TrackBack Spam:
Abuse and Prevention

Elie Bursztein, **Peifung E. Lam**, John C. Mitchell
Stanford University

Stanford Computer Security Lab

Introduction

- Many users nowadays post information on cloud computing sites
- Sites sometimes need to link to each other
- However, cross-referencing can become a vehicle for abuses (such as spamming)
- This calls for a study of security issues on cross-referencing between cloud sites

Introduction (cont.)

- Blog cross-referencing offers one such example
- Blogs have automated mechanisms, called Linkbacks, to facilitate cross-referencing, and this has been exploited by spammers

Introduction (cont.)

- We carried out a 1-year study of a major spamming platform, and analyzed 10 million spams
- Gained insight on attacker's method of operation and resources
- Propose a defense against blog spams

Outline

- Blog Spam
- Experiment setup : Honey blog !
- Results
- Defense

General Stats on Blogs

Source: universalmccann

- 184 Million blogs world-wide
- 73% of internet users have read a blog
- 50% post comments

Common Blog Platforms

Why blogs are special

- Blog are designed around the idea of user pushing content
- As an example, Linkbacks allow cross-linking between blogs.
- More specifically, when blog A cites another blog B, a notification of the citation can be sent to B, which can then link back to blog A automatically.

TrackBack - a type of LinkBack

TrackBack URL	The URL of TrackBack capture script
Auto discovery of TrackBack URL	Resource Description Framework (RDF)
Trigger	Code on blog site extracts citations to other blogs
Notification	HTTP Post

TrackBack URL and Blog Comments

Spectrogram Link:
http://erebus.nmt.edu/blog/spec/20071023_090404.jpg
Mail this Printer friendly

Trackbacks

The trackback uri for this entry is
http://erebus.nmt.edu/blog/trackback.php/1/12773

Listed below are the weblogs that reference this post

full tilt poker
full tilt poker
Blog : full tilt poker
Tracked on : Sun, 19 Apr 2009 01:06:01 +0000

Trackback Post variables

[**title**] => Title of the referencing blog entry

[**url**] => http://www.mysite.com/page

[**excerpt**] => Post excerpt ....

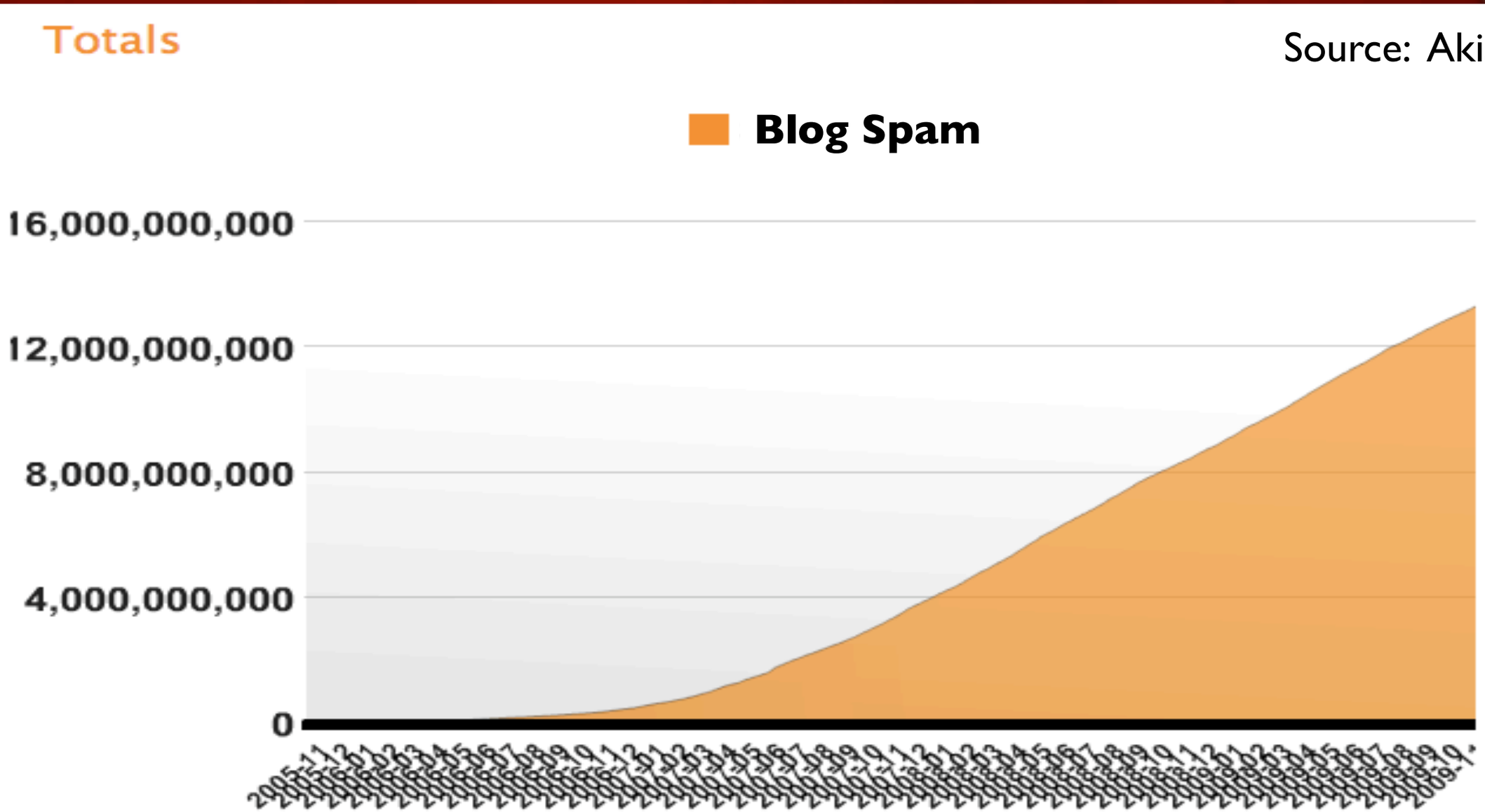
[**blog_name**] => Mysite blog

Problem

- Trackbacks are used to
  - push spam
    - do malevolent Search Engine Optimization
- One blog spam can reach thousand of users

How big is the problem?

Source: Akismet.com



Total spam: 13,275,940,950

Total ham: 2,701,440,026

Today (UTC, 1 hours left)

Spam today: 12,141,992

Ham today: 2,567,818

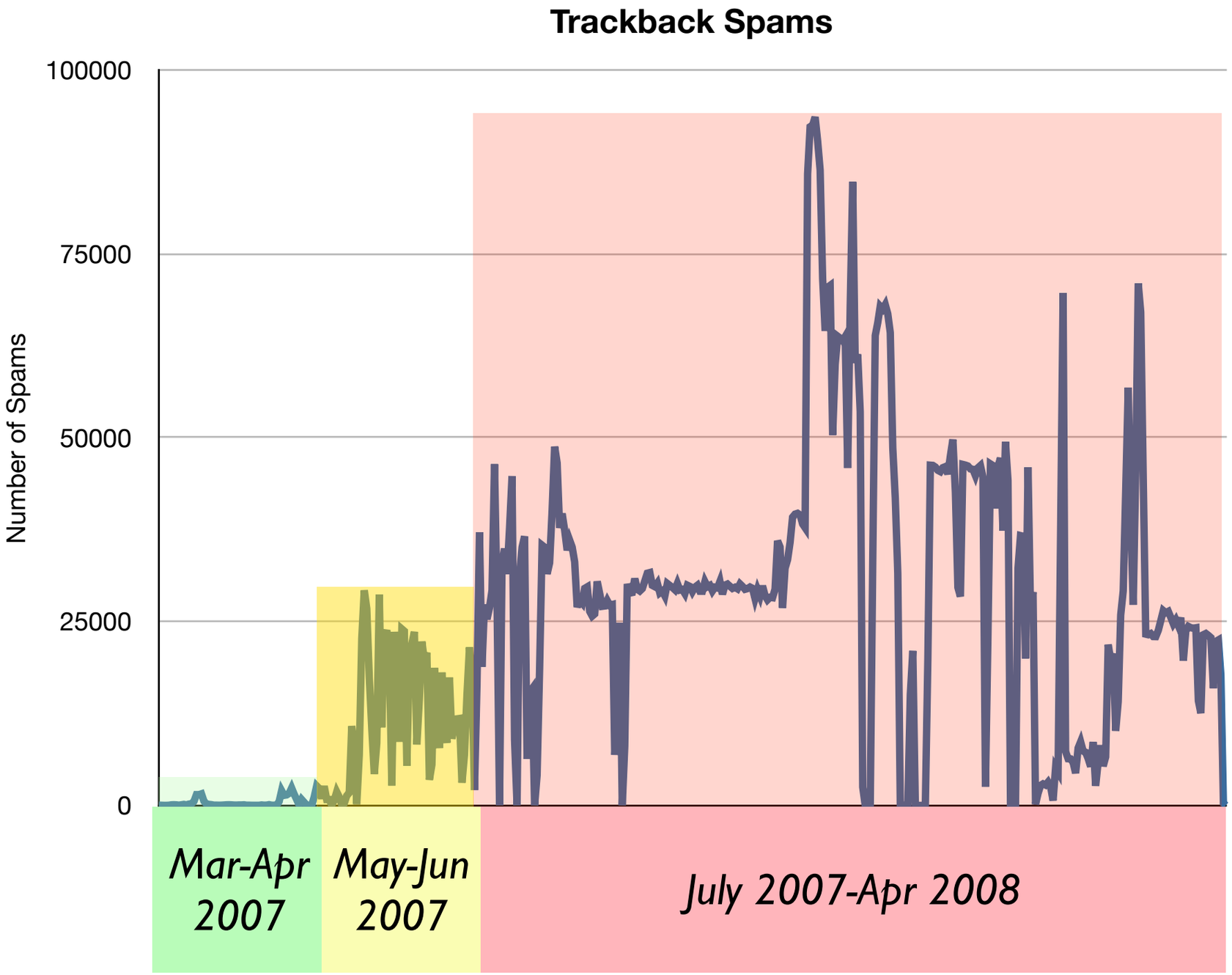
Honey Blog

- A blog acting as a potential target for spamming
- Instrumented our blog site and analyzed spams

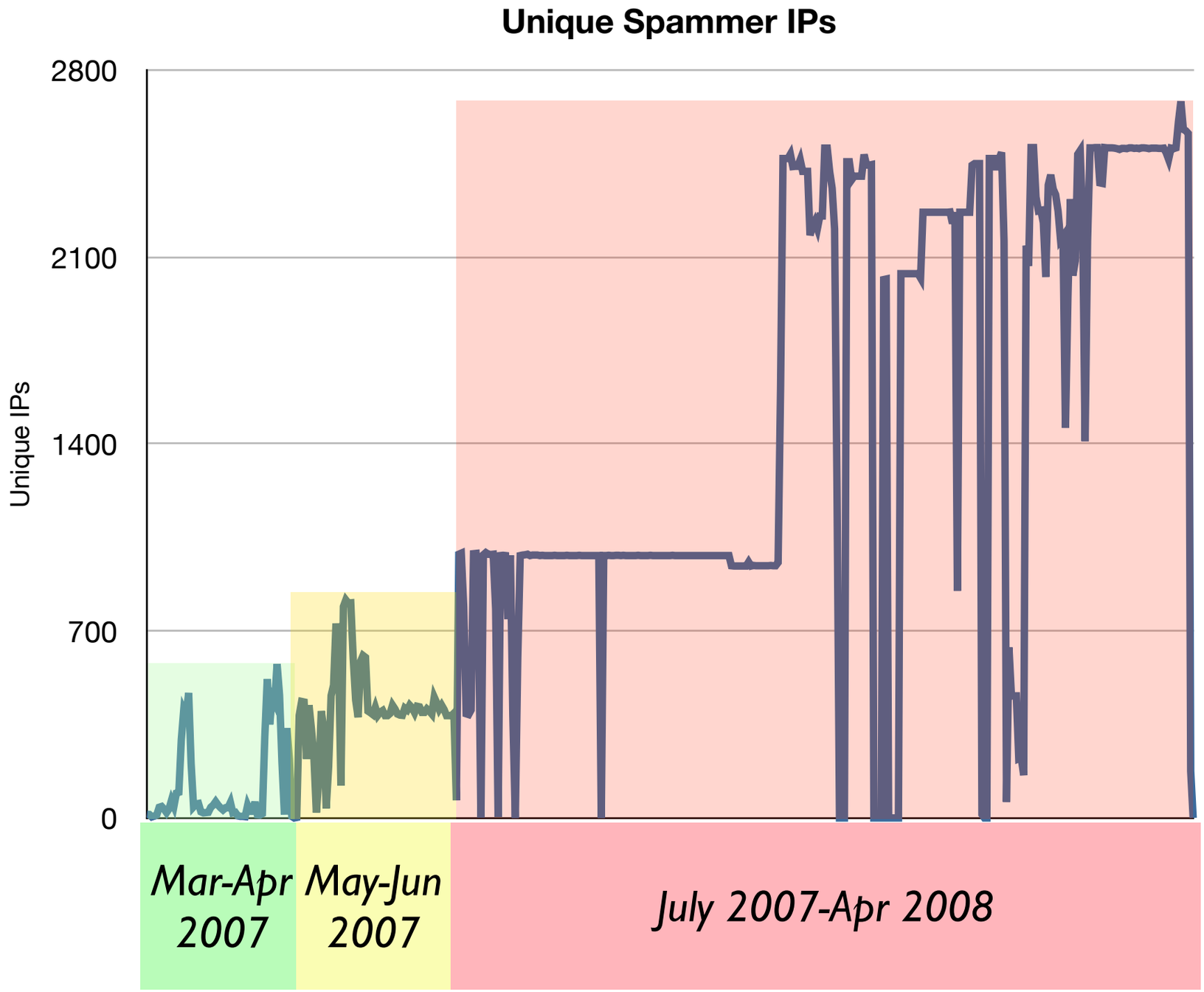
Setup

- Hosted a real blog (dotclear) with a modified TrackBack mechanism
- Record TrackBacks
- Passive fingerprinting
- Sample the lure site

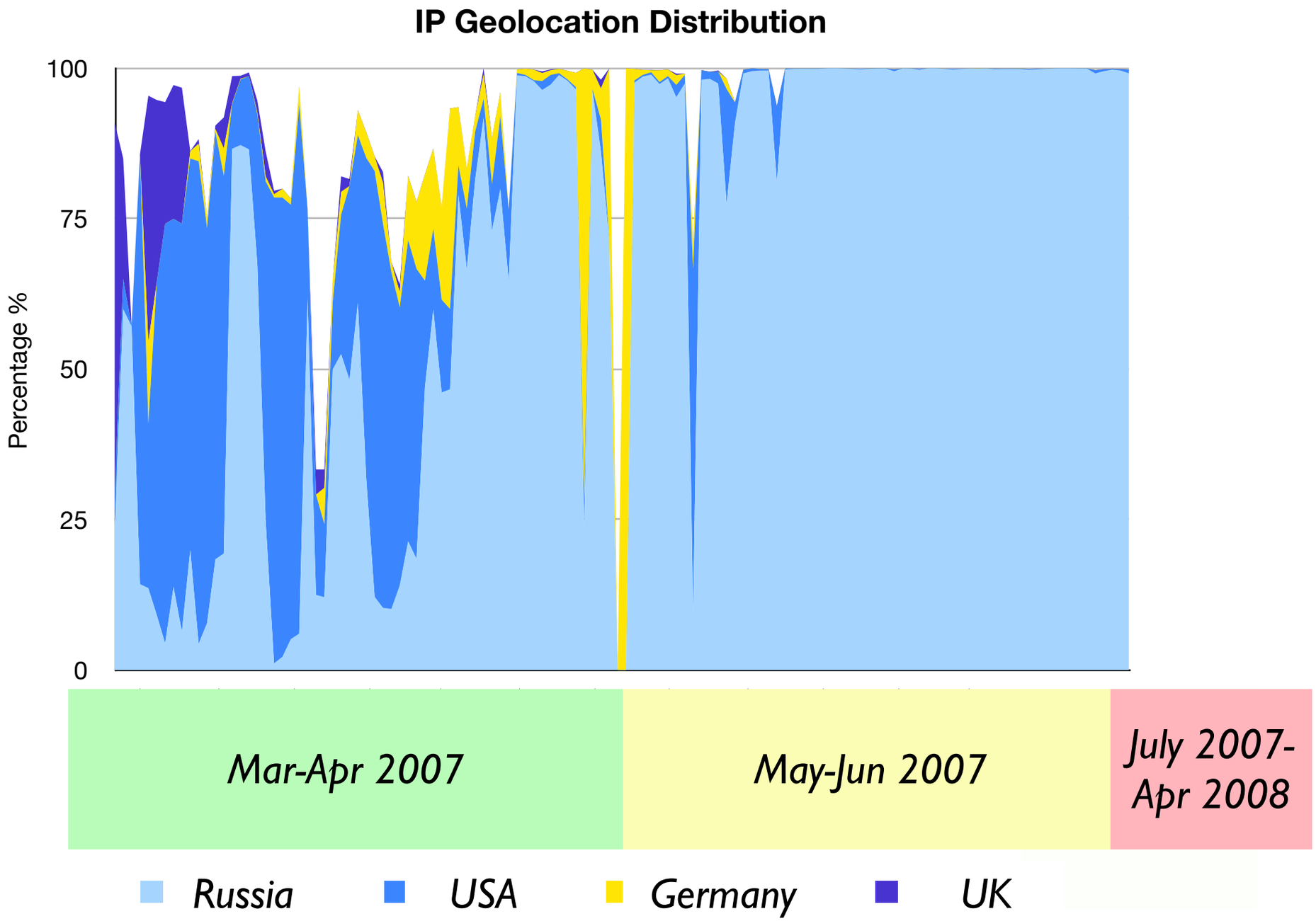
Activity


Trackback Spams
100000
75000
50000
25000
0
Number of Spams
Mar-Apr 2007
May-Jun 2007
July 2007-Apr 2008

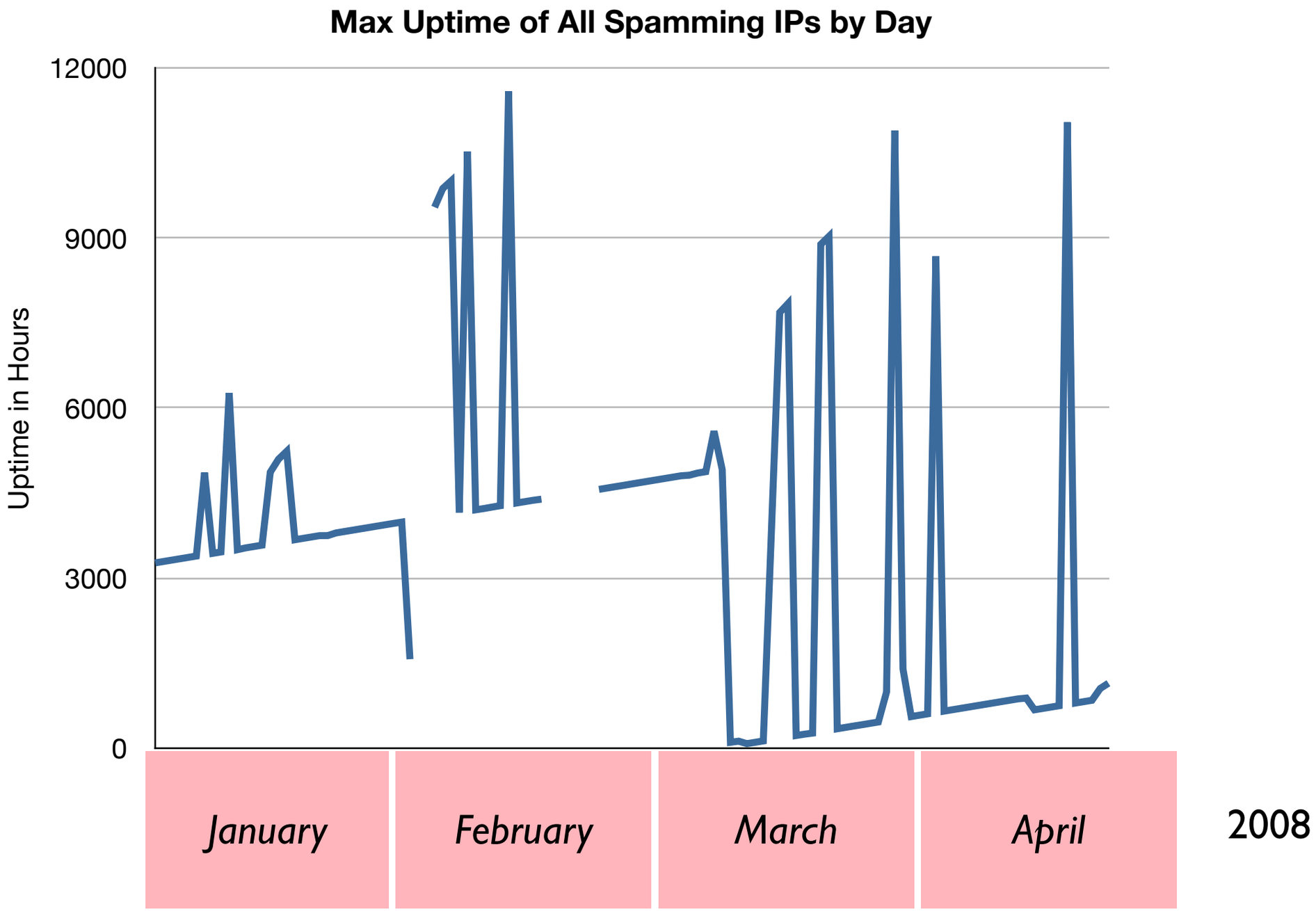
Unique Spammer IPs



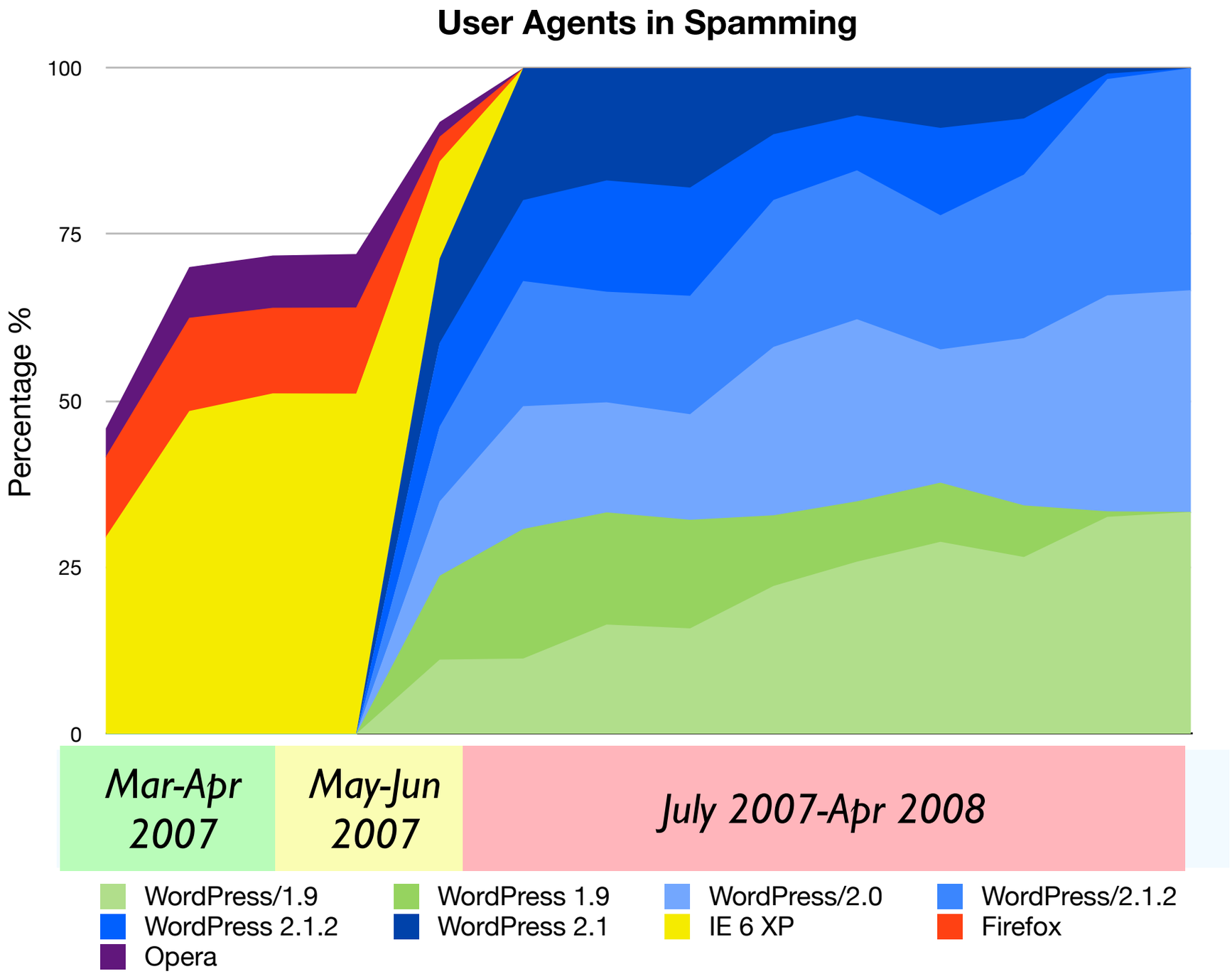
IP Geolocation Distribution



Max Uptime of Spamming IPs by Day



User Agents in Spamming



Trackback content

- Random keywords revolving around adult theme
- Blog URLs in the Trackback pings are of the form random-words.nx.cn

Trackback Post sample

Apparent Bayesian poisoning against spam filters:

[**title**] => Please teacher hentai pics

[**url**] =>http://please-teacher-hentai-pics.howdsl.nx.cn/index.html

[**excerpt**] => pics Please teacher hentai pics ...

[**blog_name**] =>Please teacher hentai pics

Created using Wordle

Spam Workflow

Servers submit Trackback spam

↓

Spam points to Social network site exploited as relay site

 obscufaction

↓

Relay site links to lure sites with purported adult content

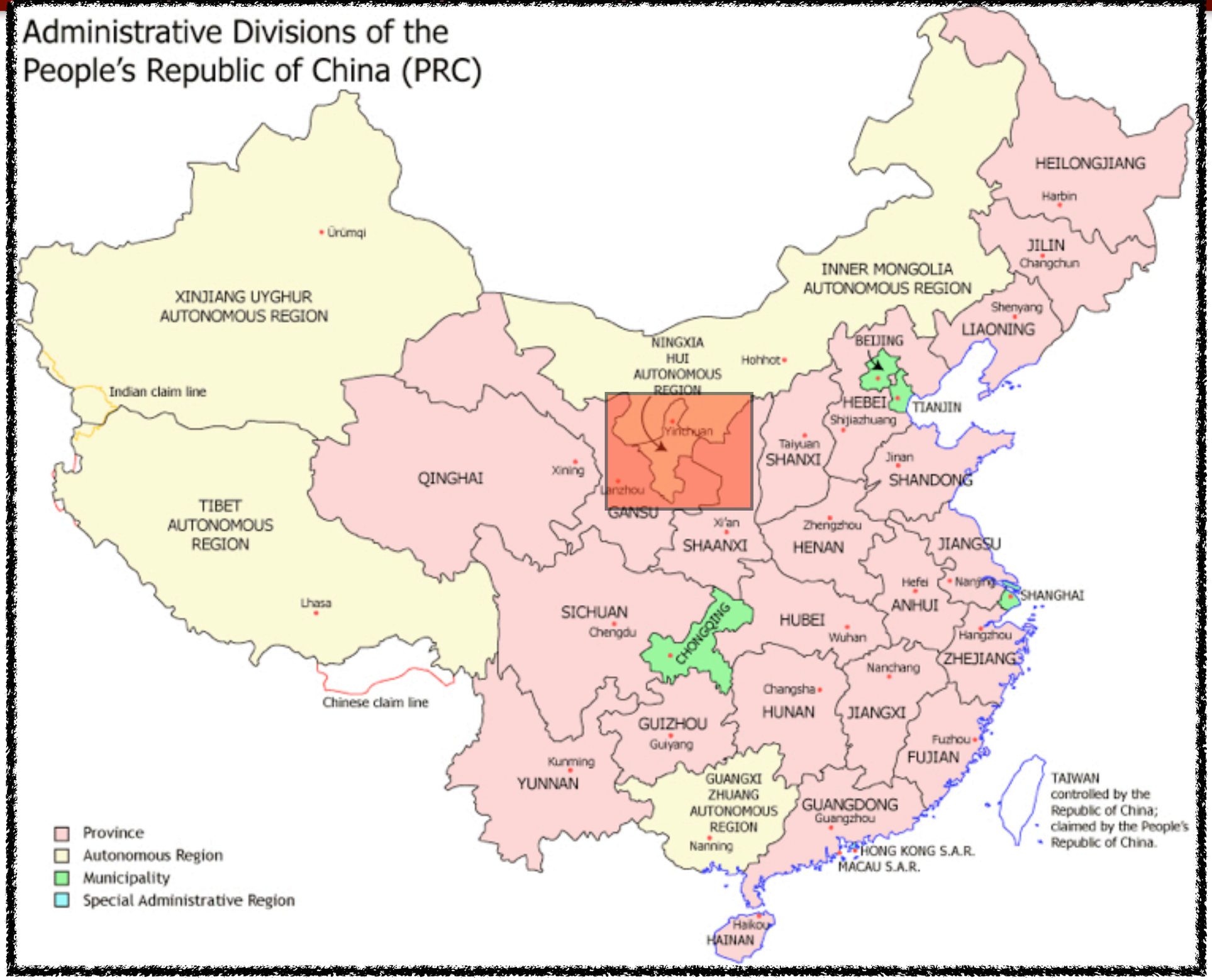
 obscufaction

↓

Lure site badgers user to download fake video plugins hosted on malware site

Relay URL

- Www.nx.cn, a community hosting site at Ningxia province, PRC
- Exploited by attackers as relay
- The hosting site started to use CAPTCHA (some in Chinese) around May, 2008
- We observed a corresponding drop of spam activities using them as relay


Administrative Divisions of the People's Republic of China (PRC)
Ürümqi
XINJIANG UYGHUR AUTONOMOUS REGION
Indian claim line
Lhasa
Chinese claim line
TIBET AUTONOMOUS REGION
QINGHAI
Xining
Lanzhou
GANSU
NINGXIA HUI AUTONOMOUS REGION
Yinchuan
Hohhot
INNER MONGOLIA AUTONOMOUS REGION
HEILONGJIANG
Harbin
JILIN
Changchun
Shenyang
LIAONING
BEIJING
TIANJIN
HEBEI
Shijiazhuang
Taiyuan
SHANXI
Jinan
SHANDONG
Xi'an
SHAANXI
Zhengzhou
HENAN
JIANGSU
Hefei
Nanjing
SHANGHAI
ANHUI
SICHUAN
Chengdu
CHONGQING
HUBEI
Wuhan
Hangzhou
ZHEJIANG
Nanchang
Changsha
HUNAN
JIANGXI
GUIZHOU
Guiyang
Fuzhou
FUJIAN
Kunming
YUNNAN
GUANGXI ZHUANG AUTONOMOUS REGION
Nanning
GUANGDONG
Guangzhou
HONG KONG S.A.R.
MACAU S.A.R.
TAIWAN
controlled by the Republic of China;
claimed by the People's Republic of China.
Haikou
HAINAN
Province
Autonomous Region
Municipality
Special Administrative Region

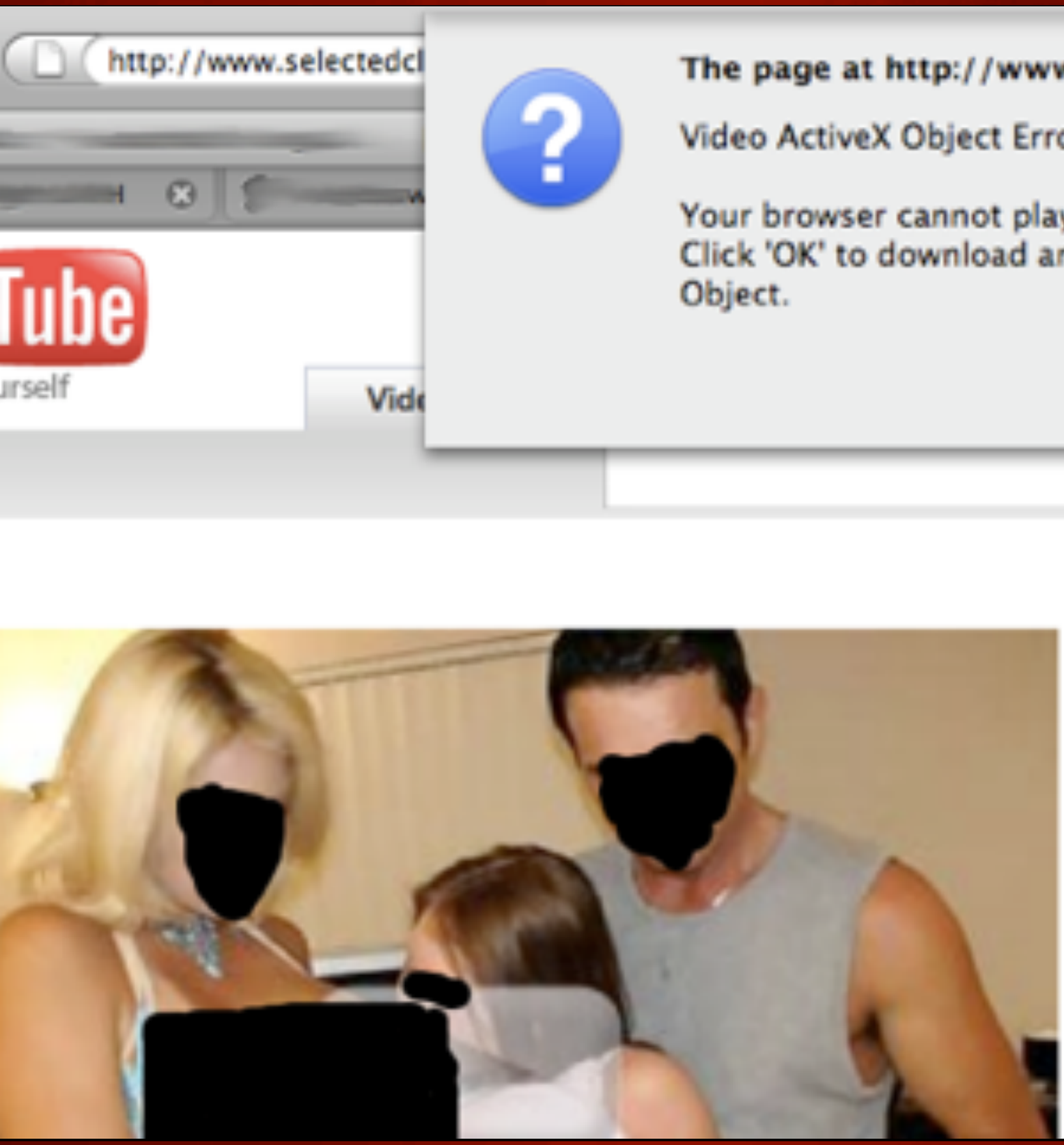
Behind the relay

- Lead to various sites
  - selectedclipz.com, gogomovz.com (purported adult site)
  - vidzwares.com (malware distribution site)
- Need an id in the url download.php?id=429

Gone

The requested resource
/
is no longer available on this server and there is no forwarding address. Please remove all references to this resource.

The Lure site



Whois

Domain Name: GOGOMOVZ.COM

Registrar: ONLINENIC, INC.

Whois Server: whois.onlinenic.com

Referral URL: http://www.OnlineNIC.com

Name Server: NS1.GOGOMOVZ.COM

Name Server: NS2.GOGOMOVZ.COM.

Updated Date: 22-oct-2008

Creation Date: 22-oct-2008

Expiration Date: 22-oct-2009

Registrant:

...

ul Beketova 3

Nijnii Novgorod,n/a,RUSSIAN FEDERATION 603057

DNS analysis : related domains

- ns1.clipzsaloon.com
- ns1.clipztube.com
- ns1.freexxxmovz.com
- ns1.itunnelz.com
- ns1.vidzselector.com, and more...

Malware

- Binary flagged as
  - TrojanDownloader:Win32/Zlob.gen!dll
  - Trojan.Popuper.origin
  - Downloader.Zlob.LI

TalkBack

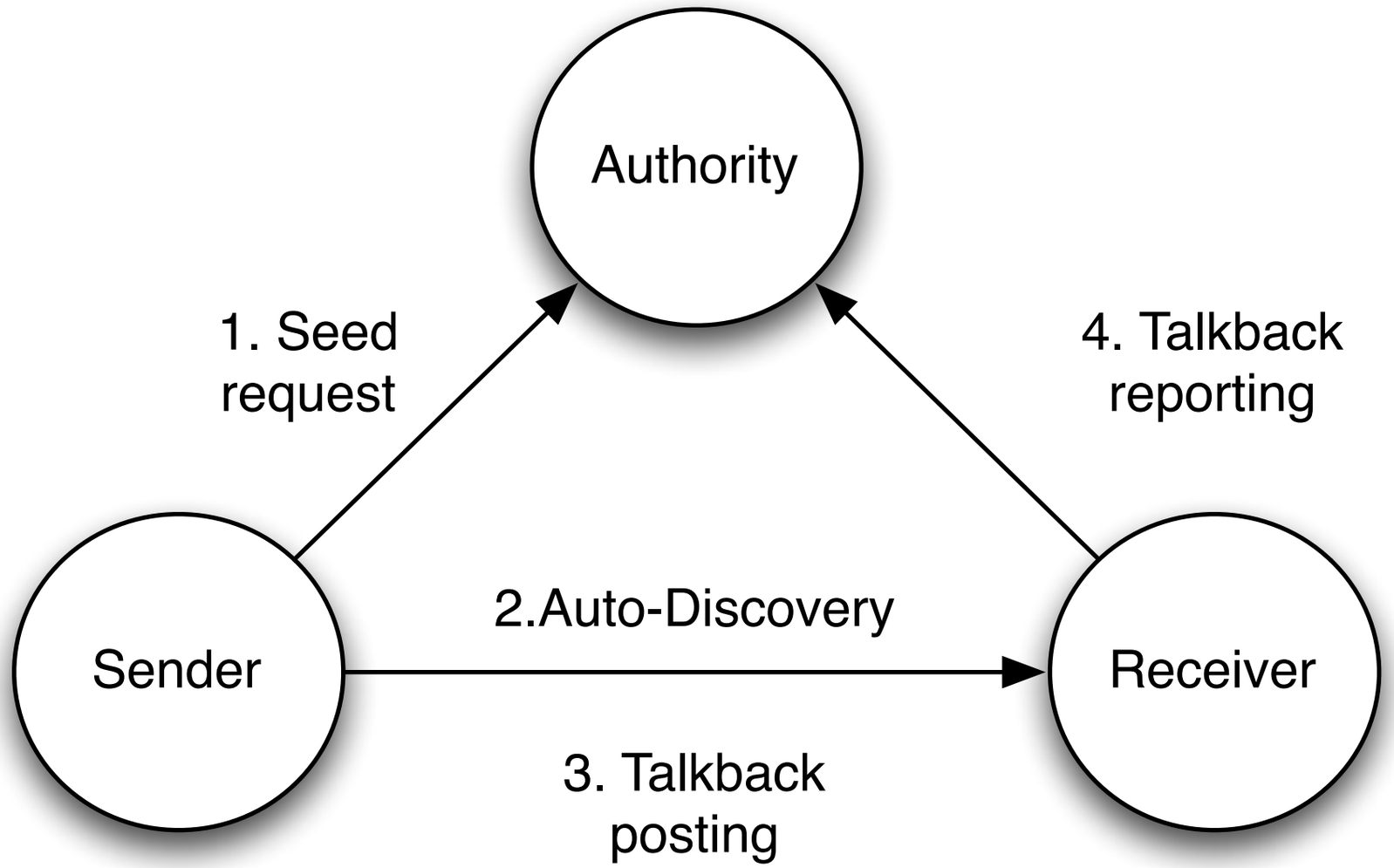
- Designed a secure protocol: TalkBack
- Address the root of the problem: prevent spammers to post notifications

- Key ideas :
  - Lightweight PKI
  - Global rate limiting

Goals

- Sender authenticity
- Receiver authenticity
- Notification integrity
- Notification irrefutability

How it works


Authority
1. Seed request
4. Talkback reporting
Sender
2.Auto-Discovery
Receiver
3. Talkback posting

Conclusion

- Linking between cloud sites can become a vehicle for spamming
- One such example is blog TrackBacks
- We did a 1 year study of a major blog spamming platform: 10 million spams analyzed
- Gained insight about TrackBack spam and spammers
- Provided us a basis to build better defense

Related work and alternative approaches

- TrackBack Validator [21]
  - Parsing sender page to find the link
- Reputation system
- IP Blacklisting
- Local rate limiting

Questions ?

Thank you!