Portuguese Internet Technologies Observatory (and how it uses the Internet.nl testing platform)

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https://isoc.pt/observatory

OBSERVATÓRIO DE TECNOLOGIAS DA INTERNET PORTUGUESA
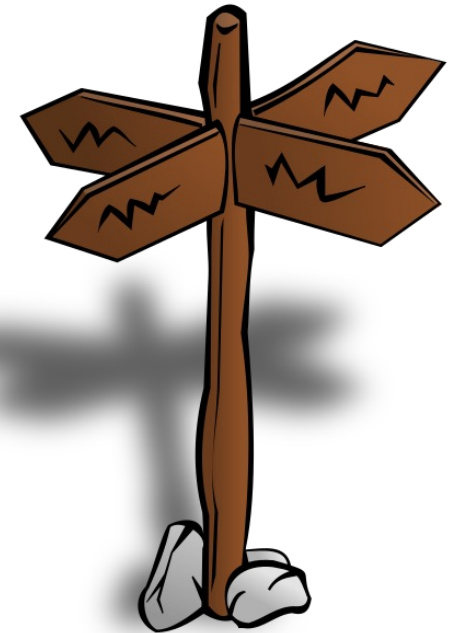
INTERNET SOCIETY (ISOC) - PORTUGAL

Agenda

- Goals of the observatory

- How it uses the Internet.nl platform

- Some curiosities

- Acknowledgements

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Goals

- Take a bird's-eye view of the adoption rate of some technologies in the Portuguese Internet

- After some preliminary analysis, Internet.nl measurements platform was adopted

- Therefore, the analysis is done mostly using the same parameters as the Internet.nl platform

- Complemented where necessary with APNIC Labs measurements (mostly for data on ISPs performance)
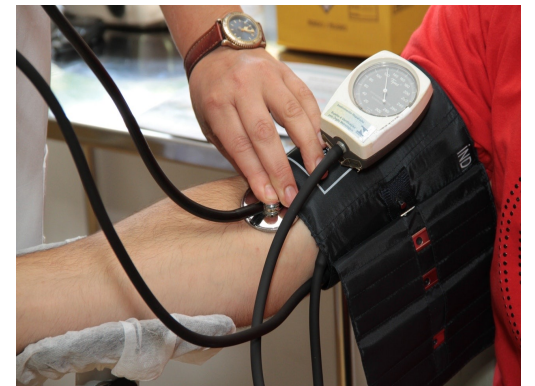
Analysed Entities

- **The 1000 most relevant .PT domains** – Organized by activity branch as well as by sponsoring entity (e.g. Government, ...)

- **The world top 1000 most visited domains** – to have a benchmarking reference

- The most important ISPs acting in Portugal

- Domains lists have been chosen by hand and using the Tranco list results (https://tranco-list.eu)
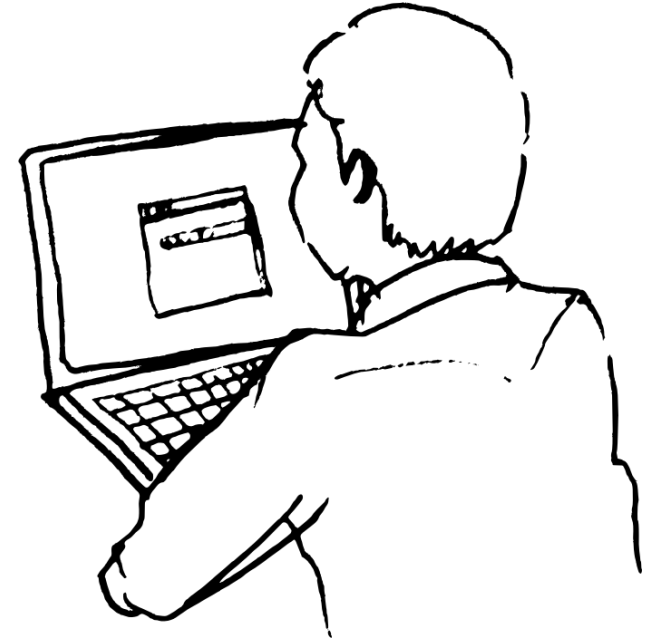
How It Works (1)

- More than 2000 domains, organized in lists, are analysed bymonthly

- The updated APNIC measurements results on PT ISPs performance are also fetched

- More than 30 domain lists are used to submit tests using the REST interface https://batch.internet.nl/api/batch/v2/requests

- Internet.nl initiative has been supporting the observatory since the beginning

How It Works (2)

- A program interactively submits each list of domains for testing, waits for the test completion, fetches and stores the result in a local json file

- Another program takes the json files as input and produces an Excel workbook with a sheet per list, as well as several aggregation sheets, used to compute averages – we took some inspiration from the dashboard but use different layouts

- These procedures are performed for web and mail tests

- The observatory is updated, aggregation tables are published, a qualitative analysis made by hand is also updated, and both workbooks are made available

- **Technical options are presented here**

  https://isoc.pt/observatory/docs.html

Examples (1)

All results made available at

https://isoc.pt/ observatory/ domains.html

Propriedade (testes realizados a 27/02/2023)	1000 sites mais populares no mundo	300 sites mais populares terminados em .PT	Sites do Estado Português selecionados
Número de domínios analisados	1051	327	297
Classificação global segundo o site Internet.nl	50.9	41.7	43.1
Acessibilidade do servidor por IPv6	24.8%	13.8%	12.5%
Nomes protegidos por DNSSEC	10.2%	14.7%	23.9%
Servidores suportam HTTPS	87.5%	82.0%	86.5%
Servidores NÃO aceitam TLS 1.0 ou 1.1	53.2%	48.3%	49.8%
Servidores suportam TLS 1.3	52.4%	47.1%	34.7%
Percentagem de adesão de listas de sites às normas de segurança analisadas. O critério Classificação Internet.nl é o grau (na escala de 0 a 100) de satisfação de todos os critérios testados pelo software usado.			

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Examples (2)

Descrição da lista de domínios de servidores WEB (testes realizados a 27/02/2023)	Lista	# domínios	Classificação INL	IPv6 webserver	DNSSEC	HTTPS disponível	NÃO suporta TLS 1.0 nem 1.1	Suporta TLS 1.3
Presidência, parlamento(s) e tribun. constitucional	A1	5	37.6	0.0%	20.0%	100.0%	40.0%	40.0%
Partidos	A2	12	51.6	41.7%	16.7%	91.7%	41.7%	66.7%
Sistema judicial	A3	4	61.8	0.0%	75.0%	100.0%	25.0%	25.0%
Governos central e regionais	A4	22	42.8	4.5%	22.7%	77.3%	45.5%	31.8%
Câmaras municipais	B	77	33.8	7.8%	7.8%	79.2%	35.1%	29.9%
Autoridades de segurança e polícias	C	12	51.9	0.0%	66.7%	91.7%	58.3%	41.7%
Serviços e institutos públicos e equiparados	D	90	46.7	12.2%	27.8%	91.1%	56.7%	33.3%
Organismos de certificação	E	12	48.7	0.0%	41.7%	91.7%	66.7%	41.7%
Cultura e monumentos	F1	35	35.5	5.7%	5.7%	85.7%	42.9%	42.9%
SNS	G1	21	37.0	42.9%	0.0%	90.5%	76.2%	23.8%
Saúde privada	G2	13	48.2	15.4%	15.4%	100.0%	84.6%	61.5%
Ensino superior público e sistema científico	H1	54	48.9	18.5%	33.3%	87.0%	48.1%	46.3%
Ensino superior privado	H2	12	32.3	0.0%	8.3%	91.7%	50.0%	33.3%
Associações de estudantes	H3	30	43.1	16.7%	3.3%	93.3%	60.0%	53.3%
Aeroportos e portos	I	14	49.1	0.0%	42.9%	100.0%	57.1%	42.9%
Águas, energia, telecomunicações, etc.	J	48	38.1	6.3%	6.3%	93.8%	47.9%	45.8%
Banca, seguros	K	53	41.4	7.5%	9.4%	92.5%	83.0%	47.2%
Transportes, combustíveis	L	38	41.1	2.6%	5.3%	94.7%	52.6%	42.1%
Comunicação social e portais informativos	M	100	49.0	32.0%	3.0%	99.0%	36.0%	52.0%
Editoras	N	20	47.6	25.0%	5.0%	95.0%	65.0%	65.0%
Associações em geral	O1	45	43.9	17.8%	4.4%	93.3%	55.6%	51.1%
Associações profissionais, ordens e sindicatos	O2	33	40.8	12.1%	6.1%	93.9%	45.5%	48.5%
Associações religiosas	O3	28	42.0	3.6%	10.7%	92.9%	35.7%	46.4%
Associações desportivas	O4	8	59.3	50.0%	25.0%	100.0%	37.5%	75.0%
Comércio eletrónico (bens, serviços, turismo, ...)	P	112	48.0	22.3%	4.5%	95.5%	55.4%	62.5%
Jogos online	Q	19	57.3	36.8%	21.1%	94.7%	52.6%	73.7%
Tecnologia e produtividade	R	57	49.9	29.8%	1.8%	93.0%	61.4%	63.2%
Redes sociais e app stores	S	37	57.6	56.8%	0.0%	94.6%	18.9%	64.9%
PSI 20	T	18	41.3	5.6%	11.1%	94.4%	77.8%	50.0%
Top 250 domains .PT	Z2	327	41.7	13.8%	14.7%	82.0%	48.3%	47.1%
Top 1000 domains World	Z3	1051	50.9	24.8%	10.2%	87.5%	53.2%	52.4%

Resultados dos testes a LISTAS DE SERVIDORES WEB associados a domínios. Os valores indicados representam a percentagem de servidores de cada lista que satisfazem o critério indicado no topo (acessibilidade por IPv6, DNS do domínio protegido por DNSSEC, suporte de HTTPS, não suporte de versões TLS "deprecated" e suporte de TLS 1.3). O critério Classificação INL- Internet.nl - é o grau (na escala de 0 a 100) de satisfação de todos os critérios testados pelo software usado. Estão sublinhados a vermelho os valores inferiores a 30 ou 30% e a azul os valores superiores a 50 ou 50%.

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Examples (3)

Descrição da lista de domínios de servidores WEB das listas com membros predominantemente do Estado (testes realizados a 27/02/2023)	Lista	# domínios	Classificação INL	IPv6 webserver	DNSSEC	HTTPS disponível	NÃO suporta TLS 1.0 nem 1.1	Suporta TLS 1.3
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Ensino superior público e sistema científico	H1	54	48.9	18.52%	33.33%	87.04%	48.15%	46.30%
Média pesada		297	43.1	12.5%	23.9%	86.5%	49.8%	34.7%

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# ISPs Analysis Using APNIC Labs Measurements

- Do their resolvers test DNSSEC?

- Do they publish **Route Origin Authentication (ROA)** certificates covering their routes, and their customers routes?

- Do ISPs filter received BGP announcements using ROAs?

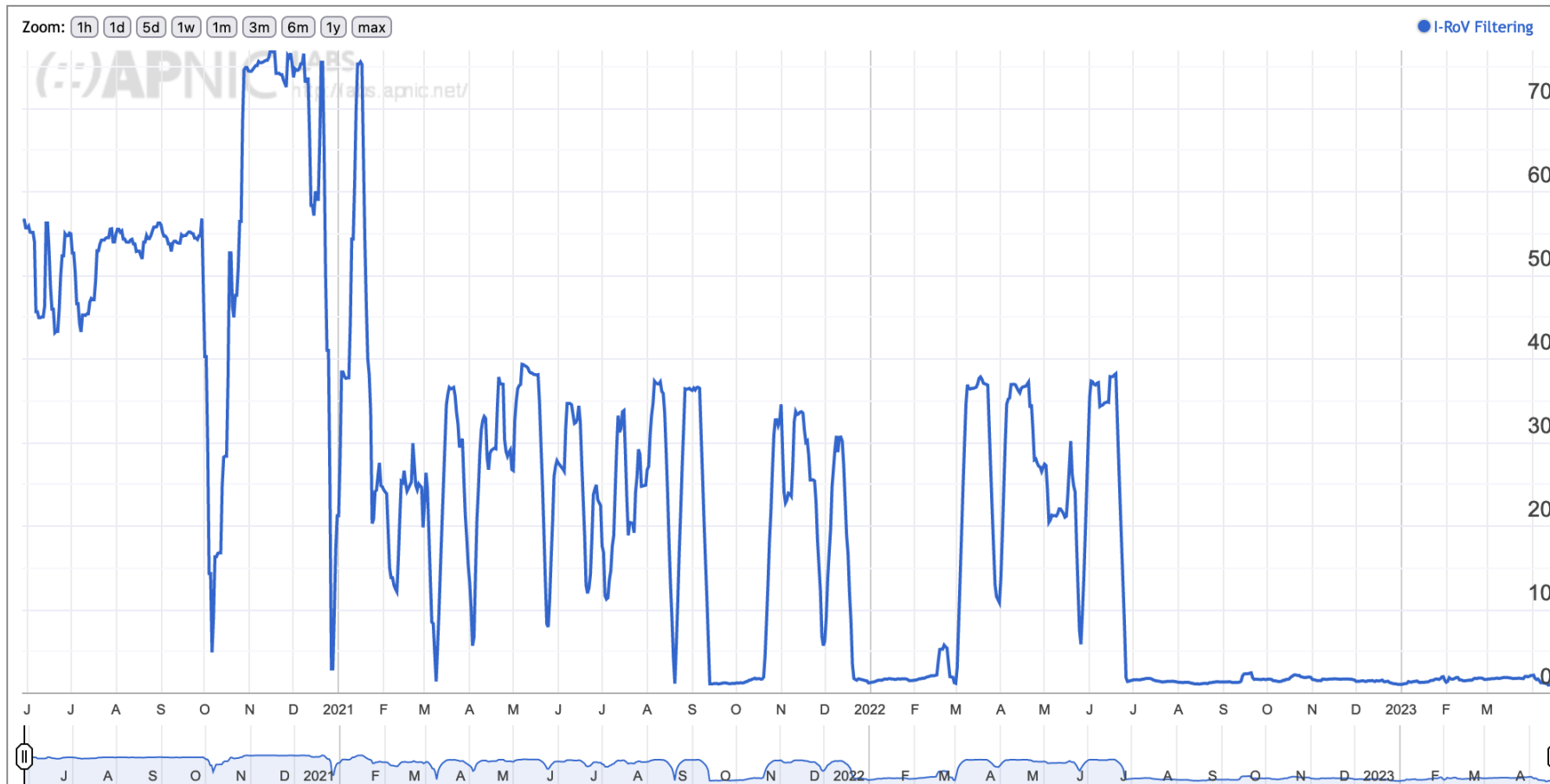# ISPs and Route Origin Authorization

Use of Route Object Validation for Portugal (PT)

Display: **Addresses** (Advertised ROA-Valid Advertised Addresses), **IPv4**, **Percent** (of Total)

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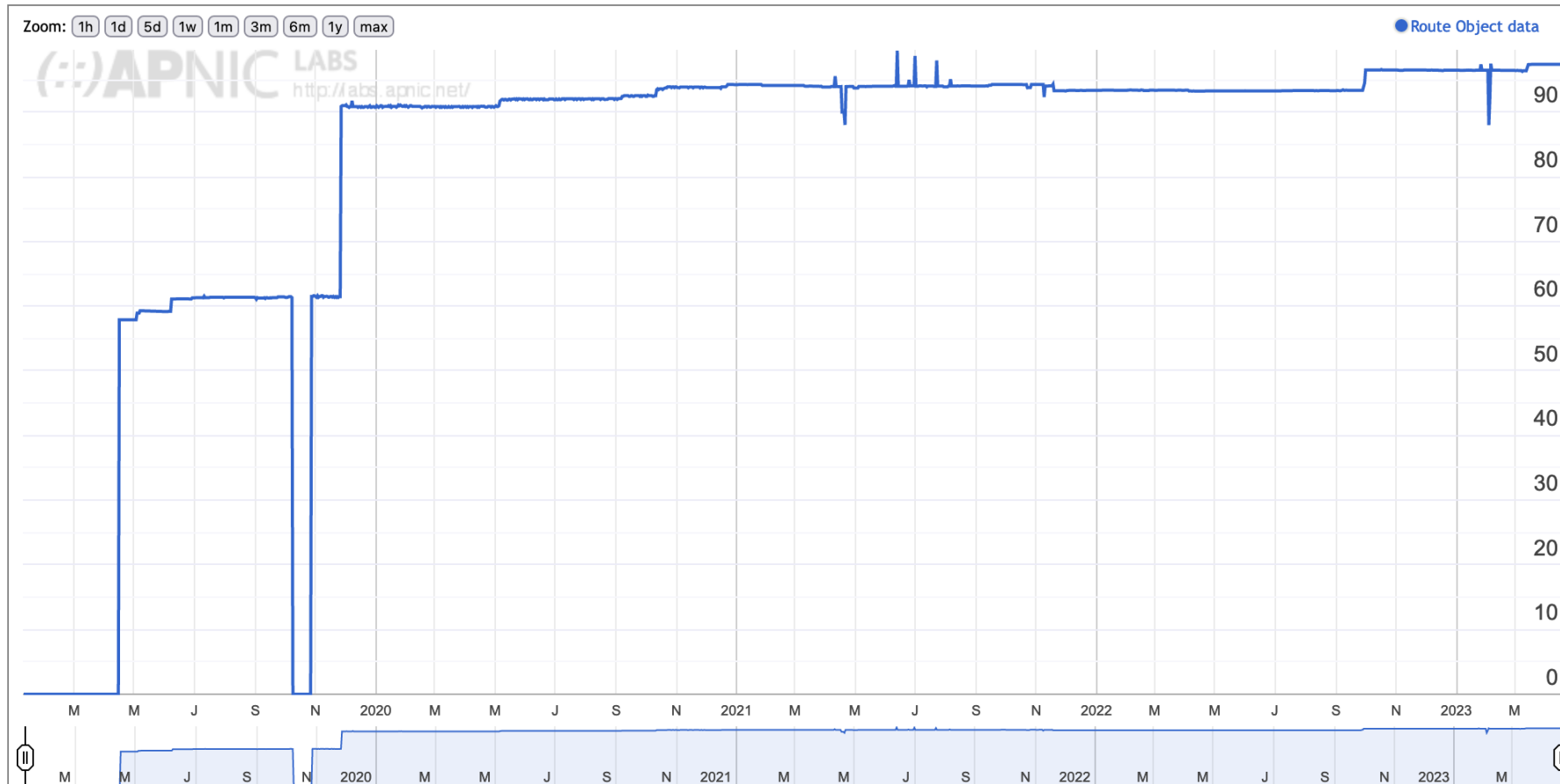
ISPs and Route Origin Validation

Use of RPKI Validation for Portugal (PT)

Some Final Notes

- We started in 2021 with the publication of a preliminary report on the status of the adoption of Internet best practices in Portugal

- In 2022 we introduced some automation of the process and periodic updates of the results as well as the site

- The qualitative reports have a best performers section, which is the part that produces more awareness (at least in the press when we presented the site for the first time)

- We setup our own platform using Internet.nl github software but give up of its use due to difficulties related to versions and need for modifications

- Some sectors (e.g. public hospitals) refused our own platform tests but accept those of internet.nl – we do not know why

- There is a similar testing platform in Portugal, made available by the official CERT PT, but it only supports manual individual domain tests and has no REST interface publicly available

Many thanks to the Internet.nl initiative for making available the software and the platform and providing us an account

Thank you for your attention

https://isoc.pt

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