The Malware Ecosystem

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Agenda

1. Recent Stories
   - USAid Website Hacked
   - Digg.com Serving Malicious Codecs
   - Conficker/Downadup Worm
   - Scareware Spyware
2. Threat Landscape
3. Web - #1 Threat Vector
4. A Bit of Good News

Recent Stories

azerbaijan.usaid.gov

1. The Azerbaijan section at the **US Agency for International Development** (azerbaijan.usaid.gov) became another well-known legitimate web site compromised. (usaid.gov has approx 86K visitors a month*)
2. The Website was embedded with **malware and exploits serving scripts** sometime around the 1st of March.
3. Upon successful exploitation a Trojan Downloader was installed on the user's computer (Windows only).

Multiple Malicious Redirections

- The malware infection showed three malicious redirections;

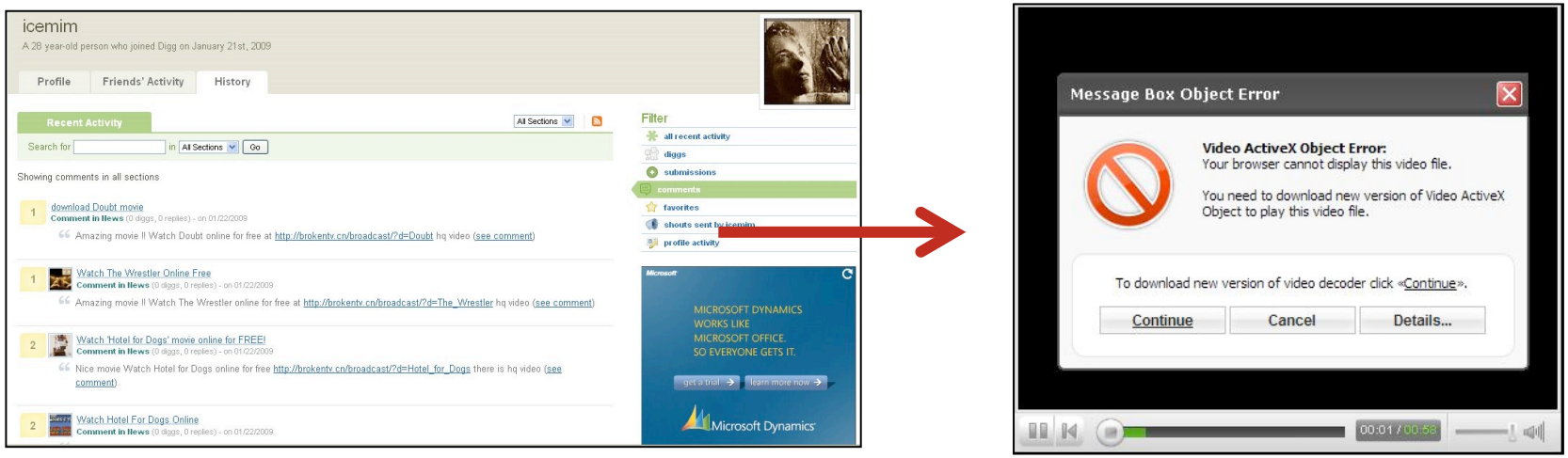
  cs.ucsb.edu.4afad2ceace1e653.should-be.cn/jan10.cn 1

  orderasia.cn/index.php 2

  orderasia.cn/iepdf.php?f=old 3

- The malware then “phones home”;
  - *fileuploader.cn/check/check.php*
- The malware’s phone home location is a domain that was exclusively used by the Russian Business Network (RBN) back in January, 2008.

Digg.com Serving Malicious Codec's



1. On February 11, a surge of false stories with popular social news subject lines were created by malware writers as an attempt to bait users into clicking links which lead to malware.

2. Users prompted to install an Fake Codec, which is actually **malware.**

3. Once the malware is installed, it can **grab sensitive data** off the users PC, like credit card numbers

Conficker/Downadup Worm

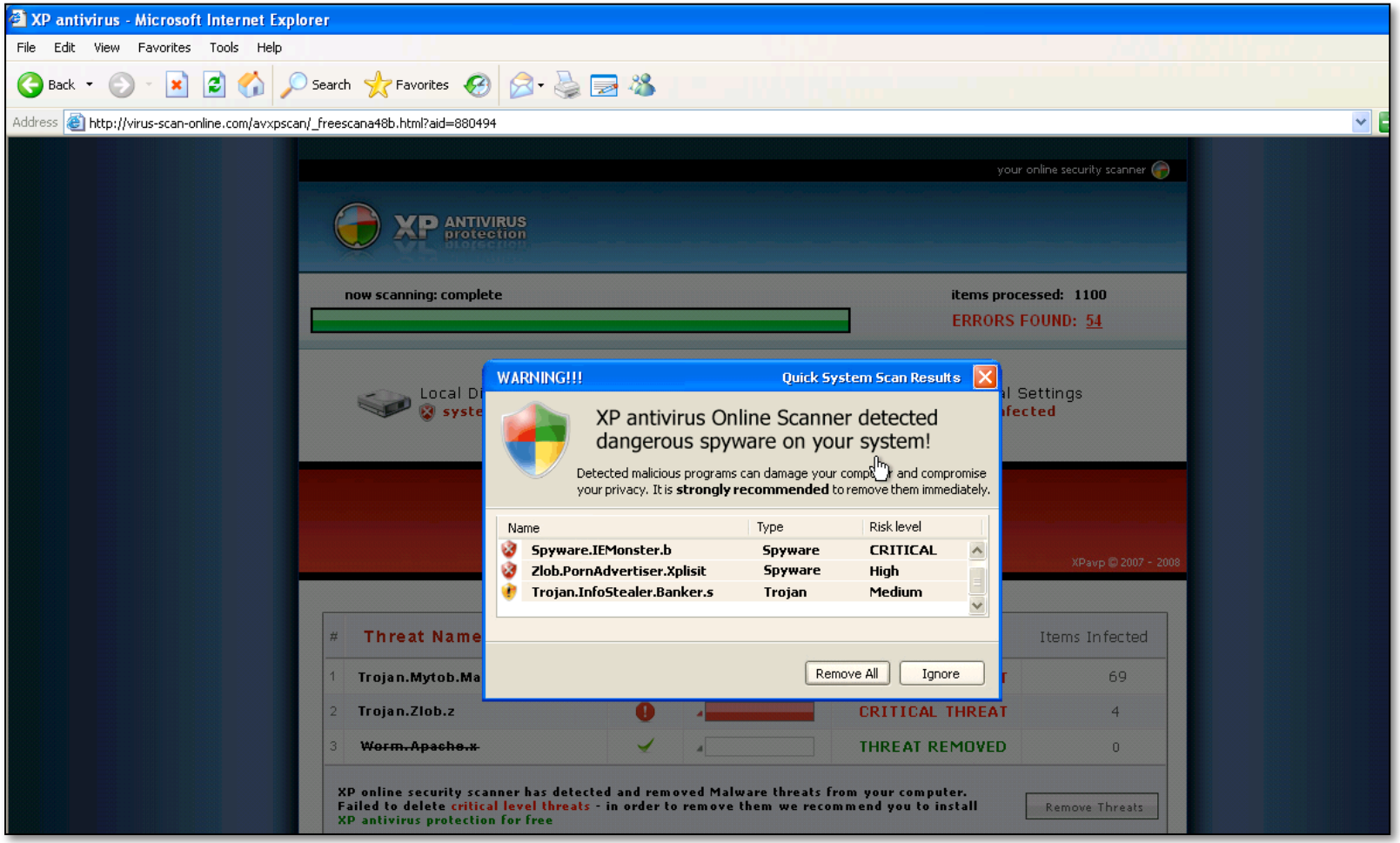
1. Microsoft MS08-067 out of band security update on Oct 23, 2008
2. MS08-067 is a vulnerability in Windows Server service allowing remote code execution using port 139 or 445
   - 2000, XP, Windows Server 2003 without authentication
   - Vista, Windows Server 2008 requires authenticated remote attacker
3. Conficker spreads via
   - Scanning local network for vulnerability
   - Via local shares by password guessing administrator logins
   - Removable devices (e.g. USB drives) via autorun.inf
4. Disables DNS lookups to security sites
5. Generates 250 domain names via algorithm daily and connects via HTTP
6. Estimate approximately 9M infected PCs (F-Secure)
   - Only 1% in US while China, Russia and Brazil account for 41%

Scareware Spyware

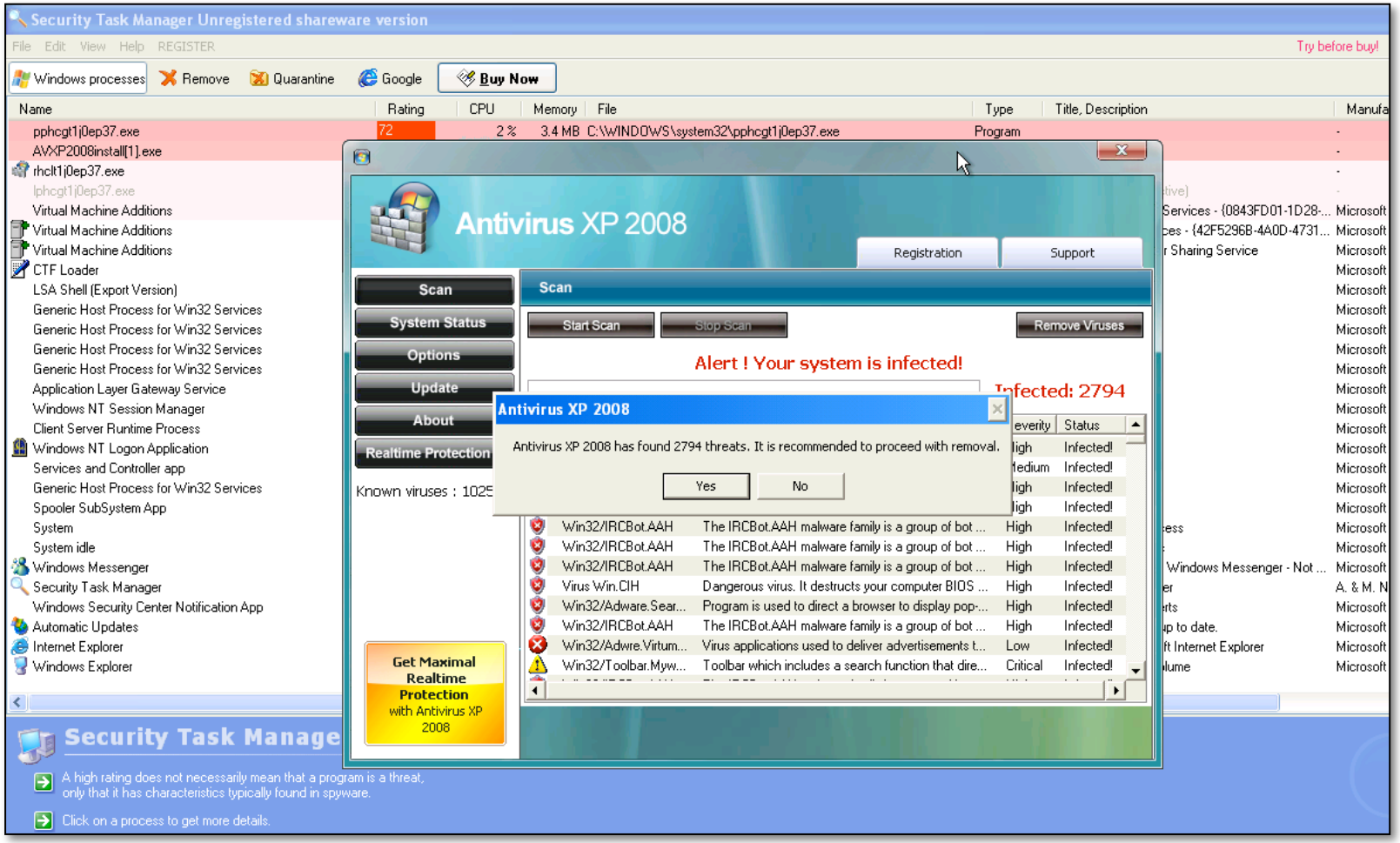
1. Malware that scares users into purchasing fake anti-virus protection
2. Greatly increases consumer-based revenue per infection from pennies to ~$1
3. Infects via (at least) socially-engineered AV sites, email blended threats and compromised legitimate websites
4. Affiliate program run by bakasoftware.com

   One affiliate earned $147k in 10 days based on 155k infects generating 2772 purchases at $50 each → $5M per year

Current Scareware Spyware Attacks



Click Yes to Remove 2794 virii ☺



Security Threat Landscape

Security Threat Landscape

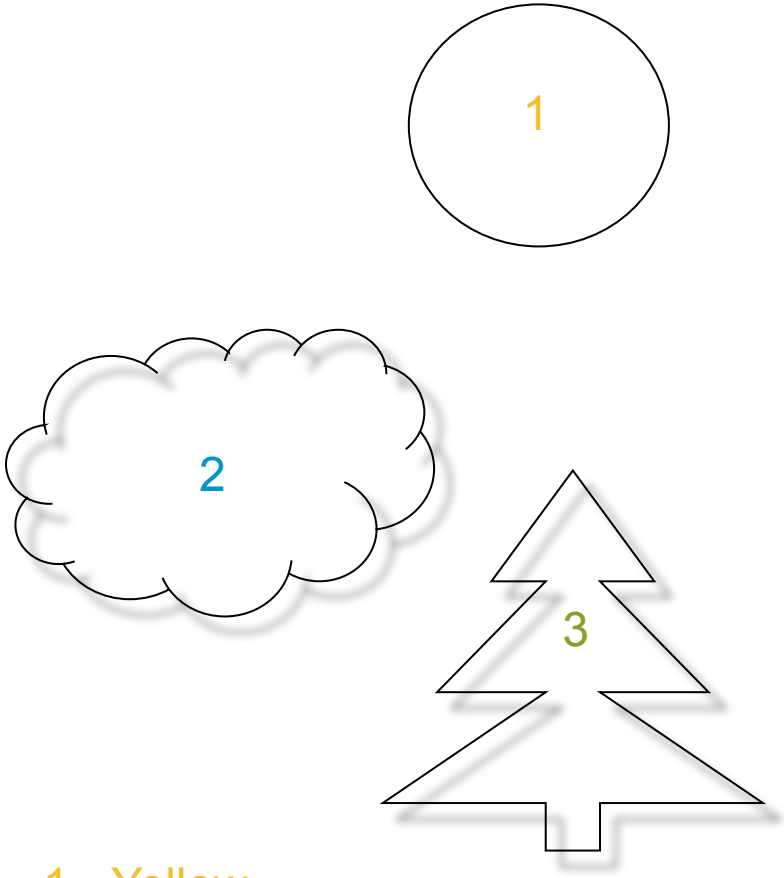
1. Profits, collaboration, innovation
2. Attack in depth – numerous attack methods to ensure any weaknesses will be exploited
3. Rising number of vulnerabilities & weaponization of vulnerabilities
4. Malware and theft is covert
5. Data loss & Virtual Banks
6. Web vector is weakest link

Web is #1

1. What's on that Web Page

Web pages are like paint by numbers

1. Web pages return html which indicates objects to fetch
2. Objects are fetched from specified location
3. Objects can be images, executables, javascript…
4. Visiting a web page can cause content to be fetched from anywhere the web pages says



1 - Yellow
2 - Blue
3 - Green

2. Web Browser Ecosystem Vulnerable

SANS Top 20 2007 Security Risks
http://www.sans.org/top20/#c1

1. IE and Firefox vulnerable

   "…**hundreds of vulnerabilities in ActiveX controls** installed by software vendors have been discovered."

2. Media Players & Browser Helper Objects (BHO)

   RealPlayer, iTunes, Flash, Quicktime, Windows Media

   Explosion of BHOs and third-party plug-ins

   Plug-ins are installed (semi) transparently by website. Users unaware an at-risk helper object or plug-in is installed … introducing more avenues for hackers to exploit users visiting malicious web sites.

Mpack: Infection rates per country

Country	Traff	Loads	Efficiency
JP - Japan	93635	19875	21.23
DE - Germany	18702	4625	24.73
ES - Spain	13218	3947	29.86
US - United states	6954	926	13.32
RO - Romania	3070	1545	50.33
GB - United kingdom	1696	261	15.39
IT - Italy	1680	286	17.02
FR - France	1432	231	16.13
CN - China	1089	294	27

3. Malware Defeats Anti-Virus Signatures

Race to Zero at DefCon Conference

1. Criminals have developed tools to mutate malware to defect signature-based detection
2. At DefCon teams of researchers proved their success yet again
3. Seven viruses and two exploits, all well-known, were mutated to defeat anti-virus engines
4. Winning time: 2 hours, 25 minutes

4. Web Servers Vulnerable

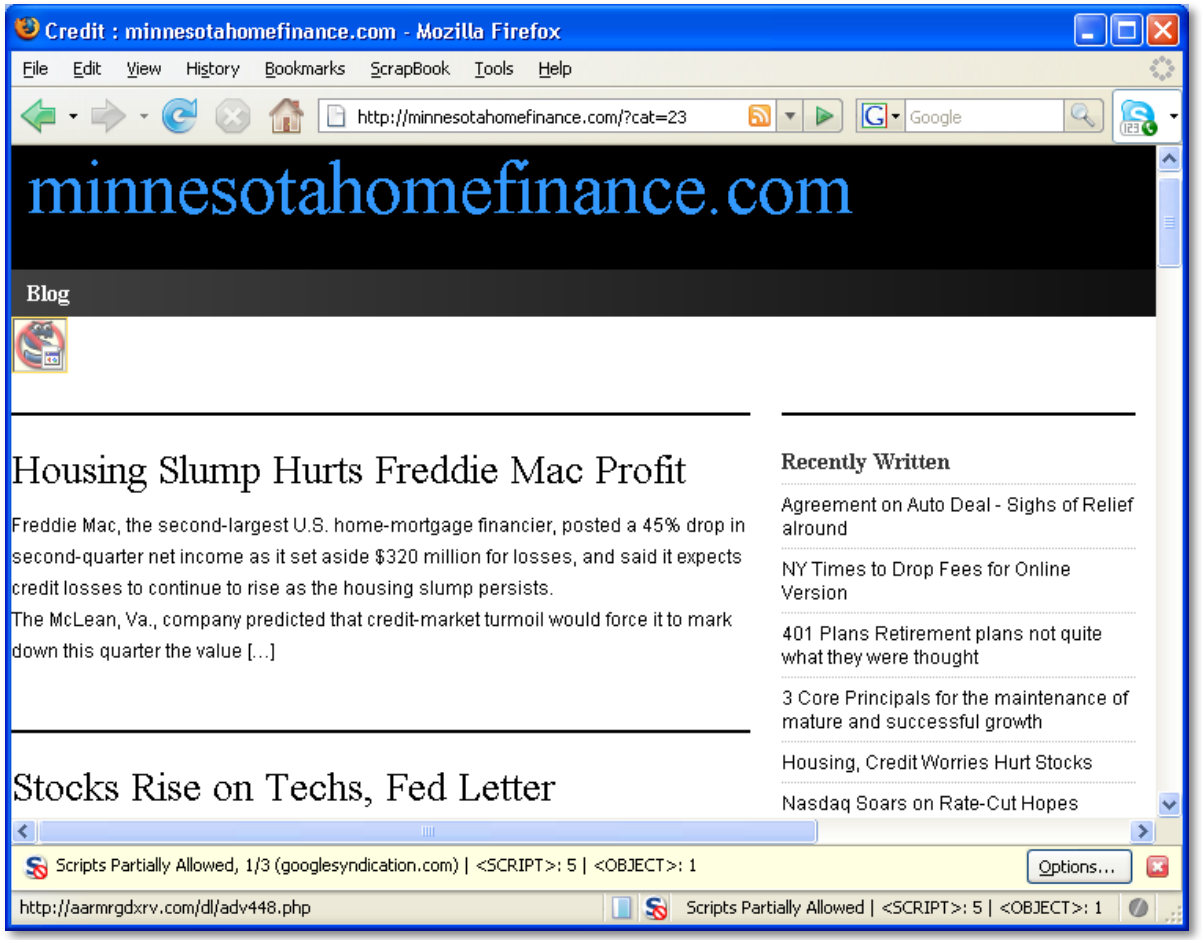
4. Attack Vector: Vulnerable Web Servers

SANS Top 20 2007 Security Risks
http://www.sans.org/top20/#c1

“ Web application vulnerabilities in open-source as well as custom-built applications account for almost half the total number of vulnerabilities being discovered in the past year. These vulnerabilities are being exploited widely to convert trusted web sites into malicious servers serving client-side exploits and phishing scams.”

minnesotahomefinance.com web site

Loading aarmrgdxrv.com



What's really happening

1. Minnesotahomefinance.com registered at Godaddy june, 2005
2. 209.51.132.218, Global Net Access in NY, with 312 domains

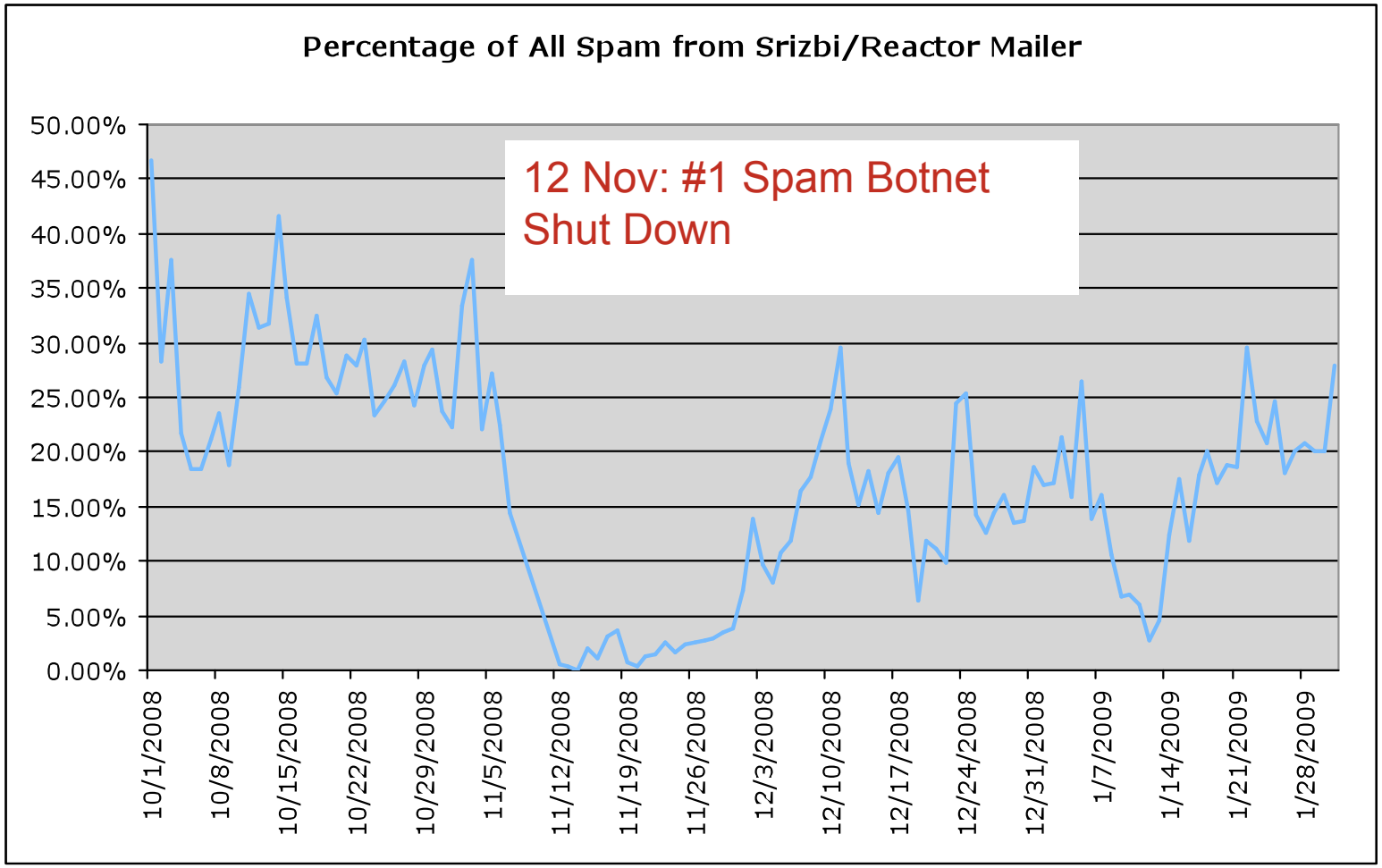
- Browser fetches IFRAME & loads PHP from aarmrgdxrv.com
- 85.255.121.195, Ukrtelegroup Ltd in Ukraine, with 15 domains
- Ukrtelegroup is part of RBN (Russian Business Network)
  - Other domains match the pattern; e.g. adtctqypoa.com…
- aarmrgdxrv.com registered at BIZCN.COM, INC.
  - Spamvertized domain ranking: #18 by volume, #11 by % bad

Some Good News

Some 2008 Good News

1. Intercage, a US hosting provider associated with the Russian Business Network, was taken offline
   - Operated in US for years from San Francisco supporting all types of criminal activity
2. McColo also taken offline
   - Supported command and control for Srizbi, largest spamming botnet of 2008, and other criminal activity
3. EstDomains de-accredited by ICANN
   - Criminal domain registrar purporting to be US company, controlled by Russian criminals
4. SanCash/GenBucks spam affiliate program shut down
   - Prosecuted by US and New Zealand law enforcement
   - Botnet affiliates spammed numerous “enhancement” products

Impact of McColo Shut Down



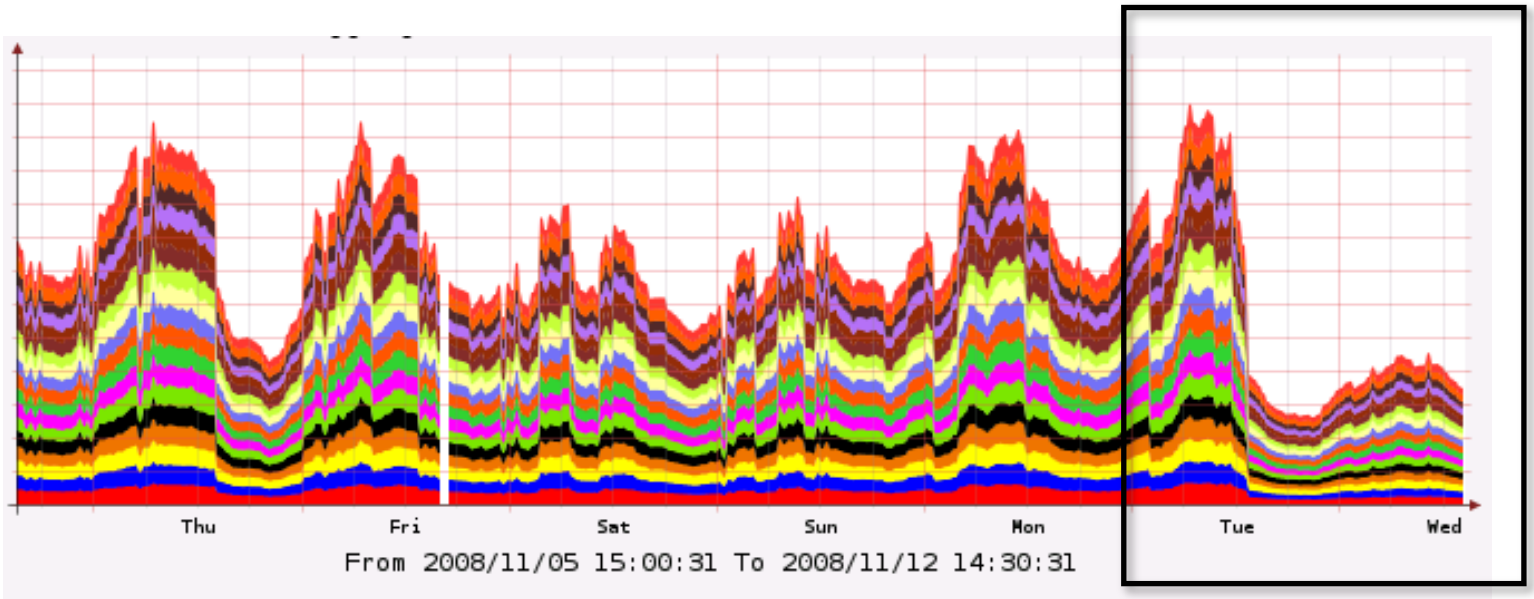
Spam Volume Growth Reprieve

SenderBase Perspective

SenderBase provides unparalleled visibility

- **30B+** queries daily
- **150+** email and Web parameters
- **30%** of the World's Traffic
- Cisco Network Devices

Global SenderBase Queries



Spam Volume Growth Reprieve

SpamCop Perspective