The Techniques of Chinese Cybersecurity and the Effects of Censorship

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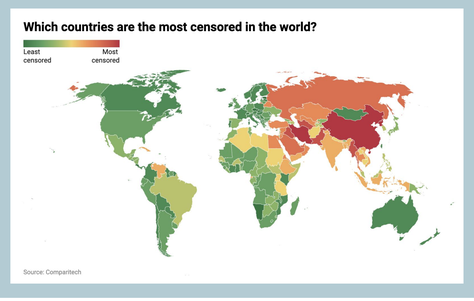
CSE185

Overview

- China's Great Firewall is one of the most advanced internet censorship systems in the world.
- It blocks foreign websites, censors content, and monitors online activity to control information.
- AI-powered surveillance and strict regulations enforce self-censorship among citizens.
- Despite restrictions, netizens use VPNs, coded language, and digital workarounds to bypass controls.



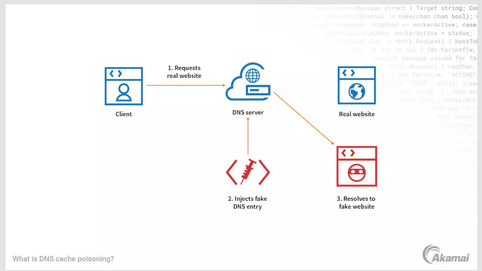
Historical Context

- China's internet censorship began after the Tiananmen Square protests (1989) to suppress dissent.
- In 1998, the Golden Shield Project laid the groundwork for nationwide online surveillance.
- The Great Firewall launched in the early 2000s, blocking foreign websites and filtering content.
- Over time, AI moderation, deep packet inspection, and VPN bans strengthened censorship.
- Today, China's internet remains highly restricted, shaping public discourse and access to information.

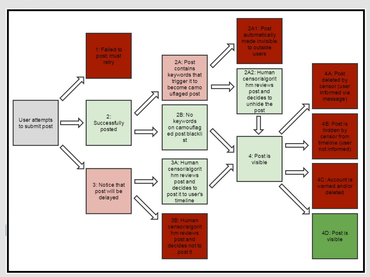
Core Functions of the Great Firewall

- The Great Firewall blocks foreign websites and restricts online information.
- AI and keyword filtering censor politically sensitive content in real-time.
- Deep packet inspection (DPI) monitors and slows access to restricted sites.
- Man-in-the-middle (MITM) attacks intercept and decrypt private communications.

Technical Censorship Methods



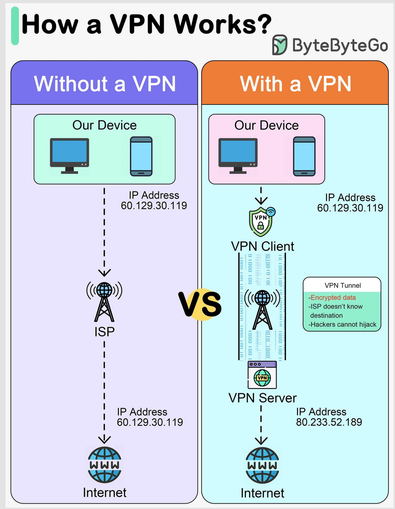
- IP Range Banning
  - blocks entire platforms or regions, cutting access to foreign services.
- DNS Spoofing
  - redirects users trying to access banned sites to error pages or fake domains.



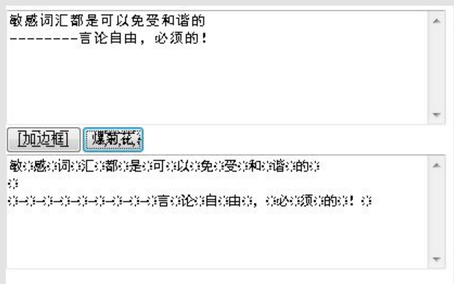
- Deep Packet Inspection (DPI)
  - scans and filters internet traffic for restricted keywords and content.
- Packet Forging
  - disrupts communications by injecting false data or slowing foreign websites.
- Man-in-the-Middle (MITM)
  - attacks intercept and decrypt private messages sent over HTTPS.

Netizen Resistance Strategies

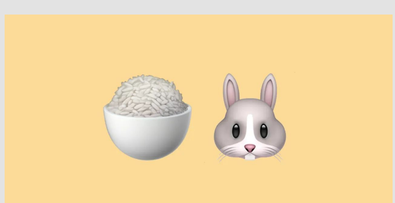
- VPNs and proxy servers allow users to bypass restrictions and access blocked websites.
- Coded language and homophones (e.g., "river crab" for censorship) evade AI keyword filters.



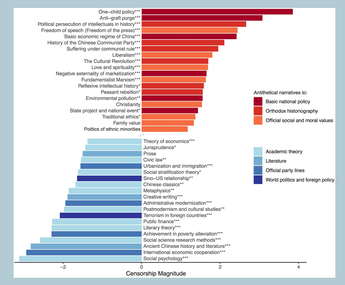
- Martian Script and Unicode manipulation distort text to slip past automated detection.



- Memes and satire provide subtle ways to critique censorship without immediate removal.
- Peer-to-peer file sharing, encrypted messaging, foreign mirror sites and decentralized platforms offer alternative access to banned content.



Consequences of Censorship



- Restricted access to information limits exposure to global news, research, and diverse perspectives.
- Self-censorship is widespread as users fear surveillance, online retaliation, or legal punishment.
- Academic and technological innovation suffer, with researchers blocked from key resources.
- Social media and entertainment are tightly controlled, filtering out politically sensitive discussions.
- Government propaganda thrives, shaping public perception through state-controlled media.

Future of Censorship

- AI-driven censorship is becoming more advanced, detecting and removing content in real-time.
- Deepfake technology and synthetic media could be used for propaganda and misinformation.
- Increased surveillance through biometrics and social credit systems may further suppress dissent.
- The crackdown on VPNs and encrypted messaging will continue, limiting ways to bypass censorship.
- Decentralized internet and blockchain-based platforms may offer new ways to resist censorship.
- China's model of digital control is influencing other authoritarian regimes, shaping the future of internet freedom worldwide.

Citations

https://dataprot.net/articles/internet-censorship-by-country/
https://doi.org/10.24908/ss.v13i3/4.5404
https://en.wikipedia.org/wiki/Great_Firewall
https://www.nytimes.com/2010/05/15/world/asia/15china.html
https://doi.org/10.1177/1742766522100596
https://doi.org/10.7202/1013949ar
https://radiolab.org/episodes/wubi-effect
https://www.websiterating.com/vpn/how-many-people-use-a-vpn/
https://chinadigitaltimes.net/space/Category:Lexicon
https://www.theguardian.com/world/2017/jul/11/china-moves-to-block-internet-vpns-from-2018
https://nordvpn.com/what-is-a-vpn/
Images
https://thewoufancenter.org/intelbrief-china-30-years-after-tiananmen-square/
https://www.akamai.com/glossary/what-is-dns-cache-poisoning
https://citizenlab.ca/2014/11/tracing-path-censored-weibo-post-compiling-keywords-trigger-automatic-review/
https://www.linkedin.com/posts/alexxubyte_systemdesign-coding-interviewtips-activity-7158862865351778305-BdgM/
https://chinadigitaltimes.net/2014/04/script-week-chrysanthemum/
https://www.wired.com/story/china-feminism-emoji-censorship/
https://nym.com/blog/internet-censorship-global-threat
https://www.cambridge.org/core/journals/perspectives-on-politics/article/censoring-the-intellectual-public-space-in-china-what-topics-are-not-allowed-and-who-gets-blacklisted/B5774AC7925D68814C989328EC3AE36B