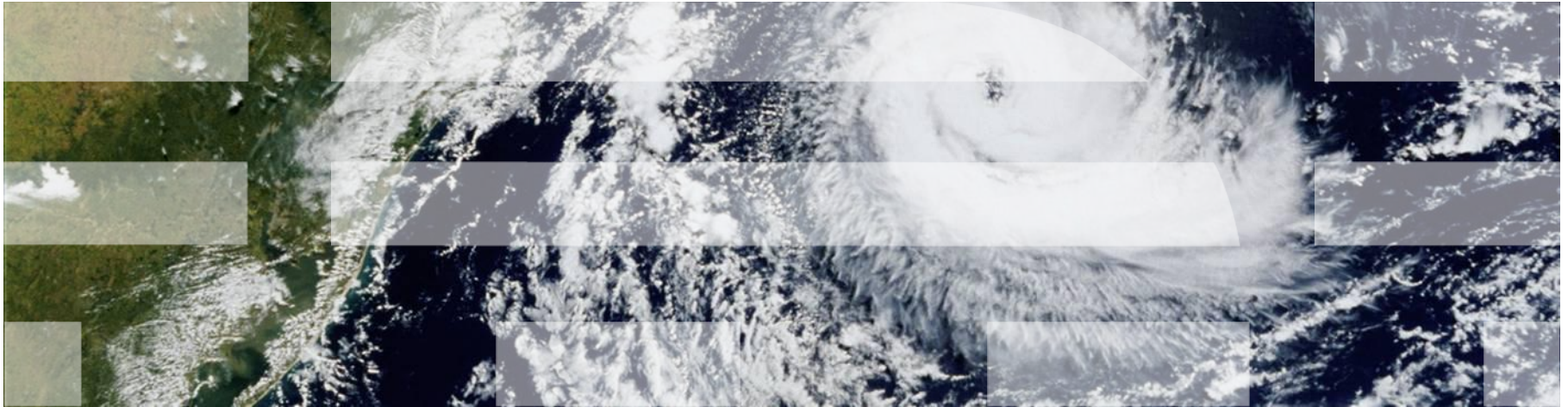


# 2010 IBM X-Force<sup>®</sup> Trend & Risk Report



## X-Force R&D - Unmatched Security Leadership

The mission of the  
IBM X-Force® research and  
development team is to:

- Research and evaluate threat and protection issues
- Deliver security protection for today's security problems
- Develop new technology for tomorrow's security challenges
- Educate the media and user communities



### X-Force Research

**14B** analyzed Web pages & images

**40M** spam & phishing attacks

**54K** documented vulnerabilities

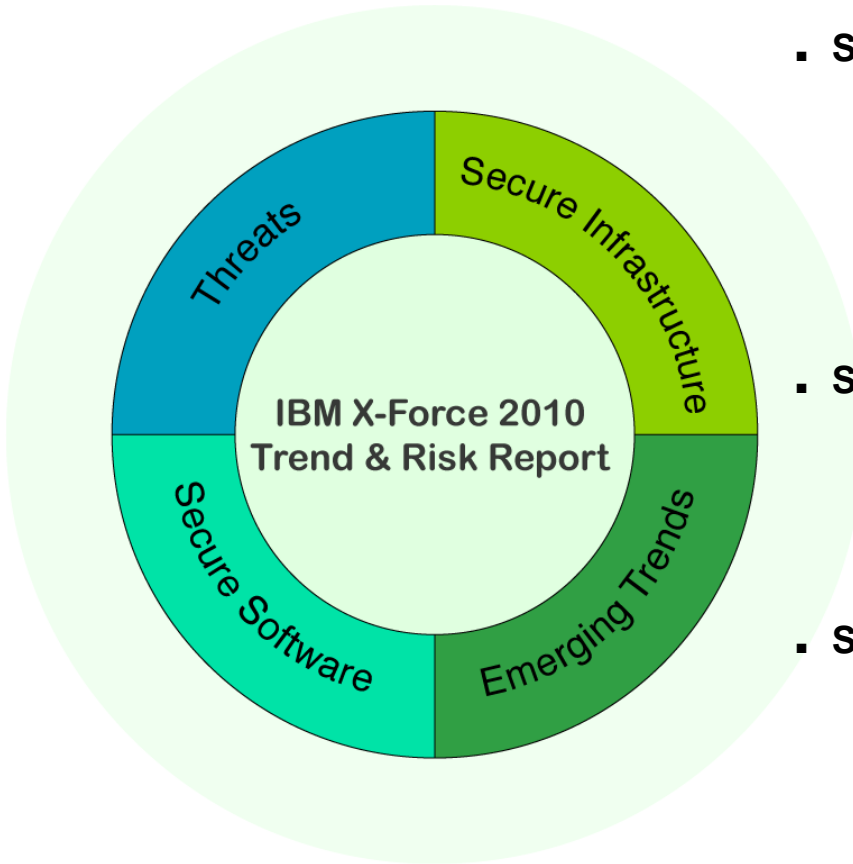
**Billions** of intrusion attempts daily

**Millions** of unique malware samples

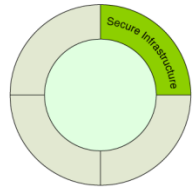
### Provides Specific Analysis of:

- Vulnerabilities & exploits
- Malicious/Unwanted websites
- Spam and phishing
- Malware
- Other emerging trends

# New Layout Design



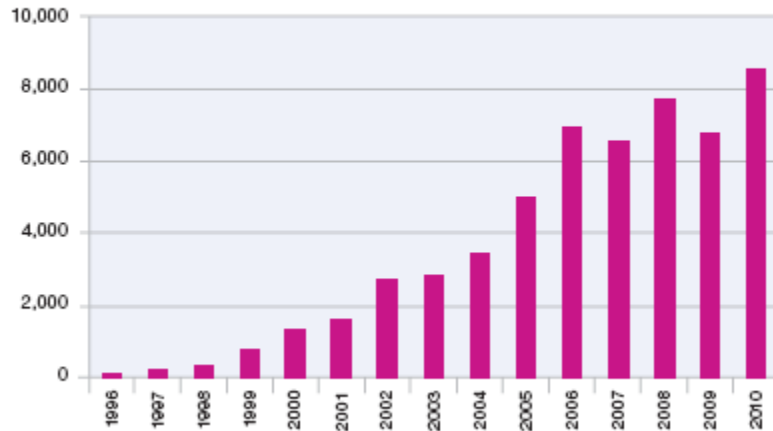
- **Section I—Threats**
  - Topics that comprise “Threats” and describe the attacks aimed at the enterprise that security specialists face.
  - Latest attack trends as identified by IBM.
- **Section II—Operating Secure Infrastructure**
  - Topics surrounding the weaknesses in process software, and infrastructure targeted by today’s threats.
  - Security compliance best practices, operating cost reduction ideas, automation, lowered cost of ownership, and the consolidation of tasks, products, and roles.
  - Present data tracked across IBM during the process of managing or mitigating these problems.
- **Section III— Developing Secure Software**
  - Proven processes and techniques for developing secure software.
  - Discussion on how enterprises can find existing vulnerabilities and help prevent new ones from being introduced.
  - Static and dynamic security testing done by the Rational AppScan group in all stages of application development and share insights
- **Section IV—Emerging Trends in Security**
  - Developing technology that presses upon enterprises for future investments
  - Explaining where threats and exploits are being utilized in these early technology adoptions and how enterprises can stay focused.



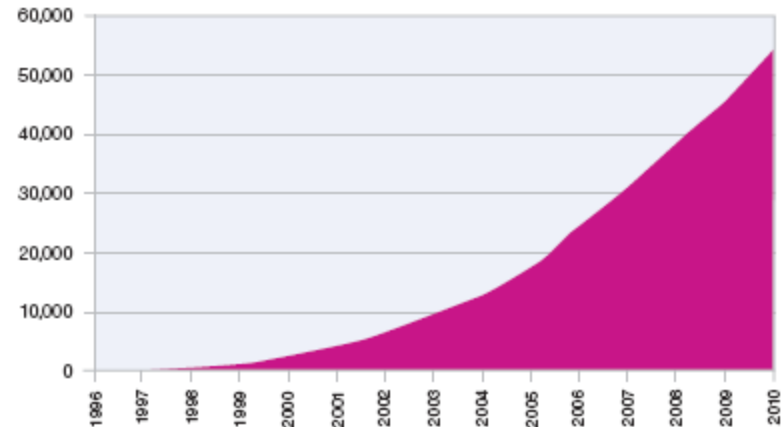
# Vendors Reporting the Largest Number of Vulnerability Disclosures in History

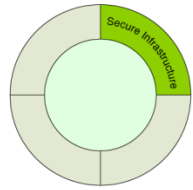
- Vulnerability disclosures up **27%**.
  - Web applications continue to be the largest category of disclosure.
- Significant increase across the board signifies efforts that are going on throughout the software industry to improve software quality and identify and patch vulnerabilities.

Vulnerability Disclosures Growth by Year  
1996-2010



Cumulative Vulnerability Disclosures  
1996-2010





## Patches Still Unavailable for Many Vulnerabilities

- **44%** of all vulnerabilities disclosed in 2010 had no vendor-supplied patches to remedy the vulnerability.
  - Most patches become available for most vulnerabilities at the same time that they are publicly disclosed.
  - However some vulnerabilities are publicly disclosed for many weeks before patches are released.

**Patch Release Timing – First 8 Weeks of 2010**

Patch Timeline	All	Top Vendors
Same Day	3400	1814
Week 1	192	34
Week 2	55	11
Week 3	57	12
Week 4	33	7
Week 5	27	7
Week 6	22	4
Week 7	17	3
Week 8	16	8

# Public Exploit Exposures Up in 2010



- Public exploit disclosures up **21%** in 2010 versus 2009
  - Approximately **14.9%** of the vulnerabilities disclosed in 2010 had public exploits, which is down slightly from the 15.7% last year
  - However more vulnerabilities were disclosed this year, so the total number of exploits increased.
  - The vast majority of public exploits are released the same day or in conjunction with public disclosure of the vulnerability.

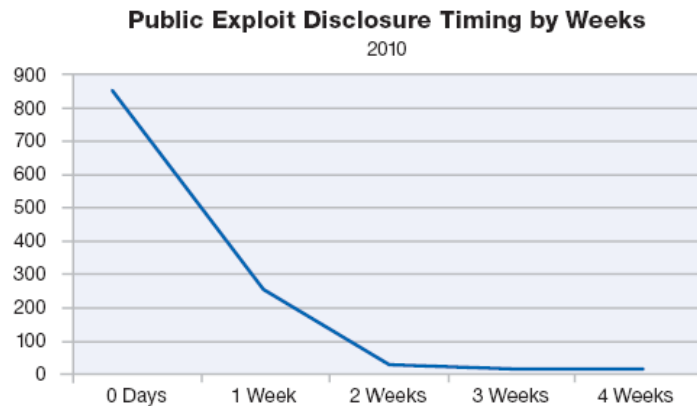


Figure 54: Public Exploit Disclosure Timing by Weeks – 2010

Exploit Timing	0 Days	1 Week	2 Weeks	3 Weeks	4 Weeks
0 Days	854	270	18	9	9

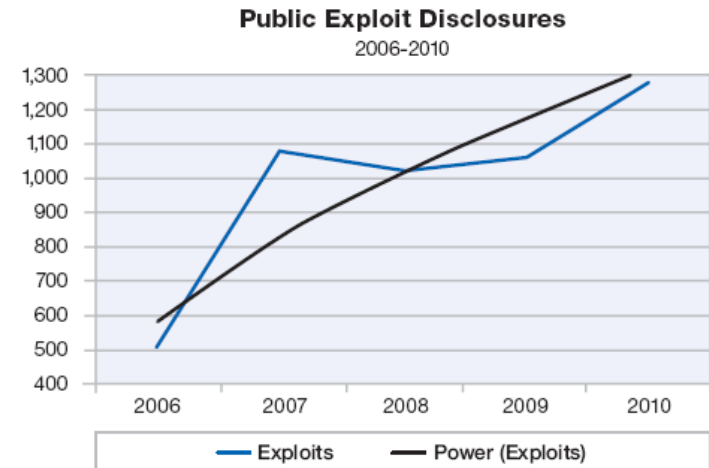
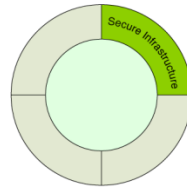


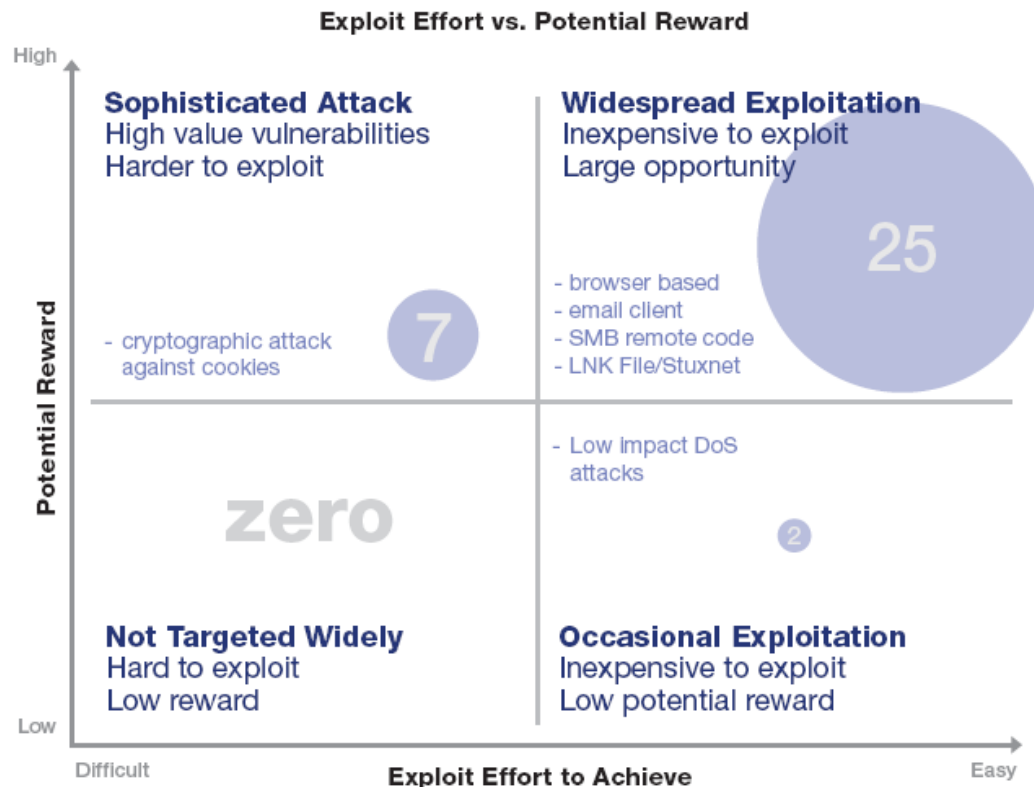
Figure 53: Public Exploit Disclosures – 2006-2010

	2006	2007	2008	2009	2010
True Exploits	504	1078	1025	1059	1280
Percentage of Total	7.3%	16.5%	13.4%	15.7%	14.9%

# Exploit Effort vs. Potential Reward



- Economics continue to play heavily into the exploitation probability of a vulnerability
- All but one of the 25 vulnerabilities in the top right are vulnerabilities in the browser, the browser environment, or in email clients.
- The only vulnerability in this category that is not a browser or email client side issue is the LNK file vulnerability that the Stuxnet worm used to exploit computers via malicious USB keys.





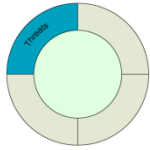
# Top Attacks seen by X-Force in 2010

- Automated SQL Injection attacks
- Lateral scanning of the entire Internet for services with weak passwords
- The SQL Slammer worm was responsible for a huge amount of malicious traffic in 2010 but traffic levels dropped off significantly in March, 2011. (For more info see the [Frequency-X Blog](#).)

Rank	Event Name	Trend Line
1	SQL_SSRP_Slammer_Worm	Down
2	SQL_injection	Down
3	Psexec_Service_Accessed	Slightly Up
4	SSH_Brute_Force	Slightly Down
5	JScript_CollectGarbage	Up
6	HTTP_Unix_Passwords	Slightly Up
7	SMB_Mass_Login	Down
8	SMB_Empty_Password	No Change
9	SQL_Empty_Password	Up

Table 1: Top MSS high volume signatures and trend line

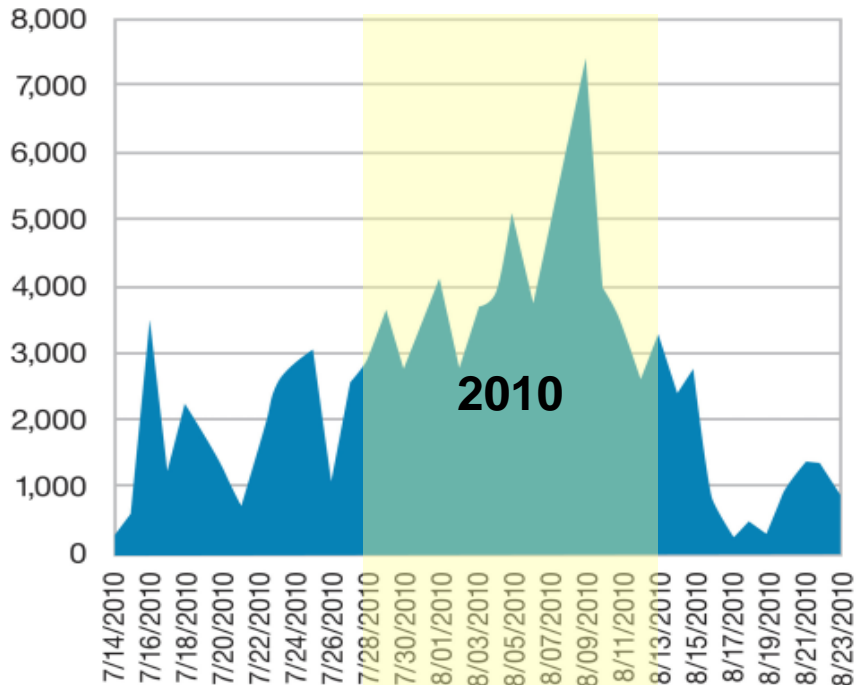




# SQL Injection Attacks

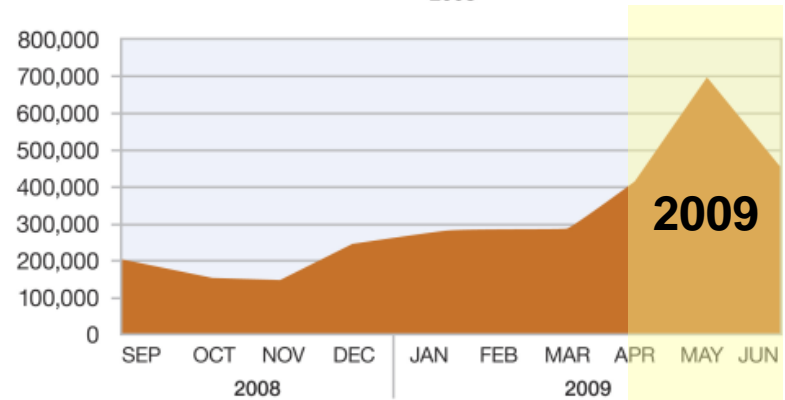
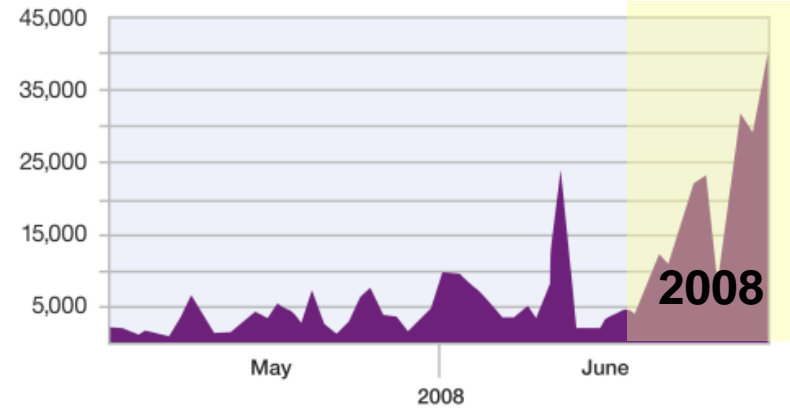
- During each of the past three years, there has been a globally scaled SQL injection attack some time during the months of May through August.
- The anatomy of these attacks is generally the same: they target .ASP pages that are vulnerable to SQL injection.

**SQL\_Injection\_Declare\_Exec Activity**



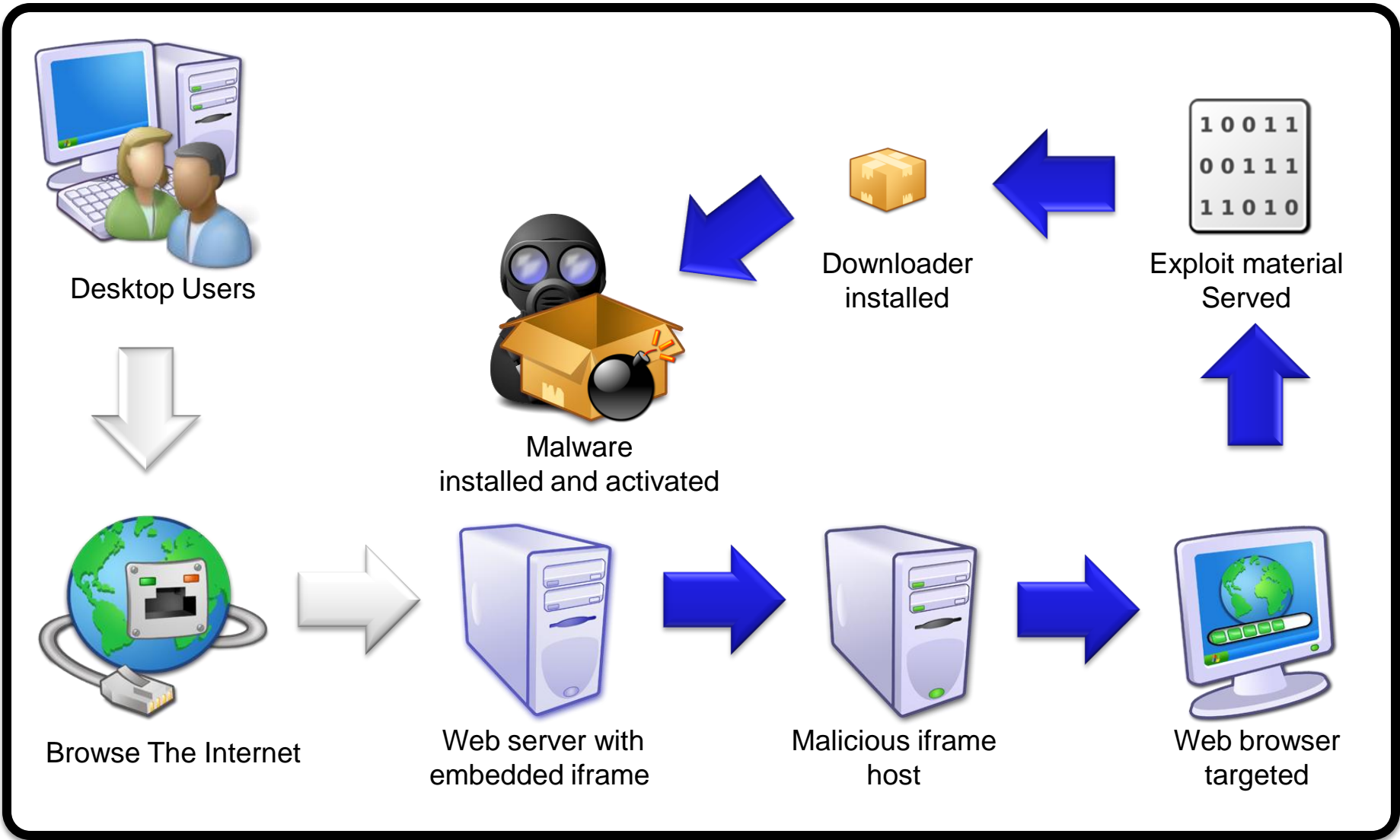
Source: IBM X-Force®

**SQL Injection Attacks Monitored by IBM Managed Security Services**



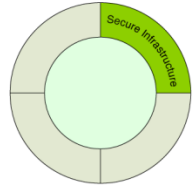
Source: IBM X-Force®

# The drive-by-download process



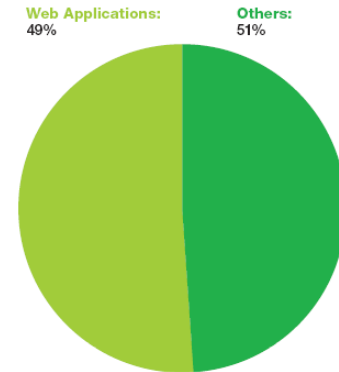


# Web App Vulnerabilities Continue to Dominate

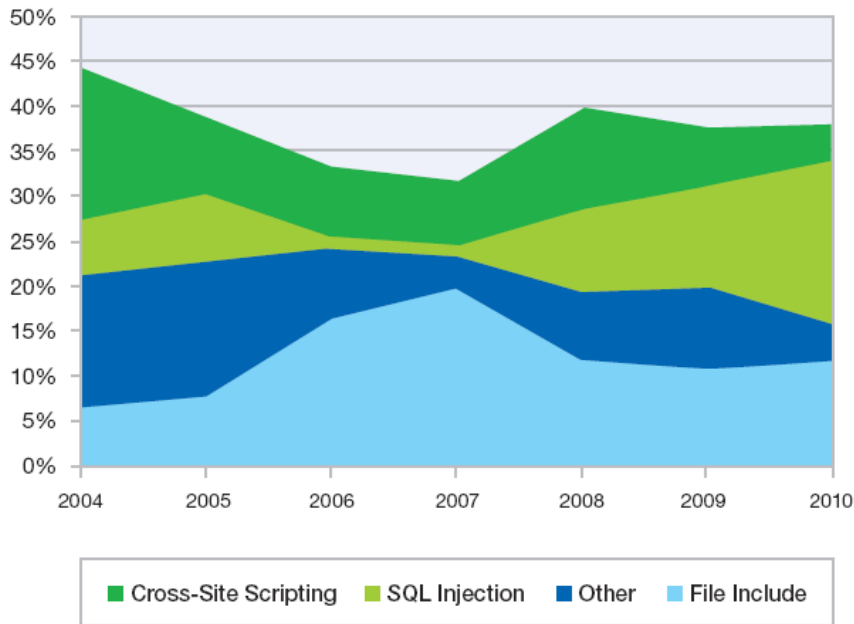


- Nearly half (**49%**) of all vulnerabilities are Web application vulnerabilities.
- Cross-Site Scripting & SQL injection vulnerabilities continue to dominate.

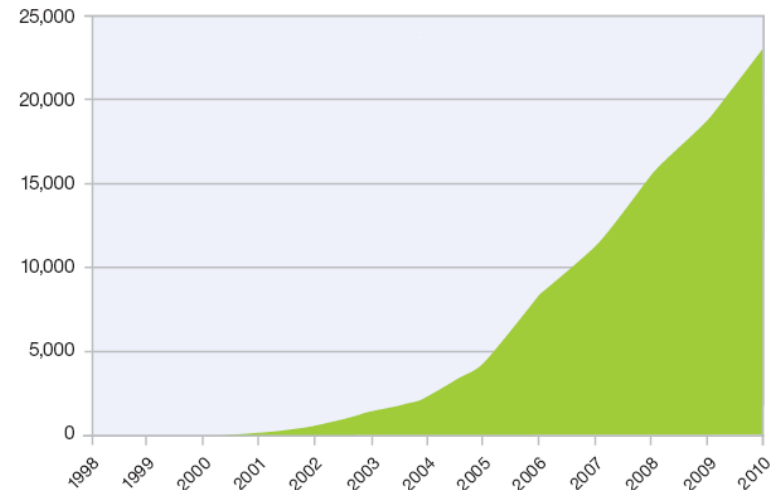
**Web Application Vulnerabilities**  
as a Percentage of All Disclosures in 2010

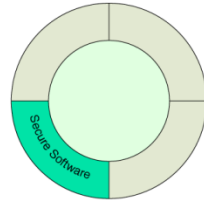


**Web Application Vulnerabilities by Attack Technique**  
2004-2010



**Cumulative Count of Web Application Vulnerability Disclosures**  
1998-2010

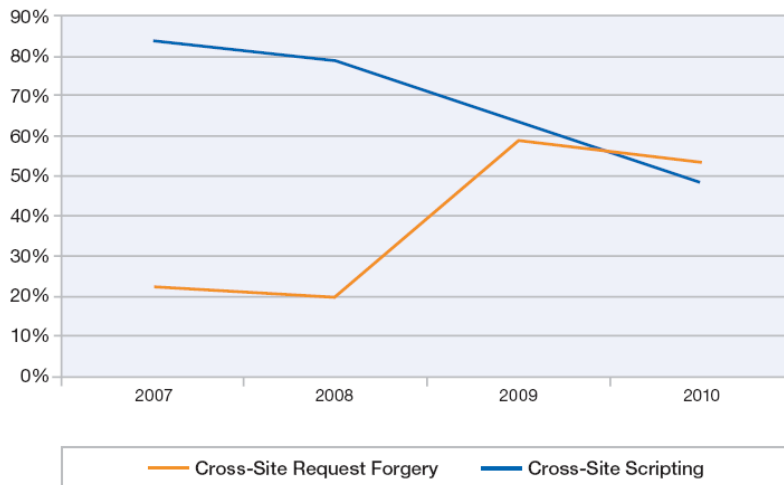




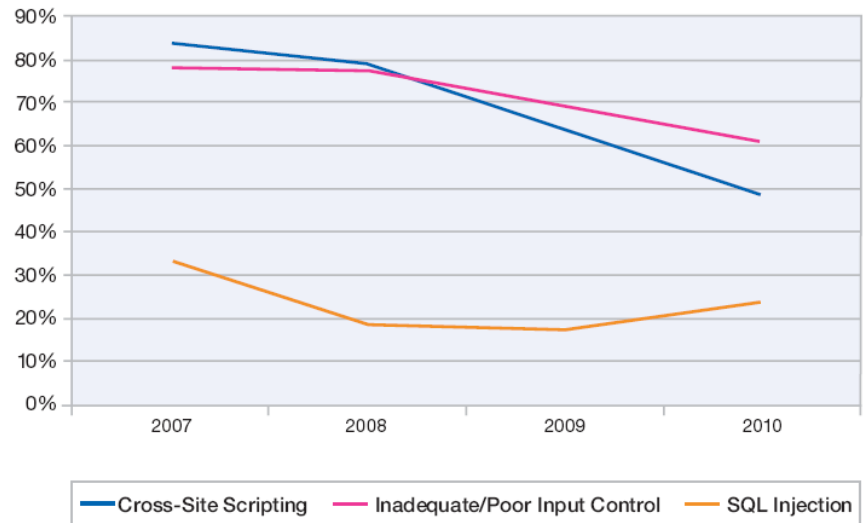
# Real World Conclusions from Web App Assessments

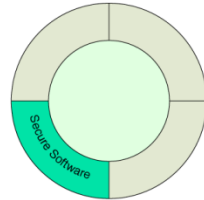
- In 2010, for the first time, we now find that Cross-Site Request Forgery (CRSF) vulnerabilities are more likely to be found in our testing than Cross-Site Scripting (XSS) vulnerabilities.
- XSS and SQL injection are both attributed directly to a lack of input control. The likelihood of finding it in 2010 is more than **60%**.

**Cross-Site Request Forgery vs. Cross-Site Scripting Vulnerabilities**  
 IBM® Rational® AppScan® OnDemand Premium Service  
 2007-2010



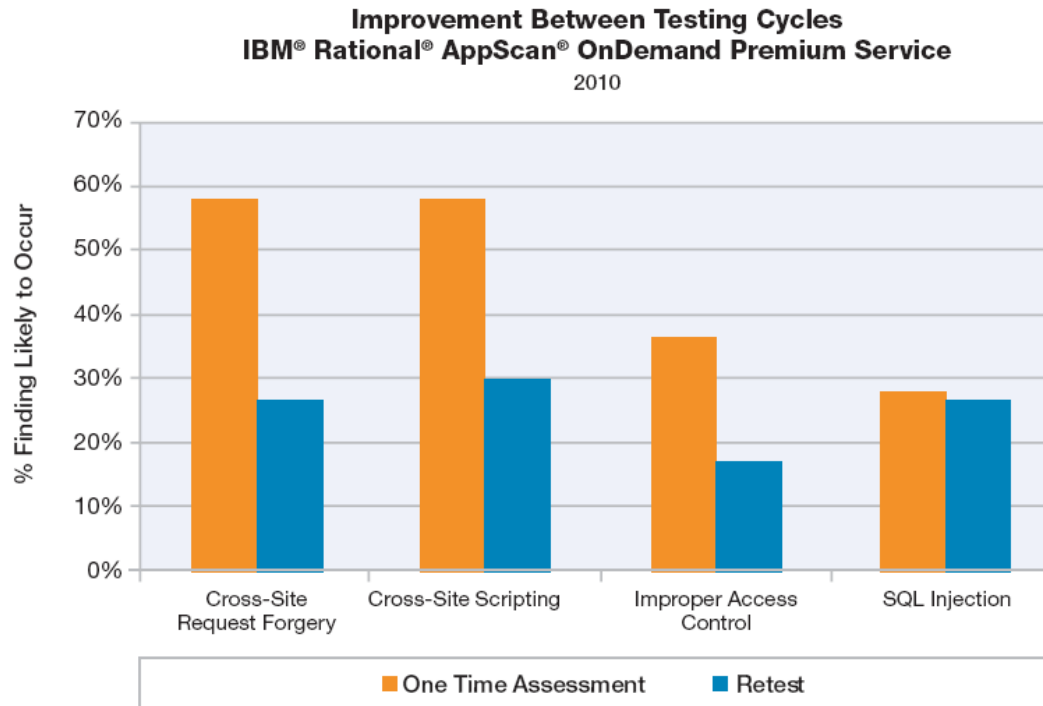
**Annual Trends for Web Application Vulnerability Types**  
 IBM® Rational® AppScan® OnDemand Premium Service  
 2007-2010



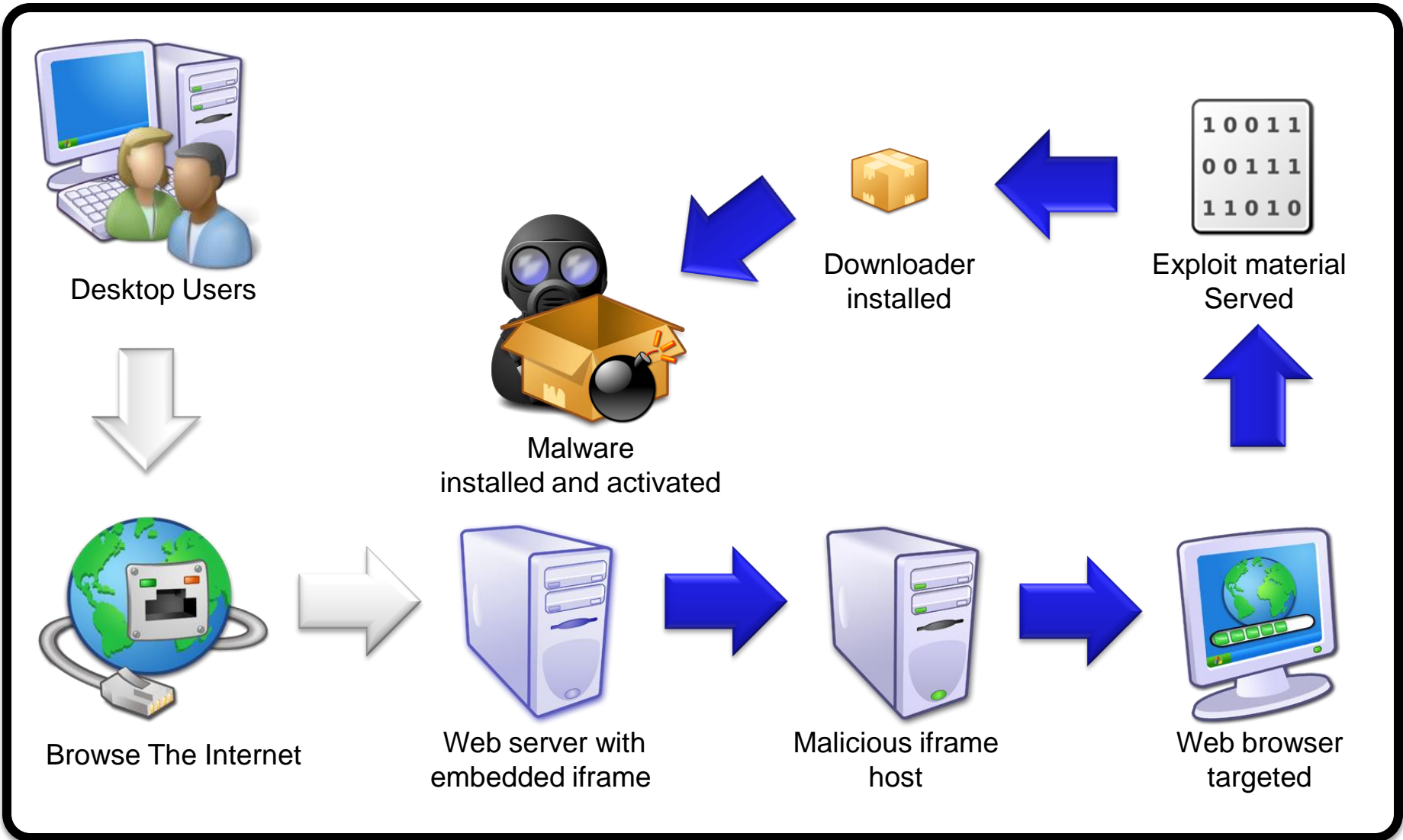


## Improvement Between Application Testing Cycles

- There is a significant decline in the likelihood of finding application vulnerabilities in a retest.
- In many cases this reduction is more than half that of the original.
- Demonstrates the importance of testing applications but also follow up and mitigation.



# The drive-by-download process




2 Weeks Ago #1

**BleedingLife** ◦  
Junior Member

Join Date: Mar 2011  
Posts: 2  
Reputation: 0

**Bleeding Life v2: RELOADED \*\*Exploit Pack\*\***



**INTRODUCTION:**

BleedingLife Exploit Pack was looked down upon in the beginning of its start. As time went on and users began to take a chance with this pack, they've eventually understood BL is no normal pack. With less exploits and a higher rate than other packs, BL has really made a name for itself. Now, BL has turned into a series. BL v1, BL v2, BL Mini-Java, BL Java Edition, BL Adobe Edition. And... Here before us, BL v2 Reloaded. If you want a low cost, high rate and great quality pack... Purchase BleedingLife v2 Reloaded!

## EXPLOITS:

- [x] CVE-2008-2992
- [x] CVE-2010-0188
- [x] CVE-2010-0842
- [x] CVE-2010-1297
- [x] CVE-2010-2884
- [x] CVE-2010-3552
- [x] JavaSignedApplet (Requires user interaction but can be disabled.)
- [x] All exploits bypass ASLR and DEP where needed.

## AVERAGE RATE:

- [x] BL v2 has an average rate between 30% - 40%
- [x] SS/Proof coming soon ...

## PAYMENT OPTIONS:

- [x] BleedingLife v2 Reloaded - \$400.00
- [x] FUD Update - \$50.00
- [x] Domain Change - \$50.00
- [x] Liberty Reserve & WebMoney ONLY!
- [x] Previous v2 Buyers - FREE Update!

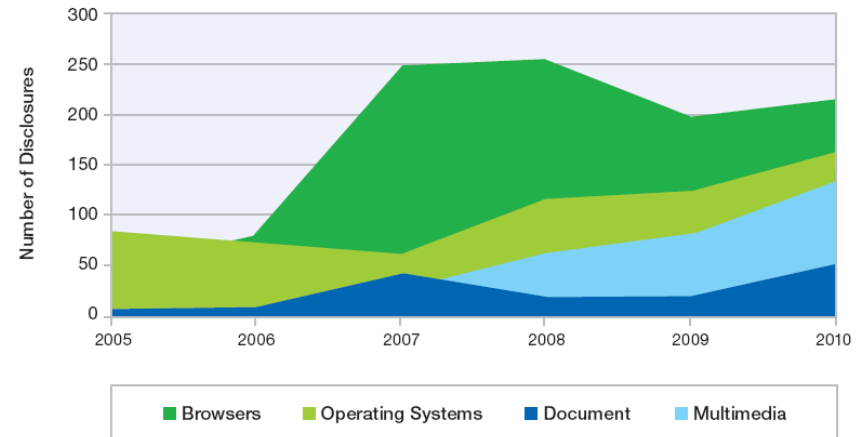


# Client-Side Vulnerabilities: Web Browser, Document Reader & Multimedia Player Vulnerabilities Continue to Impact End Users

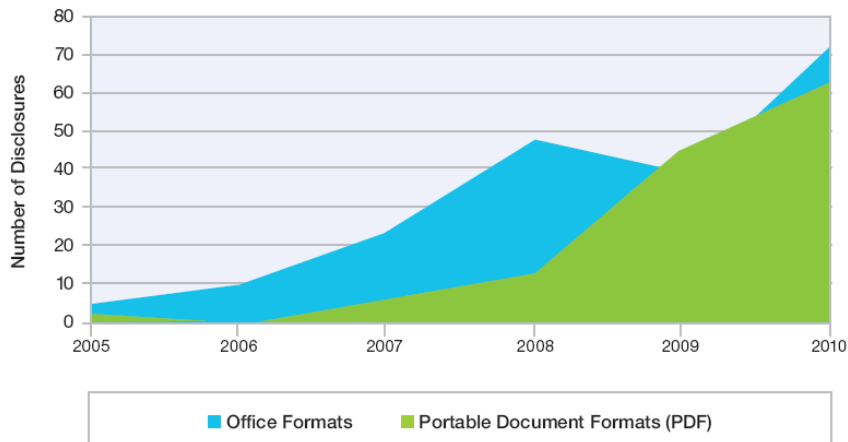


- Web browsers and their plug-ins continue to be the largest category of client-side vulnerabilities.
- 2010 saw an increase in the volume of disclosures in document readers and editors as well as multimedia players.

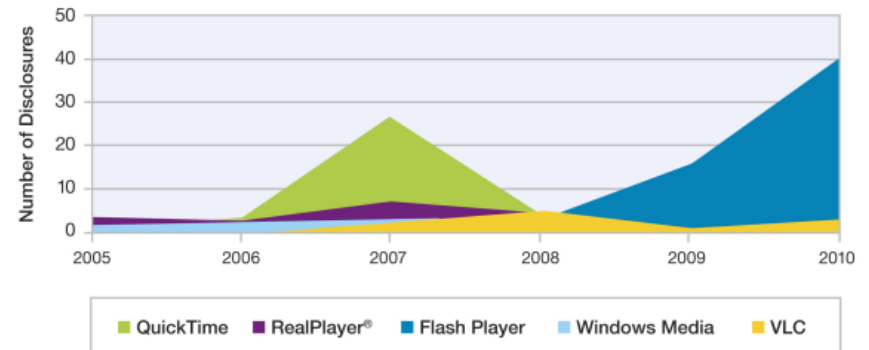
**Top Client Categories**  
Changes in Critical and High Client Software Vulnerabilities



**Vulnerability Disclosures Related to Critical and High Document Format Issues**  
2005-2010



**Critical and High Vulnerability Disclosures Affecting Multimedia Software**  
2005-2010

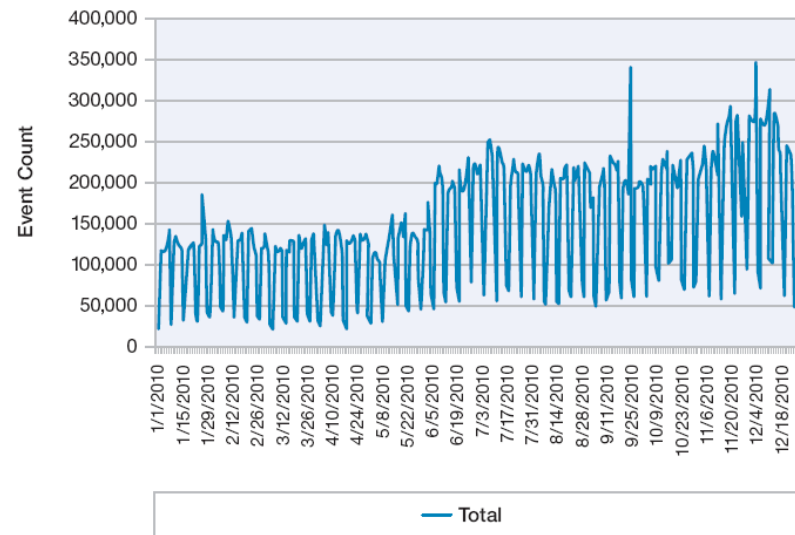




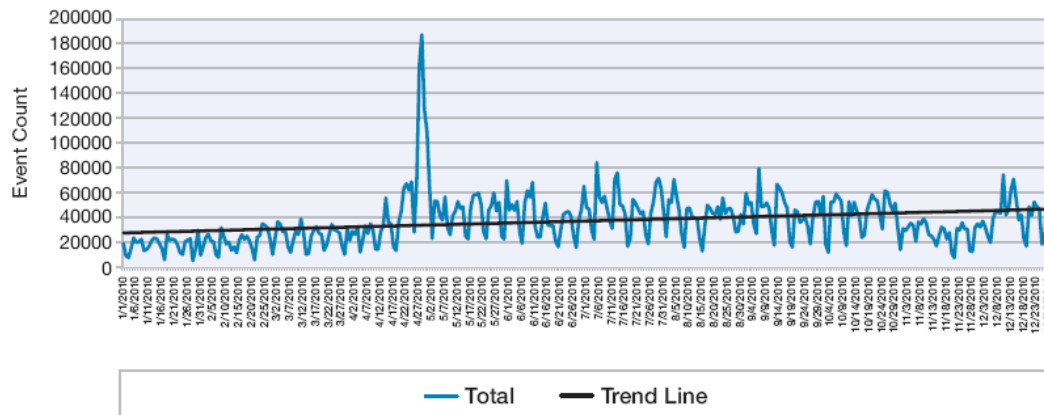
# Suspicious Web Pages and Files Show No Sign of Waning

- Obfuscation activity continued to increase during 2010.
- Attackers never cease to find new ways to disguise their malicious traffic via JavaScript and PDF obfuscation.
  - Obfuscation is a technique used by software developers and attackers alike to hide or mask the code used to develop their applications.

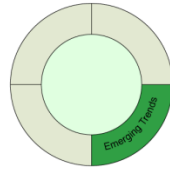
**Obfuscation Activity**



**PDF Activity**

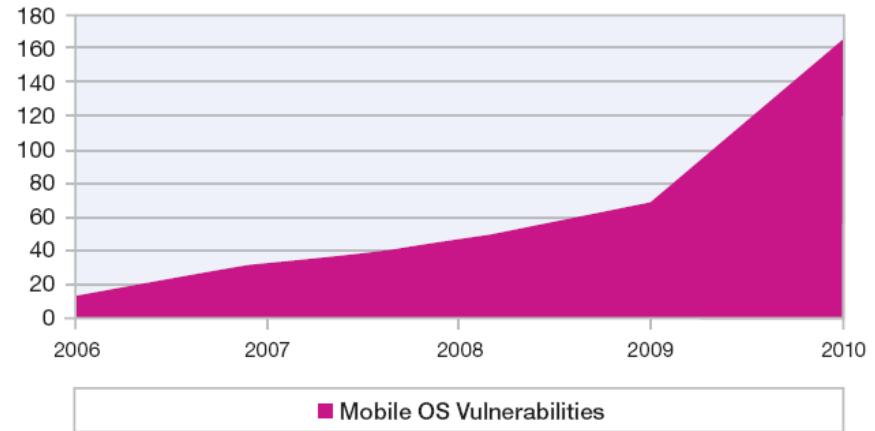


# Proliferation of Mobile Devices Raises Security Concerns

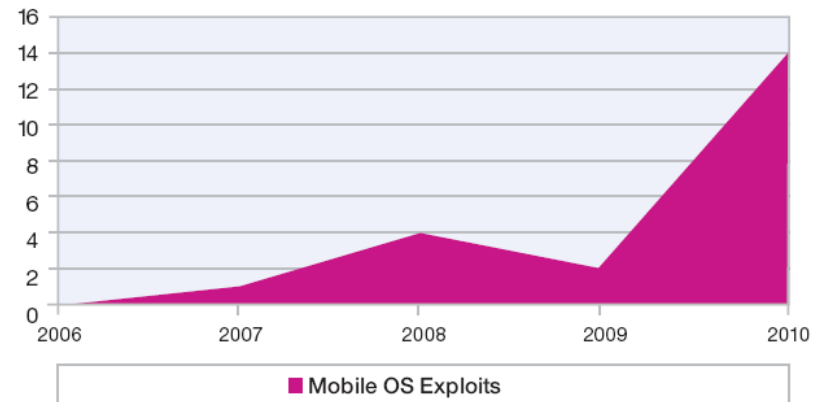


- 2010 saw significant increases in the number of vulnerabilities disclosed for mobile devices as well as number of public exploits released for those vulnerabilities.
  - Motivations of these exploit writers is to “jailbreak” or “root” devices enabling various functionality not intended by manufacturers.
  - Malicious applications were distributed in the Android app market that used widely disseminated exploit code to obtain root access to devices and steal information.

**Total Mobile Operating System Vulnerabilities**  
2006-2010

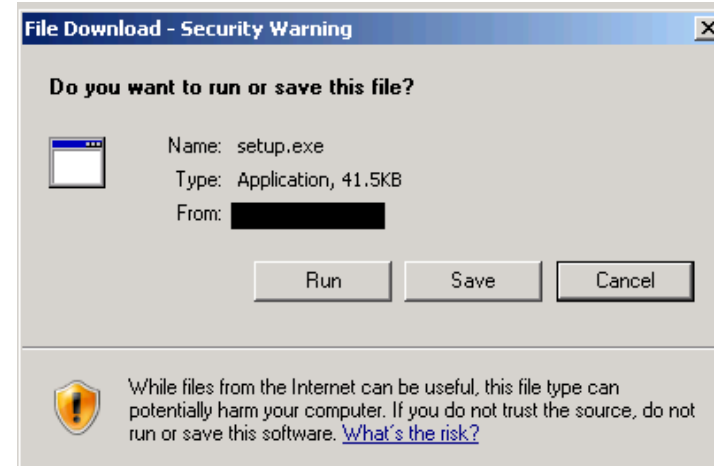


**Total Mobile Operating System Exploits**  
2006-2010



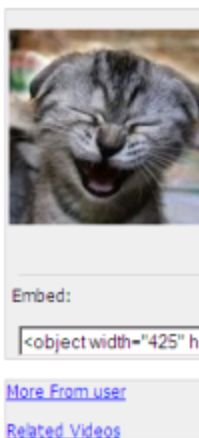
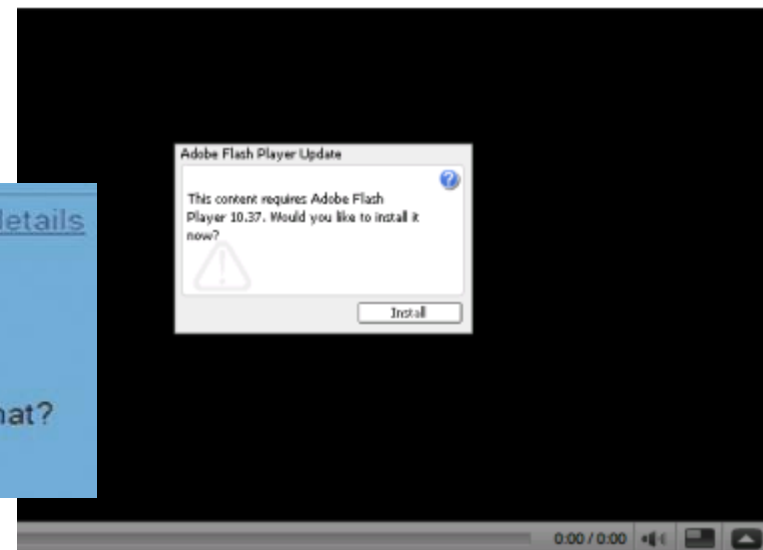
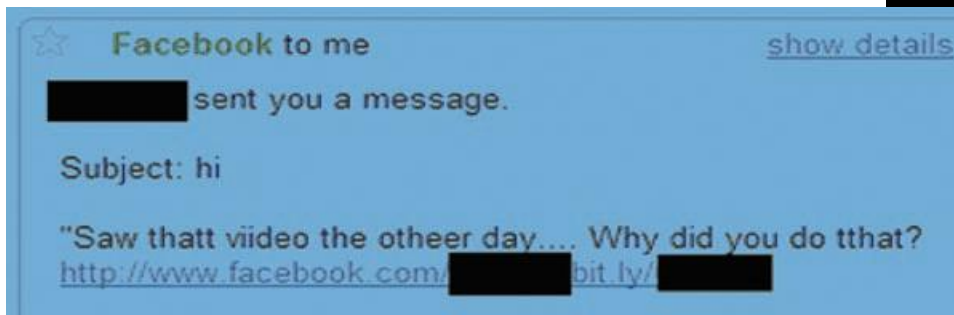
# Spear Phishing and Social Engineering on the Rise

- Social networks represent a vehicle for malware authors to distribute their programs in ways that are not easily blocked. Examples include:
  - Antivirus 2009, which lures users into downloading a fake AV product.
  - The Koobface Worm which infiltrated Facebook, Myspace, and other social networking sites.
  - The Jahlav Trojan which used Twitter to infect Mac users.



**posted by \* Tiger \***

- “There is no patch for stupid.”



# Advanced Persistent Threat

## ■ Example of e-mail with malicious PDF

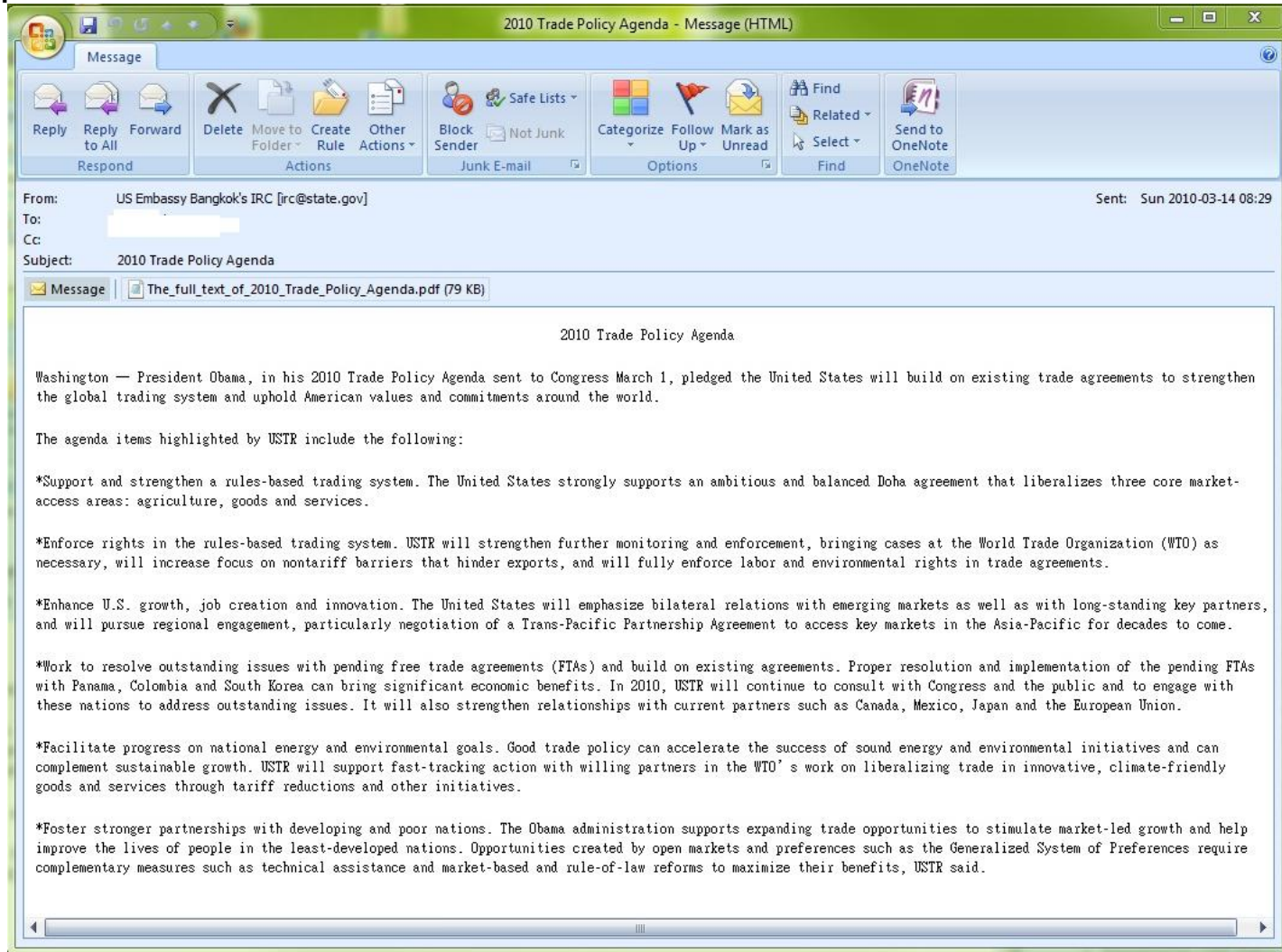
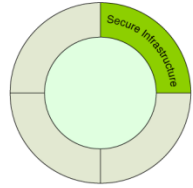
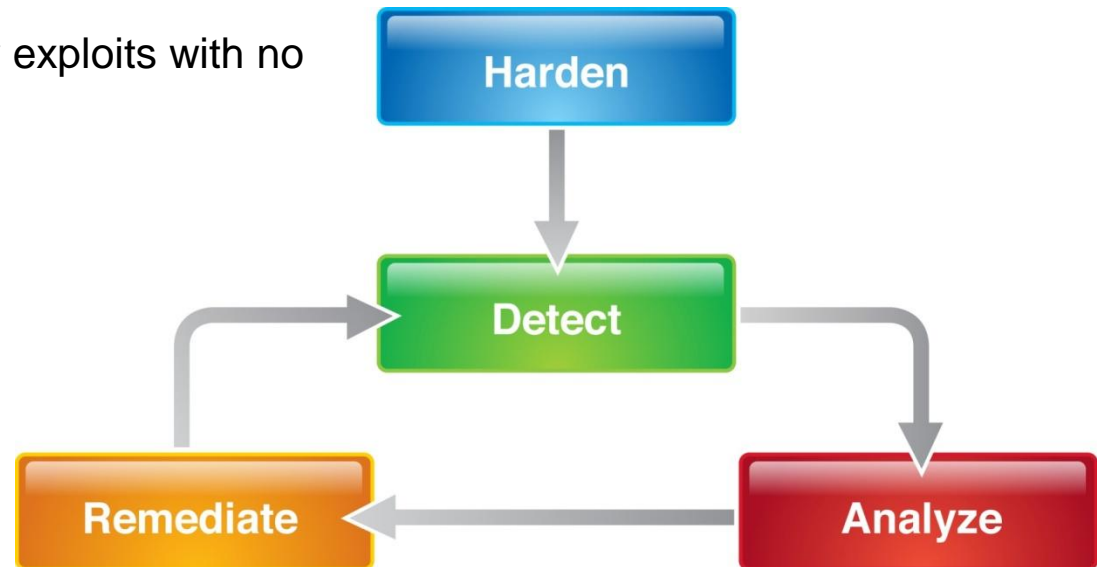


Image Source: <http://contagiodump.blogspot.com/>

# Stuxnet and Advanced Persistent Threats (APT)



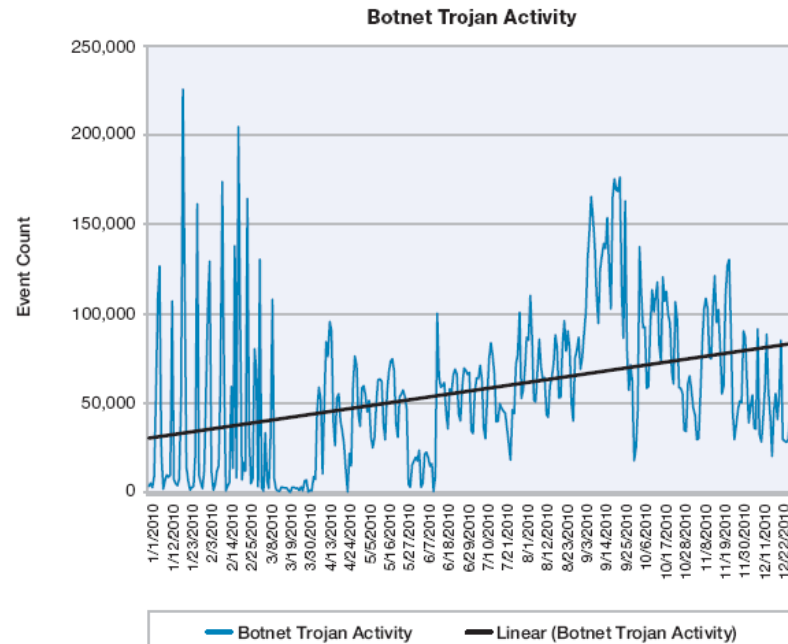
- APT previously thought to be exploitation of cyber-defense systems for the purpose of economic, political or military gain -- now associated with any targeted, sophisticated or complex attack regardless of attacker motive.
- Often a high-value target is an end-user system such as one that belongs to person who has access to sensitive data.
- Stuxnet took advantage of Zero day exploits with no work around or patch





# Bot Network Activity on the Rise in 2010

- Trojan Bot networks continued to evolve in 2010 by widespread usage and availability.
- Zeus (also known as Zbot and Kneber) continue to evolve through intrinsic and plugin advances.
- Various bot networks based on Zeus were responsible for millions of dollars in losses over the last few years.
- Microsoft led operation resulted in the takedown of a majority of Waldec botnet in late February.
  - Communication between Waledac's command and control centers and its thousands of zombie computers was cut off in a matter of days.
- Much of the other activity seen is Zeus.





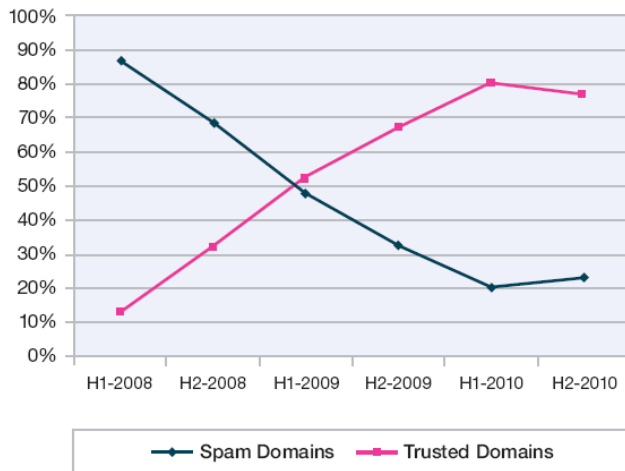




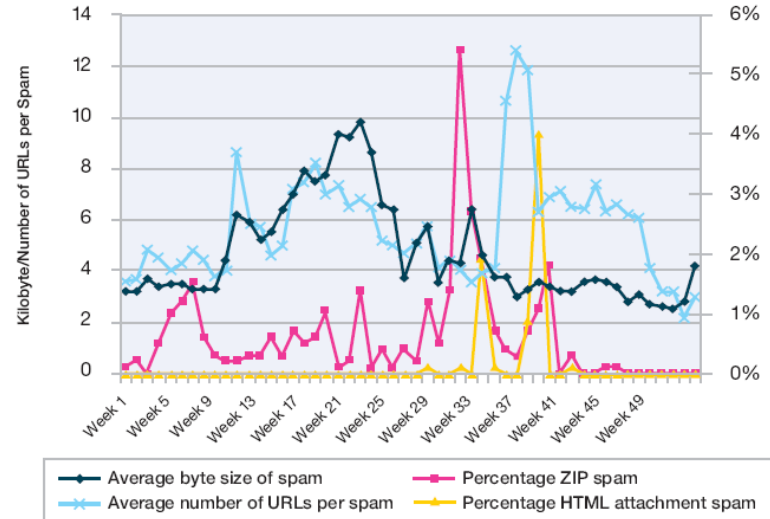
# Spammers Focus on Content Rather than Volume

- Spammers made a continuous effort in 2010 to regularly change technical contents of spam messages rather than increasing volume.
  - Moving from random text spam combined with random URLs, ZIP Attachments, HTML attachments, to significantly increasing the average byte size of spam.
  - The amount of URL spam using well-known and trusted domain names declined slightly in the 2nd half of 2010, for the first time in more than two years.

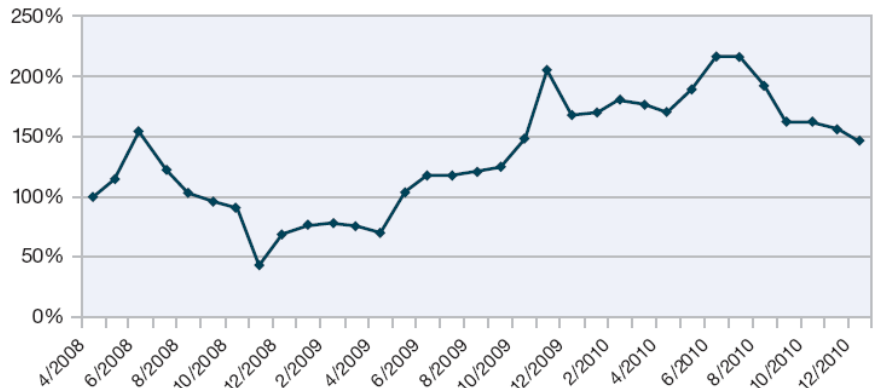
**Top Ten Domains Used in Spam  
Spam Domains vs. Trusted Domains**  
H1-2008 to H2-2010



**Major Content Trends in Spam**  
2010 per week



**Changes in Spam Volume**  
April 2008 to December 2010

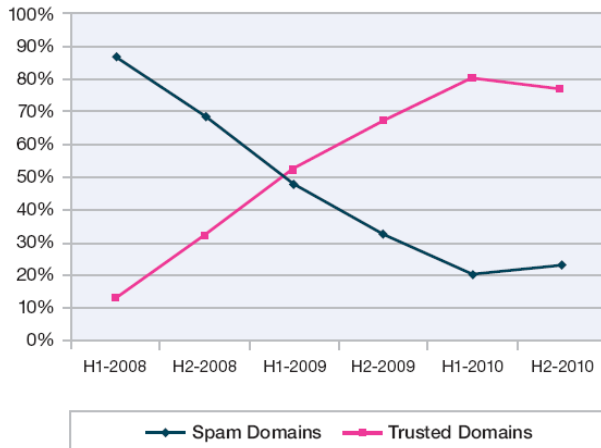




# Spam Continues to Change to Avoid Detection

- **90%** of spam is classified as URL spam.
- Spammers continue to use “trusted” domains and “legitimate links” in spam messages to avoid anti-spam technologies.
- US, India, Brazil, and Vietnam were the top four spam-sending countries, accounting for nearly one-third of worldwide spam.
  - The US once again takes the top position for the first time since 2007.

**Top Ten Domains Used in Spam  
Spam Domains vs. Trusted Domains**  
H1-2008 to H2-2010



Rank	January 2010	February 2010	March 2010	April 2010	May 2010	June 2010
1.	flickr.com	radikal.ru	livefilestore.com	livefilestore.com	imageshack.us	imageshack.us
2.	imageshack.us	imageshack.us	imageboo.com	imageshack.us	imageshost.ru	imageshost.ru
3.	radikal.ru	livefilestore.com	radikal.ru	imageshost.ru	myimg.de	pikucha.ru
4.	livefilestore.com	flickr.com	imageshack.us	imgur.com	xs.to	imgur.com
5.	webmd.com	live.com	googlegroups.com	myimg.de	imgur.com	mytasvir.com
6.	picsochka.ru	imageboo.com	live.com	xs.to	tinypic.com	mojoimage.com
7.	live.com	capalola.biz	akamaitech.net	icontact.com	livefilestore.com	myimg.de
8.	superbshore.com	feetorder.ru	gonestory.com	tinypic.com	icontact.com	twimg.com
9.	tumblr.com	laughexcite.ru	bestanswer.ru	live.com	googlegroups.com	icontact.com
10.	fairgreat.com	hismouth.ru	wrotelike.ru	binkyounet.net	images-amazon.com	twitter.com

Rank	July 2010	August 2010	September 2010	October 2010	November 2010	December 2010
1.	imageshack.us	yahoo.com	the.com	businessinsider.com	rolex.com	pfizer.com
2.	icontact.com	the.com	of.com	migre.me	msn.com	viagra.com
3.	the.com	icontact.com	msn.com	4freeimagehost.com	bit.ly	msn.com
4.	myimg.de	feetspicy.com	pfizerhelpfulanswers.com	bit.ly	pfizer.com	rolex.com
5.	of.com	of.com	and.com	postimage.org	co.cc	bit.ly
6.	imgur.com	ratherwent.com	bit.ly	imgur.com	royalfoote.com	product45h.com
7.	by.ru	and.com	in.com	pfizer.com	royalbelie.com	newpfizermed5k.com
8.	and.com	facebook.com	yahoo.com	viagra.com	royalreleasable.com	xmages.net
9.	in.com	in.com	a.com	uploadgeek.com	luxurystorewatch.com	cordfork.com
10.	tastymighty.com	a.com	x-misc.com	viplayerq.com	basincook.com	onlinepfizersoft2.com

Table 3: Most common domains in URL spam, 2010

Country	% of Spam
USA	10.9%
India	8.2%
Brazil	8.1%
Vietnam	5.4%
Russia	5.2%

Country	% of Spam
United Kingdom	4.4%
Germany	3.7%
South Korea	3.3%
Ukraine	3.0%
Romania	2.9%

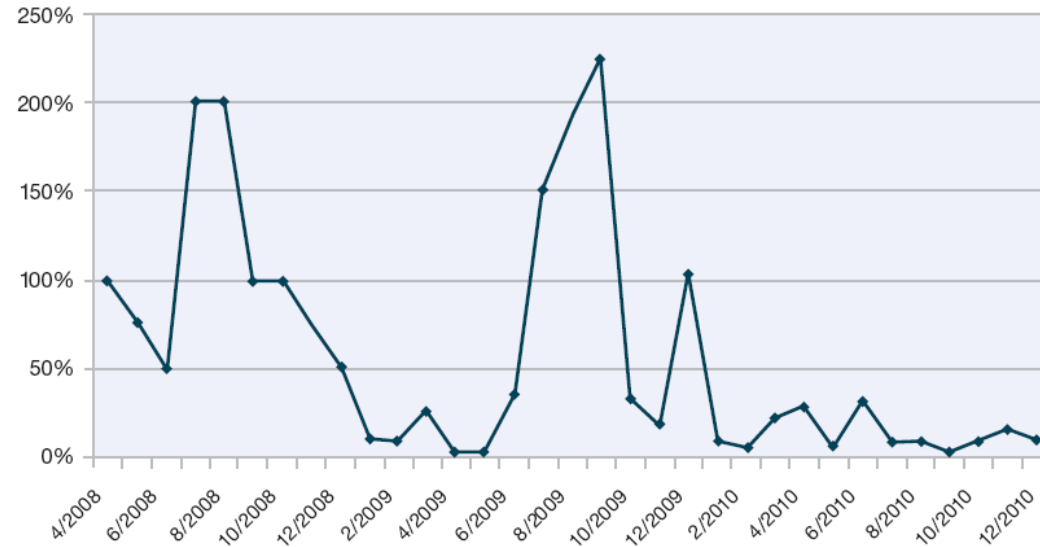
Table 5: Geographical Distribution of Spam Senders – 2010



# Phishing Attacks Continue to Decline

- In 2010, Phishing emails slowed and the volume did not reach the levels seen at the end of 2009.
- India is the top sender in terms of phishing volume, while Russia is in second place, and Brazil holds third place.
  - Newcomers in the top 10 are Ukraine, Taiwan, and Vietnam, while Argentina, Turkey, and Chile disappeared from this list.
- Over time popular subject lines continue to drop in importance.
  - By 2010, the top 10 most popular subject lines only represented about 26 percent of all phishing emails

**Phishing Volume Over Time**  
April 2008 to December 2010



Country	% of Phishing
India	15.5%
Russia	10.4%
Brazil	7.6%
USA	7.5%
Ukraine	6.3%

Country	% of Phishing
South Korea	4.7%
Colombia	3.0%
Taiwan	2.2%
Vietnam	2.2%
Poland	1.8%

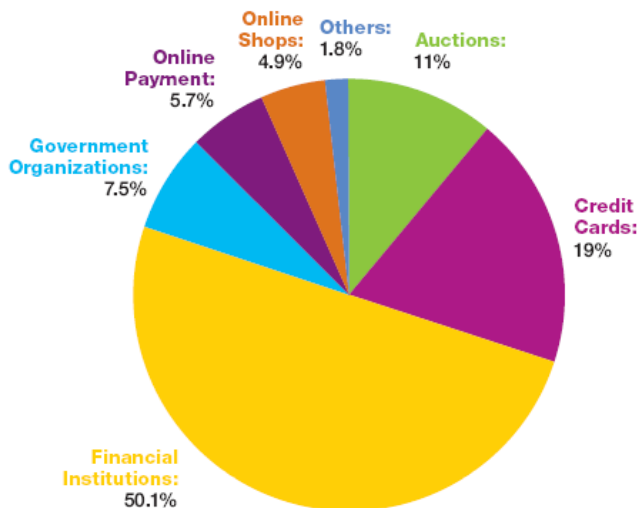
Table 7: Geographical Distribution of Phishing Senders – 2010



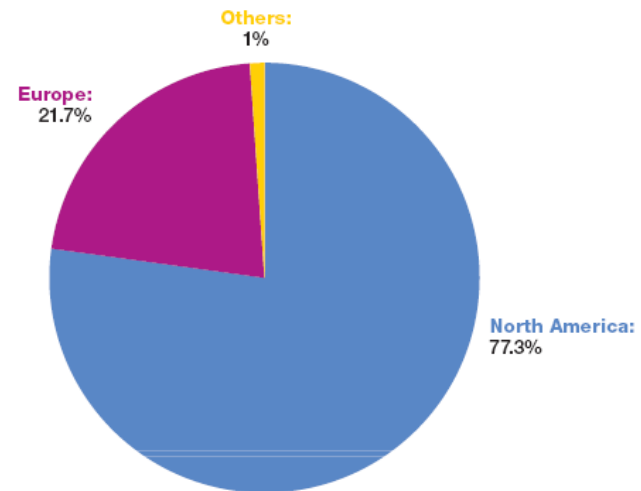
# Phishing Targets Financial & Credit Card Industries

- **50.1%** of phishing is targeted at the financial industry vs. **60.9%** in 2009.
- **77%** of all financial phishing targets in the 2010 are located in North America vs. **95%** in 2009.
  - **22%** of financial phishing targets are located in Europe
- **19%** of phishing emails were targeted at credit cards.

**Phishing Targets by Industry**  
2010



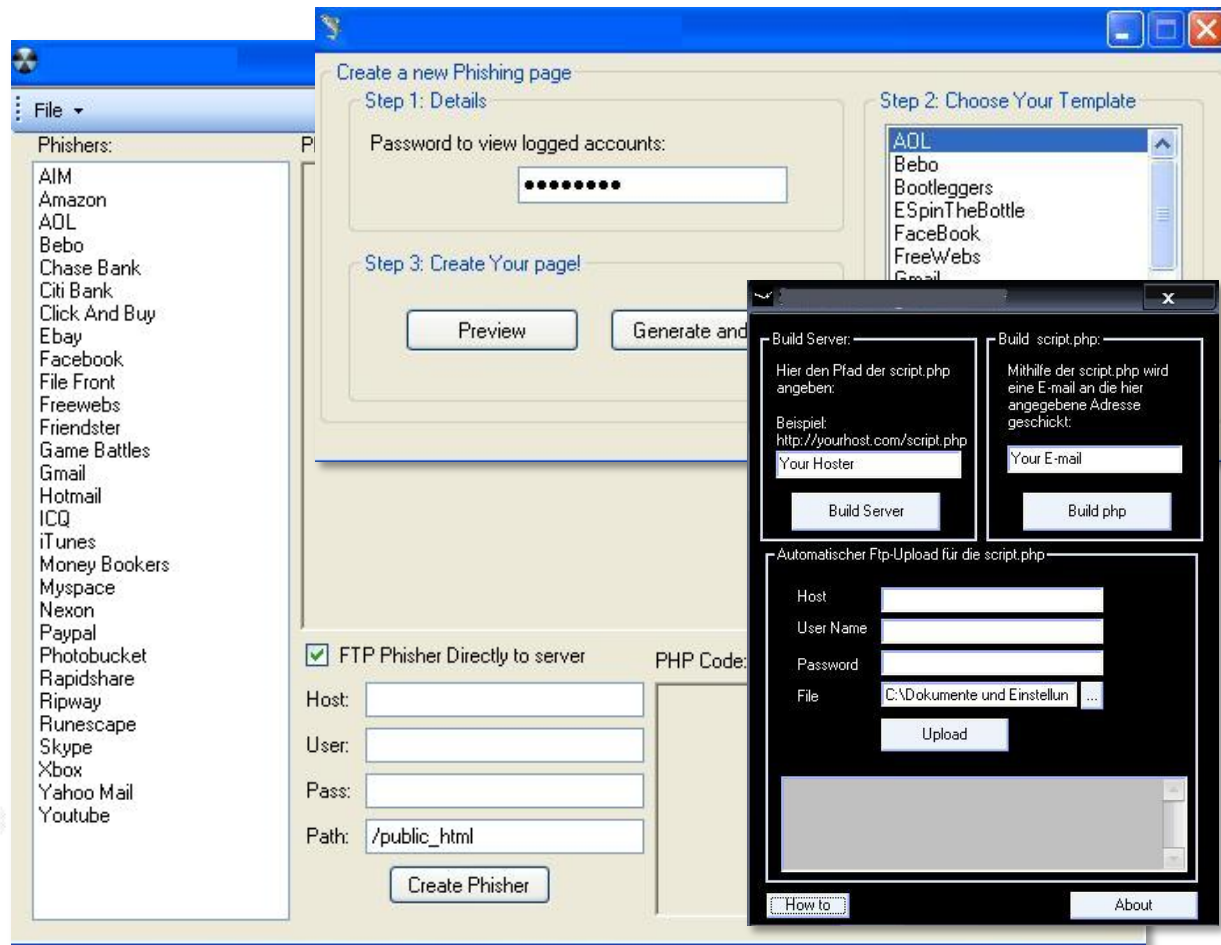
**Financial Phishing by Geographical Location**  
2010

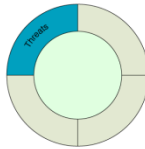


# Phishing Tools

aol.data	23 KB	DATA File
aol.phish	1 KB	PHISH File
bebo.data	69 KB	DATA File
bebo.phish	1 KB	PHISH File
bootleggers.data	5 KB	DATA File
bootleggers.phish	1 KB	PHISH File
ESpinTheBottle.data	60 KB	DATA File
ESpinTheBottle.phish	1 KB	PHISH File
facebook.data	25 KB	DATA File
facebook.phish	1 KB	PHISH File
freewebs.data	20 KB	DATA File
freewebs.phish	1 KB	PHISH File
gmail.data	21 KB	DATA File
gmail.phish	1 KB	PHISH File
hi5.data	78 KB	DATA File
hi5.phish	1 KB	PHISH File
hotmail.data	26 KB	DATA File
hotmail.phish	1 KB	PHISH File
live.data	85 KB	DATA File
live.phish	1 KB	PHISH File
livelogin.data	11 KB	DATA File
livelogin.phish	1 KB	PHISH File
messblack.data	53 KB	DATA File
messblack.phish	1 KB	PHISH File
millersmiles.data	20 KB	DATA File
millersmiles.phish	1 KB	PHISH File
moblife.data	7 KB	DATA File
moblife.phish	1 KB	PHISH File
msndelchkr.data	17 KB	DATA File
msndelchkr.phish	1 KB	PHISH File
myspace.data	50 KB	DATA File
myspace.phish	1 KB	PHISH File
plugins	1 KB	Text Document
rs.data	5 KB	DATA File
rs.phish	1 KB	PHISH File
WoW.data	11 KB	DATA File
WoW.phish	1 KB	PHISH File

- Commercial phishing kits make it easy for a novice to start in the business

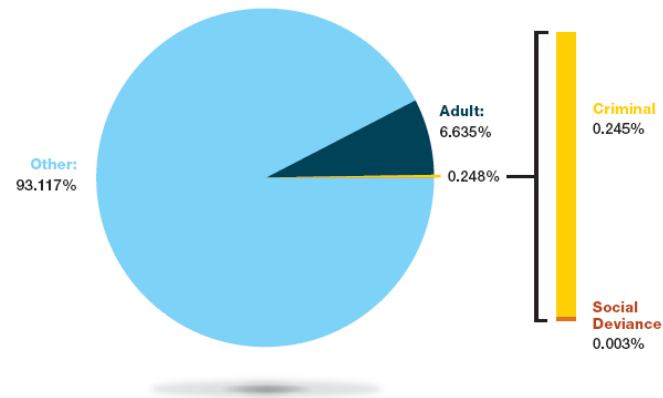




# “Bad” Web Content Tries to Evade Filters

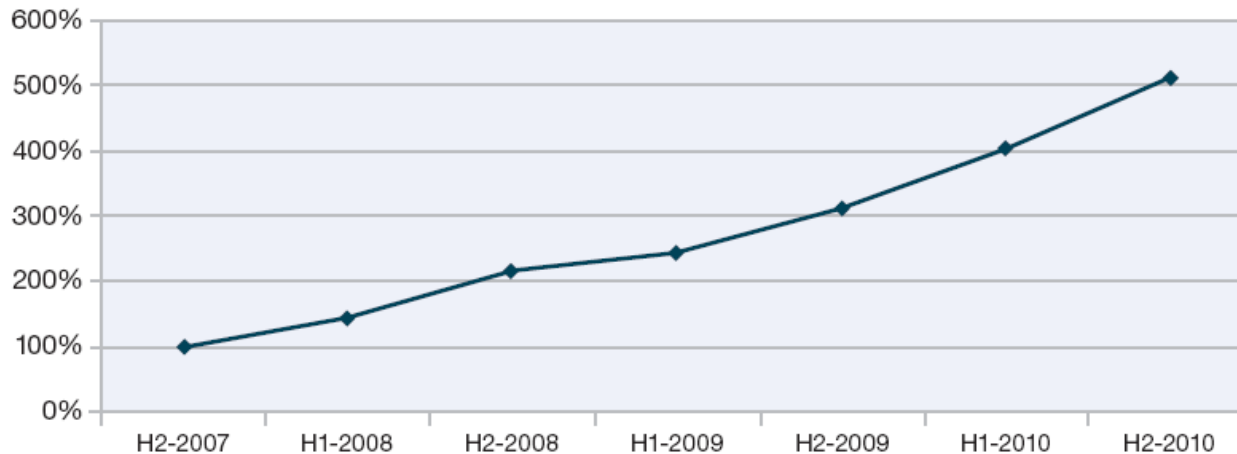
- Approximately **7%** of the Internet contains unwanted content such as pornographic or criminal Web sites.
- Anonymous proxies, which hide a target URL from a Web filter, have steadily increased more than quintupling in number since 2007.

Content Distribution of the Internet  
2010



Volume Increases of Anonymous Proxy Websites

H2-2007 to H2-2010



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