0-RTT](#)
- #### Certificate
- ✓ [Trust chain of certificate](#)
 - ✓ [Public key of certificate](#)
 - ✓ [Signature of certificate](#)
 - ✓ [Domain name on certificate](#)

DANE

- ✓ [DANE existence](#)
- ✓ [DANE validity](#)
- ✓ [DANE rollover scheme](#)

DANE

✓ DANE existence

Verdict:
All your mail server domains provide a TLSA record for DANE.

Technical details:

Mail server (MX)	DANE TLSA record existent
internet.nl.	2 1 1 E1AE9C3DE848ECE1BA72E0D991AE4D0D9EC547C6BAD1DDA89068EB0A7E0E008
...	3 1 1 D6FEA64D4E68CAEAB7CBB2E0F905D7F3CA33088B12FD88C5B469F08AD7E05C7C7

Test explanation:
We check if the name servers of each of your receiving mail servers (MX) provide a TLSA record for DANE.

As DNSSEC is preconditional for DANE, this test will fail in case DNSSEC is missing on the mail server domain(s).

Note that the test ignores TLSA records of the types PKIX-TA(0) or PKIX-EE(1) as these should not be used for receiving mail servers.

Furthermore the test will lead to a fail if there is no DNSSEC proof of 'Denial of Existence' for TLSA records. If a signed TLSA record exists but at the same time there is an insecure `MXDOMAIN` for the same domain (due to faulty signer software), the test will also show a fail. The latter two failure scenario's could lead to non-delivery of emails addressed to you by DANE validating mail senders.

See '[IT Security Guidelines for Transport Layer Security \(TLS\) v2.1](#)' from NCSC-NL, Appendix A, under 'Certificate pinning and DANE' (in English).



Hall of Fame - Hosters

Champions! | Websites | Email | **Hosters**

The 48 hosters mentioned below are included in the Hall of Fame for Hosters, because they meet the following **criteria**:

- 1. Own domain 2x 100%:** The hoster's own domain name, on which the company website is active, scores 100% in both the website test and the email test on Internet.nl;
- 2. Customer domains 2x 100%:** The hoster explicitly offers hosting services for websites and e-mail, and offers its customers the possibility to score 100% in both the website test and email test on Internet.nl;
- 3. Trade register:** The hoster's company name is mentioned as a trade name in the Trade Register of the Dutch Chamber of Commerce or in a similar foreign trade register;
- 4. Only per request:** Inclusion in this Hall of Fame is voluntary and can be requested by the hoster by sending an e-mail to question@internet.nl.



Other rules

- **Using our badge:** Only hosters listed in this Hall of Fame are allowed to use the above *Internet.nl compliant badge* in their own communications. In case you want to use the badges on your website, the domain of that website has to correspond with the 100% scoring domain.
- **Unjustified listing?** Do you see a hoster in this Hall of Fame that does not meet the criteria described above? Please send us an e-mail using proper argumentation.
- **Order:** The names of the hosters in the Hall of Fame are shown in random order.

100% Internet.nl compliant hosters

[Fastware](#)

[mijn_host](#)

[Freedom Internet](#)

[Soverin](#)

[Internationaal](#)

[Ximple](#)

[Prelution](#)

[Bouwhuis IT](#)

[Siem Hosting](#)

[Cloudwebservices](#)

[Fixmeister](#)

[TEDS-IT Automatisering](#)

[Creagraphy](#)

[Hostingindustries](#)

[xel](#)

[NederHost](#)

[Exonet](#)

[CARIEN.EU](#)

[Prolocation](#)

[Vimexx](#)

[bHosted](#)

[DMA internet services](#)

[FYN Software](#)

[Core Networks GmbH](#)

[AUVICOM Technologies](#)

[HostingU2](#)

[Misterdot](#)

[Cobytes](#)

[Xmail](#)

[Intakt](#)

[Zylon](#)

[WebOké](#)

[MKB Internet eXchange](#)

[i24 ICT](#)

[DimyNET Internet Services](#)

[Infra Blocks](#)

[AmsterdamTech](#)

[SQB](#)

[Intention](#)

[Zillner.IT](#)

[ConsulHosting](#)

[QuanTora](#)

[DevNomads](#)

[Vevida](#)

[NL Hosting](#)

[dotplex GmbH](#)

[BIT](#)

[X6 Solutions](#)



Internet.nl - API and dashboard

- **API for bulk testing**

- JSON based REST-like API
- More than 3.3M tests a year

- **Dashboard (a GUI for the API)**

- Tracking changes over time
- Adoption statistics
- Spreadsheet export

/api/batch/v2/requests/XXX/results

```
"domains": {
  "example.nl": {
    "status": "ok",
    "report": {
      "url": "https://batch.internet.nl/mail/example.nl/123/"
    },
    "scoring": {
      "percentage": 100
    },
    "results": {
      "categories": {
        "mail_ipv6": {
          "verdict": "passed",
          "status": "passed"
        },
        "mail_dnssec": {
          "verdict": "passed",
          "status": "passed"
        },
        "mail_auth": {
          "verdict": "passed",
          "status": "passed"
        }
      }
    }
  }
}
```



Internet.nl - API and dashboard

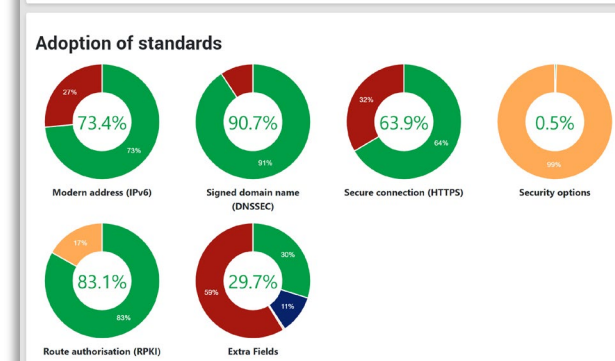
- API for bulk testing
 - JSON based REST-like API
 - More than 3.3M tests a year
- **Dashboard (a GUI for the API)**
 - Tracking changes over time
 - Adoption statistics
 - Spreadsheet export

The dashboard home page features a navigation bar with the Internet.nl logo and the tagline 'IS YOUR INTERNET UP TO DATE?'. It includes a 'Welcome to the internet.nl Dashboard' section with a brief description of the service. Below this are three main action buttons: 'Manage domains', 'Bulk scan', and 'Report'. A 'Recently published reports' section shows a list of reports with columns for score, report name, and publication date. A 'Log in' button is also present.

The Metrics table displays a grid of data for various domains. The columns include 'Score', 'Domain', 'Modern address (IPv6)', 'Signed domain name (DNSSEC)', 'Secure connection (HTTPS)', 'Security options', and 'Route authorisation (RPKI)'. Each cell contains a percentage and a status icon (green checkmark, yellow warning, or red X). A legend at the top explains the icons used.

	73.91%	95.65%	56.52%	26.09%	95.65%	91.30%
Tls						
Secure mail server connection (STARTTLS and DANE)	STARTTLS available	TLS version	Ciphers (Algorithm selections)	Cipher order	Key exchange parameters	
failed	passed	warning	warning	passed	passed	
failed	passed	passed	passed	passed	passed	
passed	passed	passed	warning	passed	passed	
passed	passed	passed	passed	passed	passed	
failed	passed	warning	warning	passed	failed	
				passed	passed	
				passed	passed	
				passed	passed	

This report shows the adoption statistics for the Websiteregister Rijksoverheid. It includes a pie chart indicating a score of 89.7% and a total of 1775 domains scanned on Sunday, 1 January 2023.



This detailed metrics table provides a granular view of the data, including columns for 'Score', 'Domain', 'HTTPS available', 'HTTPS redirect', 'HTTP compression', 'HSTS', 'TLS version', 'Ciphers (Algorithm selections)', 'Cipher order', 'Key exchange parameters', 'Hash function for key exchange', 'TLS compression', 'Secure renegotiation', and 'Client certificates'. It includes a filter for domains and a 'Back to the category view' button.

Internet.nl Toolbox



🔍 <https://github.com/internetstandards/toolbox-wiki/>

☰ README.md

Welcome to the **Internet.nl** toolbox.



This GitHub repository contains several how-to's for providing practical information and guidance on implementing secure and modern Internet Standards. The how-to's are maintained by the Dutch Internet Standards Platform (the organization behind [Internet.nl](https://internet.nl)) and are created in cooperation with industry experts and enthusiasts (hosters, vendors, etc).

Feedback and/or contributions are much appreciated and welcome through issues, pull requests or via question@internet.nl.

Quick access

[DANE how-to](#)
[DKIM how-to](#)
[SPF how-to](#)
[DMARC how-to](#)
[Parked domain how-to](#)

Interesting external sources

[SIDN Hands-on guides](#)
[The Internet Society's Open Standards Everywhere Project](#)

- [What is DANE?](#)
- [Why use DANE for SMTP?](#)
 - [Risks of SMTP with opportunistic TLS](#)
 - [DANE addresses these risks](#)
 - [How about MTA-STS?](#)
- [DANE TLSA record structure](#)
- [Advantages of DANE explained by illustrations](#)
 - [Mail delivery: TLS without DANE](#)
 - [Mail delivery: TLS with MITM stripping TLS](#)
 - [Mail delivery: TLS with MITM using evil certificate](#)
 - [Mail delivery: TLS with DANE](#)
 - [Mail delivery: TLS with DANE without DNSSEC](#)
- [Reliable certificate rollover](#)
 - [Points of attention when rolling over using "current + next"](#)
- [Tips, tricks and notices for implementation](#)
- [Inbound e-mail traffic \(publishing DANE DNS records\)](#)
 - [Generating DANE records](#)
 - [Publishing DANE records](#)
 - [Generating DANE roll-over records](#)
 - [Publishing DANE roll-over records](#)
- [Implementing DANE for SMTP on Postfix \(inbound & outbound e-mail traffic\)](#)
 - [Configuring Postfix](#)
- [Implementing DANE for SMTP on Exim \(inbound & outbound e-mail traffic\)](#)
 - [Configuration for inbound e-mail traffic](#)
 - [Install or generate key pair](#)
 - [Configure TLS](#)
 - [Configuration for outbound e-mail traffic](#)



Code is open source

- All tools are open source (GitHub)
 - <https://github.com/internetstandards>
- Reused by several other countries:
 - <https://aucheck.com.au/> (Australia)
 - <https://sikkerpanettet.dk/> (Denmark)
 - <https://top.nic.br/> (Brazil)

The screenshot shows the GitHub profile page for 'Platform Internetstandaarden / Internet Standards Platform'. The profile is verified and has 20 followers. It features a README file for the 'Internet Standards Platform' project, which includes a description of the platform's purpose and a list of social media links. Below the README, there are several pinned repositories, including 'Internet.nl', 'Internet.nl-dashboard', 'Internet.nl-dashboard-frontend', 'toolbox-wiki', 'dhe_groups', and 'Internet.nl-API-docs'. The 'Repositories' section is also visible, showing a list of repositories with their respective languages, stars, forks, and update dates.



Future new standards and functionalities

- Expand existing tests (e.g. testing DNSSEC settings)
- Interactive email test
- Test for presence of CAA record (restrict CA)
- RPKI validation in connection test

- **Simplify installation (based on Docker)**

Statistics Netherlands

- Since 2020, Statistics Netherlands has been investigating Internet.nl scores of companies annually
- Companies score a lot lower than Dutch governmental sites (65% against 87%)





Modern internet standards
keep our internet open,
free and secure.
Let's use them!



Questions and contact?

Want Dashboard or API access?

Non-profit: send an email to question@internet.nl

Others: it will be easy to host an instance yourself soon

Want a t-shirt or a mug for your coffee?

Make sure your domain scores a double 100% (email + website test) and send an e-mail to question@internet.nl

Follow us on Mastodon, LinkedIn and/or Twitter!

