



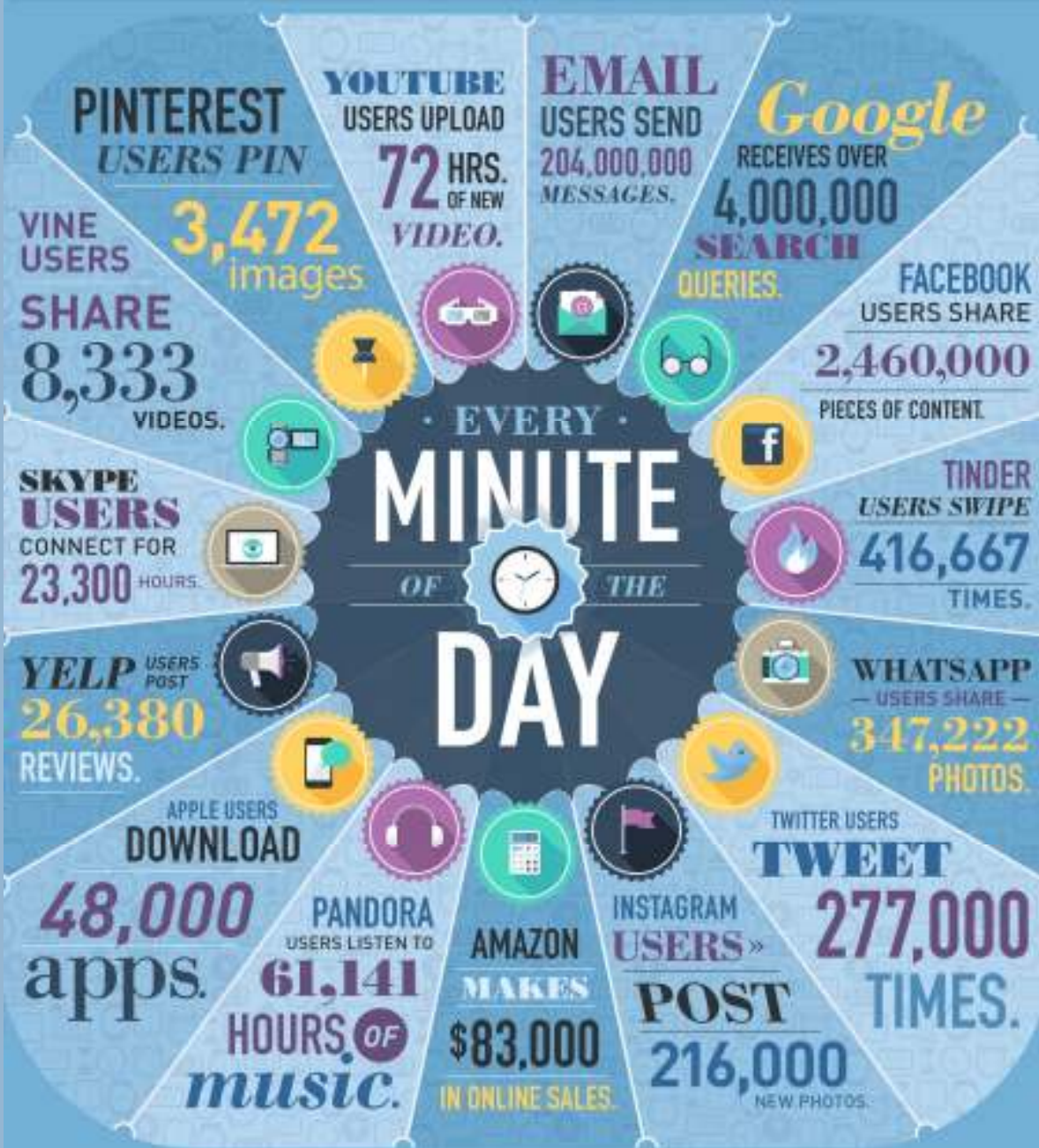
Deep Web, Dark Web The TOR Browser and Bitcoins *Plus Other stuff*

JB Burke
Senior Consulting Fellow
Prescott Computer Society
April 6, 2015



WARNING

The material contained in this presentation is for informational purposes only. It is not intended to facilitate violation of any local, state or federal laws.



THE GLOBAL INTERNET POPULATION GREW 14.3% FROM 2011 - 2013 AND NOW REPRESENTS

2.4 BILLION PEOPLE.

A Bit About Bytes ...

For Starters..

Quantities of Bytes

	BIT	=	A BINARY DIGIT SET TO EITHER A 1 OR 0
	BYTE	=	8 BITS
KB	KILOBYTE	=	1,000 BYTES
MB	MEGABYTE	=	1,000,000 BYTES
GB	GIGABYTE	=	1,000,000,000 BYTES
TB	TERABYTE	=	1,000,000,000,000 BYTES
PB	PETABYTE	=	1,000,000,000,000,000 BYTES
EB	EXABYTE	=	1,000,000,000,000,000,000 BYTES
ZB	ZETTABYTE	=	1,000,000,000,000,000,000,000 BYTES
YB	YOTTABYTE	=	1,000,000,000,000,000,000,000,000 BYTES

Then what?

- Some proposals ...

- Brontobyte (1000 Yottabytes)?

- Geobyte (1000 Brontobytes?)

- Gegobytes

- Geopbytes

- Hellabyte (1000 Yottabytes)?

- Ninabytes (1000 Yottabytes)?

- Tenabytes (1000 Ninabytes)?

- <http://www.forbes.com/sites/oracle/2013/10/09/extreme-big-data-beyond-zettabytes-and-yottabytes/>

So the Internet (Web) is Really Big!



There's Also the Deep Web



- The **Deep Web** refers to any Internet information or data that is inaccessible by a search engine and includes all Web pages, websites, intranets, networks and online communities that are intentionally and/or unintentionally hidden, invisible or unreachable to search engine crawlers.
- The Deep Web is also known as hidden Web, Undernet, Deepnet or Invisible Web.

The Deep Web



- **Techopedia explains Deep Web**
 - Coined by Mike Bergman, the **Deep Web** term relates to **deep sea/ocean environments** that are virtually invisible and inaccessible. Technically, the Deep Web is a series of interconnected systems that are **not indexed by search engines** and only directly accessible by their creators or individuals with very limited privileges.
 - The **Deep Web** contains data that is dynamically produced by an application, unlinked or standalone Web pages/websites, non-HTML content and data that is privately held and classified as confidential.
 - **Some estimate the size of the Deep Web as many times greater than the visible or Surface Web.**



Question: How big is the Deep Web?

- **Short Answer:**

- In **2001**, BrightPlanet completed a study to test the size of the Deep Web, our initial findings revealed that **search engines were searching only 0.03%** of pages available on the entire Internet. Since 2001, BrightPlanet has not completed any additional studies to predict the size of the Deep Web because of how large the Internet has grown. **The Internet has grown so vast and so large that we now classify the Deep Web as infinite.**

- **Link to Blog Post:**

- <http://www.brightplanet.com/2014/11/big-internet/>

Surface Web

Content in the Deep Web is
massive— approximately

**500 Times
Greater**

than the content indexed by
conventional search engines

Journal of
Electronic
Publishing

<http://www.informit.com/blogs/blog.aspx?uk=How-the-Internet-Works-The-Deep-Web>

internet live stats

live

1 second

watch

trends & more



3,106,455,900

Internet Users in the world



930,559,198

Total number of Websites



146,085,843,763

Emails sent **today**



2,850,358,334

Google searches **today**



2,622,803

Blog posts written **today**

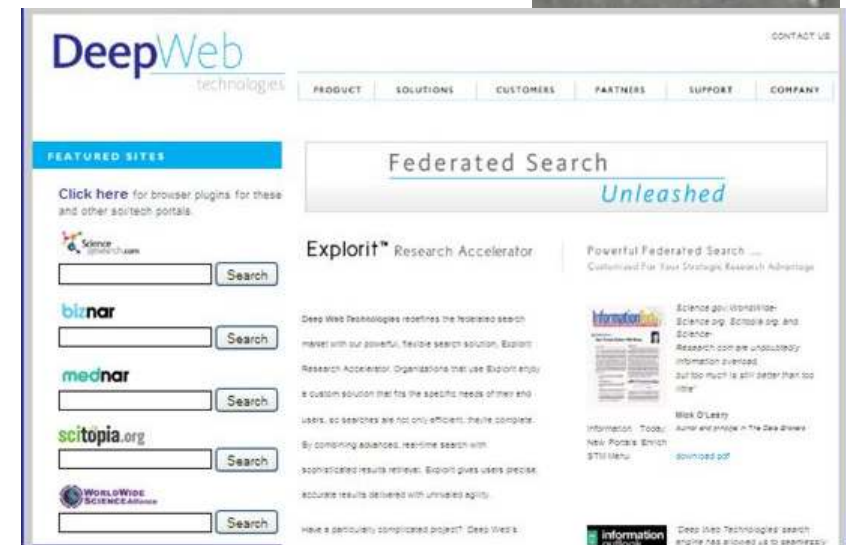


529,986,775

Tweets sent **today**

<http://www.internetlivestats.com/>

Use Deep Search Engines for More Targeted Results



Just not finding what you're looking for? Popular search engines may deliver plenty of results, but to find relevant and targeted search results you may want to try a deep search engine. These are especially helpful during **scholarly research**.

<http://deep-web.org/how-to-research/deep-web-search-engines/>

<http://deeperweb.com/>

Where to find Deep Web Databases

- University of California Berkeley Library
 - <http://www.lib.berkeley.edu/find/types/articles.html>
- The Invisible Web Databases
 - <http://www.noodletools.com/debbie/literacies/information/5locate/advisedepth.html>
- How to Search the Deep Web
 - <http://www.wikihow.com/Search-the-Deep-Web>
- How to Mine the Invisible Web: The Ultimate Guide
 - <http://websearch.about.com/od/invisibleweb/a/ultimate-guide-deep-web.htm>
- 10 Search Engines to Explore the Invisible Web
 - <http://www.makeuseof.com/tag/10-search-engines-explore-deep-invisible-web/>

Deep Web Search Engines

(Just some examples!)

- Deep Web Search – A How-To Site
- <http://deep-web.org/how-to-research/deep-web-search-engines/>
- Search the Invisible Web: 20 Resources
- <http://websearch.about.com/od/invisibleweb/tp/deep-web-search-engines.htm>
- How to search the Deep Web
- <http://www.dailydot.com/technology/how-to-search-the-deep-web/>

Further Reading



- **The Ultimate Guide to the Invisible Web**
 - <http://oedb.org/ilibrarian/invisible-web/>
- **White Paper: Understanding the Deep Web in 10 Minutes**
 - <http://www.brightplanet.com/2013/03/whitepaper-understanding-the-deep-web-in-10-minutes/>
- **[Whitepaper] Google Search vs. Deep Web Harvesting – Questions Answered**
 - <http://www.brightplanet.com/2013/07/whitepaper-google-search-vs-deep-web-harvesting-questions-answered/>
- **Use Deep Search Engines for More Targeted Results**
 - <http://www.brighthub.com/internet/google/articles/98349.aspx>

StarWars
On a
Subway!

<https://www.youtube.com/watch?v=J5gCeWEGiQI>

The Deep Web

- Google searches the Surface Web (Visible Web)
 - ▣ Approximately **8 Billion Pages**
- Google can't see the Deep Web pages
 - ▣ E.g. Library of Congress (<http://www.loc.gov/>)
- Deep Web pages are within specialized databases
 - not formatted as web pages
 - ▣ Approximately **900 Billion Pages**
- Source: <http://www.llrx.com/features/deepweb2006.htm>

Question: What's the difference between the Surface Web, Deep Web, and the Dark Web?

- The **Surface Web** is anything that can be found by a search engine, it normally consists of Web data that is linked and can be navigated to through a clickable link.
- The **Deep Web** refers to any portion of the Internet that cannot be found through a standard link crawling search engine. The vast majority of this content exists because you need to navigate through a Web search form or input a query to get there.
- **Dark Web** refers to anything that is intentionally hidden. The most common place on the Dark Web is the TOR network or a private anonymous Internet that can only be accessed via a special browser. The Dark Web makes up a small portion of the Deep Web.
- **Link to Blog Post:** [Clearing Up Confusion – Deep Web vs. Dark Web](#)

Beneath the Deep Web there's a **Dark Web**

- The BBC defines the Dark Web as “anonymous, virtually untraceable global networks used by political activists and criminals alike”
- Because the Dark Web is not connected to the Internet via traditional means, hosts are harder to find and connect to site operators. This makes it an appealing haven to purveyors of child pornography and other illegal content. Similarly, terror groups have been discovered to haunt the Dark Web as part of their effort to recruit and radicalize new members.
- Although the Dark Web has some nebulous uses, many of them are innocuous. For example people who want to communicate and associate online without fear of being shut down by a government agency.

The Internet (more or less)



You can turn a computer on. Yay.

You must be really bored.

Either use a proxy, or say hi to the FBI.

The Dark Web is scary ...

- Guns, drugs and other illegal products bought and sold
- All sorts of illegal activities occur (*hire a hit man?*)
- It's really not that hard to find out how to access it
- Anyone accessing these sites is in effect totally anonymous and therefore cannot be traced
- Payments on many of these websites are nearly totally anonymous as they operate in the decentralized anonymous currency of **Bitcoins**
- Silk Road is a famous example of a Deep Web site that was found and dismantled

What's available on the Dark Web?

Category	#. items	Pct.
Weed	3338	13.7%
Drugs	2207	9.0%
Prescription	1784	7.3%
Benzos	1193	4.9%
Books	955	3.9%
Cannabis	880	3.6%
Hash	821	3.4%
Cocaine	633	2.6%
Pills	473	1.9%
Blotter	441	1.8%
Money	406	1.7%
MDMA (ecstasy)	393	1.6%
Erotica	385	1.6%
Steroids, PEDs	376	1.5%
Seeds	375	1.5%
Heroin	370	1.5%
Opioids	344	1.4%
DMT	343	1.4%
Stimulants	292	1.2%
Digital goods	261	1.1%

Inside The Underweb: Home To Stolen Credit Cards, Pedophiles, Hit men, Drug Dealers— And Free Speech

- <http://www.fastcompany.com/3004614/inside-underweb-home-stolen-credit-cards-pedophiles-hitmen-drug-dealers-and-free-speech?partner=newsletter>



Skimmer Services
We offer: Wincor & Diebold skimmers [Flash] + camera.
All products can work about 24hrs from battery.
Possible to develop a model for other ATMs special for you.
Price for listed models: 2000\$. Rent is possible too.
Rent terms: 1000\$ deposit + 30% skimmed dumps (70% for you, 30% for us).
Product can be delivered worldwide, shipping fees included in price.
All info will be provided with skimmer [installation manual, software & firmware + datasheet]
Contact us: skimmer@wincor.com
P.S: Sorry for page look. We are not designers. :)
Some photos. Wincor:

A photograph of a small, black, rectangular device, likely an ATM skimmer, sitting on a light-colored surface. The device has a small opening on its front face and a thin wire extending from its side.

Betcha never ran across a website like this with a Google search!

Welcome! | Silk Road

http://ianxz6zefk72ulzz.onion/index.php

Most Visited - Learn more about Tor The Tor Blog

Are you using Tor? list of TOR sites silkroad - Goo... TORDIR - Link List Welcome! | Silk Road

Silk Road
anonymous marketplace

Welcome
messages(0) | orders(0) | account(฿0) | settings | log out
🛒 (0)

Shop by category:
Cannabis(203)
Ecstasy(35)
Psychedelics(127)
Opioids(39)
Stimulants(68)
Dissociatives(9)
Other(197)
Benzos(43)

Step-by-step:
 1. Get **anonymous money**
 2. Buy something here
 3. Enjoy it when it arrives!

Vacation mode. Important info for **sellers...**

recent feedback:

seller	rating	feedback	
1UP of Canada(97)	4 of 5	amazing weed. the only reason this is not a 5 is because the package was so tightly double vaccuum sealed that the product was flattened, which I know is necessary for security but it still decreases quality	item
CaliforniaSunrise	5 of 5	Fast shipping. Nice packaging. I haven't tried the chocolate yet, but it looks tasty! Smooth transaction.	item
Rook	5 of 5	all good! thanks so much!	item
illy	5 of 5	Very friendly. Fast Shipping. Great packaging.	item
somatik	5 of 5	Order arrived quickly and as described. Thanks!	item
gamely54	5 of 5	No issue at all, I officially recommend this seller. Now go forth and purchase from him!	item
mellowyellow	5 of 5	Item arrived quickly and as described, good communication. This guy's legit.	item
dirtysouf(100)	5 of 5	looks good	item



- Weaponry(41)**
- Firearms(13)**
- Handguns(8)**
- Ammunition(7)**
- Melee(8)**
- Apparel(3)**
- Art(26)**
- Books(129)**
- Computer equipment(4)**
- Digital goods(70)**
- Drug paraphernalia(33)**
- Drugs(1831)**
- Electronics(14)**
- Food(1)**
- Forgeries(15)**
- Home & Garden(3)**
- Lab Supplies(6)**
- Medical(6)**
- Money(80)**
- Services(48)**
- XXX(52)**

sort by

title	price	seller	ship from	
Taurus 990	\$108.72	edgarnumbers(98)	United States of America	add to cart
Smith and Wesson Model 625 JM	\$175.70	edgarnumbers(98)	United States of America	add to cart
Glock 26 9MM like new	\$139.02	DBush(100)	United States of America	add to cart
Glock 27 compact 40 cal	\$142.67	DBush(100)	United States of America	add to cart
Beretta US M9 w/fac. laser NIB Govt' Issue	\$204.36	edgarnumbers(98)	United States of America	add to cart
9mm Machine Pistol with Silencer	\$187.32	DBush(100)	United States of America	add to cart
Desert Eagle .44Mag	\$347.19	edgarnumbers(98)	United States of America	add to cart
Ruger P89	\$82.73	edgarnumbers(98)	United States of America	add to cart
Beretta 92FS Italian new in box	\$166.14	edgarnumbers(98)	United States of America	add to cart
Desert Eagle 50AE Brushed Chrome	\$294.49	DBush(100)	United States of America	add to cart
Raging Bull 454	\$147.00	edgarnumbers(98)	United States of America	add to cart
AR15 .5.56mm NATO pistol	\$165.84	DBush(100)	United States of America	add to cart
Glock 17 9mm	\$161.28	DBush(100)	United States of America	add to cart

DARK Web – a true service economy!

If you need the job done in the EU, you must pay me in advance 5000 EUR in preparation for the job.
If you need the job done outside the EU, you must pay me in advance 10 000 EUR in preparation for the job.
*This money is required for me to purchase the weapon, vehicle of transport, ticket to the target's country, etc

To eliminate:

- Ordinary person: 20 000 EUR
- Criminal or lower rank government official: 50 000 EUR
- High rank government official: 100 000 EUR
- Paparazzi: 50 000 EUR
- Journalist: 65 000 EUR
- Business Associate: ranging from 50 000 EUR to 200 000 EUR
- Spouse: price depending on the secondary aspects of person(job, social status etc)

You are required to provide as much information about the target as possible. Necessary information includes:

- Name
- Picture (many if possible)
- Home address
- Work address
- How many family members live in the same household. (not a necessity, but good to know)
- Vehicle used for transport and registration of vehicle, along with any other identifying numbers

After the money you pay me in advance, I will purchase whatever is necessary for the mission.

After the necessary elements have been bought and accomplished, you will pay me the rest of the money to confirm the job, and then I will execute it.

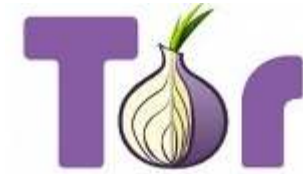
Keep in mind, the amount of time needed for such operation is crucial. The sooner you want a target eliminated, the sooner you should notify me.

A two month headstart is perfect for me.

If you expect me to do such job, I expect you to trust me. We are both anonymous, and a bond of trust is required for such jobs to be successful.

You can contact me and send target information at: fritz@formail.net

There's Another Browser



- The Tor Browser
- It is really private!
 - ▣ Tor prevents people from learning your location or browsing habits.
 - ▣ Tor is for web browsers, instant messaging clients, and more.
 - ▣ Tor is free and open source for Windows, Mac, Linux/Unix, and Android

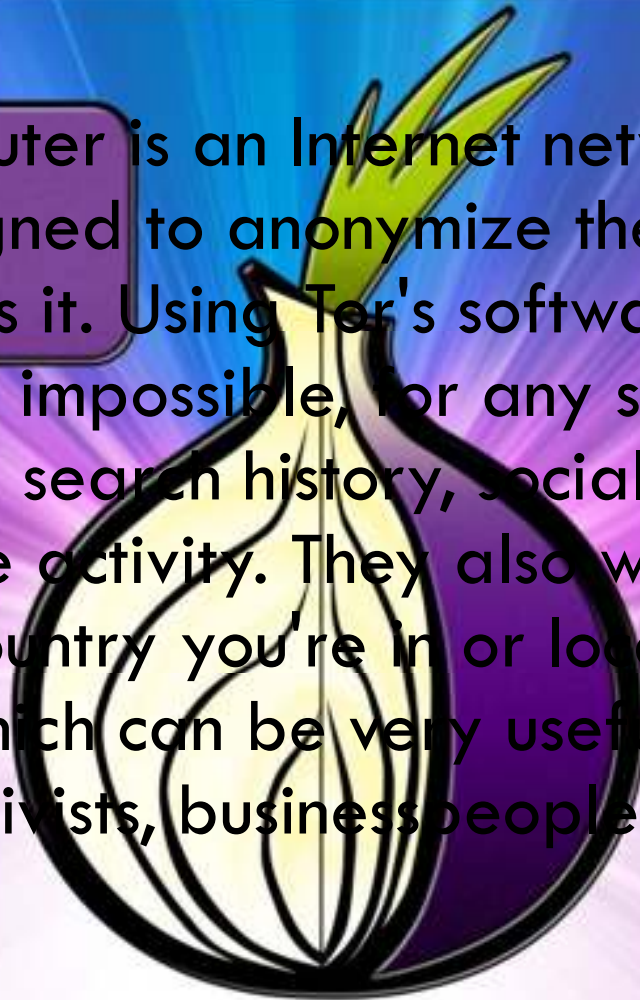


More on Tor



□ What is Tor?

- The **O**nion **R**outer is an Internet networking protocol designed to anonymize the data relayed across it. Using Tor's software will make it difficult, if not impossible, for any snoops to see your webmail, search history, social media posts or other online activity. They also won't be able to tell what country you're in or locate you by an IP address, which can be very useful for journalists, activists, businesspeople and more.



Tor is Used to Access the Dark Web

- **What is Tor? (*According to the creator of Tor*)**
- Tor is free software and an open network that helps you defend against traffic analysis, a form of network surveillance that threatens personal freedom and privacy, confidential business activities and relationships, and state security.
- **Why Anonymity Matters**
- Tor protects you by bouncing your communications around a distributed network of relays run by volunteers all around the world: it prevents somebody watching your Internet connection from learning what sites you visit, and it prevents the sites you visit from learning your physical location.
- <https://www.torproject.org/>
- <http://www.theguardian.com/technology/2013/nov/05/tor-beginners-guide-nsa-browser>



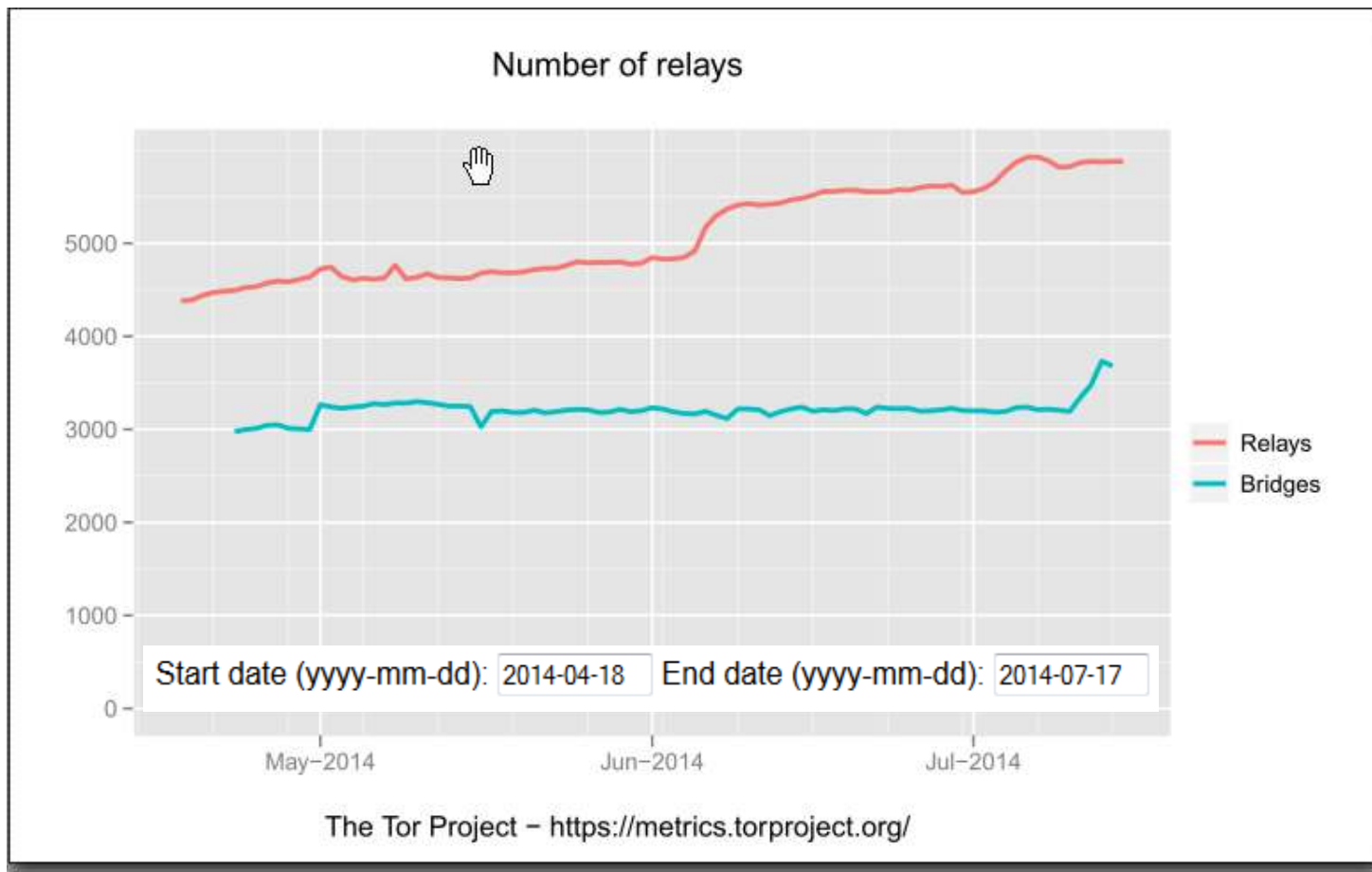
What Tor is good for ...

- Tor is a legitimate service used by individuals living under repressive governments worldwide to communicate outside the reach of intelligence services.
- Much of the content on Tor, however, is illegal under U.S. law.
- Really Private Browsing: An Unofficial User's Guide to Tor
 - ▣ <http://www.makeuseof.com/pages/really-private-browsing-an-unofficial-users-guide-to-tor>



Tor Metrics

The following graph shows the average daily number of relays and bridges in the network.



How Can I Stay Anonymous with Tor?

lifehacker

- <http://lifehacker.com/how-can-i-stay-anonymous-with-tor-1498876762>



An Up-To-Date Layman's Guide To Accessing The Deep Web (they mean **DARK WEB**)

- From FastCompany magazine (**Adult language alert**)
 - <http://www.fastcolabs.com/3026989/an-up-to-date-laymans-guide-to-accessing-the-deep-web>
- **How To Access The Deep Web (Tor)**
- **Where To Go Once You're On The Inside**
- **New Sites To Explore**
- **What are you looking for first of all?**
 - ▣ **Drugs? Guns? Assassins? Credit cards or counterfeit cash?**
- **Could be a treacherous journey.**
- **Don't say I didn't warn you.**

IS IT LEGAL?

YES You use it as you would any other Internet browser. Many people are now beginning to use TOR as a way of maintaining their privacy whilst online.

WHO ELSE USES IT



MILITARY



POLICE



JOURNALISTS



WHISTLEBLOWERS



Edward Snowden



Julian Assange

Where is Tor?

<https://www.torproject.org/>



Home

About Tor

Docu

Anonymity Online

Protect your privacy. Defend yourself against network surveillance and traffic analysis.



Download Tor 

- ▶ Tor prevents people from learning your location or browsing habits.
- ▶ Tor is for web browsers, instant messaging clients, and more.
- ▶ Tor is free and open source for Windows, Mac, Linux/Unix, and Android

What is Tor?

Tor is free software and an open network that helps you defend against traffic analysis, a form of network surveillance that threatens personal freedom and privacy, confidential business activities and relationships, and state security.

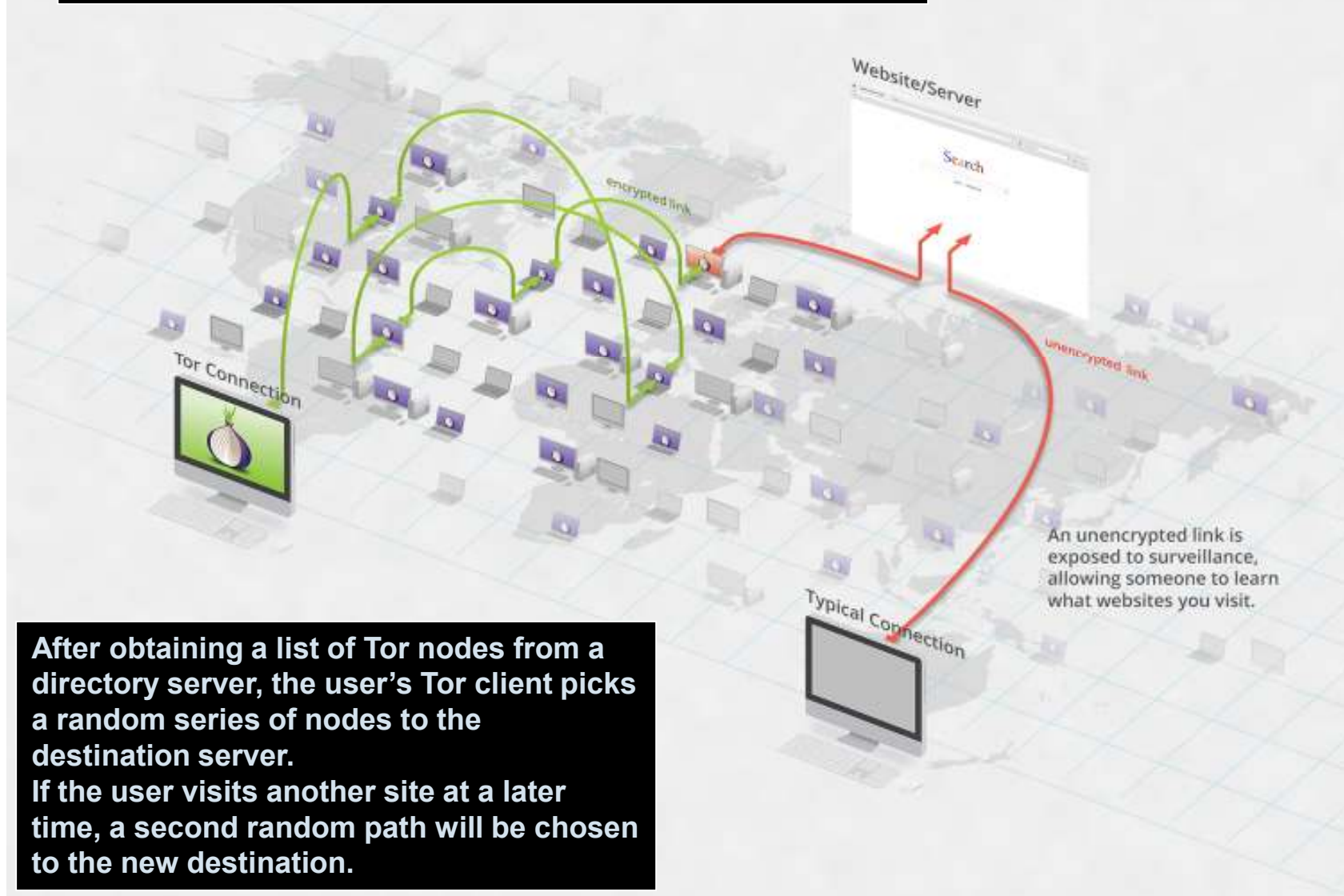
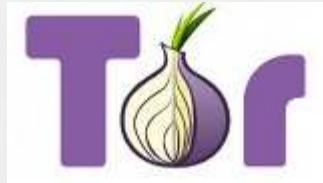
[Learn more about Tor »](#)

Why Anonymity Matters

Tor protects you by bouncing your communications around a distributed network of relays run by volunteers all around the world: it prevents somebody watching your Internet connection from learning what sites you visit, and it prevents the sites you visit from learning your physical location.

[Get involved with Tor »](#)

Let's try it out!



Let's Look At Bitcoin – The Deep Web payment of choice

- **What is it ... and should we care?**
- Bitcoin is a **digital currency** (also called crypto-currency) that is not backed by any country's central bank or government. Bitcoins can be traded for goods or services with vendors who accept Bitcoins as payment.
- Bitcoins are created in a process called **mining**, where a computer repeatedly works through a series of calculations that are designed to be difficult to solve, but to lead to a specific answer.
- <https://medium.com/future-of-currency/4624cef09e87>

WHAT BITCOINS MIGHT LOOK LIKE IF THEY WERE PHYSICAL.



Current value of a bitcoin ...

<https://www.coinbase.com/charts>

Bitcoin – A Quick Overview ... (Video)

- <https://www.youtube.com/watch?v=Um63OQz3bjo>

How we get Bitcoins – by “mining” (Video)



<https://www.youtube.com/watch?v=GmOzih6l1zs>

<http://www.weusecoins.com/en/mining-guide>

Some Light Shines in the Dark Web

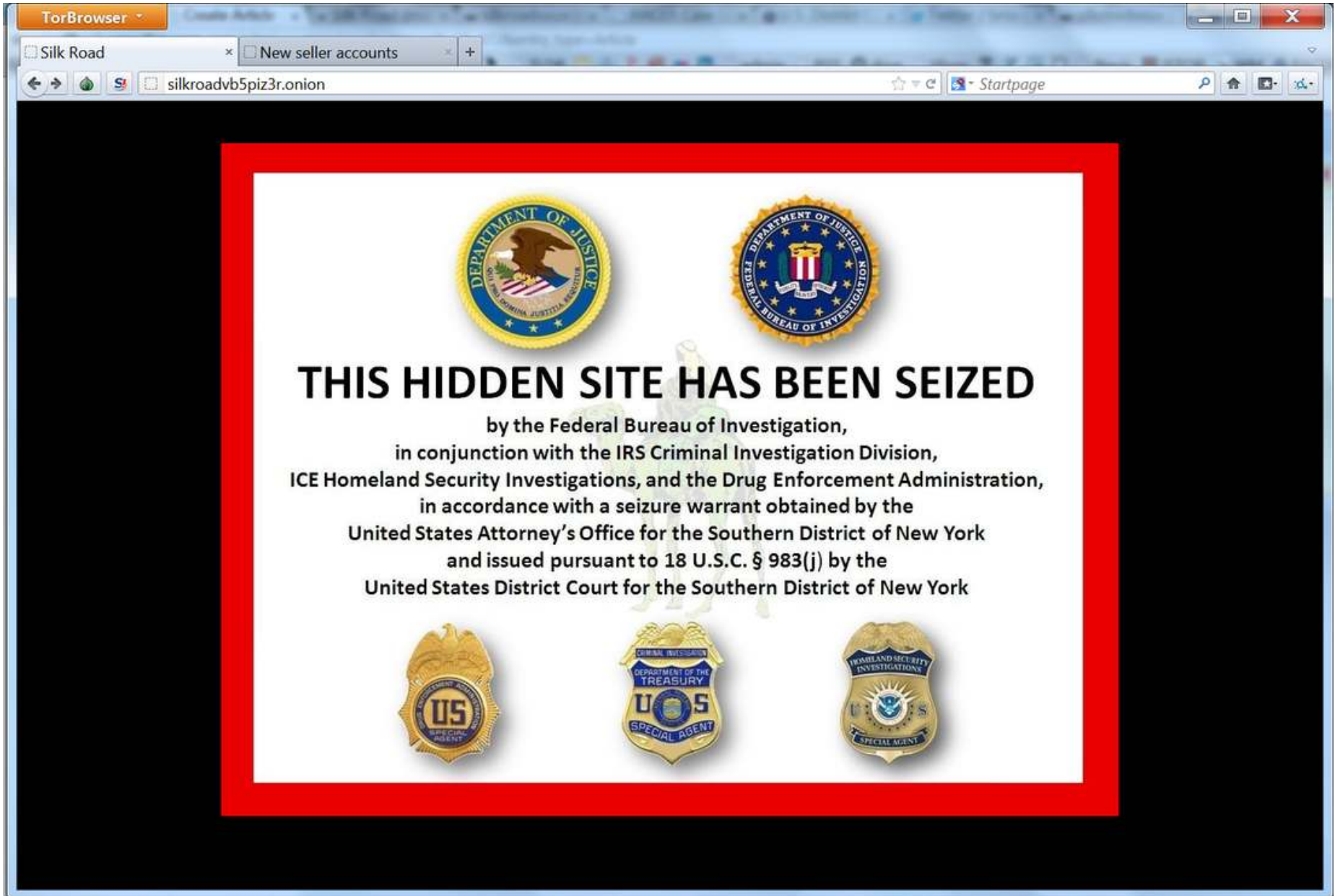
The Demise of Dread Pirate Robert

- **Here's the Secret Silk Road Journal From the Laptop of Ross Ulbricht**
 - <http://www.wired.com/2015/01/heres-secret-silk-road-journal-laptop-ross-ulbricht/>
- **Prosecutors Trace \$13.4M in Bitcoins From the Silk Road to Ulbricht's Laptop**
 - <http://www.wired.com/2015/01/prosecutors-trace-13-4-million-bitcoins-silk-road-ulbrichts-laptop/>
- **Follow The Bitcoins: How We Got Busted Buying Drugs On Silk Road's Black Market**
 - <http://www.forbes.com/sites/andygreenberg/2013/09/05/follow-the-bitcoins-how-we-got-busted-buying-drugs-on-silk-roads-black-market/>

SILK ROAD WAS RUN BY ROSS ULBRICHT (DREAD PIRATE ROBERTS) UNTIL ...

2. On or about January 26, 2013, **ROSS WILLIAM ULBRICHT, a/k/a “Dread Pirate Roberts,” a/k/a “DPR,”** communicated with the UC via the Internet, and told the UC that the Employee had been arrested by law enforcement and that the Employee had stolen funds from other Silk Road users. **ROSS WILLIAM ULBRICHT, a/k/a “Dread Pirate Roberts,” a/k/a “DPR,”** asked the UC to arrange for the Employee to be beaten and forced to return the money, stating specifically, “I’d like him beat up, then forced to send the bitcoins he stole back. like sit him down at his computer and make him do it[.]”

3. On or about January 27, 2013, **ROSS WILLIAM ULBRICHT, a/k/a “Dread Pirate Roberts,” a/k/a “DPR,”** communicated with the UC via the Internet, and asked: “can you change the order to execute rather than torture?” **ROSS WILLIAM ULBRICHT, a/k/a “Dread Pirate Roberts,” a/k/a “DPR,”** wrote that the Employee “was on the inside for a while, and now that he’s been arrested, I’m afraid he’ll give up info[.]” and added that he had “never killed a man or had one killed before, but it is the right move in this case.”



THIS HIDDEN SITE HAS BEEN SEIZED

by the Federal Bureau of Investigation,
in conjunction with the IRS Criminal Investigation Division,
ICE Homeland Security Investigations, and the Drug Enforcement Administration,
in accordance with a seizure warrant obtained by the
United States Attorney's Office for the Southern District of New York
and issued pursuant to 18 U.S.C. § 983(j) by the
United States District Court for the Southern District of New York



SEALED
BY COURT ORDER

UNITED STATES DISTRICT COURT
for the
Northern District of California

ORIGINAL
FILED

MAR 25 2015

RICHARD W. WIEKING
CLERK, U.S. DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

United States of America
v.
CARL MARK FORCE IV, et al

Case No.

3-15-70370

Defendant(s)

MEJ

CRIMINAL COMPLAINT

I, the complainant in this case, state that the following is true to the best of my knowledge and belief.

On or about the date(s) of 2012 through 2013 in the county of San Francisco in the
Northern District of California, the defendant(s) violated:

<i>Code Section</i>	<i>Offense Description</i>
18 U.S.C. Section 641	Theft of Government Property
18 U.S.C. Section 1343	Wire Fraud
18 U.S.C. Section 1956(h)	Money Laundering
18 U.S.C. Section 208	Conflict of Interest

This criminal complaint is based on these facts:

See Affidavit of Special Agent Tigran Gambaryan (attached)

Approved as to form:


AUSA Kathryn Haun

Even the Tor Browser is Under Attack

- **Hackers target Tor after disrupting Xbox Live, PlayStation Network on Christmas**
 - http://www.pcworld.com/article/2863752/hackers-target-tor-as-playstation-disruption-continues.html#tk.rss_all
- Tor (**T**he **O**nion **R**outer) looks and acts like a browser (Firefox) to its users
- But, unlike Firefox, Tor routes traffic through a network of servers (relays), scattered worldwide, to anonymize the user's location
- If the servers on the network are hacked, the network would become less reliable, and less secure for its users



U.S. Immigration and
Customs Enforcement



THIS HIDDEN SITE HAS BEEN SEIZED

as part of a joint law enforcement operation by
the Federal Bureau of Investigation, ICE Homeland Security Investigations,
and European law enforcement agencies acting through Europol and Eurojust

In accordance with the law of European Union member states
and a protective order obtained by the United States Attorney's Office for the Southern District of New York
in coordination with the U.S. Department of Justice's Computer Crime & Intellectual Property Section
Issued pursuant to 18 U.S.C. § 983(j) by the
United States District Court for the Southern District of New York



So to sum up ...

- The Web as we know it is a small fraction of what's out there on the Internet
- The Deep Web has much good information – like Library of Congress – e.g., use their search engine
- The Dark Web is a scary, shady place that is best avoided
- There is much that is illegal, immoral and dangerous in the Dark Web
- The Dark Web has some legitimate uses (safe online access if living in a repressive regime – e.g. N. Korea, Syria?)
- Google doesn't see it, so you don't either
- Now that you know all that, proceed with caution.
- And ... there is no consensus on terminology – Deep and Dark are used interchangeably. Just be aware that there are both and you can get real value from Deep.

**Don't you wish we
Had commercials
Like this
In the U. S. of A.?**

Push button to add drama.

<https://www.youtube.com/watch?v=sanHTQAJ9JA>