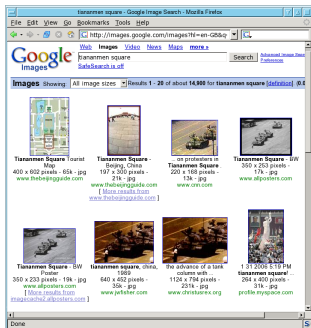


# Censorship resistant technologies



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CAMBRIDGE  
Computer Laboratory



OpenNet Initiative  
www.opennet.net

## Summary

- What is blocked, who by and why?
- How does blocking work?
- How can such blocking be circumvented?
- Why is this insufficient?
- What is the future of censorship resistance?

# Political

- Human Rights in China
- Aung San Suu Kyi, leader of National League for Democracy, an opposition party in Burma

The screenshot shows a Mozilla Firefox browser window displaying the HRIC website. The address bar shows the URL <http://www.hrichina.org/public/ir>. The website header features the HRIC logo (a red flame above the letters 'HRIC' and the text 'HUMAN RIGHTS IN CHINA') and the Chinese characters '中国人权' (Human Rights in China). Below the header, there is a navigation menu with the following categories: ACTIVE ISSUES: ETHICAL GLOBALEIZATION, TECHNOLOGY AND HUMAN RIGHTS, LEGAL REFORM, and HUMAN RIGHTS DEFENDERS. Below this menu is a 'PUBLICATIONS:' section with a highlighted 'CHINA RIGHTS FORUM' link. The main content area displays two press releases. The first is titled 'Sun Xiaodi Receives Interna Activism Award' and describes an award given to Gansu-based activist Sun Xiaodi for his work on radioactive contamination. The second is titled 'HRIC Protests Denial of App Journalist Zhao Yan' and mentions a protest against the denial of an appeal by Human Rights in China (HRIC) regarding journalist Zhao Yan.

# Political

- Human Rights in China
- Aung San Suu Kyi, leader of National League for Democracy, an opposition party in Burma



Daw Aung San Suu Kyi's pages - Daw Aung San Suu Kyi - Mozilla

File Edit View Go Bookmarks Tools Help

http://www.dassk.org/contents.php?

**Browsing Dassk.org**

- News
- Announcements
- Articles
- News Headlines
- Biography
- Speeches
- Interviews
- Awards
- Letters from Burma
- Books
- Articles in Burmese
- NLD statements
- Heroines
- Press Release
- Letters to DASSK
- Sounds & Videos

**Announcements**

- Life of Burma's .....
- Dr. Rice's Message .....
- Protests against .....
- Job in Community .....
- List of political .....

**Subscriber Login**

Username:

Password:

Remember Me

[Lost My Password](#)

[I Want To Subscribe](#)

**DASSK Quotes**

Myanmar is a name that

**Daw Aung San Suu Kyi**



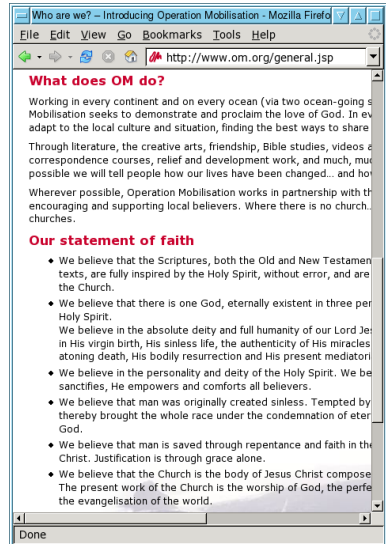
**A**t the ceremony for Aung San Suu Kyi in December 1991, she was still being held in detention by the military dictatorship in Myanmar (Burma) and could only be represented by her two sons, her husband and her picture facing the audience. In his speech presenting the prize to her sons, Professor Francis Sejersted, chairman of the committee, declared, "Her absence fills us with fear and anxiety," but he felt we could also have confidence and hope. He went on to sum up the meaning of her prize:

In the good fight for peace and reconciliation, we are dependent on persons who set examples, persons who can symbolize what we are seeking and mobilize the best in us. Aung San Suu Kyi is just such a person. She writes deep commitment and tenacity

Done

# Religion

- Sites aimed at religious conversion are sometimes blocked. This particular site is not accessible in Saudi Arabia
- Christian websites which target Islamic audience are particularly liable to be filtered in some Middle Eastern countries. This site is additionally inaccessible in the UAE, Iran and Bahrain



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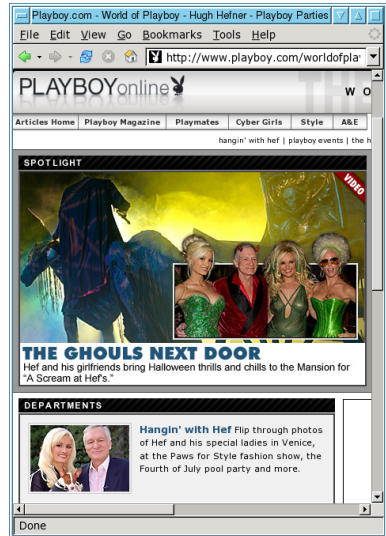


The screenshot shows a web browser window with the address bar displaying 'http://www.islameyat.com/english/c'. The page title is 'Prophecies & fulfillments about Jesus - Christian issues - islameyat.com'. The browser interface includes a menu bar (File, Edit, View, Go, Bookmarks, Tools, Help) and a navigation bar with buttons for 'English', 'Guestbook', and 'Contact us'. The main content area contains a table with the following data:

Prophecies & fulfillments about Jesus	Old T
1.He was to be born in Bethlehem	MI
2.He was to be born of virgin	ISAI
3.He was to be prophet like Moses	Due 18
4.He was to enter Jerusalem in triumph	Zech
5.He was to be rejected by his own	Isaia psalr
6.He was to be betrayed by one of his followers	Psa
7.He was to be tried and condemned	Isai
8. He was to be silent before his accusers	Isai
9. He was to be struck and spat on by his	Isai

# Pornography

- Blocked by several countries and sub-nationally (libraries, homes)
- Middle East (e.g. Bahrain, Saudi Arabia, Iran, Oman), Singapore, Burma/Myanmar . . .
- Convenient cover for other types of blocking
  - In Vietnam, the state claim that **only** obscene material is restricted, but testing revealed that while **no** pornography was blocked, political, religions and media websites were
- Governments can derive legitimacy by being seen to block content prohibited by the dominant religion



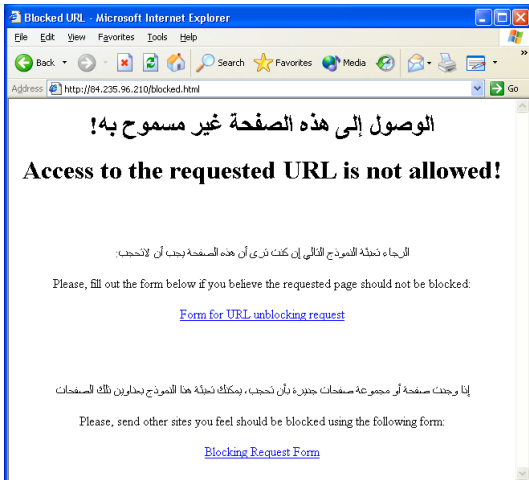
## Many more issues

- Military and militant websites
- Sex education, alcohol/drugs, music
- Gay and lesbian websites
- News, online communities and chat
- Censorship circumvention
- Child pornography
- Nazi material
- ...



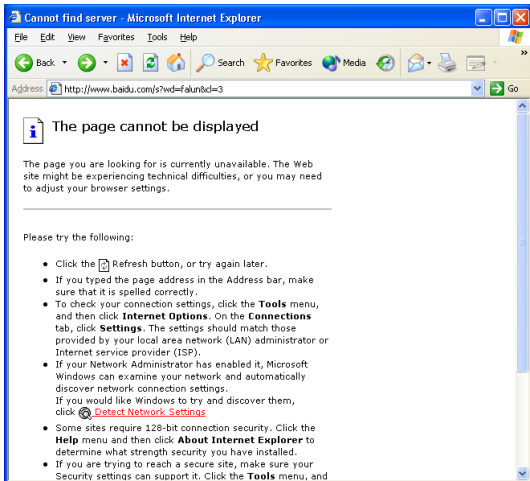
# Explicit blocking

- Another way in which blocking regimes vary is how transparent the process is
- In this example, from Saudi Arabia the fact that the site is blocked is clear, and the user may request unblocking



# Disguised as errors

- In contrast, when a site or keyword is blocked in China, it will appear to be a network error
- The situation is similar in Tunisia, where an the blocking system impersonates an Internet Explorer error message

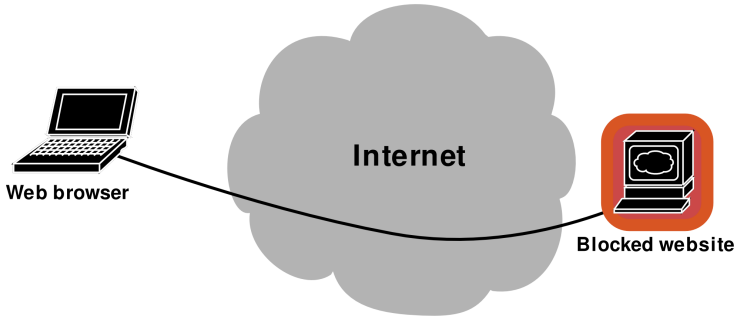


## Transparency of process

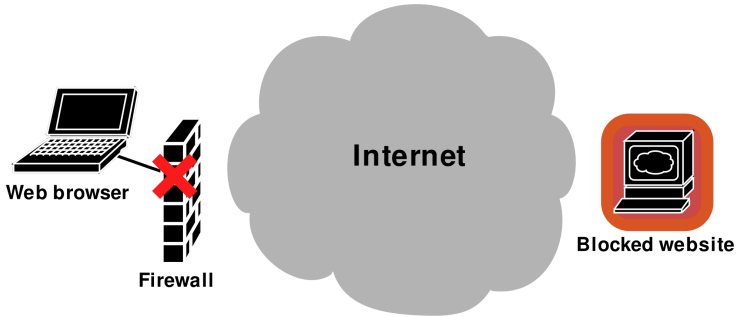
“In China, we don’t have software blocking Internet sites. Sometimes we have trouble accessing them. But that’s a different problem. . . . We do not have restriction at all.”

Chinese official at 2006 Internet Governance Forum, Athens

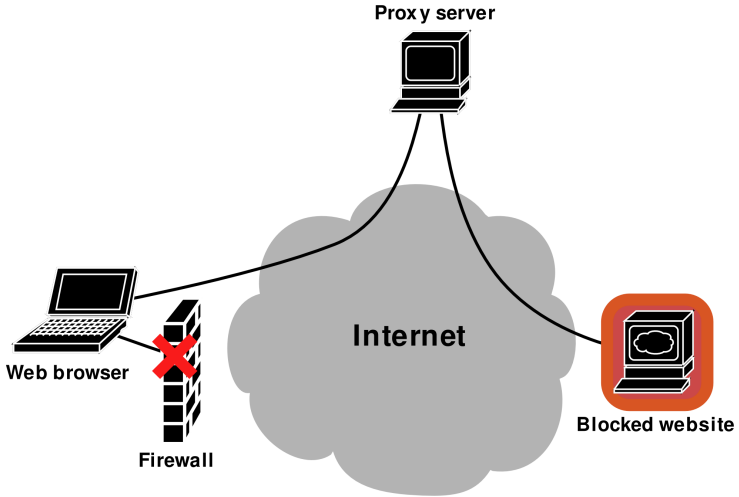
# Blocking and proxy servers



# Blocking and proxy servers



# Blocking and proxy servers



## Types of proxy servers

- Some types require altering the configuration of the computer so may not be usable in Internet cafés
- Unencrypted proxies will bypass most types of blocking, but the content of pages is available so keyword blocking will succeed
- Encrypted proxies, such as Psiphon, do hide the content, but the operator of the proxy will still know who is browsing which website
- Privacy software, such as Tor, will hide patterns of communication



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## Privacy

- Undesirable content can be reliably blocked simply by cutting off the Internet, at cost of blocking desirable content too
- Blocking can be resisted by hiding within content too valuable to block (e.g. e-commerce, online banking)
- Cannot hide by yourself, need a crowd with a variety of members
- Privacy needed for many different reasons, and need each other for any of them to have privacy. e.g.
  - Censorship resistance
  - Police communicating with contacts
  - Intelligence organisations investigating terrorist websites
  - Human rights workers in the field
  - Internet Watch Foundation building list of child pornography
  - Companies monitoring competitors and potential take-over targets
- Tor started by US Navy, taken over by a civil rights organisation (EFF) and used by law enforcement, financial research, human rights workers, censored Internet users worldwide

## Why does filtering still work?

- Circumvention technologies are far ahead of blocking, anyone sufficiently motivated will be able to bypass existing blocking techniques
- But blocking remains effective because of self-censorship and reluctance to use circumvention
- The fact that users are circumventing blocking can be detected and social/legal pressure can be applied. Even the risk of prosecution can be an effective deterrent



## Future research

- Better understanding of censorship capabilities
- More reliable and comprehensive mechanisms for detecting censorship
- Surveillance resistant communications: improving usability and security