DrupalCon

NASHVILLE 2018

APRIL 9-13

The Digital Speakeasy

Secure and Anonymous Access to Your Website

Dustin Younse

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Join us for contribution sprints

Friday, April 13, 2018

Mentored Core sprint

9:00-18:00
Room: 103

First time sprinter workshop

9:00-12:00
Room: 101

General sprint

9:00-18:00
Room: 104

#drupalsprint

DrupalCon
NASHVILLE 2018
APRIL 9-13

What did you think?

Locate this session at the DrupalCon Nashville website:

http://nashville2018.drupal.org/schedule

Take the Survey!

https://www.surveymonkey.com/r/nashiville

Howdy!
I’m an engineer at Acquia

Dustin Younse
@milsyobtaf
https://github.com/milsyobtaf/prez

What Is The Digital Speakeasy?

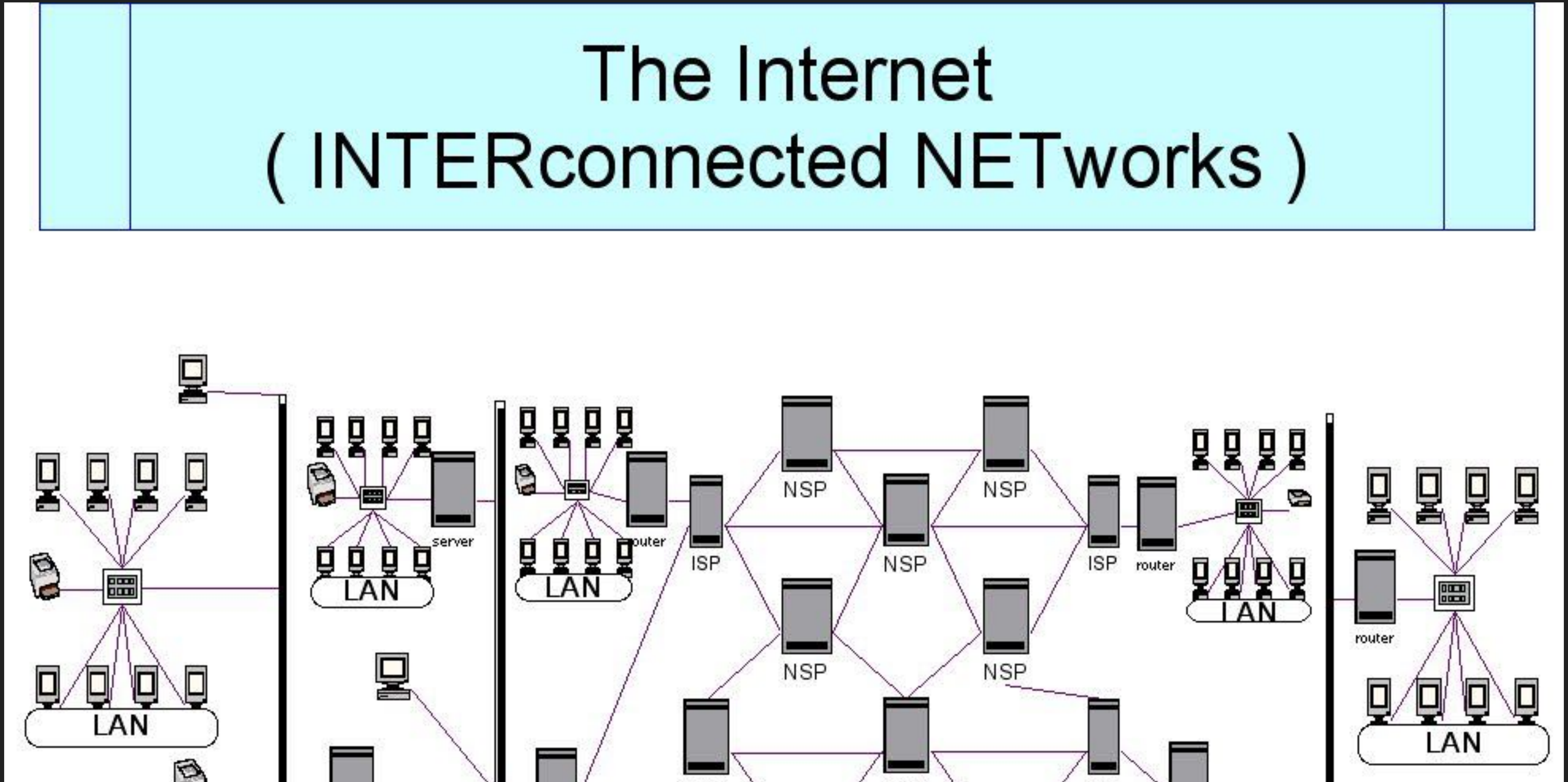
Browsing in Secret

- Plain Text browsing

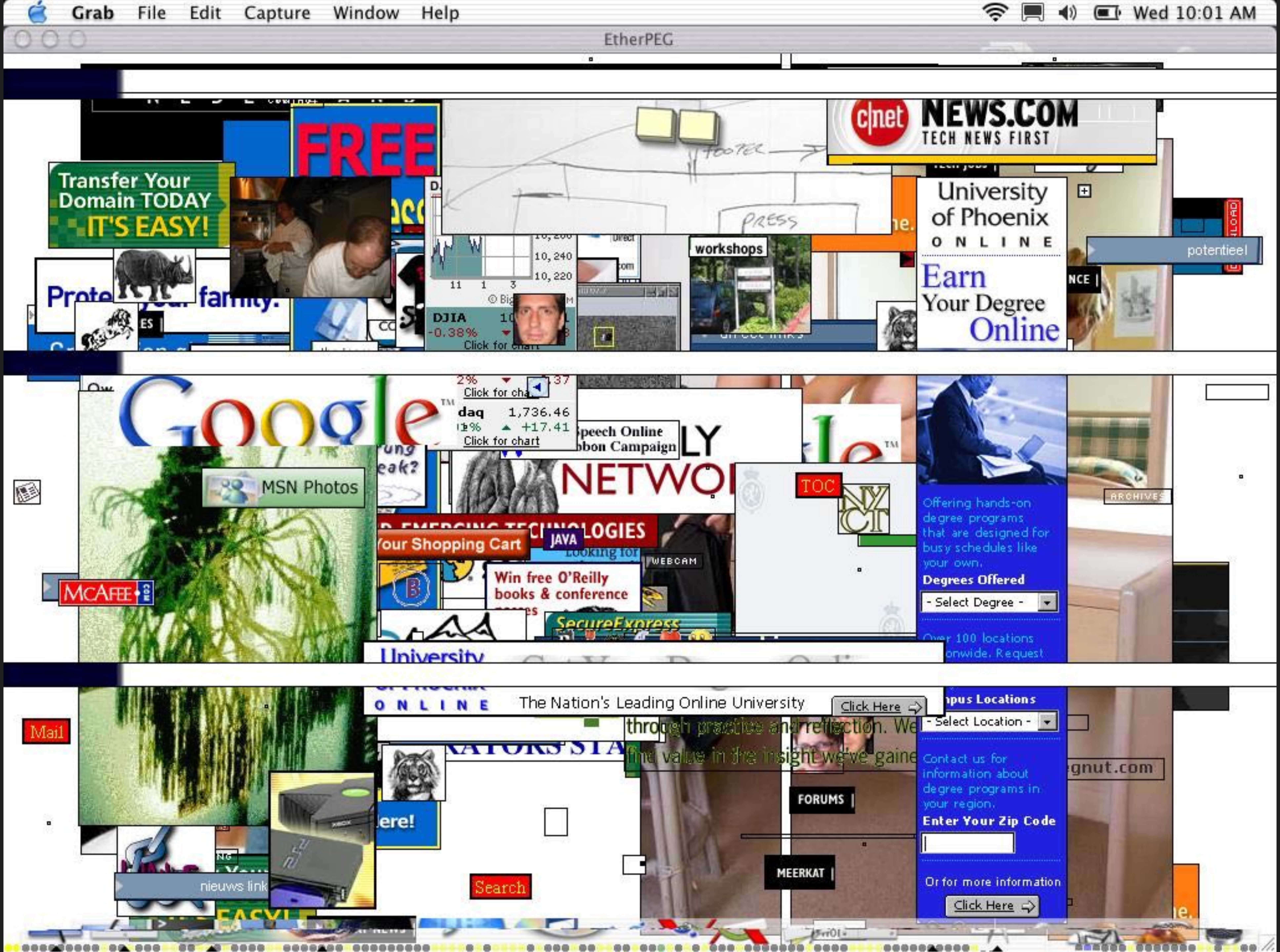
```
<!DOCTYPE html>
<html lang="en-US">
  <head>
    <meta charset="utf-8">
    <title>Web design, development, and strategy |
Four Kitchens</title>
    <meta name="viewport" content="width=device-
width, initial-scale=1.0, maximum-scale=1.0">
    <meta property="og:title" content="Web design,
development, and strategy">
<meta property="og:type" content="article">
<meta property="og:url" content="http://
fourkitchens.com/">
<link rel="canonical" href="http://
```

```
HTTP/1.1 200 OK
Server: nginx/1.6.1
Date: Sat, 20 Aug 2016 03:42:11 GMT
Content-Type: text/html; charset=utf-8
Content-Length: 56595
Last-Modified: Wed, 17 Aug 2016 00:07:26 GMT
Connection: keep-alive
Vary: Accept-Encoding
ETag: "57b3aabe-dd13"
Expires: Sun, 21 Aug 2016 03:42:11 GMT
Cache-Control: max-age=86400
X-UA-Compatible: IE=Edge
Accept-Ranges: bytes
```

The Internet Is Trusting By Default



AirPort
© 1999 Apple Computer, Inc. All rights reserved. Reg. TMs in the U.S.A. and other countries. AirPort is a trademark of Apple Computer, Inc. Apple Computer, Inc. Cupertino, CA 95014 Made in Taiwan. 825-4593-A



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Or for more information

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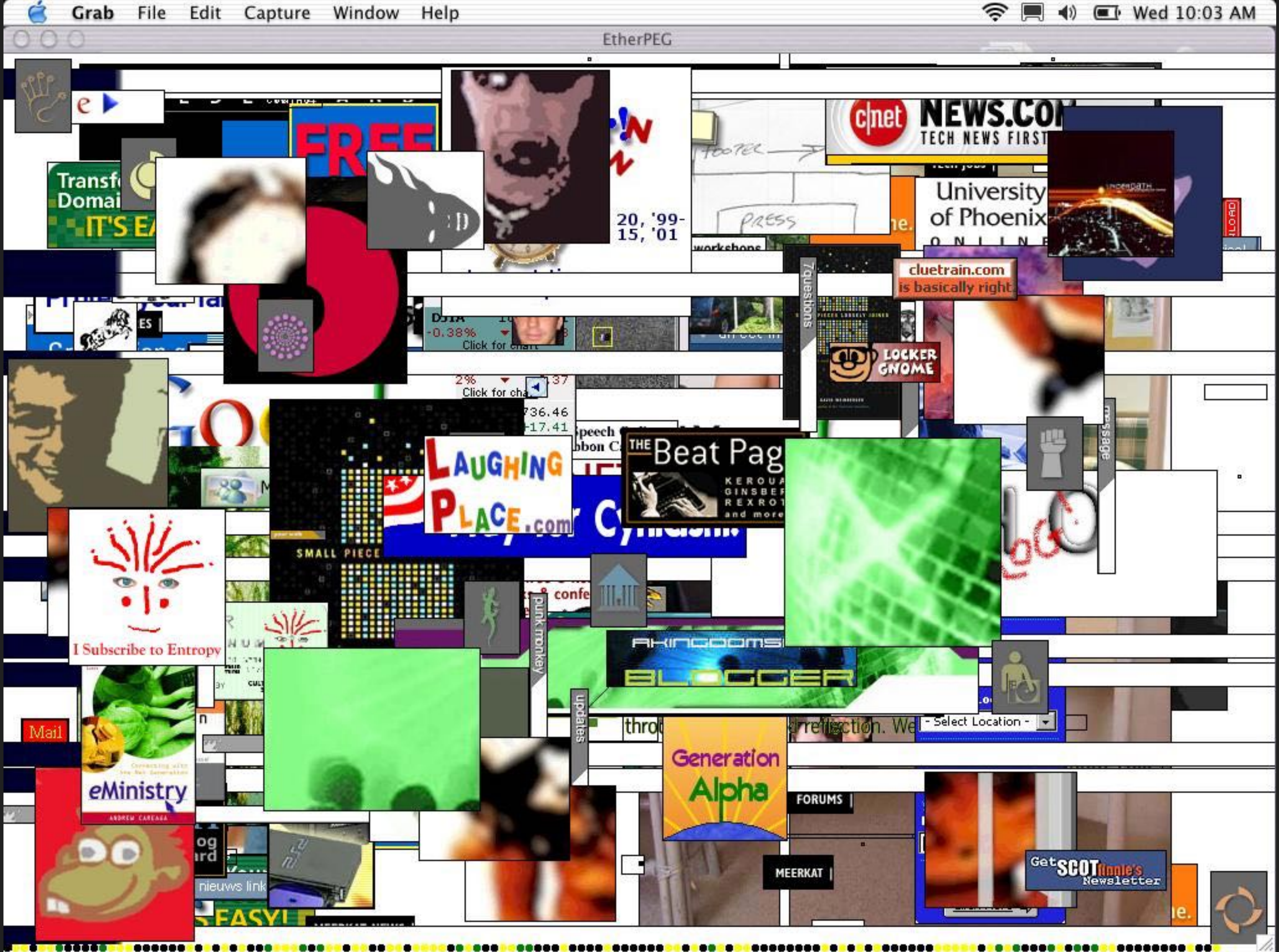
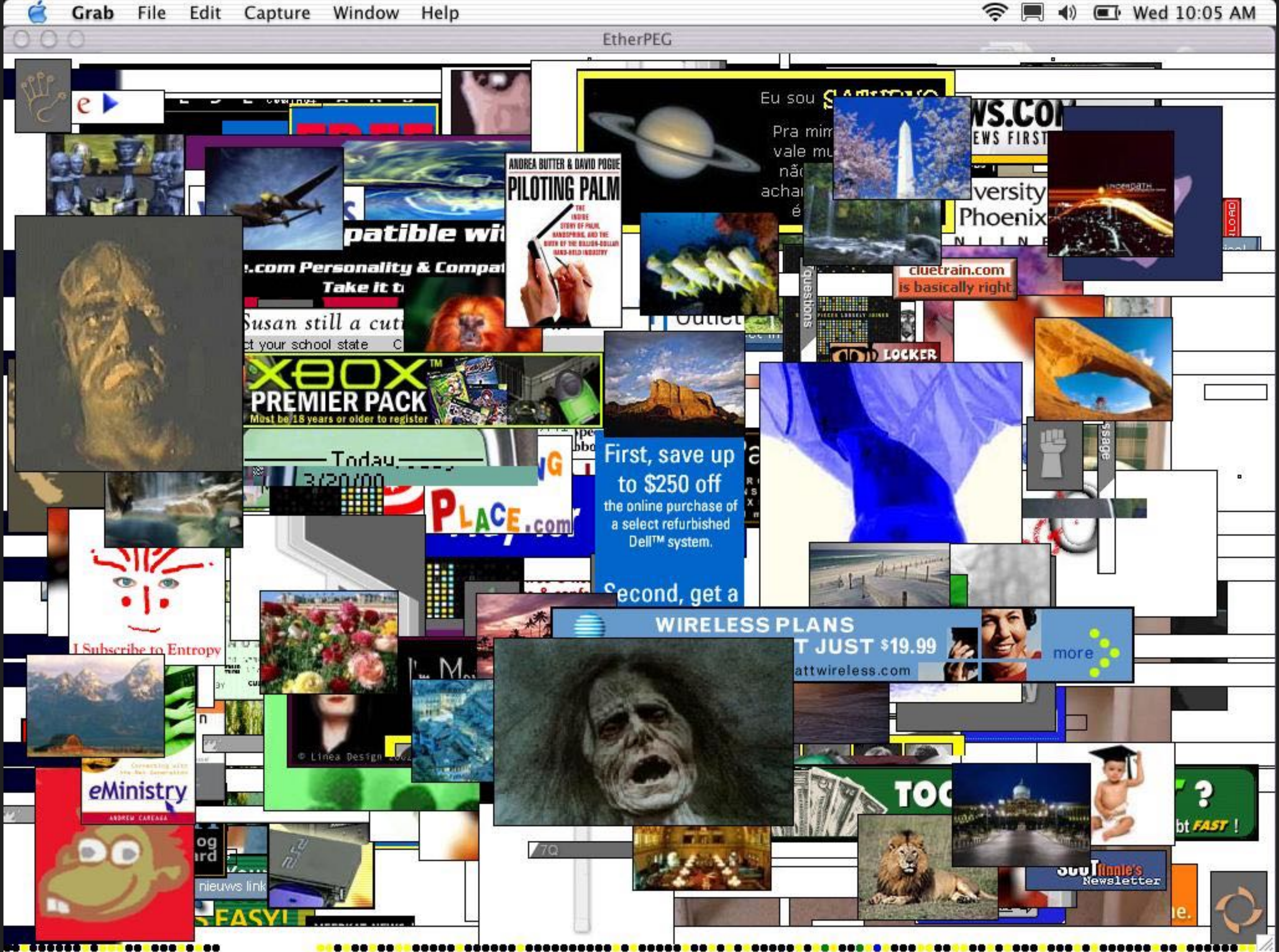
through practice and reflection. We find value in the insight we've gained


Grab
File
Edit
Capture
Window
Help
Wed 10:03 AM
EtherPEG
FREE
Transf Domai IT'S EA
20, '99-
15, '01
cnet NEWS.COM
TECH NEWS FIRST
University of Phoenix
ONLINE
cluetrain.com is basically right
7questions
LOCKER GNOME
DJIA -0.38% Click for chart
Click for chart
736.46
+17.41
Speech
LAUGHING PLACE.com
THE Beat Page
KEROUAC GINSBERG REXROTH and more
SMALL PIECES
message
I Subscribe to Entropy
punk monkey
AKINGDOMS BLOGGER
updates
- Select Location -
Generation Alpha
FORUMS
MEERKAT
Mail
eMinistry
nieuws link
EASY!
Get SCOTfinnie's Newsletter


Grab File Edit Capture Window Help
Wed 10:05 AM
EtherPEG
Eu sou
Pra mim
vale mu
não
achar
é
ws.com
ews first
versity
Phoenix
cluetrain.com
is basically right
ANDREA BUTTER & DAVID POGUE
PILOTING PALM
patible wit
.com Personality & Compat
Take it t
Susan still a cut
t your school state
XBOX
PREMIER PACK
Must be 18 years or older to register
LOCKER
questions
Today
3/20/00
PLACE.com
First, save up to $250 off the online purchase of a select refurbished Dell™ system.
Second, get a
I Subscribe to Entropy
WIRELESS PLANS
T JUST $19.99
attwireless.com
more
© Linea Design
eMinistry
nieuws link
EASY!
TOO
bt FAST !
Newsletter

Browsing in Secret

- Plain Text browsing
- HTTPS browsing

```
<!QBPGLCR ugzy>
<ugzy ynat="ra-HF">
  <urnq>
    <zrgn punefrg="hgs-8">
    <gvgyr>Jro qrfvta, qrirybczrag, naq fgengrtl |
Sbhe Xvgpuraf</gvgyr>
    <zrgn anzr="ivrjcbeg" pbagrag="jvqgu=qrivpr-
jvqgu, vavgvny-fpnyr=1.0, znkvzhz-fpnyr=1.0">
    <zrgn cebcregl="bt:gvgyr" pbagrag="Jro qrfvta,
qrirybczrag, naq fgengrtl">
<zrgn cebcregl="bt:glcr" pbagrag="negvpyr">
<zrgn cebcregl="bt:hey" pbagrag="uggc://
sbhexvgpuraf.pbz/">
<yvax ery="pnabavpny" uers="uggc://
```

```
HTTP/1.1 200 OK
Server: nginx/1.6.1
Date: Sat, 20 Aug 2016 03:49:34 GMT
Content-Type: text/html; charset=utf-8
Content-Length: 56595
Last-Modified: Wed, 17 Aug 2016 00:07:26 GMT
Connection: keep-alive
Vary: Accept-Encoding
ETag: "57b3aabe-dd13"
Expires: Sun, 21 Aug 2016 03:49:34 GMT
Cache-Control: max-age=86400
X-UA-Compatible: IE=Edge
Accept-Ranges: bytes
```

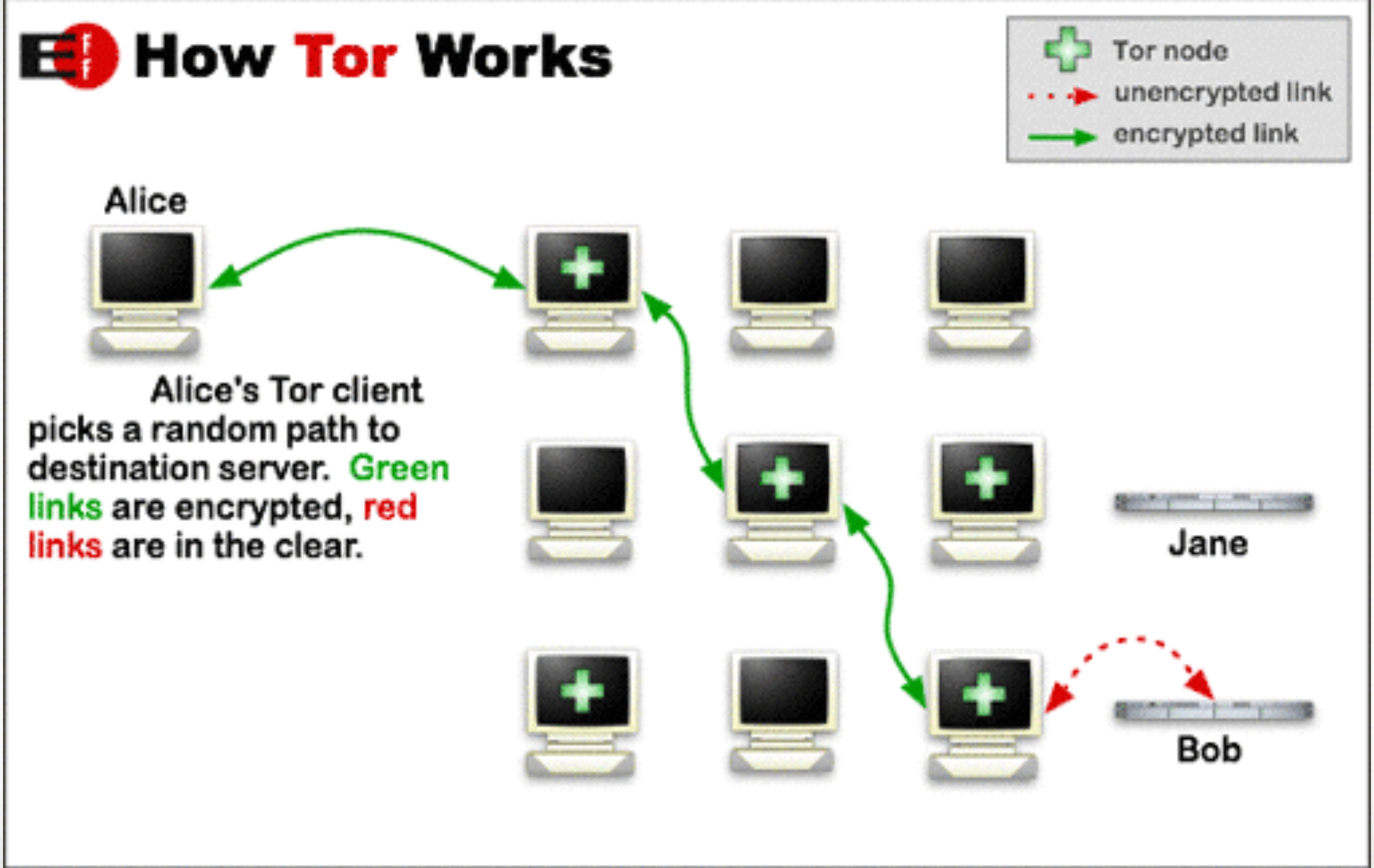
Browsing in Secret

- Plain Text browsing
- HTTPS browsing
- Onion Router (gen 0 and gen 1)

Browsing in Secret

- Plain Text browsing
- HTTPS browsing
- Onion Router (gen 1)
- Tor (The Onion Router, gen 2)

How Tor Works



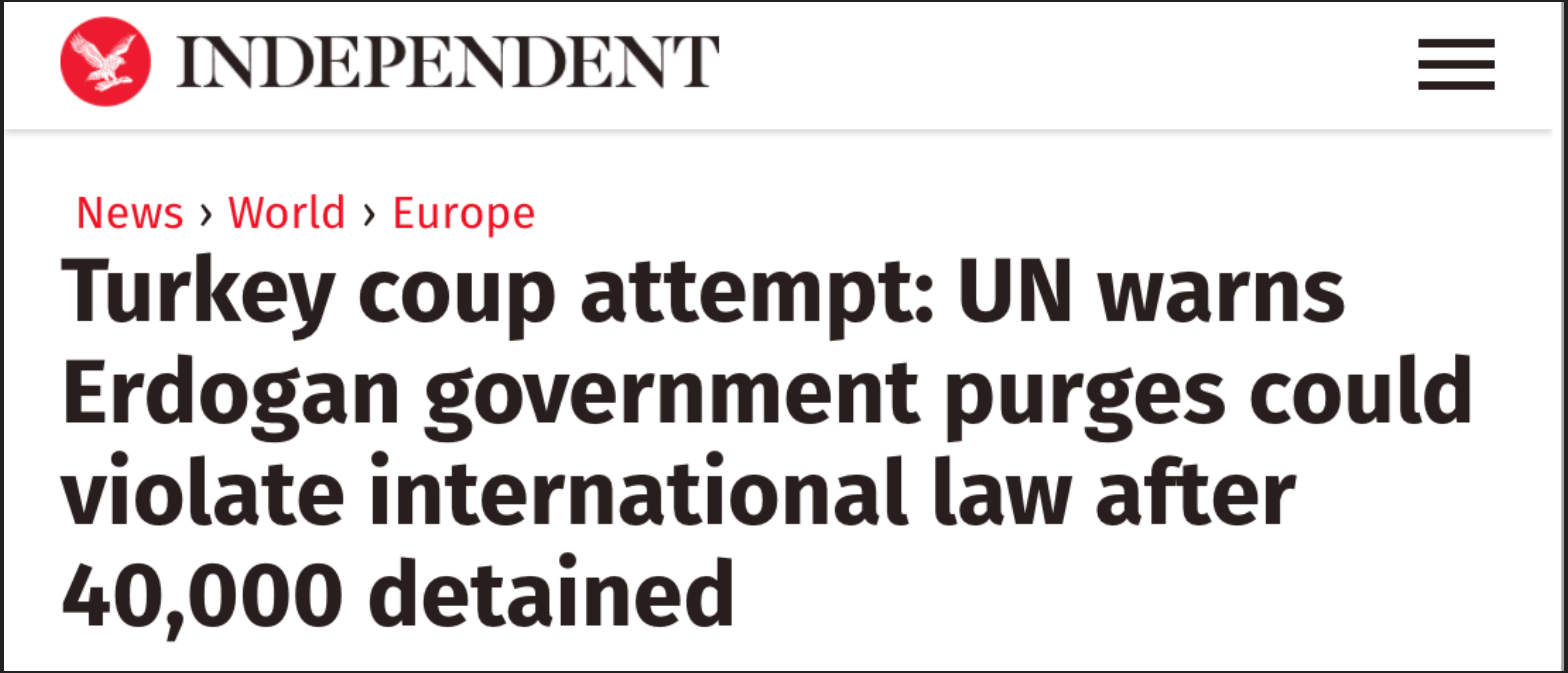
Alice's Tor client picks a random path to destination server. Green links are encrypted, red links are in the clear.

The Rule of Three

So Why Bother?

The Importance of Privacy

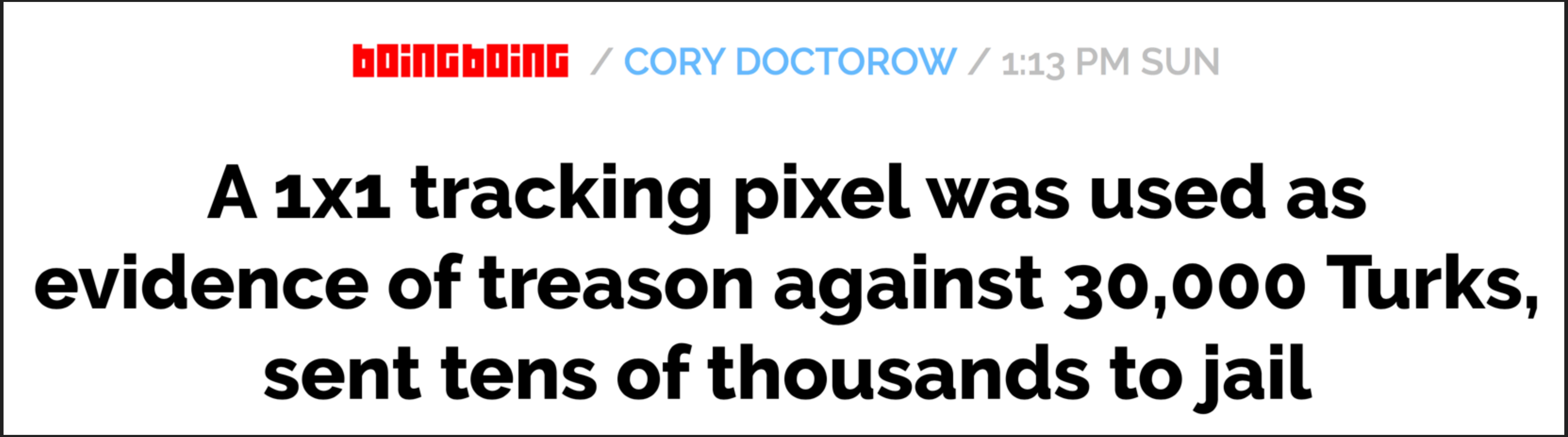
- Not all governments are that forgiving
  - Arab Spring
  - Turkish Coup



INDEPENDENT

News › World › Europe

Turkey coup attempt: UN warns Erdogan government purges could violate international law after 40,000 detained

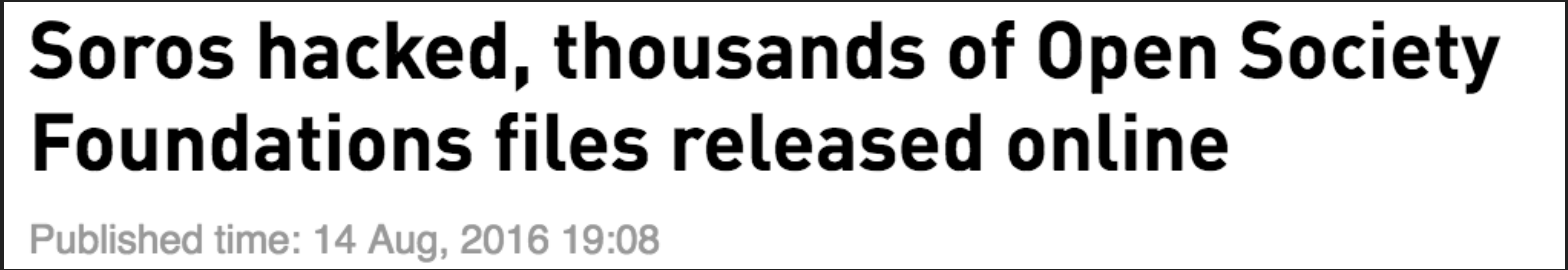


boingboing / CORY DOCTOROW / 1:13 PM SUN

A 1x1 tracking pixel was used as evidence of treason against 30,000 Turks, sent tens of thousands to jail

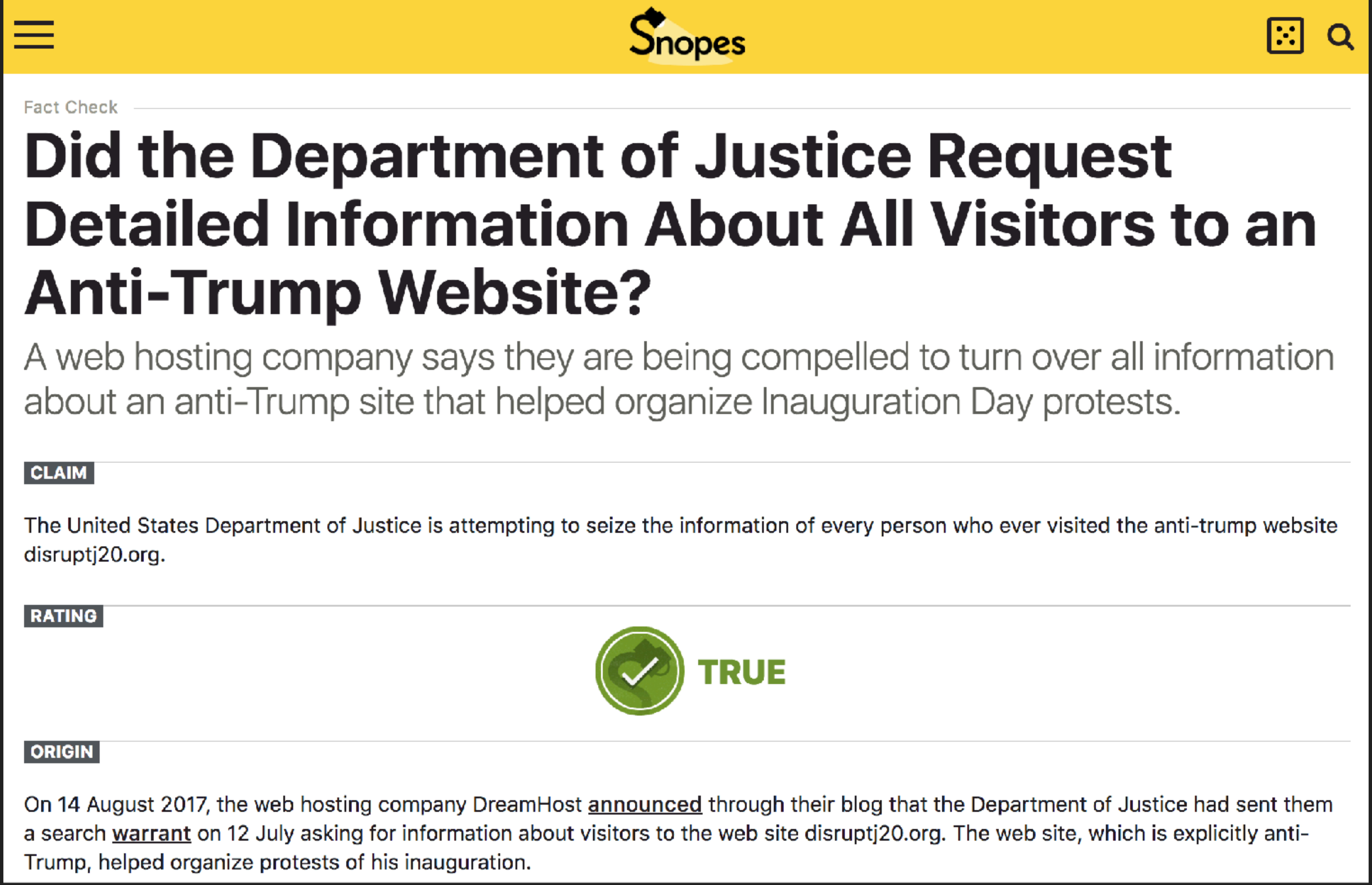
The Importance of Privacy

- Not all governments are that forgiving
  - Arab Spring
  - Turkish Coup
- Not all jobs are fully ethical
  - Edward Snowden
  - Chelsea Manning
- Your reading habits can have consequences
  - Open Societies Foundation



Soros hacked, thousands of Open Society Foundations files released online

Published time: 14 Aug, 2016 19:08



Fact Check

Did the Department of Justice Request Detailed Information About All Visitors to an Anti-Trump Website?

A web hosting company says they are being compelled to turn over all information about an anti-Trump site that helped organize Inauguration Day protests.

CLAIM

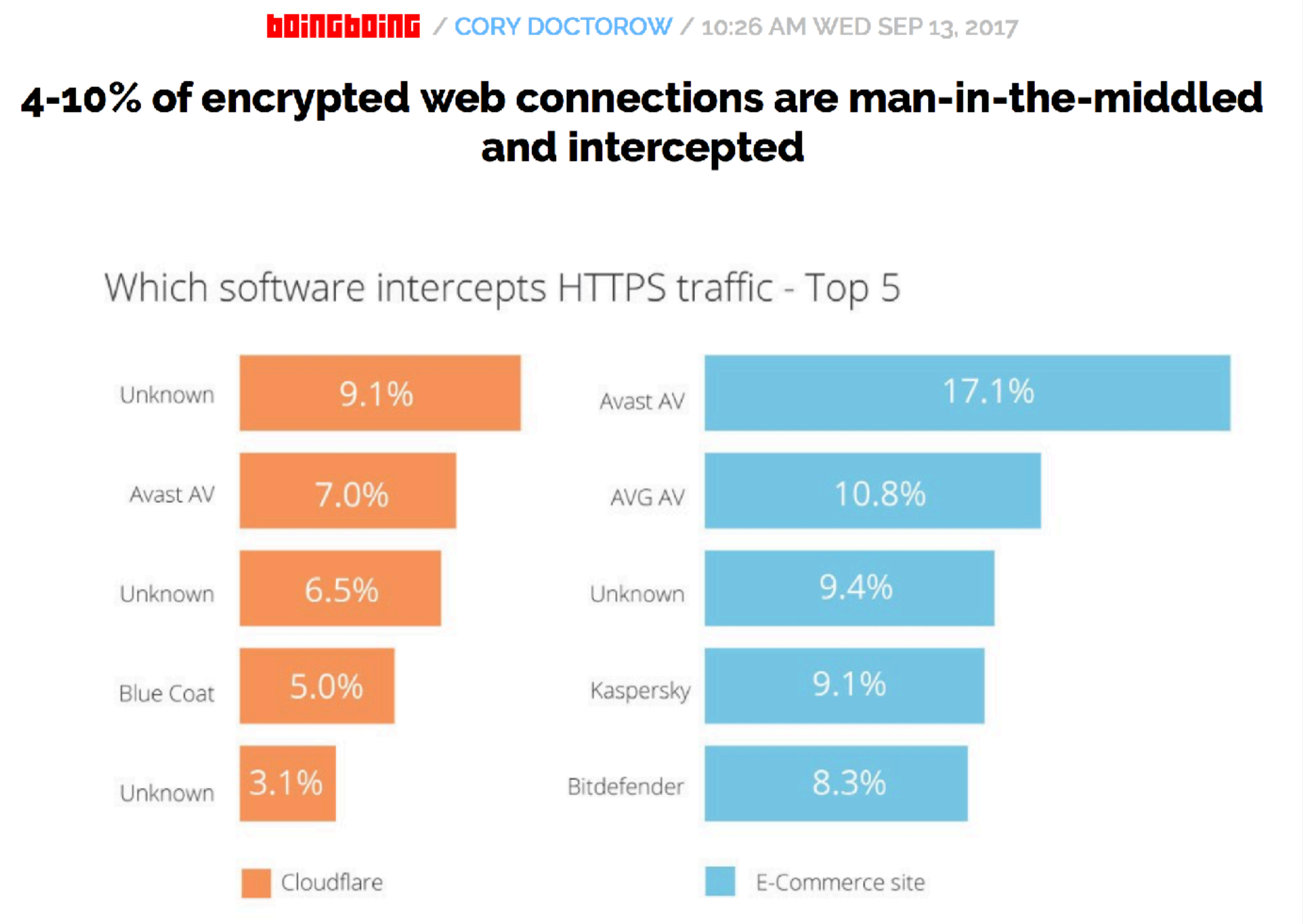
The United States Department of Justice is attempting to seize the information of every person who ever visited the anti-trump website disruptj20.org.

RATING

TRUE

ORIGIN

On 14 August 2017, the web hosting company DreamHost announced through their blog that the Department of Justice had sent them a search warrant on 12 July asking for information about visitors to the web site disruptj20.org. The web site, which is explicitly anti-Trump, helped organize protests of his inauguration.



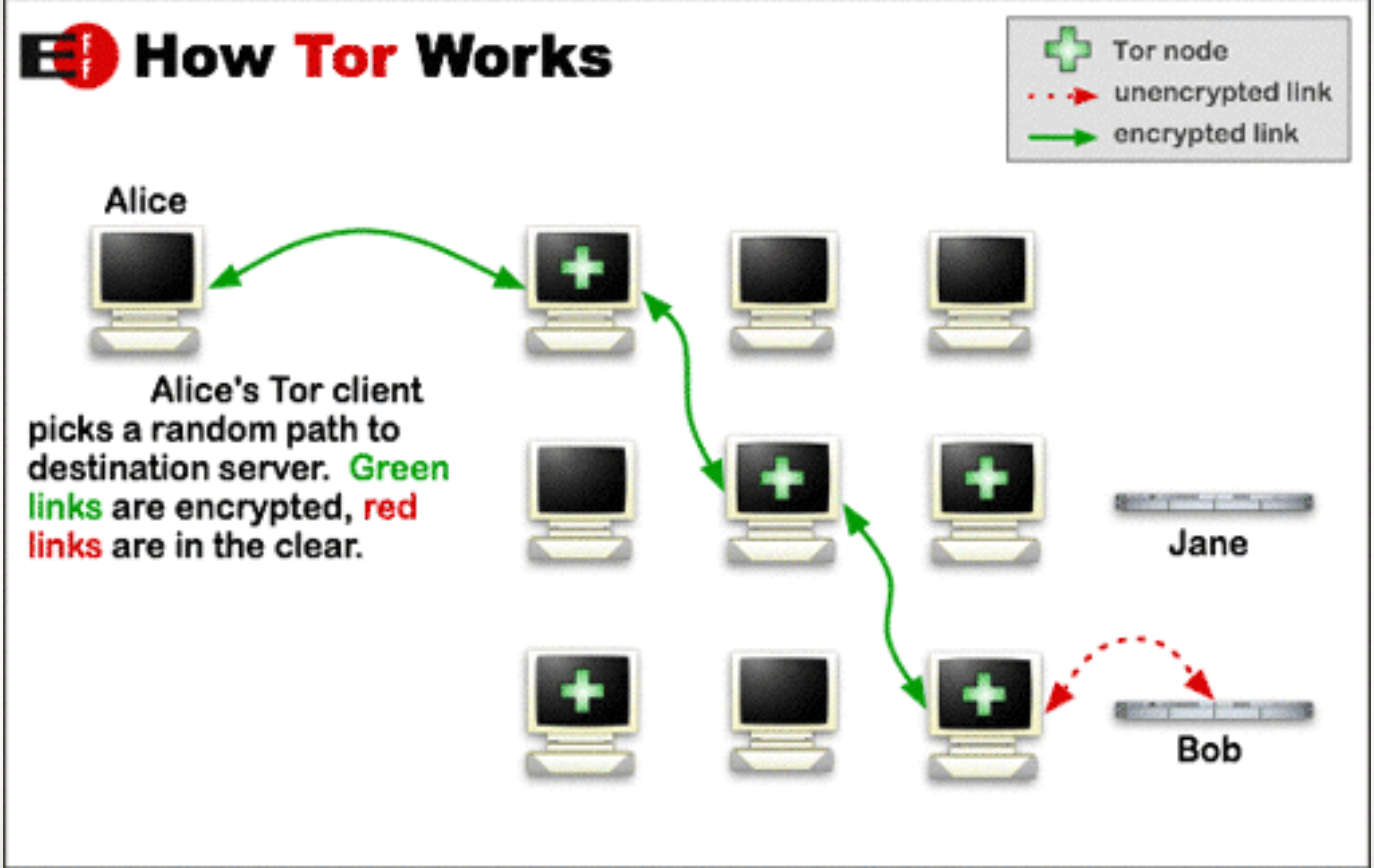
bOiNGbOiNG / CORY DOCTOROW / 10:26 AM WED SEP 13, 2017

4-10% of encrypted web connections are man-in-the-middled and intercepted

Which software intercepts HTTPS traffic - Top 5

Well, Tor Seems Great!

But There's A Problem



How Tor Works

Alice's Tor client picks a random path to destination server. Green links are encrypted, red links are in the clear.

Hidden Services

http://fkdheignoueupfmf.onion/

http://facebookcorewwwi.onion/
http://www.nytimes3xbfgragh.onion/

```
Cooking up some delicious scallions...
Using kernel optimized from file kernel.cl (Optimized4)
Using work group size 128
Compiling kernel... done.
Testing SHA1 hash...
CPU SHA-1: d3486ae9136e7856bc42212385ea797094475802
GPU SHA-1: d3486ae9136e7856bc42212385ea797094475802
Looks good!
LoopIteration:40  HashCount:671.09MH  Speed:9.5MH/s  Runtime:
00:01:10  Predicted:00:00:56  Found new key! Found 1 unique keys.
<XmlMatchOutput>
  <GeneratedDate>2014-08-05T07:14:50.329955Z</GeneratedDate>
  <Hash>prefix64kxpwmzdz.onion</Hash>
  <PrivateKey>-----BEGIN RSA PRIVATE KEY-----
MIICXAIBAAKBgQCmYmTnwGOCpsPOqvs5mZQbIM1TTqOHK1r6zGvpk61ZaT7z2BCE
FPvdTdkZ4tQ3/95ufjhPx7EVDjeJ/JUbT0QAW/YflzUfFJuBli0J2eUJzhhiHpC/
1d3rb6Uhnwvv3xSnfG8m7LeI/Ao3FLtyZFgGZPwsw3BZYyJn3sD1mJIJrQIEB/ZP
ZwKBgCTUOTR4zcz65zSOfo95l3YetVhfmApYcOOd8HTxgTgFsjr00XzW799joIWt
```

Caveat Typor

- Reduction of randomness per character
  - Loss of .onion domain
- Phishing attacks
  - **smspriv6fynj23u6**.onion
    vs
    smsprivyevs6xn6z.onion

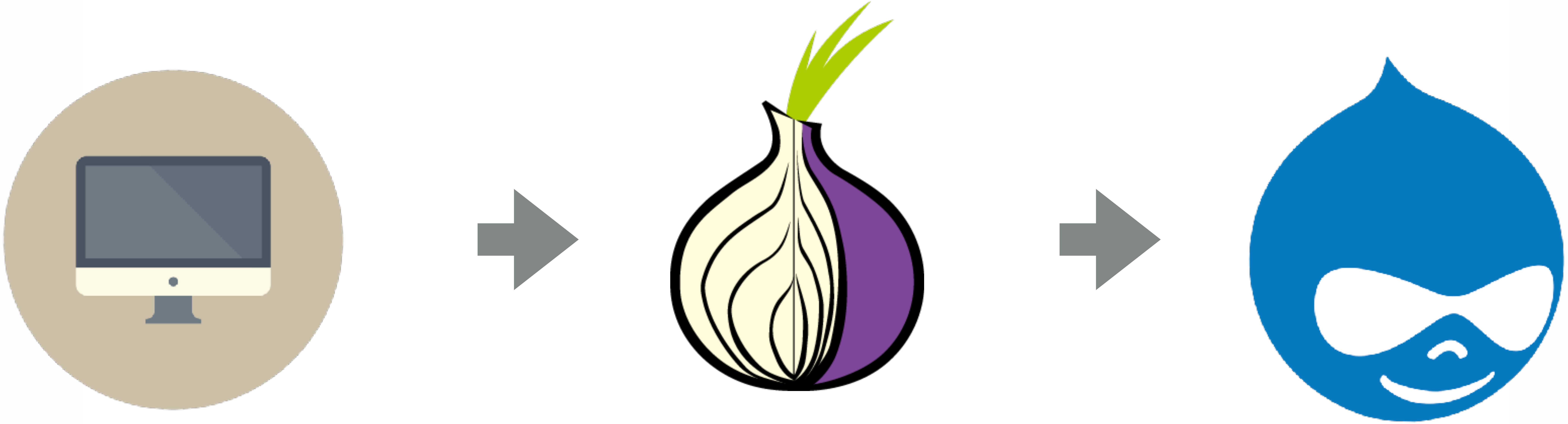
But Drupal?

There’s A Module For That!™

Drupal Hidden Services

- Drupal Module (http://dgo.to/tor)
  - Very out of date, somewhat clunky
- Tor on Production Server
  - Complicates production server
  - Potential attack vectors
- Something else?

The Unix Way™



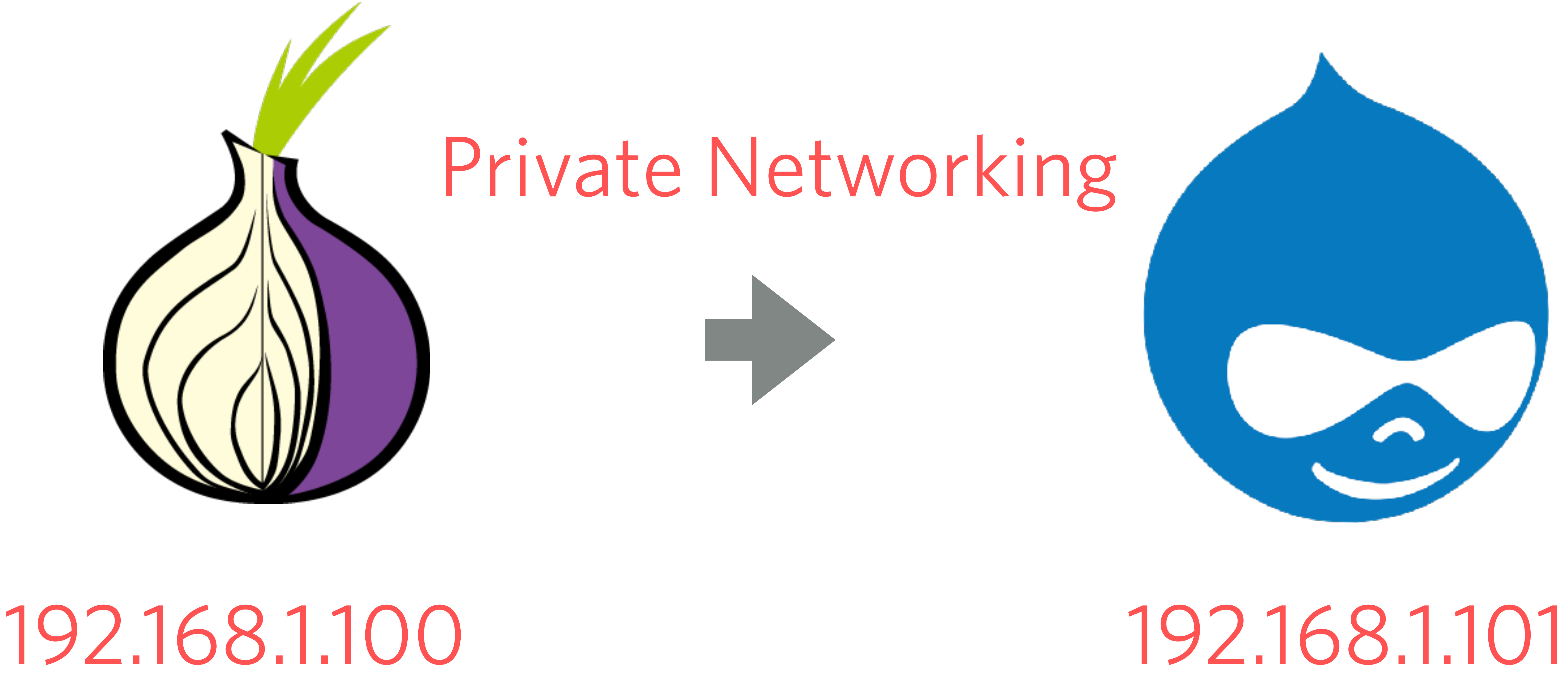
Reverse Proxy Setup

- Drupal server only accessed as standard web server
    - Can’t blame Tor if the server white screens
- Drupal server can continue to collect logs normally
    - Tor server can be locked down and scrubbed

```
# Try to run Tor more securely via a syscall sandbox.
# https://www.torproject.org/docs/tor-manual.html.en#Sandbox
Sandbox 1

# Disable the SOCKS port. Not like anything else on this box is
using tor.
SocksPort 0

HiddenServiceDir /var/lib/tor/hidserv
#HiddenServicePort 80 127.0.0.1:80

HiddenServicePort 80  unix:/var/run/nginx-80.sock
#HiddenServicePort 443 unix:/var/lib/nginx/nginx-443.sock
```

```
server {
    server_name fdg22p3lmweopgho.onion;
    listen unix:/var/run/nginx-80.sock;
    allow "unix:";
    deny all;
    #listen 80;
    #allow 127.0.0.1;

    # Set cache on this nginx end so that we avoid fetching from
    # the real infrastructure when possible.
    proxy_cache tor;
    proxy_cache_valid any 5m;
    proxy_cache_revalidate on;
    proxy_cache_use_stale timeout updating;
    proxy_cache_key $request_uri;
    proxy_ignore_headers expires set-cookie;

    server_tokens off;
```

Ideal Setup



Private Networking

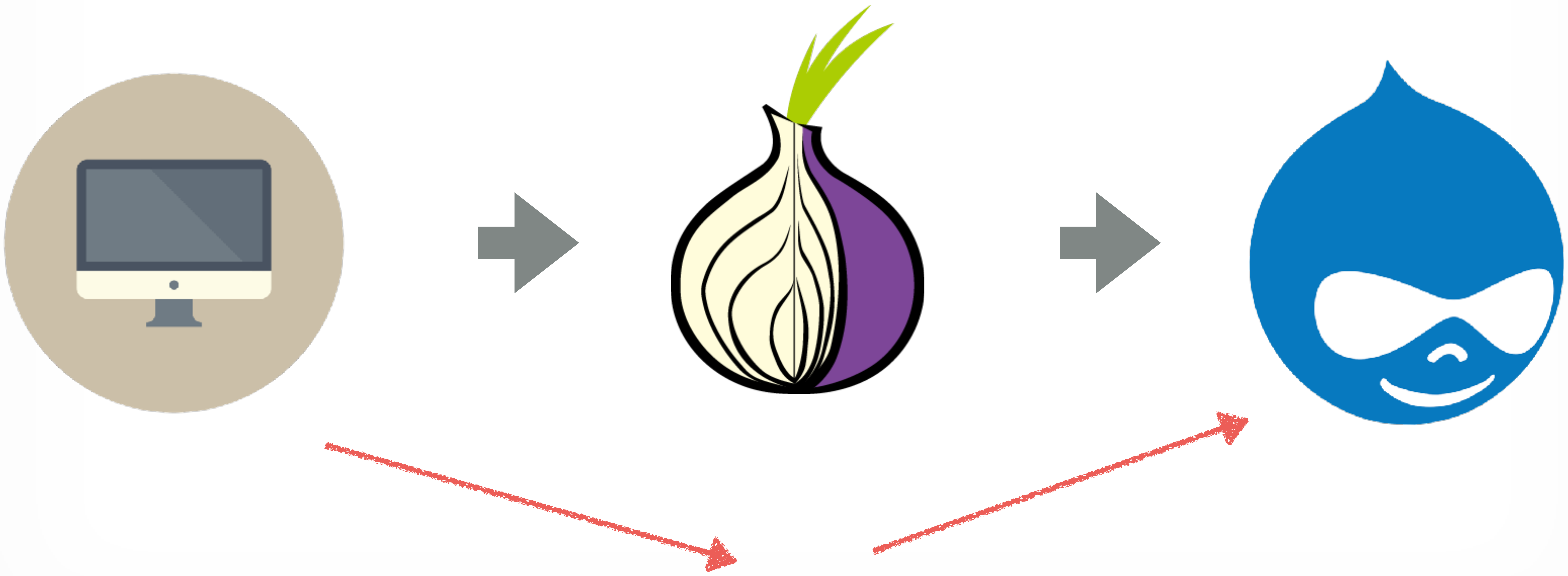
192.168.1.100

192.168.1.101

```
    location / {
        proxy_pass https://192.168.1.100;
        proxy_http_version 1.1;
        proxy_set_header Host "www.website.org";
        proxy_set_header  Connection      $connection_upgrade;
        proxy_set_header  Upgrade        $http_upgrade;
        #proxy_ssl_server_name on;
        proxy_read_timeout 30;
        proxy_connect_timeout 30;

        # Don't compress data, since the subs module can't replace
        proxy_set_header Accept-Encoding "";

        # TODO: denying non-GET requests due to some bot-related
        #       abuse on some endpoints that poorly handle that.
        limit_except GET {
            deny all;
        }
```

An Important Step

http://fkdheignoueupfmf.onion/

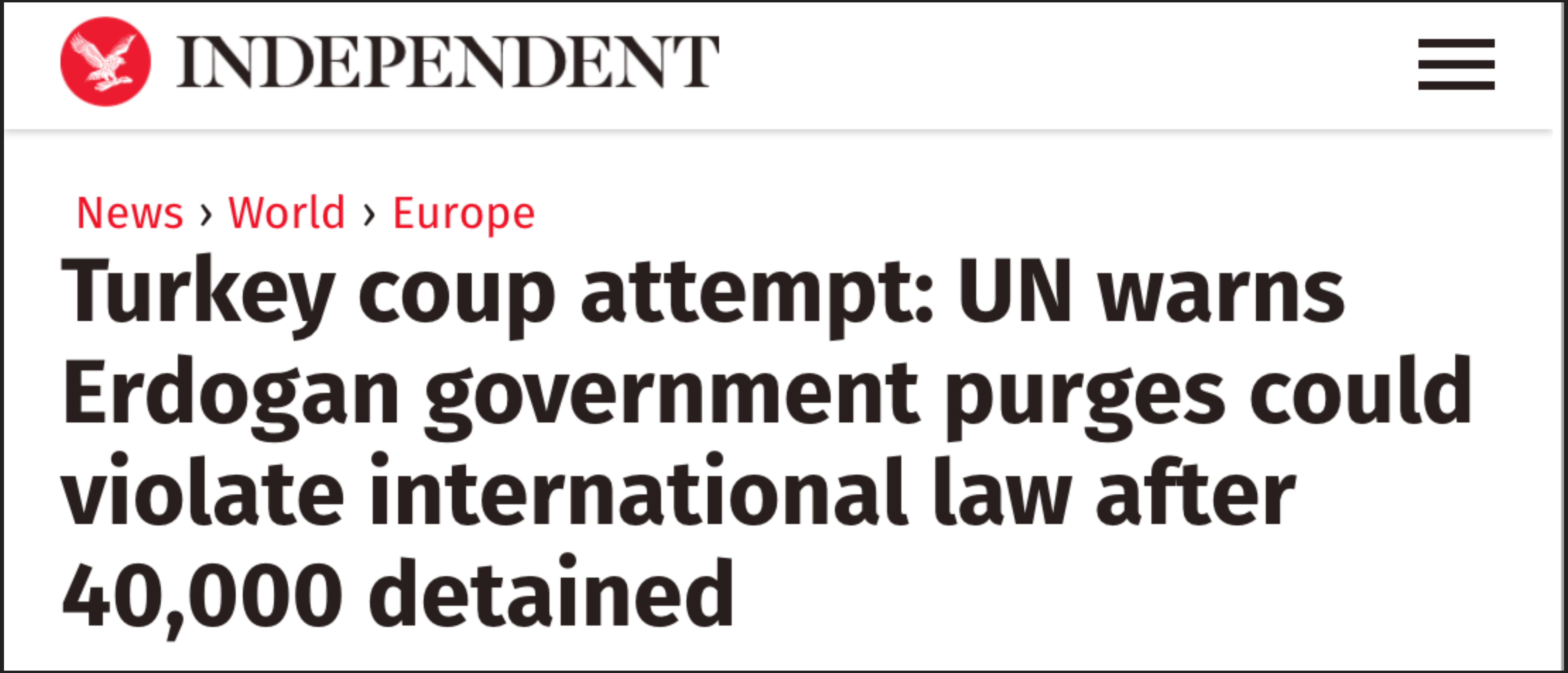


http://website.org/node/42

```
### SUBS https://github.com/yaoweibin/
ngx_http_substitutions_filter_module ###
        # We're rewriting links, but we need to preserve
rel=canonical for analytics.
        subs_filter "rel=\"canonical\" href=\"http://
www.website.org" "-----CANONICALHTTPfdgDOTORG-----" i;
        subs_filter "rel=\"canonical\" href=\"https://
www.website.org" "-----CANONICALHTTPSfdgDOTORG-----" i;
  # Keep links in .onion
  subs_filter (http:|https:)?//(www\.)?website.org //$server_name
gir;
        # Restore the rel="canonical" tag
        subs_filter "-----CANONICALHTTPfdgDOTORG-----"
"rel=\"canonical\" href=\"http://www.website.org" i;
        subs_filter "-----CANONICALHTTPSfdgDOTORG-----"
"rel=\"canonical\" href=\"https://www.website.org" i;
        ### /SUBS ###
        # We're rewriting links, but we need to preserve
rel=canonical for analytics.
        subs_filter "rel=\"canonical\" href=\"http://
www.website.org" "-----CANONICALHTTPfdgDOTORG-----" i;
        subs_filter "rel=\"canonical\" href=\"https://
www.website.org" "-----CANONICALHTTPSfdgDOTORG-----" i;
  # Keep links in .onion
  subs_filter (http:|https:)?//
(www\.)?website.org //$server_name
gir;
        # Restore the rel="canonical" tag
        subs_filter "-----CANONICALHTTPfdgDOTORG-----"
"rel=\"canonical\" href=\"http://www.website.org" i;
        subs_filter "-----CANONICALHTTPSfdgDOTORG-----"
"rel=\"canonical\" href=\"https://www.website.org" i;
```

```
### HEADERS http://wiki.nginx.org/HttpHeadersMoreModule ###
      more_clear_headers "Age";
      more_clear_headers "Server";
      more_clear_headers "Via";
      more_clear_headers "X-From-Nginx";
      more_clear_headers "X-NA";
      more_clear_headers "X-Powered-By";
      more_clear_headers "X-Request-Id";
      more_clear_headers "X-Runtime";
      more_clear_headers "X-Varnish";
      more_clear_headers "Content-Security-Policy-Report-Only";
      ### /HEADERS ###

  }
```

Ideal Setup



INDEPENDENT

News › World › Europe

Turkey coup attempt: UN warns Erdogan government purges could violate international law after 40,000 detained

It's only illegal if you ***get caught***

- me, 1998

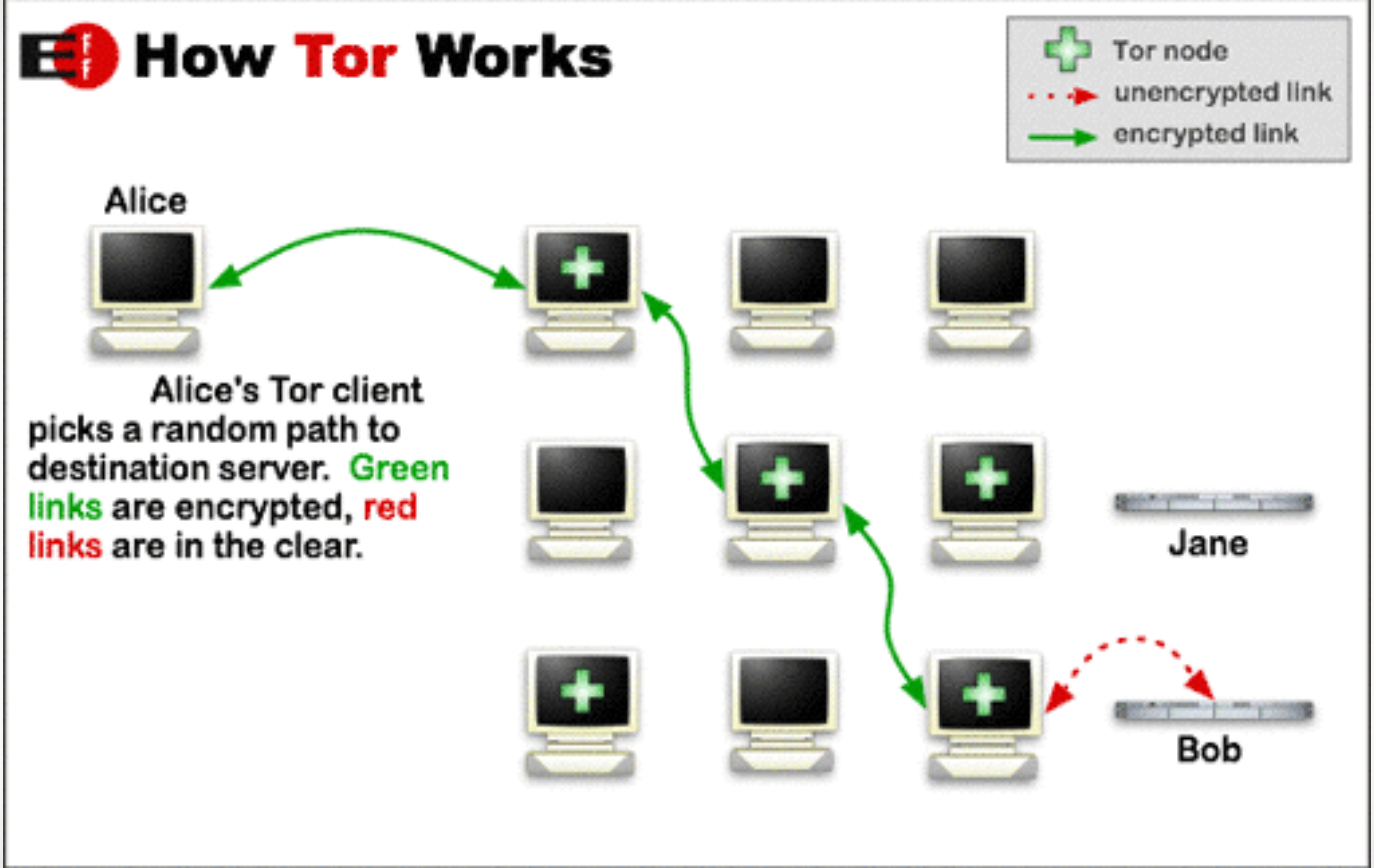
It's only secure if they can't ***prove anything***

- me, 2016

Ideal Setup

- All logging turned off
  - All log paths set to /dev/null
- All non-Tor traffic kept internal

There’s Still One Problem…



How Tor Works

Alice's Tor client picks a random path to destination server. Green links are encrypted, red links are in the clear.

There Can Be Only One

- Hidden sites, by their nature, have unique and secure URLs
- It’s still possible to be exposed to malicious Tor nodes
- Your browser might try to communicate to non-Onion addresses

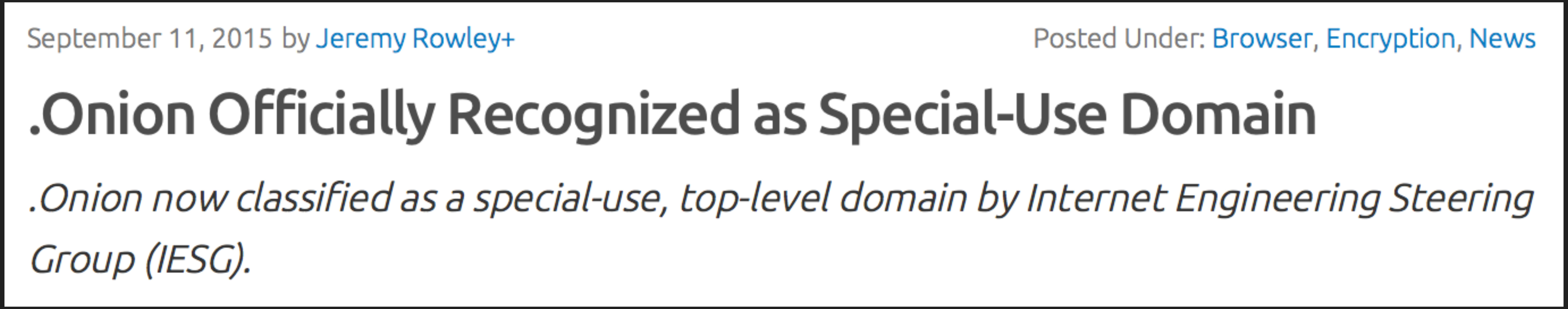
Facebook - Log In or Sign Up

Facebook, Inc. (US)

https://www.facebookcorewwwi.onion/

There Can Be Only One

- DigiCert
  - Only game in town, currently



September 11, 2015 by Jeremy Rowley+ Posted Under: Browser, Encryption, News

.Onion Officially Recognized as Special-Use Domain

.Onion now classified as a special-use, top-level domain by Internet Engineering Steering Group (IESG).

There Can Be Only One

- DigiCert
  - Only game in town, currently
  - Working to standardize .onion as a TLD

Press The Easy Button!

The Enterprise Onion Tool Kit

https://github.com/alecmuffett/eotk

Future Improvements

- Future Improvements
  - Single Onion Services - 1 hop server (🐵)
  - OnionBalance - load balancing
  - Permanent SSL Certificates

Resource Links

General:

https://www.torproject.org/about/overview.html.en

https://www.torproject.org/docs/hidden-services.html.en

https://www.eff.org/pages/tor-and-https

https://github.com/alecmuffett/eotk

https://github.com/alecmuffett/onion-sites-that-dont-suck

https://onionshare.org

http://incoherency.co.uk/blog/stories/hidden-service-phishing.html

https://boingboing.net/2017/10/02/pwnage-to-catalonia.html

ProPublica setup:

https://www.propublica.org/nerds/item/a-more-secure-and-anonymous-propublica-using-tor-hidden-services

https://gist.github.com/mtigas/9a7425dfdacda15790b2

HTTPS:

https://www.cybersecureasia.com/blog/tor-ssl-onion-certificate-from-digicert

Vanity URL:

http://www.zdnet.com/article/facebook-sets-up-hidden-service-for-tor-users/

Thanks!
Questions?

@milsyobtaf

https://github.com/milsyobtaf/prez