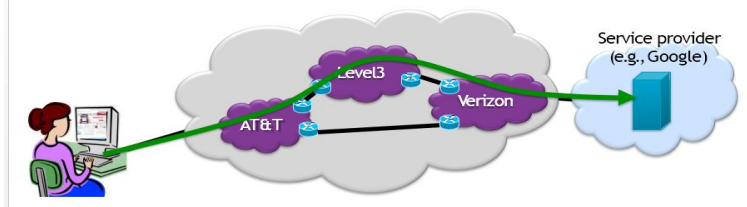# LESSON 2

SECURITY, PRIVACY, AND CENSORSHIP

Internet was not designed with security in mind

- Mainly a way for researchers to share/access data

Fine if you just care about accessing data…

… but what if you want your data to avoid a certain region

Access Region-Restricted Content From Anywhere

The Internet may be known as the World Wide Web, but it is not the same in every country. Many apps and websites restrict the content you can access in certain areas. However, there is an easy way around most of these region restrictions and see the Internet you want to see

How Region Restrictions Work

Region restrictions typically work by determining your physical location based upon your IP address. The restrictions are usually put in place by the developers of different apps and websites.

Once they know your physical location, a filter is applied to the content you can access. Companies such as **YouTube**, Netflix, and Hulu use region restrictions.
While region restrictions are usually based on the country you are in, sometimes content is restricted inside of the same country. For example, many **sports games** may not be accessible to you in certain regions of the United States and Canada.
By using your IP address to determine your location, region restrictions can be used to block an area as small as a neighborhood or as big as a country.
Why Some Apps and Content Providers Have Region Restrictions
The three main reasons for region restrictions are:
- Compliance with local laws
- Licensing issues
- Protect marketing partners

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Fine if you just care about accessing data… but what if you want to be anonymous?

### How do I visit a website anonymously?

Familiarize yourself with the privacy settings in your browser of choice. Access the web via your favorite browser's "incognito" functionality. Use the anonym zing for Browser to keep your tracks covered. Use a proxy server to access **websites** without revealing your real IP address.

Internet Was Not Designed With Security In Mind

- Mainly a way for researchers to share/access data

Fine if you just care about accessing data…
… but what if your ISP doesn't want you to access content?
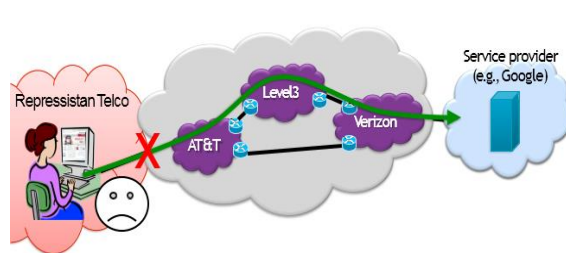
How to access blocked websites: 13 useful methods!

1. Use VPN for unblocking

VPN (Virtual Proxy Network) allows you to connect your device to a secure connection to another network over the internet. Thus, it enables you to access blocked websites from your home network and puts your IP address in a land far away. You can also download the apps, open the sites blocked in your country, or use it as a way to unblock sites in school.

VPN acts as a tunnel that converts your data into garbage value that's difficult for anyone to sniff and recognize. There are tons of free/cheap VPN services that one can use and enjoy an uninterrupted internet experience.

Check out our detailed article on what is VPN and how it works. Here are some great VPN packages for you to try —

PIA (Private Internet Access)
ExpressVPN
NordVPN

2. Become Anonymous: Use Proxy Websites

Very often, in a professional environment, employers draw certain boundaries, restricting your access to some particular websites like video streaming, social networking, or even personal emails. At times, you need a way to access the blocked websites and in those situations, proxy websites act as a rescue method. However, do note that an unblock proxy isn't as secure as a VPN. So, if you're really secretive about your work, #1 method is the one to choose.

On the web, there are hundreds of proxy websites that make your web experience 'unrestricted'. A proxy website camouflages the blocked site from the ISPs and allows you to access blocked websites.

Eg: In case Facebook is blocked in your institution, or you can go to and enter the blocked URL to access the service —

3. Use IP Rather Than URL

Each website's URL has an IP address and the authorities blocking the site might have just stored the URL instead of the IP. In that case, our quest of how to unblock websites might end here. To get the IP address for any website, you do a *ping domain (dot) com* command in Command Prompt. Using IP is a simple way to access blocked websites in your region. However, if the website had hidden its IP too, then it won't open with this method.

All you need to do is run CMD on your computer. Now type "ping www.websitename.com" and press Enter. This will promptly return the IP

address. Now enter this IP address in your web browser's address bar and hit Enter to visit "access denied" websites. Similar tools and commands can also be used on other platforms like Mac, Linux, Android, etc.

4. Change Network Proxy in Browsers

Your college or institute might be having more than one proxy for its network. So, it happens that some websites are restricted on one proxy, but accessible in another. So, you can give a try to proxy surfing to access blocked websites in your college.

Disabling the network proxy settings in our web browsers isn't a tough task. You just need to find the connections/network option in the settings of your web browser. There, you can select the no proxy option or use another one that's providing unrestricted browsing at your institution. For example, here's a settings window showing how you can change the settings in the Firefox web browser:

5. Use Google Translate

Institutes or even countries sometimes don't ban Google Translate. Probably because it's an education tool and nobody considers it something powerful enough to unblock sites at school or offices. So, with this tool, you can bypass the restriction by converting the blocked website into some other language that you may know. Try Google Translate and see for yourself. It is yet another simple way to access blocked websites.

You can also use Microsoft's Bing translation service to unblock a banned website. To unblock websites at school and office, there are other translation services available as well.

6. Bypass censorship via Extensions

If the websites that are blocked by your institute or office are dynamic in nature such as Facebook or YouTube, then you should give a try to these extensions. Hola and ProxMate are some extensions that you can use to access blocked websites on Chrome and other browsers. UltraSurf is one such effective extension that lets you browse freely using its encrypted proxy network. It's powerful enough to evade lots of power to defeat firewalls like Lightspeed.

7. URL recasting method

There are instances when a particular website is hosted in VPN and it doesn't have a verified SSL installed. For such websites, you can simply go to the address bar of your web browser and try typing https://www.url.com, instead of accessing www.url.com or http://www.url.com. This change might display a security notice. Press on the Proceed Anyway option and visit the website. This isn't a foolproof method but it could be handy at times.

8. Replace your DNS Server

We've already discussed this method under a separate topic named DNS Hack. You can simply use this method and bypass the blockade. This method generally involves using Google DNS or OpenDNS for accessing the internet. Here are the detailed steps on the same.

Recently, CloudFlare also launched their 1.1.1.1 DNS service which claimed to be the fastest, privacy-focused DNS service. CloudFlare also made available their 1.1.1.1 DNS service via Android and iOS apps. I often use this one-click method to access blocked sites on my region.

Changing DNS also ensures better privacy while browsing. Because with default settings every WiFi network you've connected to and ISPs have lists of sites you've visited.

9. Go to Internet Archive — Wayback Machine

Wayback Machine is an interesting service that stores a copy of most of all website on the internet. It saves multiple versions of a website and you can use it to access the past versions of a website. The users can also use it to browse the blocked content online.

Moreover, this amazing website also contains lots of free movies, documentaries, nostalgic games, ebooks, etc. So, even if some service or websites becomes defunct, Wayback Machine has got your back.

10. Use RSS Feed of site

RSS readers are useful for getting the fresh content and reading them with ease. You can grab the RSS feed of the blocked website and add it to your reader. Just in case that website doesn't have a feed, there are some useful online services to create the feed. In recent times, with the rise of fake news on social media platforms and algorithmic updates, RSS readers are making a comeback. You can use one like Feedly and get all the content delivered from your trusted sources.

11. Use IP Anonymizer like TOR

If you're a privacy advocate, you might be already knowing about the massively popular Tor browser. This could act as a web blocker bypass tool if you set it up properly. In many cases, you can unblock websites at school or office and remain anonymous as well. There's a dual advantage as you'd also be able to get rid of any kind of surveillance. After VPN and proxies, using Tor is the most powerful method to unblock sites. It's also used as a gateway to dark web sites, or .onion sites, which are blocked on your usual web.

Apart from just web blocker bypass, if you are into exploring ways to enhance your computer security, you can also go for the deadly combination of TOR and VPN. Many VPNs like NordVPN and ExpressVPN provide technology like Onion Over VPN, which offer an extra layer of protection.

12. Use HTML to PDF converter

SodaPDF provides a free online service that can help you directly download a web page on your computer without even accessing it. Just visit this link and enter the desired URL. That's it. There are other HTML to PDF converter web blocker bypass services that you can try. There are some services that need your URL and they simply mail the unblocked webpage.

13. Use Firefox from USB drive

If your school or office is known to take steps to restrict site access, I won't be surprised you're not allowed to install extensions on the web browser to open the websites for your personal use. In that case, you can install a web browser like Firefox portable on a USB drive. Couple it with some good unblock proxy service and you've got it covered.

These are some of the most effective and easy to use methods to circumvent the censorship that has been put on your favorite websites. Let us know which one you prefer to access blocked websites in your region.

INTERNET WAS NOT DESIGNED WITH SECURITY IN MIND

- Mainly a way for researchers to share/access data

Fine if you just care about accessing data…

… but what if your computer or ISP are compromised?
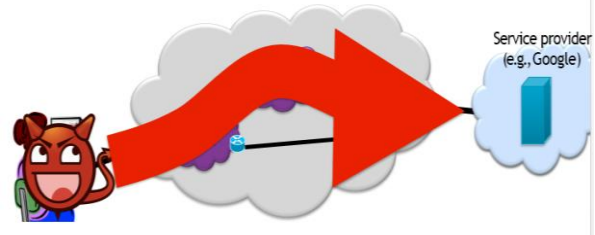
Security, Privacy, and Censorship

- Alibi Routing.
- Herd:A Scalable,Traffic Analysis Resistant Anonymity Network for VoIP Systems
- Encore: Lightweight Measurement of Web Censorship with Cross-Origin Requests
- ASwatch:An AS Reputation System to Expose Bulletproof Hosting ASes

Alibi Routing

- **Motivation: What if you want your traffic to avoid a certain geographic region?**

  - Canadian health data cannot flow into US
  - Maybe you want to avoid a country that performs filtering
    - Related reading: CCR paper by anonymous

- **How to accomplish this?**
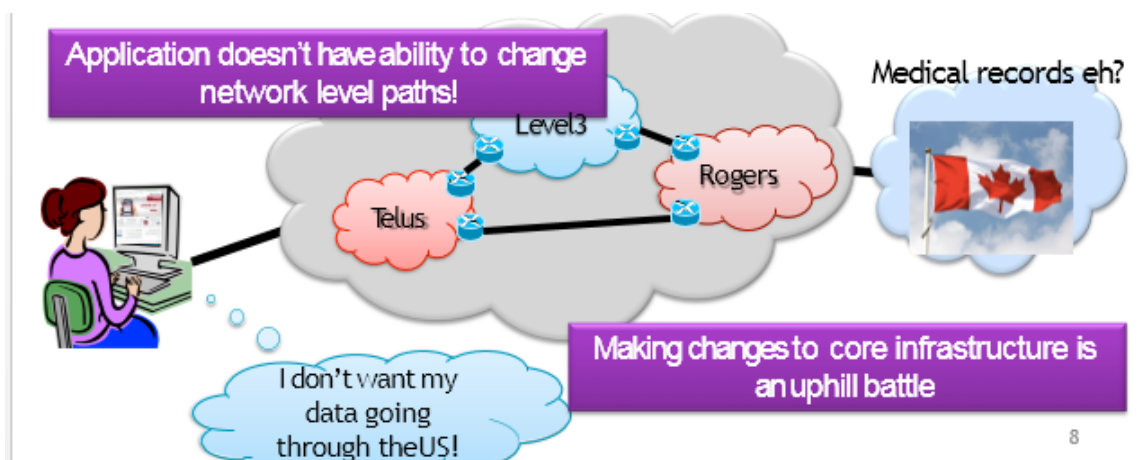
We introduce **Alibi Routing**, a peer-to-peer system that allows users to understand and control where in the world their packets *don't* go. In other words, it lets users provably avoid parts of the world while communicating with others or browsing the web.

- Key idea: Routing in an application layer overlay
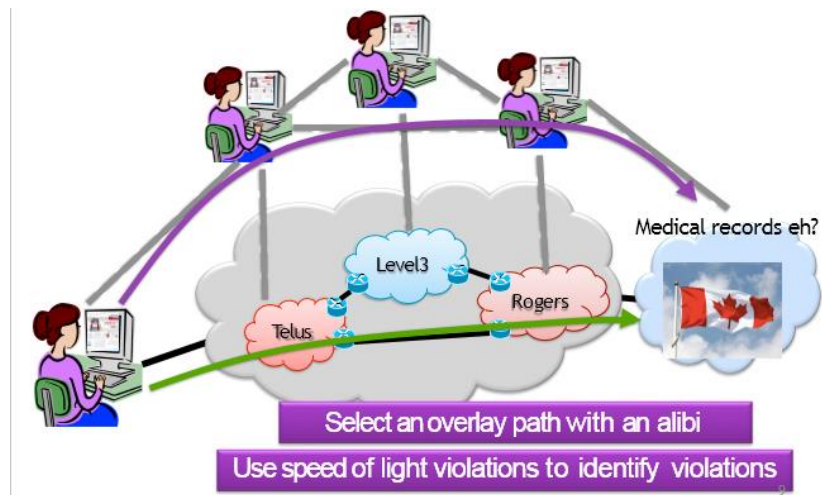
ENCORE: LIGHTWEIGHT MEASUREMENT OF WEB CENSORSHIP WITH CROSS-ORIGIN REQUESTS

- Governments around the world realize Internet is a key communication tool

    - … Working to clamp down on it!

- How can we measure censorship?

Main approaches:

- User-based testing: Give users software/tools to perform measurements

    - E.g., ONI testing, ICLab

- External measurements: Probe the censor from outside the country via carefully crafted packets/probes

    - E.g., IPID side channels, probing the great firewall/great cannon

Censorship measurement challenges:

- Gaining access to vantage points
- Managing user risk
- Obtaining high fidelity technical data

Encore key idea:

ISSUES…
- Informed consent?

- Users can opt out … after the test has already run
- Does consent increase risk?

  - … No consent = plausible deniability?
- What is the risk of having users query sites?

  - Magnitude of risk vs. likelihood of bad event

- Censorship measurement is inherently risky

  - Risk benefit trade offs

AS WATCH: AN AS REPUTATION SYSTEM TO EXPOSE BULLETPROOF HOSTING ASES

- **Bulletproof hosting ASes:**

  - ASes with the sole purpose of hosting malicious activities

    - Illegal content, spammers etc.

- **Previous reputation approaches focus on client behavior**

  - E.g., spamming, DDoS etc.

- **How to identify maliciousness at the AS-level vs. a benign AS with compromised clients?**

  - Key idea: Look at control plane data. Routing churn, announcing different subsets of IP space.

- **Gives a signal before anything malicious has even happened**

  - Data- vs. control- plane data as input
- **Identifies suspicious behavior of the AS not the clients**

Professionalism and software reliability

Software reliability is **defined** as: – The probability of failure-free **software** operation for a specified period of time in a specified environment. • It can be an important factor affecting system **reliability**.

WHISTLEBLOWING

- Is the term used when a worker passes on information concerning wrongdoing? In this guidance, we call that "making a disclosure" or "blowing the whistle". The wrongdoing will typically (although not necessarily) be something they have witnessed at work.

Software Reliability and Engineering Responsibilities

- Software Reliability is the probability of failure-free software operation for a specified period of time in a specified environment. Software Reliability is also an important factor affecting system reliability.

- In an IT environment, people and processes are as important as software. The concept of site reliability engineering, pioneered by Google, applies aspects of software engineering to operations with the goal of creating software systems that are highly scalable and reliable

- During the **engineering** design process, the **responsibilities** of the **engineer** may include defining problems, conducting and narrowing research, analyzing criteria, finding and analyzing solutions, and making decisions. Much of an **engineer's** time is spent on researching, locating, applying, and transferring information.

- The **Reliability Engineer** is responsible for adhering to the Life Cycle Asset Management (LCAM) process throughout the entire life cycle of new assets. ... Guides efforts to ensure **reliability** and maintainability of equipment, processes, utilities, facilities, controls, and safety/security systems.

SOFTWARE WARRANTIES

- Software license agreements often contain limited promises (known as "warranties") by the vendor regarding the quality of the licensed software. ...Software quality warranties are usually subject to exceptions for software ,problems that are not caused by software defects or are otherwise beyond the vendor's control

EULA

What IS the purpose of Eula?

- In proprietary software, an end-user license agreement (EULA) or software license agreement is the contract between the licensor and purchaser, establishing the purchaser's right to use the software.