Blame (and) DNS

Who, where, and how broke your DNS

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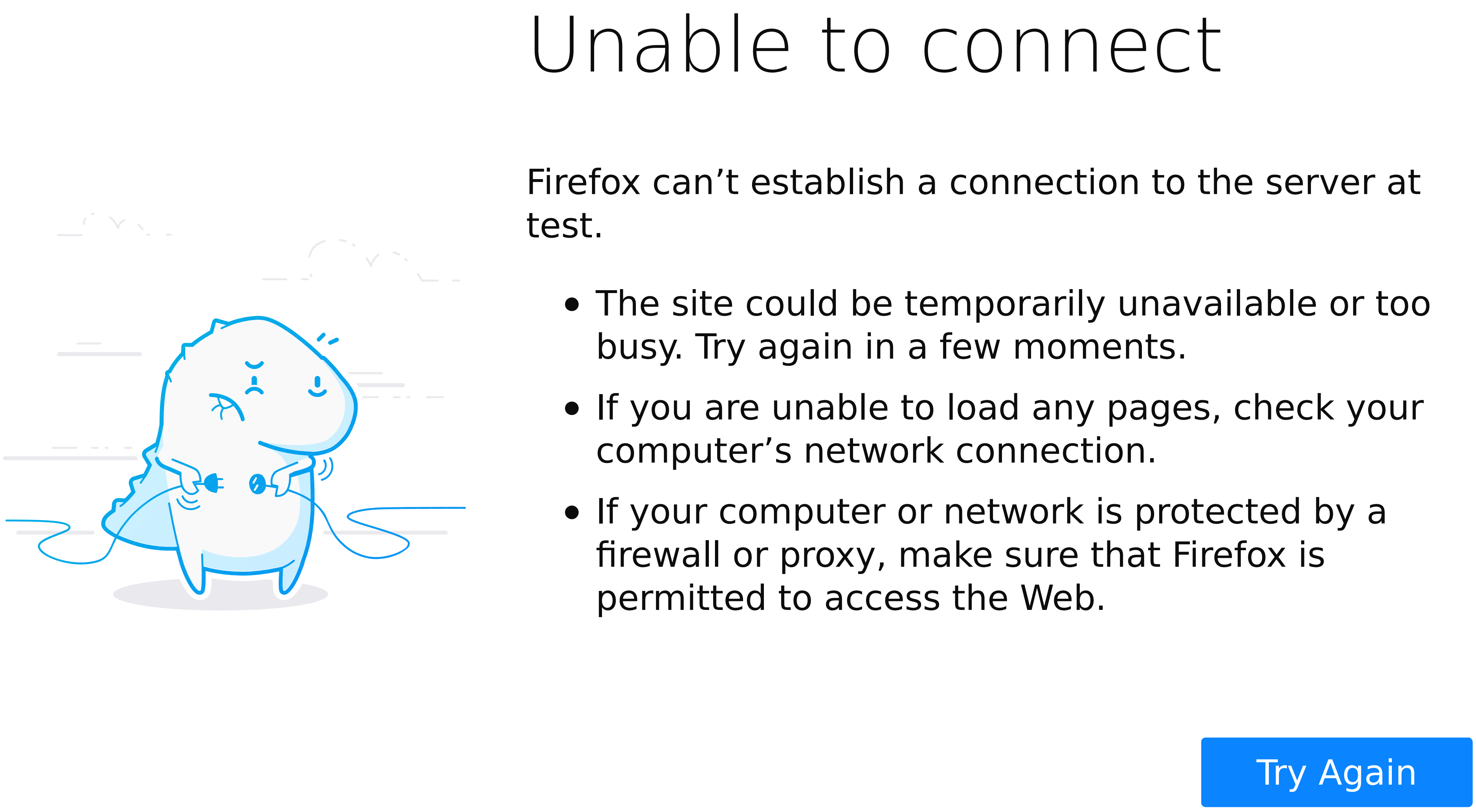
KNOT RESOLVER

cz.nic | CZ DOMAIN REGISTRY

Focus

- Who broke your DNS?
- Not fixing issues, just detecting them

Who is to blame?



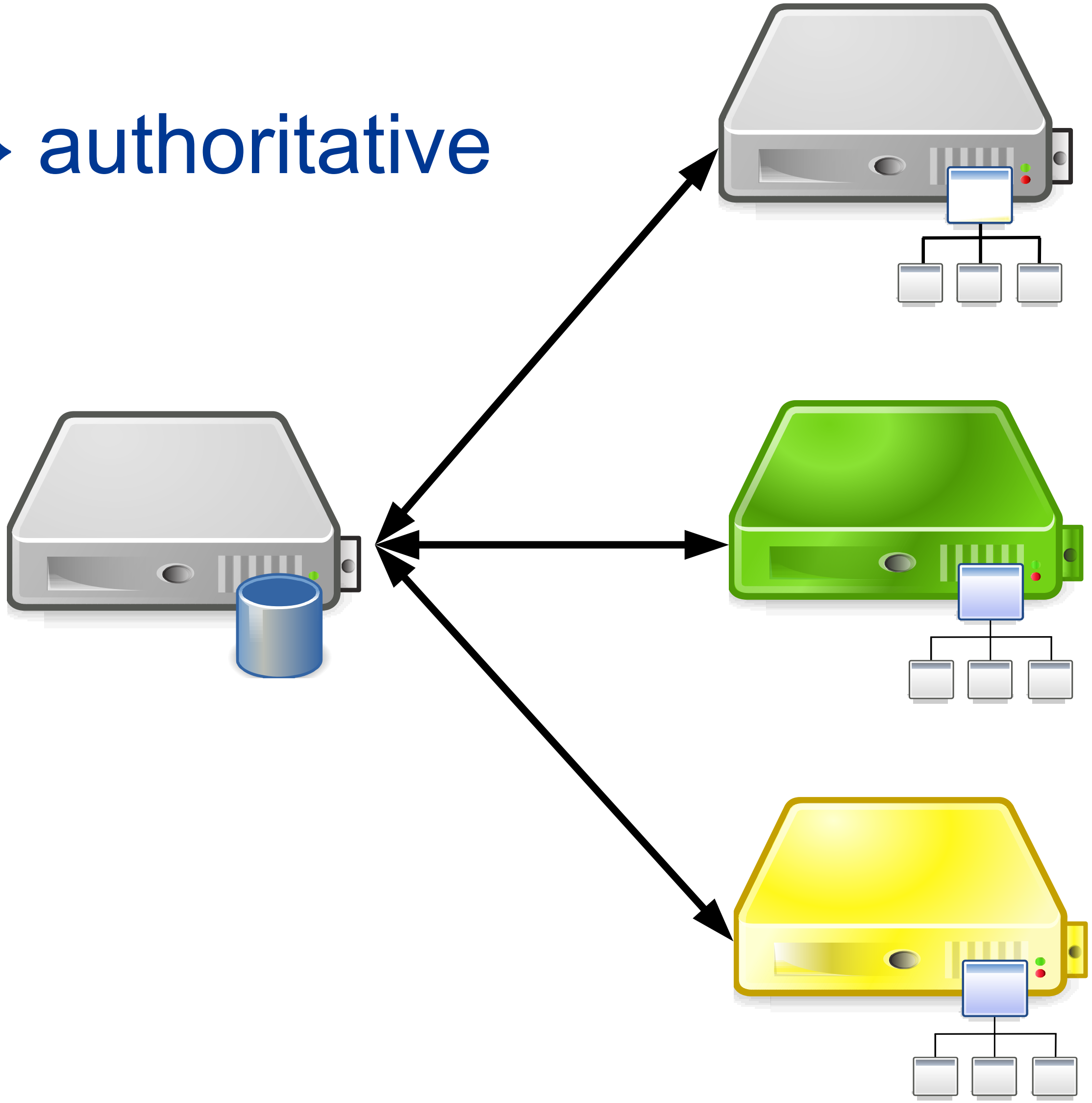
Unable to connect

Firefox can’t establish a connection to the server at test.

- The site could be temporarily unavailable or too busy. Try again in a few moments.
- If you are unable to load any pages, check your computer’s network connection.
- If your computer or network is protected by a firewall or proxy, make sure that Firefox is permitted to access the Web.

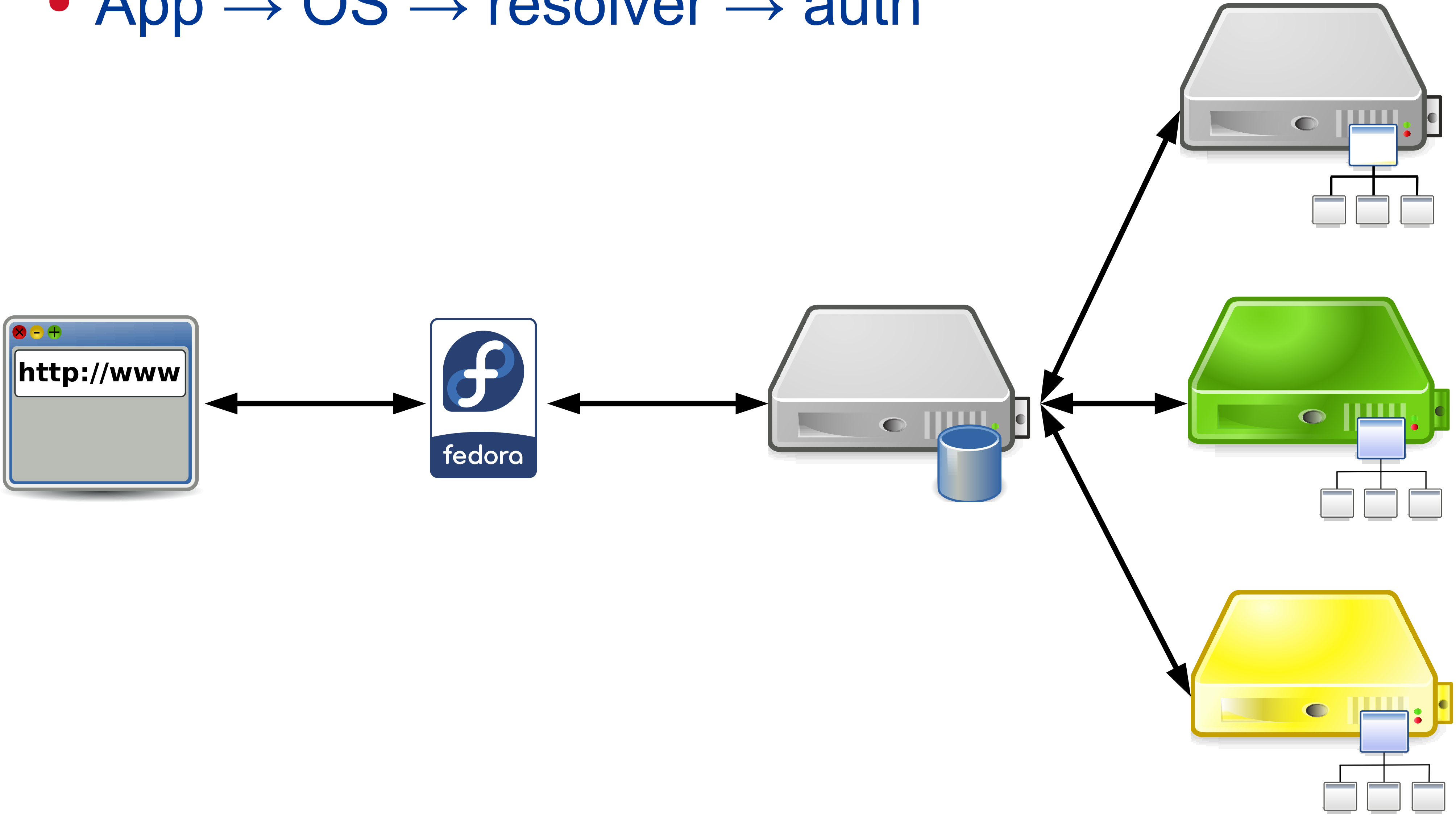
DNS resolution theory

- Resolver → authoritative



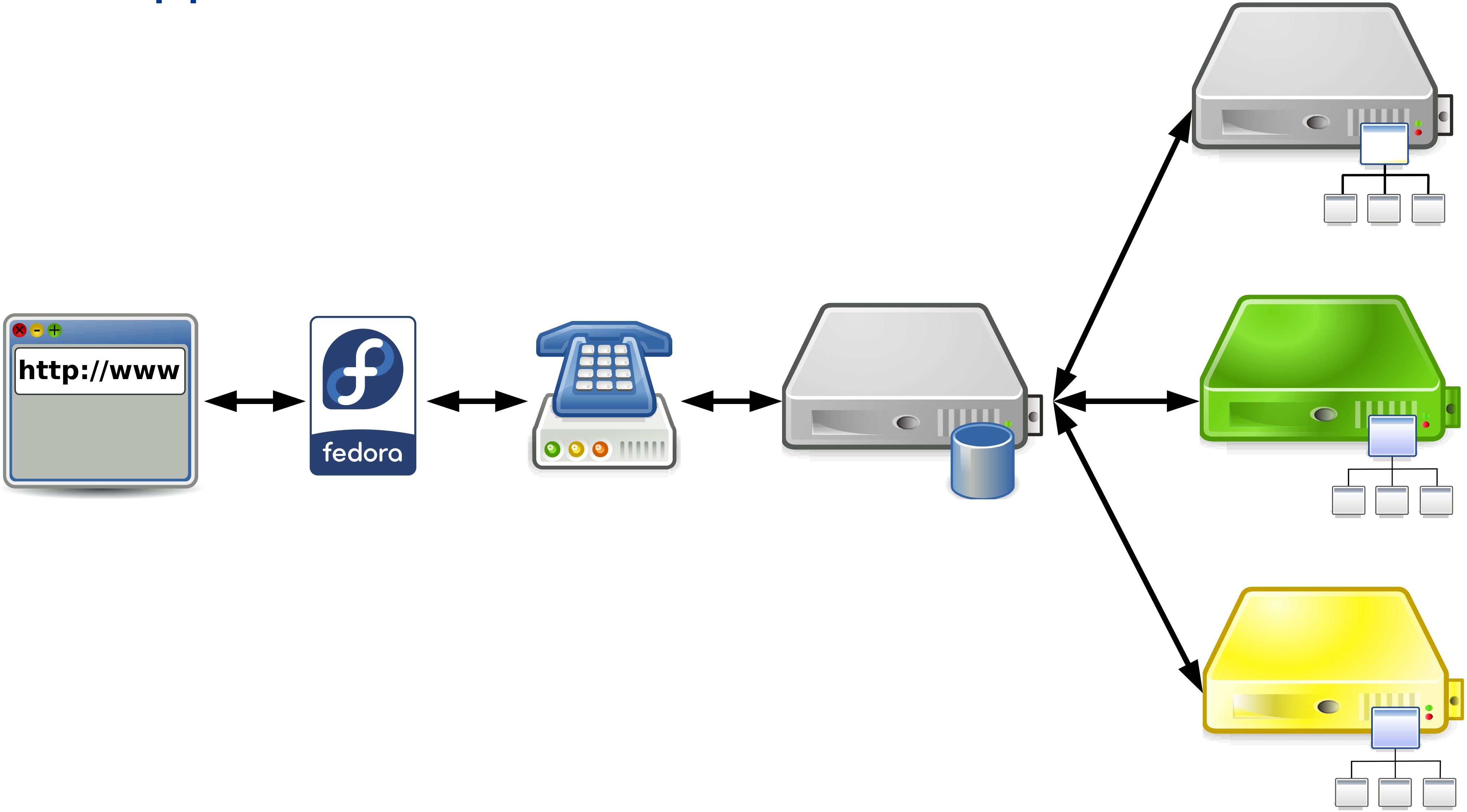
DNS resolution with user

- App → OS → resolver → auth



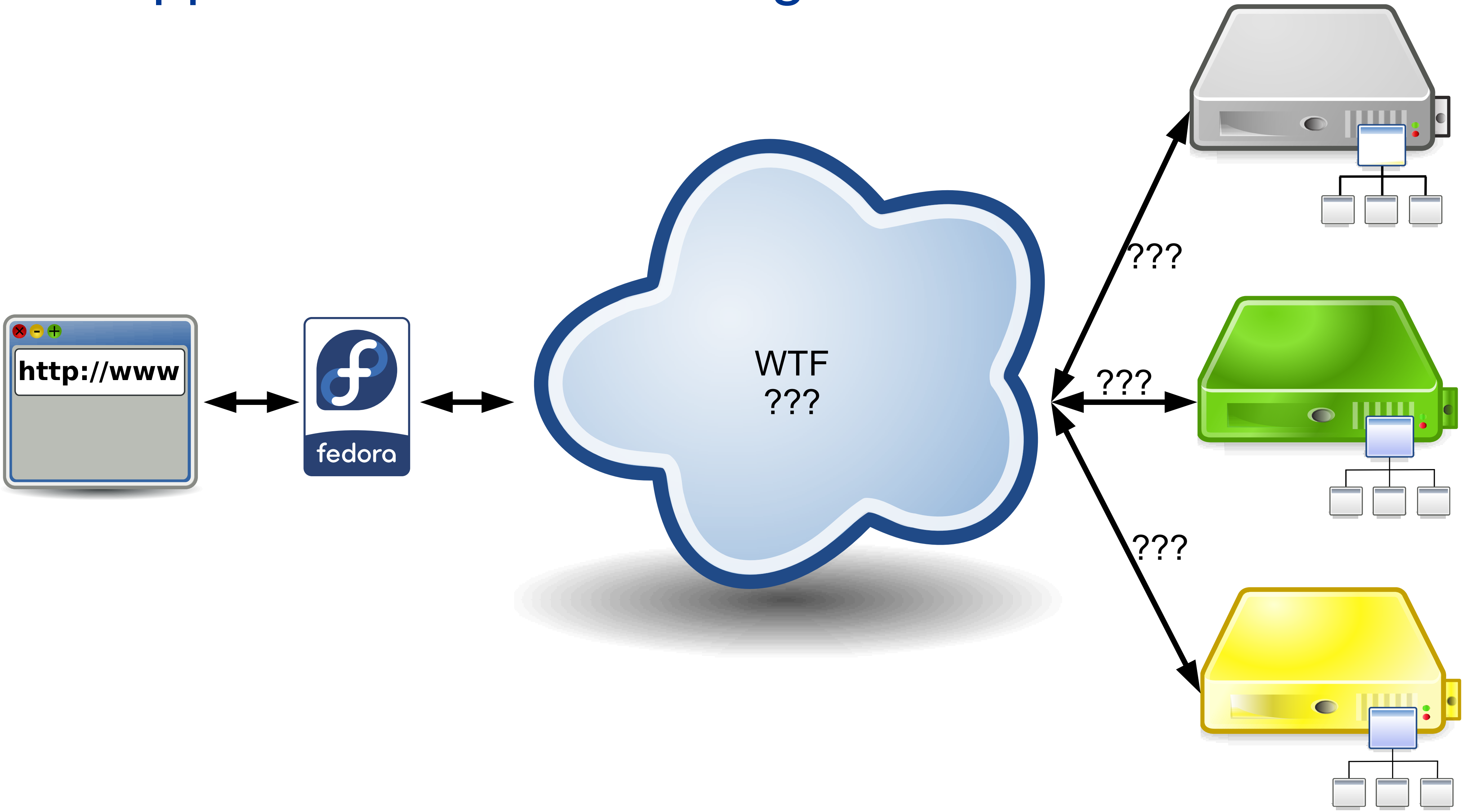
DNS resolution in practice … almost

- App → OS → forwarder → resolver → auth



DNS resolution reality

- App → OS → "something"



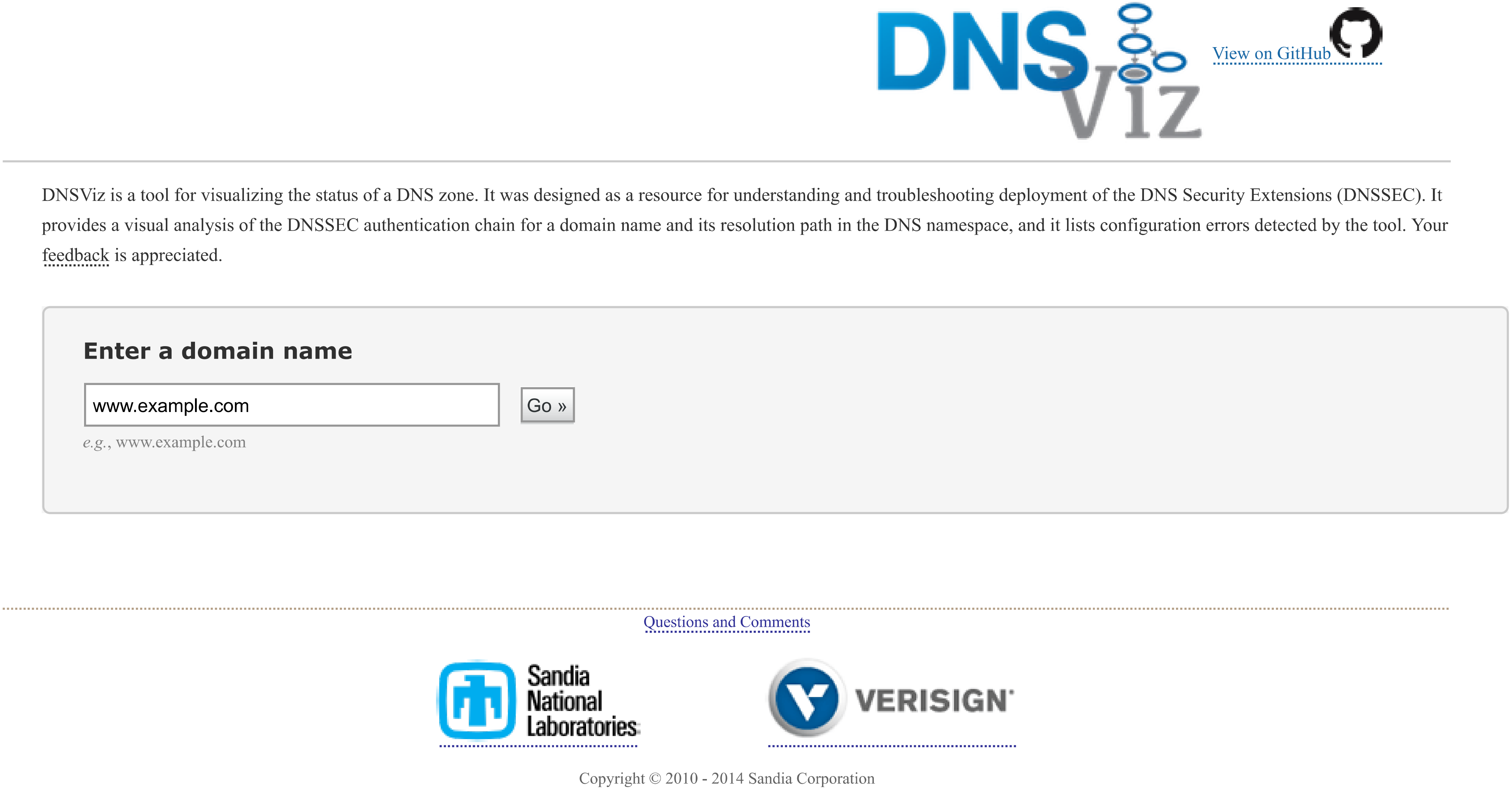
Where to start?

- Use own judgment
- Authoritative end – web app, expected values
- Local end

Authoritative end: DNSViz

- **http://dnsviz.net** – a DNS "looking glass"
- Enter a DNS name
- "Updated" time → Update now
- Notices
  - ok → look somewhere else
  - errors → bad, call domain owner
  - warnings → likely bad → call domain owner
- Record data – compare with local answer

http://dnsviz.net



DNSViz is a tool for visualizing the status of a DNS zone. It was designed as a resource for understanding and troubleshooting deployment of the DNS Security Extensions (DNSSEC). It provides a visual analysis of the DNSSEC authentication chain for a domain name and its resolution path in the DNS namespace, and it lists configuration errors detected by the tool. Your feedback is appreciated.

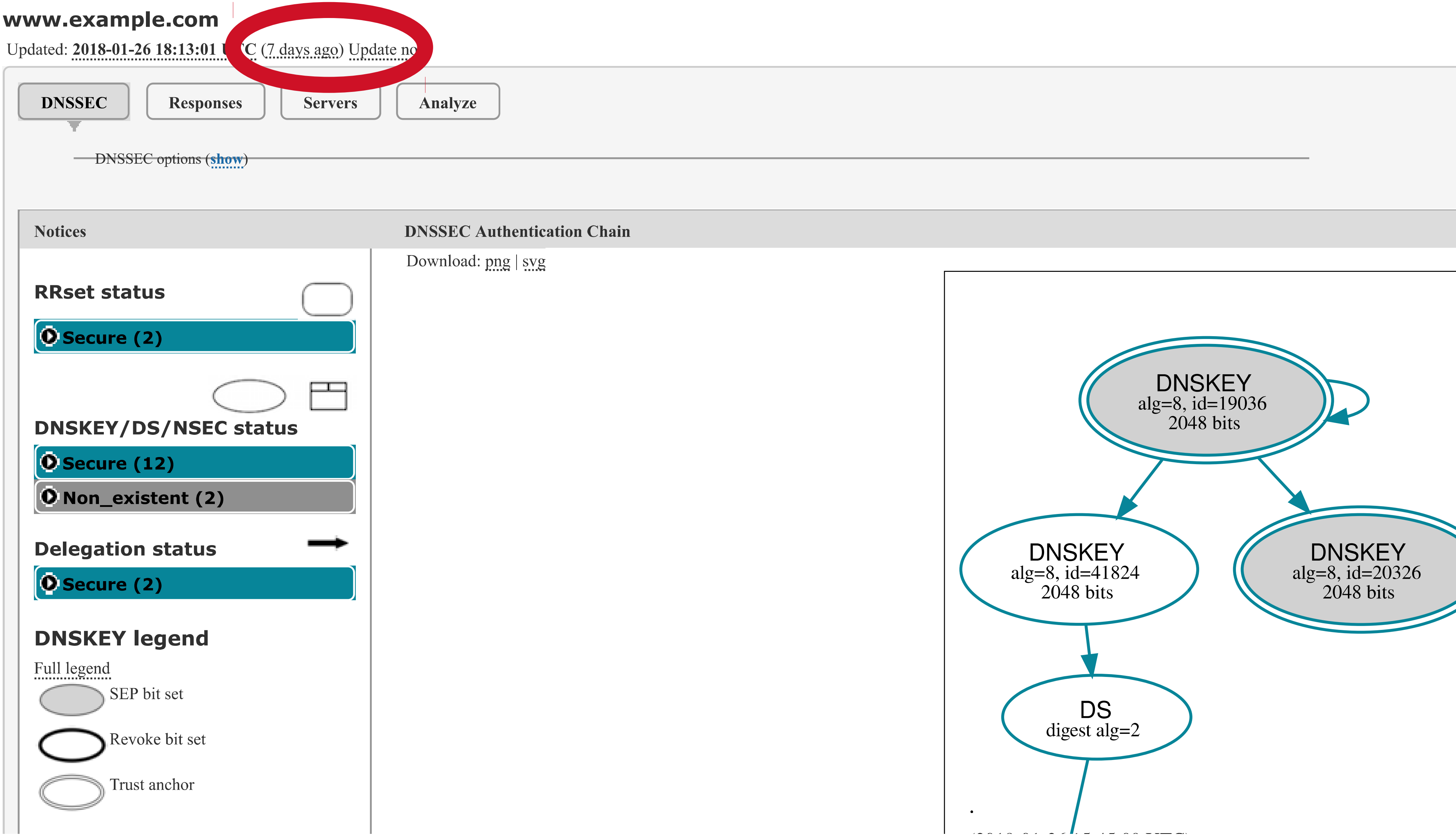
Enter a domain name

www.example.com

e.g., www.example.com

Questions and Comments

Authoritative end: DNSViz



www.example.com

Updated: 2018-01-26 18:13:01 UTC (7 days ago) Update no

DNSSEC options (show)

Notices

DNSSEC Authentication Chain

Download: png | svg

RRset status

- Secure (2)

DNSKEY/DS/NSEC status

- Secure (12)
- Non_existent (2)

Delegation status

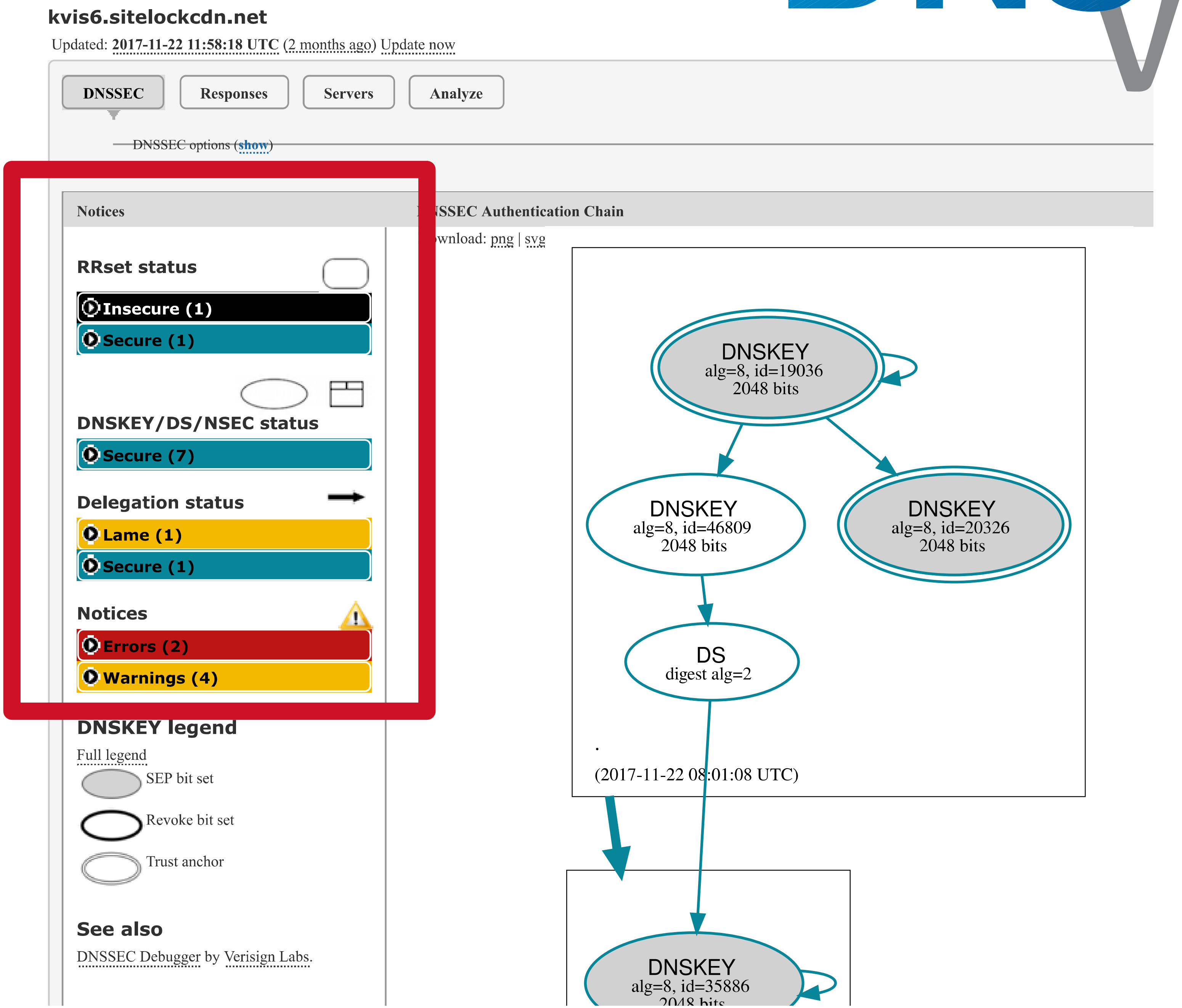
- Secure (2)

DNSKEY legend

Full legend

- SEP bit set
- Revoke bit set
- Trust anchor

Authoritative end: DNSViz



kvis6.sitelockcdn.net

Updated: 2017-11-22 11:58:18 UTC (2 months ago) Update now

Notices

RRset status

- Insecure (1)
- Secure (1)

DNSKEY/DS/NSEC status

- Secure (7)

Delegation status

- Lame (1)
- Secure (1)

Notices

- Errors (2)
- Warnings (4)

DNSKEY legend

Full legend

SEP bit set

Revoke bit set

Trust anchor

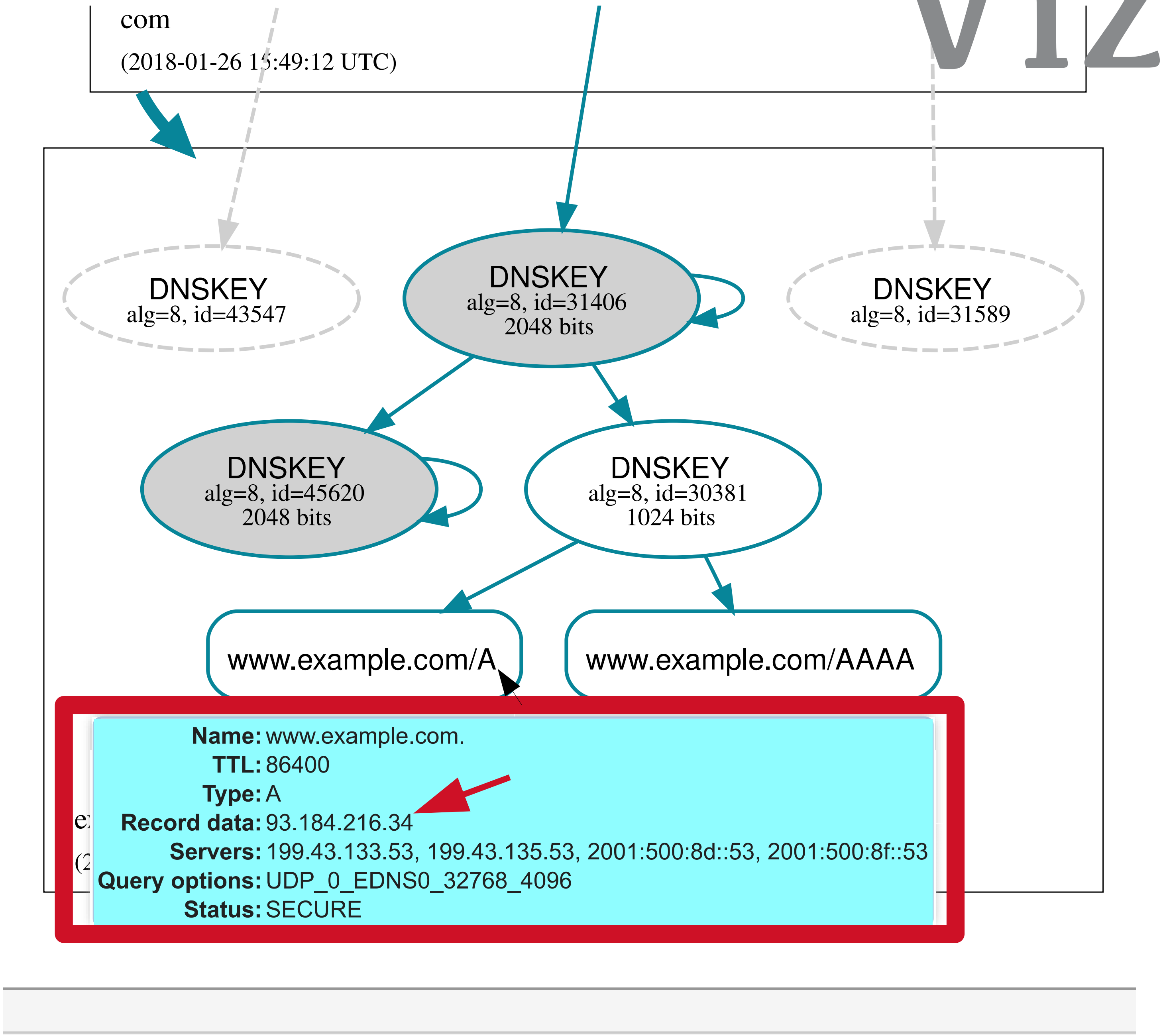
See also

DNSSEC Debugger by Verisign Labs.

NSSEC Authentication Chain

wnload: png | svg

Authoritative end: DNSViz



Name: www.example.com.
TTL: 86400
Type: A
Record data: 93.184.216.34
Servers: 199.43.133.53, 199.43.135.53, 2001:500:8d::53, 2001:500:8f::53
Query options: UDP_0_EDNS0_32768_4096
Status: SECURE

Local machine: Is it a DNS issue?

- Compare
  - `$ ping <name>`
    - or `$ getent hosts <name>`
  - `$ dig <name>`
- ping wrong, dig same as DNSViz
  → not a DNS problem, e.g. broken /etc/hosts
- ping & dig same but different than DNSViz
  → problem beyond OS DNS API
  → next step /etc/resolv.conf

What is next hop?

- `$ cat /etc/resolv.conf`
  - dig's default, override with @
- → localhost → see logs, flush cache
  - weird stuff → ISP/tranzit mocking with DNS
    → time to change ISP now!
  - `$ dig @authority <name>` – compare with DNSViz
  - `$ dig @192.0.2.1 <name>` – works?!
- → anything else → CPE/local net/ISP
  → check config on it/call

Avoid first hop (local thing)

- Ask ISP's resolver directly
- `$ dig @<IP from CPE config> <name>`
- Works
  → CPE/local problem, flush, restart, call ISP
- Doesn't work
  → ISP DNS down? call ISP

Summary

- DNS is Wild West
- Expect unexpected, do not panic
- Use looking glass (DNSViz, SSH, ...)
- Use DNSViz, dig, and common sense
- **Complain loudly**
  - the domain owner might not know about the problem
  - change ISP if needed
- https://github.com/**dns-violations**/dns-violations/