

F.O.E.

Feed Over Email

A Proxy-less RSS Reader

<http://code.google.com/p/foe-project>

By

Sho Ho

Broadcasting Board of Governors

F.O.E.

Who am I?

Name: Sho Ho

Job Title: Software Engineer

Employer: Broadcasting Board of Governors
Mother ship of Voice of America, Radio Free Europe/Radio Liberty, Radio Free Asia, Radio & TV Marti, etc.

Duties: Internet anti-censorship R&D;
programming.

Contact: ssho@bbg.gov

F.O.E.

The Big Challenge

Facts: Countries censor the Internet and people cannot access “indecent” websites.

Problem: “Indecent” may include Voice of America, CNN, BBC, etc.


Challenge: How to bypass censorship?

F.O.E.

Offending Countries

- “Big offenders” of Internet censorship:
 - Belarus, Burma, China, Cuba, Egypt, Ethiopia, Iran, North Korea, Saudi Arabia, Syria, Tunisia, Turkmenistan, Uzbekistan, Vietnam, Zimbabwe
- and “minor offenders” :
 - Australia, Bahrain, Belgium, Brazil, Canada, Chile, Czech Republic, Denmark, Fiji, Finland, France, Ghana, India, Ireland, Israel, Italy, Jordan, Maldives, Mexico, Morocco, Myanmar, Netherlands, Norway, Pakistan, Russia, Saudi Arabia, Singapore, South Korea, Sweden, Thailand, Turkey, United Arab Emirates, United Kingdom, Yemen, and **USA (WTF?!!)**

Censorship Technologies

- IP Address Filtering
- Domain Name Blocking
- Packet (Content/URL/Keyword) Filtering
- DNS Hijacking
-  Desktop monitoring software. E.g. Green Dam (made in China).
- Any combination and/or variation of the above.

F.O.E.

Anti-Censorship Technologies

- Web-Based Proxy Servers
- Client-Side Proxy Software
- Pure Peer-to-Peer (P2P)
- Email
- Monitoring software removal tools.

Anti-Censorship Technologies

- Web-Based Proxy Servers
 - Advantages:
 - Easy to deploy
 - No download required
 - Effective against most common forms of censorship
 - Disadvantages:
 - Limited multimedia capability (e.g. no videos)
 - Limited interactivity (e.g. no AJAX)
 - Difficult to find new proxy servers
 - Example:
 - Psiphon, CGIProxy (By James Marshall)

Anti-Censorship Technologies

- Client-Side Proxy Software
 - Advantages:
 - Automatically update new routes.
 - Browser independent.
 - Better multimedia and interactivity supports.
 - Disadvantages:
 - Difficult to get a copy of the programs in censored countries.
 - Anti-virus software may treat some programs as Trojans or viruses.
 - Some systems are proprietary and may have privacy and security concerns.
 - Connection speed can be slow for some.
 - Examples:
 - Tor, Freerate, Ultrasurf, etc.

Anti-Censorship Technologies

- Pure Peer-to-Peer (P2P)
 - Advantages:
 - Distributed, thus difficult to block.
 - Data redundancy – data may be available from multiple nodes.
 - Disadvantages:
 - Initial nodes discovery can be difficult.
 - Speed can be very slow. Usually not good enough for web browsing.
 - Network reliability and security.
 - Example:
 - Freenet.

Anti-Censorship Technologies

- Email
 - Advantages:
 - Difficult to block individual emails.
 - No known censorship technology blocks email delivery on the national firewall level.
 - Can be used to update proxy addresses.
 - Emails can be scrambled or encrypted to deliver sensitive information and bypass content filtering.
 - Disadvantages:
 - Susceptible to server-side spam-filtering.
 - Plain-text emails are susceptible to content-filtering.
 - Encrypted emails require the recipients to have certain technical skills.
 - Recipients do not know whether their emails have been blocked.

F.O.E.

Anti-Censorship Technologies

- Monitoring Software Removal Tools
 - Advantage:
 - Completely remove desktop monitoring software such as Green Dam.
 - Disadvantage:
 - Can be difficult to obtain a copy of the removal software.

F.O.E.

FOE

**Anti-Censorship Tool
For Receiving News/Files
Built on Email**

F.O.E. = “Feed Over Email”

F.O.E.

Problems

No proxy, no RSS / podcast

(China's Great Firewall blocks VOA/RFA feeds)

F.O.E.

Problems

Web (CGI) Proxy

Unreliable

IP addresses change too often

Cannot “push” content to users

No good way to inform user of new IP

F.O.E.

Problems

Proxy Clients (e.g. Freegate)

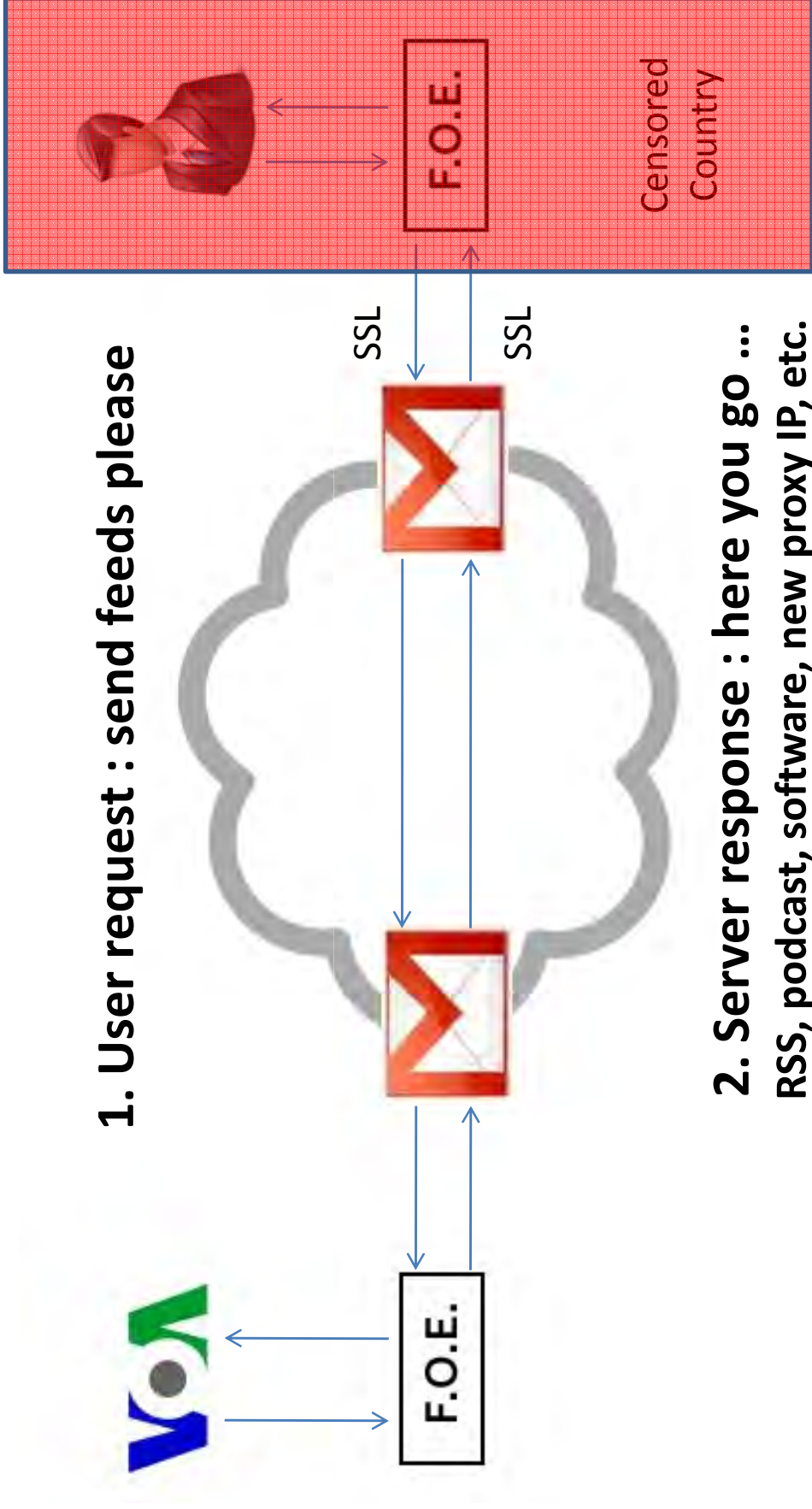
Expensive to maintain

Proprietary

No mobile phone support

F.O.E.

How F.O.E. Works?



How F.O.E. Works?

- FOE messages are embedded in email messages.
- FOE messages are compressed so it can:
 - Reduce the message size.
 - Bypass content filters.
- Requirement: user needs a foreign email account (e.g. Gmail).
- FOE client sends a request to FOE server via email.
- FOE server sends the requested feed/file to the user's email.
- FOE client download the FOE message and display the feed (or save the file).

F.O.E.

How F.O.E. Works?

Build On Email

Use existing email service providers
(e.g. Gmail)

F.O.E.

Advantages

User friendlier

(No need to update IP periodically)

More portable

(Can be port to mobile phones easily)

Capable of “push”

(Communication is 2-way)

More reliable

(US email services are quite reliable)

Low costs

(Build on open standards-SMTP,POP3,IMAP,XML)

F.O.E.

Feed Over Email, Why?

Abundant Foreign Email Servers

No Need to Update Proxy Addresses

Secured SMTP, POP3, IMAP

Reliable

Inexpensive or Free (e.g. Gmail)

Difficult to Block

F.O.E.

Sample Usages

News feed (RSS)

Podcasting

File download

Distribute proxy IP

Get user feedback

Important announcement (push)

F.O.E.

Can It Be Blocked?

Yes, when ...

Email server is blocked.

Email account is closed.

Email provider turns evil.

What FOE Is and Isn't?

FOE is:

- A tool to allow users to receive news feeds, Podcasts, files, programs, and proxy updates.
- A complement to existing anti-censorship solutions.

FOE is not:

- An universal proxy solution.
- For real-time applications.
- For downloading large files.

F.O.E.

Supported Platforms

PCs

Currently Supporting Microsoft Windows.

Potentially on Linux, FreeBSD, Mac OS X, etc.

Mobile phones

Can easily be ported to most mobile platforms.

F.O.E.

How To Improve FOE?

- Run on other protocols (e.g. Jabber) instead of SMTP?
- Create a client-side plug-in architecture?
- Create an architecture to allow anyone to set up a FOE server to provide different services?
- Port FOE to other operating systems?
- Create FOE clients for mobile devices?

F.O.E.

Demo

Showtime

Conclusion

- FOE is one of the many tools that helps to fight Internet censorship.
- You can help to fight censorship by:
 - Contributing to the FOE project by writing codes, submitting new ideas, writing papers, talking about it on your blogs and/or websites, and in any ways that you can imagine. (*We DO NOT accept money contribution but thank you for asking.*)
 - Creating your own anti-censorship tools and make it freely available to the public.
 - Set up your proxy servers or other anti-censorship services to help people in censored countries.
 - Making sure politicians hear your concerns loud and clear.
 - Providing financial supports to other anti-censorship programs that you believe are most promising.

F.O.E.

Project Contact

Sho Ho

ssho@bbg.gov

<http://code.google.com/p/foe-project>