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### If You Only Knew the Power of the Dark Web! Finding Intellectual Freedom, Privacy, and Anonymity Online

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BUILDING  
CULTURES  
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**RESILIENCE**



6th Annual Conference  
**MAY 17-21, 2021**  
Virtual | #nclive2021



TUESDAY, MAY 18 | 10:00AM

# If You Only Knew the Power of the Dark Web: Finding Intellectual Freedom, Privacy, and Anonymity Online

DANIEL JOLLEY

Systems Librarian

Gardner-Webb University

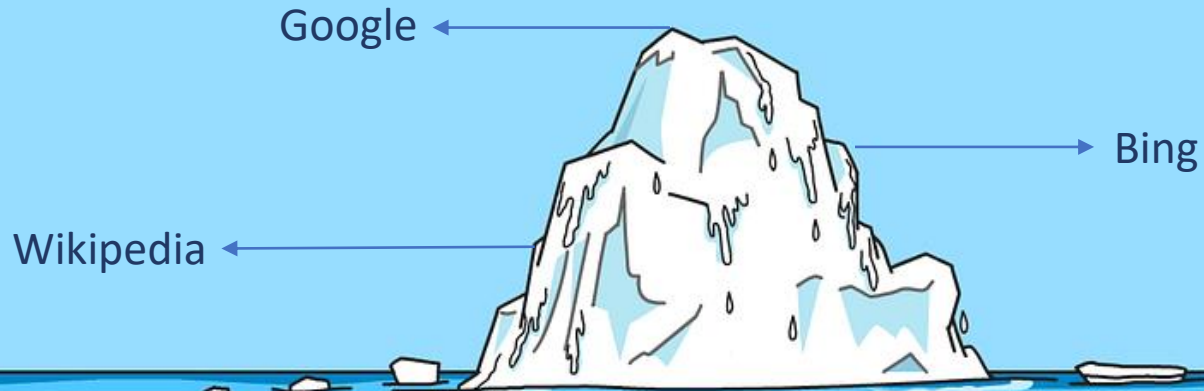


#nclive2021

# Some Dark Web-related headlines

- “Covid-19: Vaccines and Vaccine Passports Being Sold on Darknet”  
(BBC News, March 23, 2021)
- “Hacker Looks to Sell 655,000 Alleged Patient Healthcare Records on the Dark Web” (Fox News, June 27, 2016)
- “Hackers, Hitmen for Hire and Torture Rooms – The Sinister Dark Web Exposed” (Daily Star Online, September 12, 2015)

# Surface Web (4%)



Google

Bing

Wikipedia

# Deep Web (90%)

Banking/financial information

Email Systems

Academic Databases

Medical Records

Court Records

Company Intranets

# Dark Web (6%)

Political Protest

Whistleblowers

TOR Encrypted Sites

Criminal Activity

# Deep, Dark – What's the difference?

## Deep web:

- Not indexed and thus not accessible through search engines
- Content behind paywalls,, available by IP address, requires a login, etc.

## Dark web:

- Not accessible via search engines
- Not accessible via standard browsers
- Intentionally hidden part of the Internet that requires special tools to access (e.g., Tor Browser)

# The Dark Web supports the mission of librarians

## **Dark Web:**

- Allows access to information without being tracked/monitored
- Allows users to protect their right to privacy online while engaging in free speech

## **Librarians:**

- Protect and defend freedom of speech
- Oppose censorship
- Believe everyone should have free access to information

Who uses the Dark  
Web?





# Criminals and Bad Guys

## Goods available:

- Drugs
- Guns
- Fake passports and IDs
- Counterfeit currency
- Stolen items and personal info

## Services available:

- Hacking for hire
- Hitmen
- Child pornography and adult content
- Terrorist propaganda and recruiting

# Silk Road Anonymous Marketplace

Shop by category:

- Drugs(1582)
- Cannabis(271)
- Dissociatives(33)
- Ecstasy(217)
- Opioids(106)
- Other(65)
- Prescription(274)
- Psychedelics(306)
- Stimulants(190)
- Apparel(37)
- Art(1)
- Books(300)
- Computer equipment(9)
- Digital goods(218)
- Drug paraphernalia(33)
- Electronics(13)
- Erotica(165)
- Fireworks(1)
- Food(1)
- Forgeries(34)
- Hardware(1)
- Home & Garden(5)
- Lab Supplies(5)
- Medical(3)
- Money(89)
- Musical instruments(2)
- Parkinson(1)

Product Image	Product Name	Price
	10 Grams high grade MDMA 80+%	฿61.17
	Amphetamines sulfate / Speed freebase...	฿28.59
	2g Jack Frost (weed) *420 SALE****	฿8.54
	5 Grams of pure MDMA crystals	฿42.04
	100 red Y tablets 111mg (lab tested)...	฿97.77
	Michael Jackson Discography 1971-2009...	฿2.52
	3.5g Albino Rhino (weed)	฿12.37
	10mg Flexeril (muscle relaxant)...	฿3.22
	***10gr. Amphetamine Sulphate...	฿33.19

News:

- The gift that keeps on **giving**
- Who's your **favorite?**
- Acknowledging **Heroes**
- A new anonymous market **The Armory!**
- **State of the Road Address**

Founded in 2011 as a marketplace that connects vendors and customers anonymously using bitcoin as currency

Shut down by the FBI in October 2013

While in operation, saw an estimated \$1.2 billion in sales from 150,000 – 960,000 customers buying from 4000+ vendors, yielding over \$4 million - \$13 million in commission for creator Ross William Ulbricht (aka Dread Pirate Roberts)

Most notorious for its drug sales, but Silk Road vendors sold legitimate products, as well

Ulbricht sentenced to life in prison with no chance of parole in May 2015

Silk Road screenshot. Retrieved from <https://www.techrepublic.com/a/hub/i/r/2017/05/10/709e488c-6c51-407f-ae13-5115b14d86c4/resize/1200x/78ce3e394c2cf9063e001f67acaa861c/screenshot-2012-04-24-at-2-02-25-am.png>

# Journalists

- Journalists use the dark web to communicate with informants, whistleblowers, and dissidents
- News organizations such as The Washington Post, Forbes, The New Yorker, and The Guardian use platforms such as SecureDrop, an open-source software platform for secure communications



[Freedom of the Press Foundation, AGPL](#), via Wikimedia Commons

# Whistleblowers

- Whistleblowers use the dark web and services such as SecureDrop to securely share classified information with journalists and privacy advocates
- Wikileaks has used the dark web to publish and analyze large datasets of classified and otherwise restricted material



[!Original:Wikileaks , NowikileaksVector:  
Cirt, CC BY-SA 3.0](#), via Wikimedia Commons

# Dissidents

- Individuals living under restrictive regimes use the dark web to
  - Get access to news and sites in other parts of the world
  - Report conditions and events inside their own country
  - Express their own thoughts and ideas anonymously
- Not surprisingly, the leading countries working to block access to Tor and the dark web include China, Iran, Egypt, and Tunisia

# Individuals seeking anonymity

- Victims of domestic violence or rape who fear being tracked and found by their persecutors
- Individuals who want to communicate with others on sensitive subjects without revealing their identities online (e.g., rape survivors or those with a certain illness communicating via chat or web forum)
- Anyone who wants to browse the internet without being tracked and targeted for advertising by companies

# Individuals seeking anonymity

- Libertarians, free speech advocates, and pretty much anyone seeking to avoid Big Brother government surveillance
- Tor Browser usage almost tripled following the revelations from Edward Snowden about NSA spying on Americans online.



Who is or might be  
watching you online?





# Who might be watching or tracking you online?

- Your Internet Service Provider (ISP)
- Your employer
- Facebook, Google, Microsoft, etc. (traffic trackers, email scanners)
- Websites you visit
- The NSA, FBI, other government agencies
- Hackers

# What information is revealed to anyone watching?

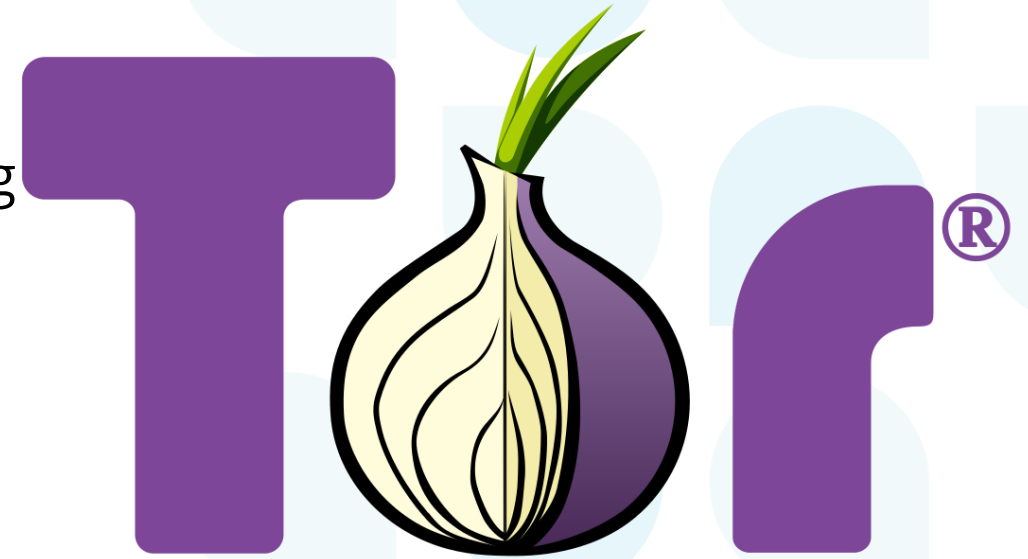
- Your IP address (which can be used to determine your location)
- Information on your browser, hardware and software programs
- What sites you are visiting/who you are communicating with, when, and how often
- Even if your data is encrypted, the header information used to route data packets reveals all of the above to anyone conducting legal (ISP) or illegal traffic analysis surveillance

Wouldn't it be great if there were a way to bounce your data packets through a random maze of relays that just pass that data along without ever knowing the full path? That would make traffic analysis a lot more difficult for anyone snooping.



# The Tor Project's Mission

- “To advance human rights and freedoms by creating and deploying free and open source anonymity and privacy technologies, supporting their unrestricted availability and use, and furthering their scientific and popular understanding.”

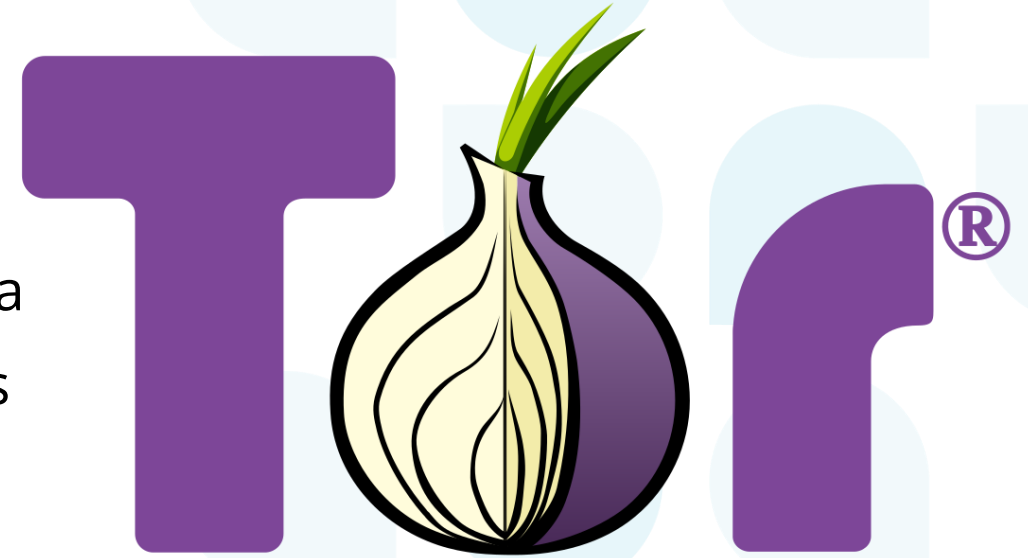


**TorProject.org**

[Tor Project](#), [CC BY-SA 3.0](#), via Wikimedia Commons

# What is Tor?

- TOR stands for The Onion Router
- Free, open source software that anonymizes communication by routing traffic through a series of relays operated by volunteers in such a way as to hide the location and identity of users
- Adds a layer of encryption at each level, encompassing net traffic in onion-like layers; each relay only sees the immediate predecessor and successor nodes



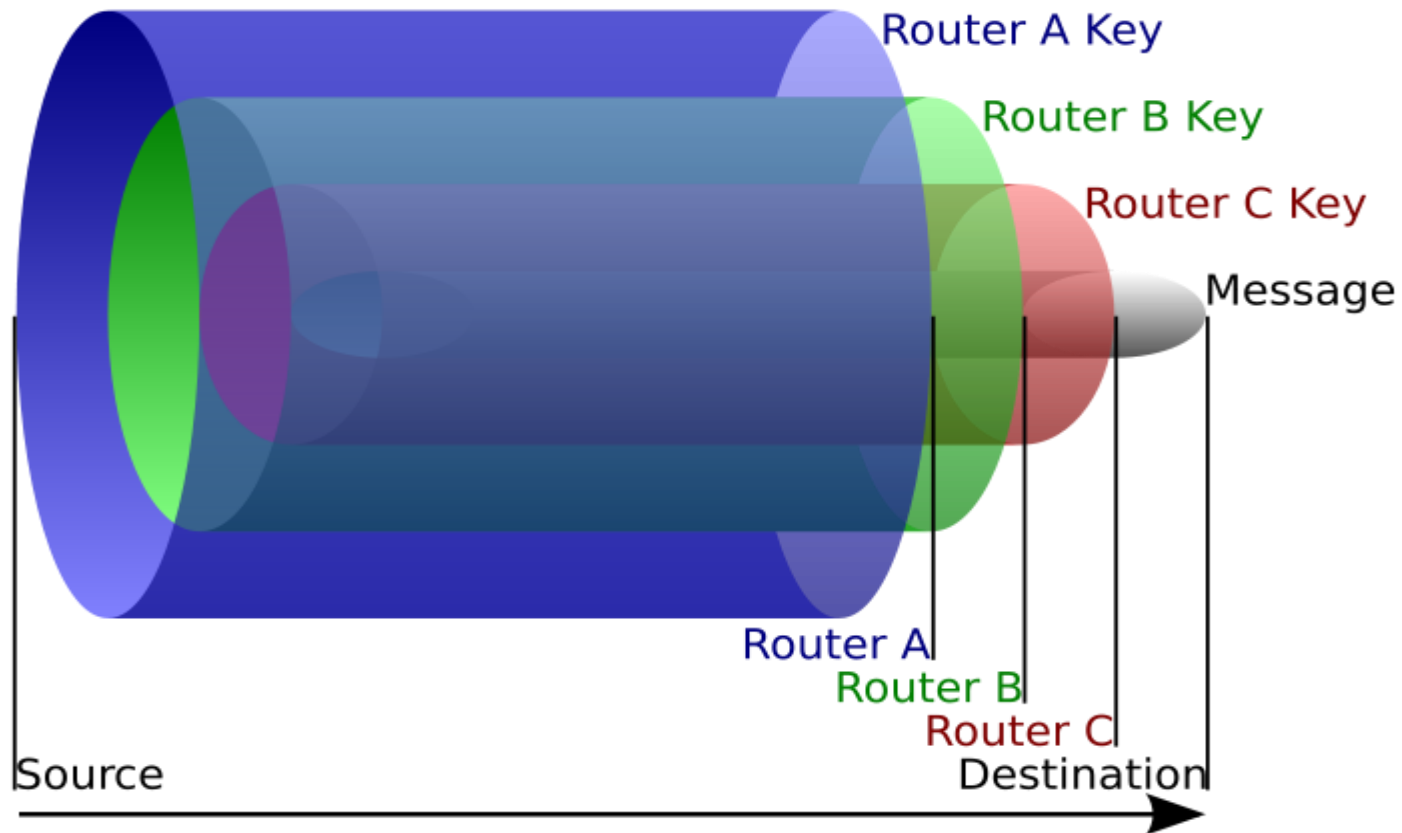
**TorProject.org**

[Tor Project, CC BY-SA 3.0](#), via Wikimedia Commons

# Onion routing

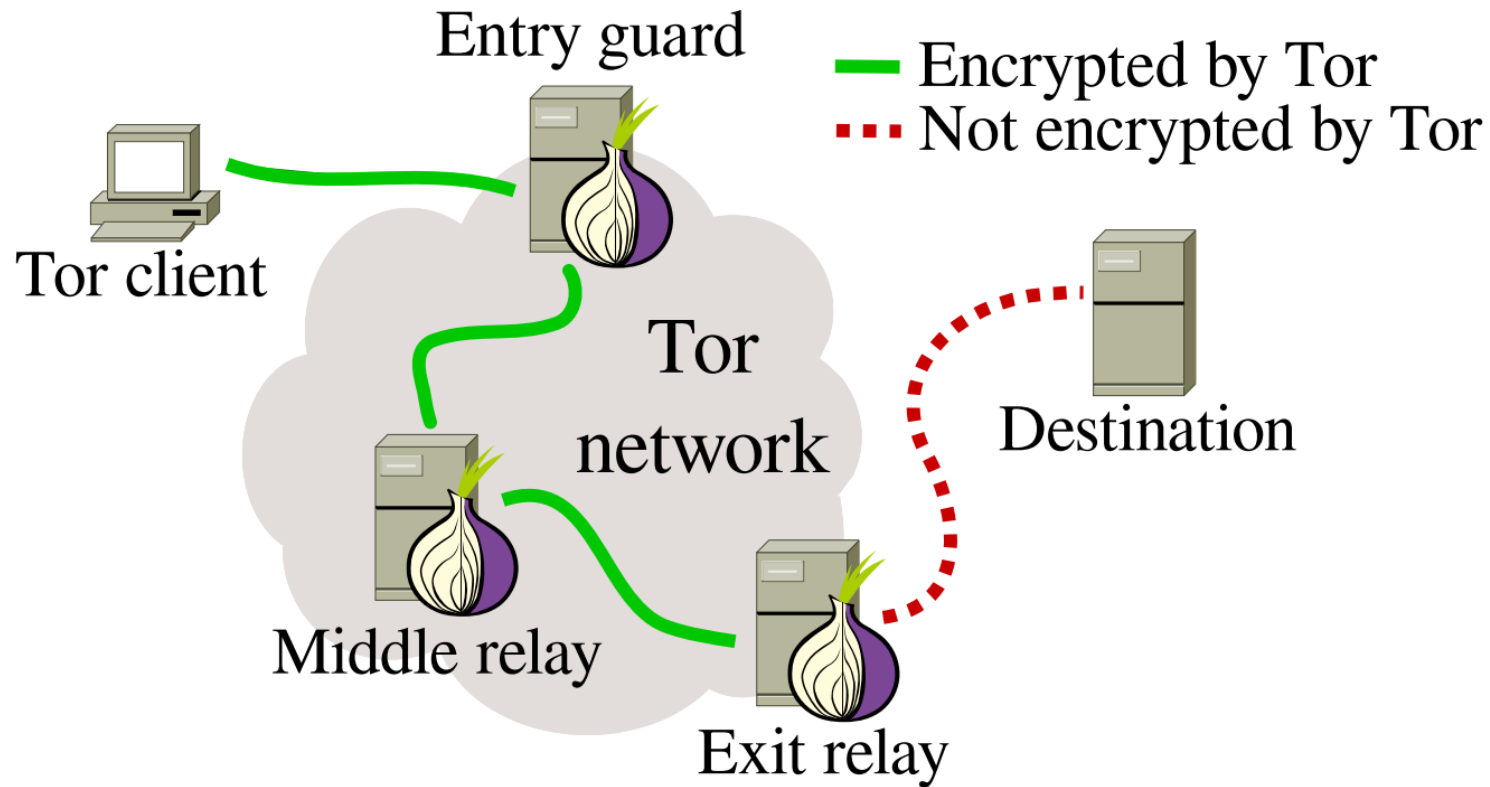
- Onion routing was developed in the mid-1990s by the United States Naval Research Laboratory and further developed by DARPA
- Original purpose was to protect government communications over a secure network
- Released to the public in 2004
  - Public use helps hide government traffic across the network

# Onion Routing



- All data is encrypted at least three times as it moves through the Tor relay network
- Each relay point along the way de-encrypts one layer and passes the data packet on to the next destination
- Each relay point only knows the identity of the previous relay and the next relay

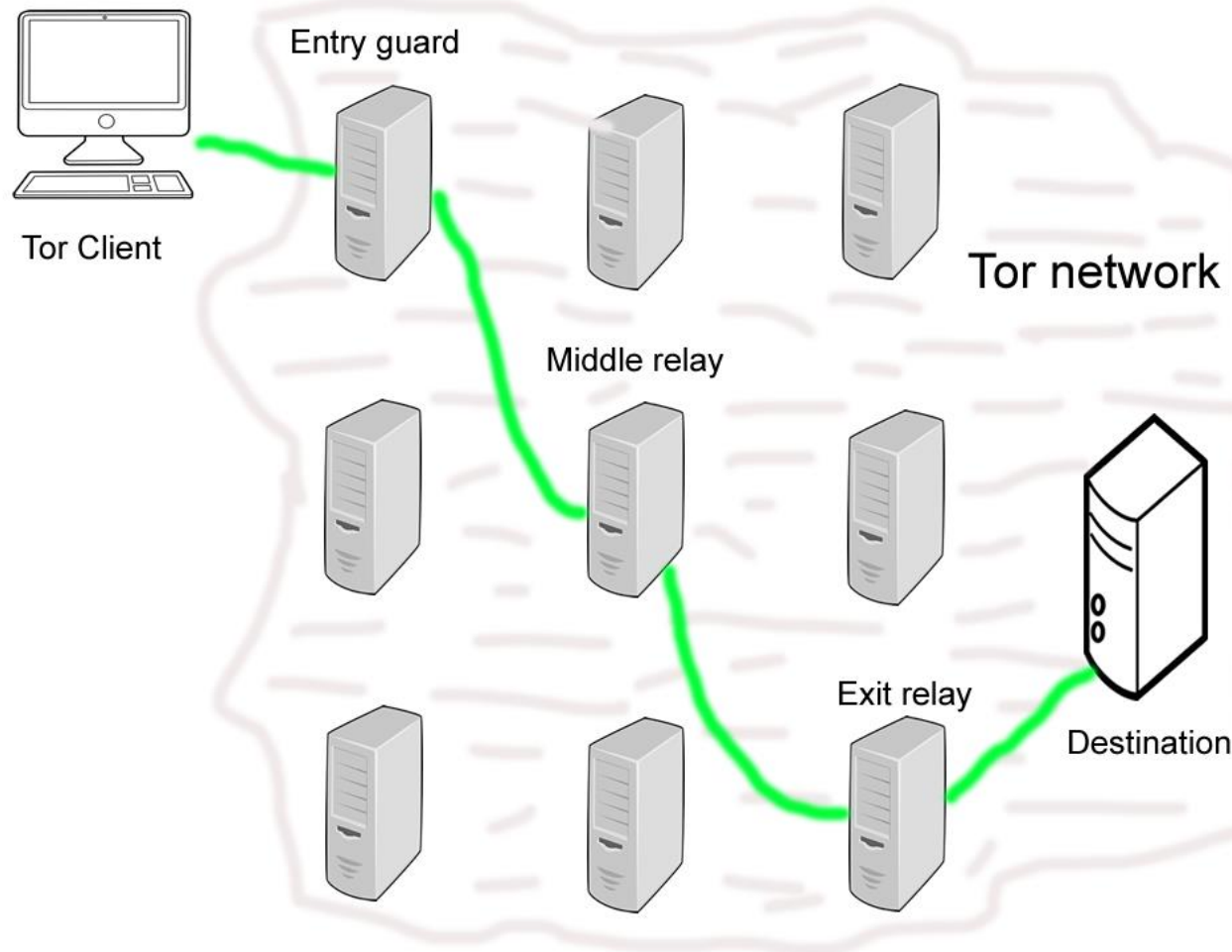
# How Onion Routing Works on the Surface Web



- Entry guard knows where the packet came from and that it needs to send it to the Middle Relay, but the actual content is hidden beneath two other encrypted layers
- Middle relay only knows where the packet came from and that it needs to send it to Exit Relay – does not know anything about the sender, recipient, or actual content
- Exit relay peels back the final layer of encryption, so it knows the content and where to send it – but it only knows that it got the packet from Middle Relay and does not know anything about the original sender



# How Onion Routing Works on the Dark Web



- Destination is incorporated into the Tor routing network itself as a hidden service, so the information remains encrypted in the Tor network
- Tor client and destination server communicate without ever knowing the identity of each other

# Tor Browser

- The Tor Browser enables you to access hidden services on the dark web
- Based on Firefox codebase
- Hidden services have unique .onion domains rather than DNS names or IP addresses
  - Onion domain names usually consist of random characters
  - V3 .onion domains now consist of 56 characters (V2 domains were 16 characters long). Ex: <http://cnkj6nippubgycuj.onion>
  - Must know the .onion address in order to access an .onion site

# Tor Browser disadvantages

- Slower browsing (because of the way onion routing works)
- Blocks all plugins (plugins come with vulnerabilities)
- Does not block ads (extensions are not recommended because they can give away your identity)
- Only encrypts and hides web traffic – ISP and others can still see that you are using Tor unless you also use a virtual private network (VPN)
- Most dark web sites are pretty basic in appearance (like sites from the 1990s), and some websites actively block Tor users

# How to explore the dark web

- Searching the dark web is often frustrating and difficult
  - Sites such as The Hidden Wiki provide lists of links in different categories
  - Dark web search engines such as Torch and Ahmia are only somewhat effective
  - Many hidden services are only online at certain times, come and go quickly, or change .onion domain names often

# Welcome to The Hidden Wiki – The Front Page of the Dark Web.

Add The Hidden Wiki to your bookmarks and spread it!!

To access darkweb sites on The Hidden Wiki, install [TOR Browser](#)

## Volunteer

- Bookmark this page
- Defend your right to privacy: donate to the [EFF](#) and [The TOR Project](#)

## Hidden Wiki Editor's picks

Some of the most interesting sites on The Hidden Wiki and the dark web:

1. [Mixabit](#) – Bitcoin mixer
2. [OnionLinks](#) – .Onion link directory.
3. [Bitpharma](#) – Biggest european .onion drug store.
4. [DarkWebHackers](#) – Dark Web Hackers For Hire.
5. [Cardshop](#) – USA CVV KNOWN BALANCE & Worldwide CC & CVV .

## Introduction Points

- [The Hidden Wiki](#) – The Hidden Wiki 2020 link.
- [DuckDuckGo](#) – A Hidden Service that searches the clearnet.
- [OnionLinks](#) – .Onion link directory.
- [Hidden Wiki](#) – New Hidden Wiki 2019
- [Another Hidden Wiki](#) Another hidden wiki like link collection.
- [The Dark Web Pug](#) Pug's Ultimate Dark Web Guide .

[New Long V3 Onion Services](#)  
[Version 3 Hidden Service Links](#)  
[On The Hidden Wiki](#)  
[Privacy When Using Sites On](#)  
[The Hidden Wiki](#)  
[Coronavirus And The Dark](#)  
[Web](#)  
[The Uncensored Hidden Wiki](#)  
[How To Use Bitcoin](#)  
[Anonymously On Hidden Wiki](#)  
[Sites](#)

## Information

[Privacy Policy](#)  
[Terms And Conditions](#)  
[Contact](#)

The Hidden Wiki. Screenshot by author.

## Commercial Services

Hackers for hire, mobile phones, Fake IDs, guns and passports.

- [DarkWebHackers](#) – Dark Web Hackers for hire.
- [Mobile Store](#) – Best unlocked cell phones vendor
- [Kamagra 4 Bitcoin](#) – Like Viagra but cheaper
- [OnionIdentityServices](#) – Fake passports and ID cards for bitcoin
- [UkGunsAndAmmo](#) – Uk Guns and Ammo Store
- [USfakeIDs](#) – US fake ID store
- [EuroGuns](#) – Your #1 european arms dealer.
- [Apples4Bitcoin](#) – Iphones, Ipads and more for bitcoin
- [UKpassports](#) – real UK passports
- [USAcitizenship](#) – become a citizen of the USA
- [Rent-A-Hacker](#) – Hire a hacker for Bitcoin

## Drugs

All types of drugs you can imagine.

- [DCdutchconnectionUK](#) – The dutch connection for the UK
- [DrChronic](#) – Weed straight from the source
- [TomAndJerry](#) – Cocaine, Heroin, MDMA and LSD from NL
- [420prime](#) – Cannabis in dispensary quality from the UK
- [Bitpharma](#) – Biggest european .onion drug store
- [EuCanna](#) – First Class Cannabis
- [Smokeables](#) – Finest organic cannabis from the USA
- [CannabisUK](#) – UK wholesale cannabis supplier
- [Brainmagic](#) – Best Darkweb psychedelics
- [NLGrowers](#) – Coffee Shop grade Cannabis from the netherlands
- [Peoples Drug Store](#) – The Darkwebs best Drug supplier!
- [DeDope](#) – German Weed Store

The Hidden Wiki.  
Screenshot by author.

# What Is The Torch Search Engine?

Torch or TorSearch is the best search engine for the hidden part of the internet. They're also the oldest and longest running search engine on Tor. Torch claims to have over one billion dark net pages indexed. They also don't censor search results or track what you search for. No logs are kept, so there is no record of your searches. They also don't use any tracking or analytics code for the sake of privacy.

<http://cnkj6nippubgycuj.onion>

## Why Use Torch Search Engine?



They Don't Track  
You

Torch doesn't keep tabs on what you search for, so you can have peace of mind when seeking information.



Explore The Dark  
Net

Torch is the best way to explore the dark net by allowing you to search for new and cool onion sites.



Uncensored Results

Torch doesn't censor any of its search results, meaning you can find anything you want safely.


Torch Search Engine homepage.  
Retrieved from  
<https://torchsearch.wordpress.com>.  
Screenshot by author.


RAMBLE


rambleeeqrhty6s5jgefdfdtc6tfgg4jj6svr4jpgk4wjtjg3qshwbaad.onion


Forums All New Posts Global Mod Log Wiki Log in


Submissions Comments Featured Hot

up 1 down  **Super Mario Kart Cover had to be changed because Bowser was too scary, apparently** files.catbox.moe  
Posted by Wahaha | on May 10, 2021 at 4:15 PM in gaming  
No comments


up 1 down  **Video Game Box Art: America Is Getting Trounced By Japan** web.archive.org  
Posted by Wahaha | on May 10, 2021 at 1:03 PM in gaming  
No comments

up 1 down  **Bad Cover Design** files.catbox.moe  
Posted by Wahaha | on May 9, 2021 at 4:13 PM in gaming  
No comments

up 3 down  **NY: Broadband companies paid for 8.5M fake net neutrality comments** apnews.com  
Posted by Rambler | on May 7, 2021 at 3:57 PM in news  
1 comment

up 1 down  **DIY Ceramic Landscape Lights (not to mention the mason jars)** youtube.com  
Posted by dontvisitmyintentions | on May 7, 2021 at 3:02 PM in craftsmen  
No comments

up 4 down **New service: brain.i2p - Knowledge database**  
Posted by XANA | on May 7, 2021 at 10:32 AM in I2P  
2 comments

up 2 down  **Linux has Largely Abandoned Still-Useful Near-Vintage Computers** cheapskatesguide.org  
Posted by HMTg927 | on May 6, 2021 at 1:38 PM in linux  
7 comments

**Featured forums**

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conspiracy craftsmen

CryptoCurrency cryptography

DarkMemes DarkNetMarkets

DarkNetNews datahoarder

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gaming goldandblack

gooddesign guns HDLUnited

HiddenLOL I2P linguistics

linux lokinet Memes music

NewForums news OddSides

opsec pics piracy politics

PracticeEncryption privacy

programming ramble rant

technology tor videos

WebGuides whatever

WorldNews yggdrasil zeronet



Ramble homepage. Screenshot by author.

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# Welcome to the BBC



## LIVE Women's Champions League final: Chelsea v Barcelona

Football



## PM condemns 'shameful' anti-Semitism in video

UK



## Liverpool goalkeeper pays tribute to father after scoring winner

Football

BBC News Onion Site. Screenshot by author.

# Danger! Danger! Danger!

- Can be dangerous or unpleasant clicking certain links
  - Hackers and malicious software abound on the dark web
  - Visiting sites that conduct illegal practices could put you at risk of government or law enforcement monitoring
  - You may see something disturbing

# Dark Web Dos and Do Nots

## Do:

- Use a VPN to hide your IP address
- Close all other browsers before opening Tor
- Use cryptocurrency (Bitcoin) to conduct any transactions
- Disable or cover your webcam
- Remain careful and security-conscious at all times


## Do not:

- Reveal any personal info
- Have anything delivered to your actual address
- Click on suspicious-looking links
- Enable any plugins or install any extensions
- Open any downloads or online documents while still connected (might open in default browser)

So, maybe (probably) the Dark Web isn't for you. What steps can you take to protect your online privacy on the surface web?



# Doesn't Incognito Mode protect my privacy?




## You've gone incognito


Now you can browse privately, and other people who use this device won't see your activity. However, downloads, bookmarks and reading list items will be saved. [Learn more](#)

Chrome won't save the following information:	Your activity might still be visible to:
<ul style="list-style-type: none"><li>• Your browsing history</li><li>• Cookies and site data</li><li>• Information entered in forms</li></ul>	<ul style="list-style-type: none"><li>• Websites you visit</li><li>• Your employer or school</li><li>• Your internet service provider</li></ul>

Block third-party cookies  
When on, sites can't use cookies that track you across the web. Features on some sites may break.



## Firefox

 Search the Web

### You're in a Private Window

Firefox clears your search and browsing history when you quit the app or close all Private Browsing tabs and windows. While this doesn't make you anonymous to websites or your internet service provider, it makes it easier to keep what you do online private from anyone else who uses this computer.

[Common myths about private browsing](#)

Need more privacy?  
[Try Mozilla VPN](#)

# Incognito (Privacy Browsing) Mode

- Incognito mode in Chrome (Private Browsing in Firefox, etc.) tells the browser not to save your browsing history, cookies, or cache for that browsing session.
- Good to use to keep others from seeing what you did on a PC (like a spouse at home or others on a public PC)
- Also helps you log into multiple accounts or check sites that may change based on your browsing history or cookies (such as air travel prices)

# Incognito (Privacy Browsing) Mode

- It does not stop your ISP (and any decent hacker) from seeing your browsing activity or keep the websites you visit from tracking your activity
- Key loggers or other malware could still log the information

# Aren't most sites encrypted now?

- Encryption scrambles readable text you are sending, protecting sensitive information from being read by anyone other than the sender and the recipient who has the decryption key for unscrambling the data.
- Secure sockets layer (SSL) is the most common form of encryption today, protecting the transmission of sensitive data such as tax and banking information, medical information, purchase information, student records, etc.



# Encryption and anonymity are different things

- Any visits to HTTPS sites are encrypted – but third parties can still see what pages you are visiting and when
- So encryption is important (especially end-to-end encryption), but it certainly does not make you anonymous online

# Suggestions for protecting your online privacy



# Use common sense

- Create long, complex passwords
- Do not click on suspicious links
- Keep your software updated

# Install the HTTPS Everywhere extension for your browser

- If a site still uses unencrypted HTTP or offers only limited support for HTTPS encryption, this extension rewrites requests to the site using HTTPS
- Created by the Tor Project and the Electronic Frontier Foundation
- This makes your Internet activity more secure from traffic analysis and malicious attacks

# Helpful plugins/extensions

- Use NoScript (Firefox) or ScriptBlock (Chrome) to block scripts that enable annoying ads and third-party referrers
- Install Ghostery in Firefox or Chrome to block web traffic trackers like Google AdSense
- Turn on “Prevent cross-site tracking” in Safari’s Privacy settings

# Test your browser

- The Electronic Frontier Foundation maintains a site called Cover Your Tracks (<https://coveryourtracks.eff.org/>) that lets you test your browser to see how well your browser is covering your online tracks

# Use DuckDuckGo instead of Google

- Google keeps your search history forever and has their trackers placed on millions of websites (<https://spreadprivacy.com/what-does-google-know-about-me/>).
- DuckDuckGo is a private search engine that never tracks or logs users' search activity or manipulates search results

# Use DuckDuckGo instead of Google



<https://duckduckgo.com/> and <https://3g2upl4pq6kufc4m.onion/>



# VPNs (Virtual Private Networks)

- Prevents websites from identifying your IP address and location
- If using a public wi-fi network, helps you avoid man-in-the-middle attacks by anyone sniffing on the network
- Keeps your ISP from tracking your Internet activity (or handing over your browsing history to a government agency)
- Make sure your VPN provider does not track you or keep logs of user activity

# Tor over VPN

- Use Tor over VPN if you are truly concerned about your privacy and anonymity online
- An onion a day keeps (almost) everyone away



[Sebastian Wallroth](#), Public domain, via Wikimedia Commons

# The Dark Web and Librarianship

- Despite the criminal activity and other negatives associated with the Dark Web, its very existence supports the traditional mission of libraries and librarians in several ways:
  - The right to privacy
  - Intellectual freedom
  - Free access to information
- It is important for librarians to be aware of such privacy-protecting technology when assisting patrons with privacy concerns

Questions?



# Contact Information

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