

Phishing – Tackling the Problem

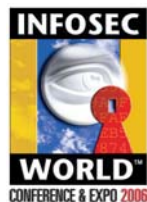
Session# A2

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CISSP, IAM, CCSI, SCSA, CSI

VeriSign, Inc.

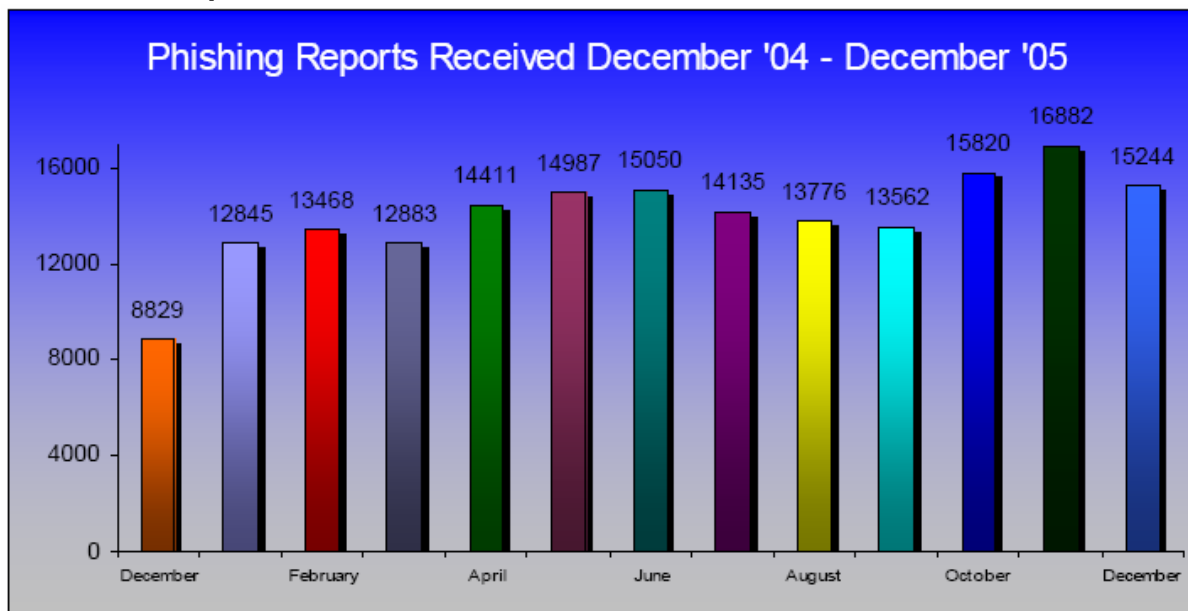
Monday, April 3 1:30-3PM



The Growing Phishing Problem

• What is Phishing?

- Mass distribution of 'spoofed' e-mail messages with return addresses, links, and branding which appear to come from banks, insurance agencies, retailers or credit card companies.
- Designed to fool recipients into divulging personal data such as account names, passwords, credit card numbers, social security numbers, etc.



Reference: Antiphishing.org

The Growing Phishing Problem (how did we get here?)

Cyber criminal can break their head against the steel walls of the bank's Internet security plan

Or

They can take the easy approach and just ask customers for their username and password for their account

- + **Users are still not as protective of their online information as they should be.**
- + **An informal survey found that 85% respondents compromised their passwords by providing their actual password, or hint about their password, for a \$3 Starbucks gift card.**
- + **Phishers are able to convince > 5% of recipients to respond.**

The Growing Phishing Problem (how did we get here?)

Phishing Harder to Detect

- + **Phishers no longer send crude, misspelled emails in plain text.**
- + **Traditionally, phishers have used social engineering to register “cousin” domains, which sound similar to the company they are trying to impersonate.**
- + **Lately, phishers lure victims by forging an email’ “from” address**
- + **Phishers use browser camouflage techniques such as floating a JavaScript window over the Address Bar to fool people into thinking they are viewing a legitimate, branded site.**
- + **The rogue JavaScript remains installed even after leaving the phisher’s site.**
 - + A phisher could easily write additional JavaScript routines to record everything sent or received through your Web browser until closing the application.

The Client Challenge

- + Consumers and institutions suffer significant losses as a result of phishing attacks
 - + **Credit card fraud**
 - + **Identity theft**
 - + **Financial loss**
- + Adverse impact on brand image, loss of consumer confidence
- + Demonstration of due care to stakeholders
- + Resource constraints and the need to focus on high priority, high payoff activities for greatest business efficiency
- + Responding requires paid highly skilled professionals on demand 24x7
- + Phishing exploits are getting more difficult to detect and shut down
- + Complexity of addressing through current incident response process

*Phishers are abusing the trust relationship
between the victim and the business.*

The Client Challenge

- + Number of unique phishing reports received in December: 15244
- + Number of unique phishing sites received in December: 7197
- + Number of brands hijacked by phishing campaigns in December: 121
- + **Number of brands comprising the top 80% of phishing campaigns in December: 7**
- + **Country hosting the most phishing websites in December: United States**
- + **Contain some form of target name in URL: 51 %**
- + No hostname just IP address: 32 %
- + Percentage of sites not using port 80: 7 %
- + **Average time online for site: 5.3 days**
- + Longest time online for site: 31 days

Phishing Activity Report December 2005

APWG – www.antiphishing.org

Recent targets...

Recent targets other than banks

+ **IRS**

- + A phishing attack is **exploiting an open redirect on a U.S. government web site** to gain credibility for bogus e-mails promising an IRS tax refund. The scam e-mail offers an IRS refund of \$571 to recipients if they click on a link to govbenefits.gov, a legitimate federal web site that has recently been promoted by President Bush as a tool to streamline relief for victims of Hurricane Katrina. (Source: netcraft.com)

+ **Credit Unions**

- + Targets people who are members of credit unions and it looks very official. Not only are the graphics very real looking, but the link in the e-mail looks real too. You never want to update your information or your accounts through an e-mail. Always go to the Web site itself or call the organization.

+ **Non-profit organizations**

- + Donations for **Katrina victims**
- + The US Federal Bureau of Investigations (FBI) issued a warning on Jan. 11, 2006, alerting Internet users of a new phishing e-mail requesting financial aid for Randy McCloy Jr., the sole survivor of the **West Virginia mine explosion** that killed 12 men.

+ **U.S. Navy and Airforce**

- + In addition, naval seamen who use the Navy Knowledge Online (NKO) Web portal and Air Force personnel with access to the Air Force Portal are also exposed to phishing emails leading them to fictitious Websites. Users are urged to double check the Website address and to change their portal password if they believe they have fallen victim to the scams.

Can you detect a phishing attempt? Take the test!

MailFrontier Phishing IQ Test - Microsoft Internet Explorer provided by VeriSign

File Edit View Favorites Tools Help

Back Forward Stop Reload Home Search Favorites Media Mail Print W Go Links

Address <http://survey.mailfrontier.com/survey/quiztest.html>

MailFrontier
Email is good again.

Products Customers Press Company Support Partners

MailFrontier Phishing IQ Test II

The astounding response to the first MailFrontier Phishing IQ test, taken by over 225,000 people, successfully raised "phishing" awareness to an all-time high. But with phishing emails increasing daily, it's time for a whole new challenge: the MailFrontier Phishing IQ Test II.

We're back with 10 **new** suspect "phish" fresh from our collection – all actually received by real people like you. Whether you're brand new or a repeat tester, the question is the same: **if you received one of these emails in your inbox – what would you do?**

To take the test, **click on the link for each question**. Then read it, review it, and decide if it's legitimate or a "phish." When you're done with all 10 questions, click "Get Your Score" to find out how well you did. Good luck!

1: Chase <input type="radio"/> Legitimate <input type="radio"/> Phishing Fraud <input checked="" type="radio"/> No Answer	6: Earthlink <input type="radio"/> Legitimate <input type="radio"/> Phishing Fraud <input checked="" type="radio"/> No Answer
2: Paypal Tsunami <input type="radio"/> Legitimate <input type="radio"/> Phishing Fraud <input checked="" type="radio"/> No Answer	7: Amazon <input type="radio"/> Legitimate <input type="radio"/> Phishing Fraud <input checked="" type="radio"/> No Answer
3: Bank of America <input type="radio"/> Legitimate <input type="radio"/> Phishing Fraud <input checked="" type="radio"/> No Answer	8: eBay <input type="radio"/> Legitimate <input type="radio"/> Phishing Fraud <input checked="" type="radio"/> No Answer

Phishing Facts

5.7 Billion - Number of phishing emails sent each month (APWG)

\$1,200 - Average loss to each person successfully phished (FTC)

13,228 - Average number of unique phishing attacks per month (APWG)

3,431 - Average number of phishing web sites each month (APWG)

Phishing Awareness

Done Internet

Real Cybercrime

- Stealing Credentials 'Phishing'
 - Credit Card Numbers
 - Bank User Name, Password
 - Social Security Number, Address etc. to apply for credentials
- Using Stolen Credentials 'Carding'
 - Package Reshipping Schemes
 - Money Laundering Schemes
 - Identity Theft
- Support Functions
 - Compromise machines
 - Send Spam

More Cybercrime

PINS no obstacle for debit card thieves - Security - MSNBC.com - Microsoft Internet Explorer provided by VeriSign

Address <http://www.msnbc.msn.com/id/11731365/page/1>

MSNBC Home » Technology & Science » Security

Sponsored by **EQUIFAX**

Debit card thieves get around PIN obstacle

Wave of ATM fraud indicates criminals have upped the ante

By Bob Sullivan
Technology correspondent
MSNBC
Updated: 2:00 p.m. ET March 9, 2006

MSNBC VIDEO

Nationwide ATM fraud uncovered
March 9: NBC's Tom Costello reports on a sophisticated nationwide criminal plot.

Launch

Nightly News

MSNBC.COM SPECIAL REPORT

THE RED TAPE CHRONICLES

• March 6: EBay's clever fee increase plan

MSN TECH & GADGETS

Charge-to-e-mail plan needs help

Related Links

- Sony's software future
- Cell phone Hall of Fame

Story continues below ↓

advertisement

Shop for jeans

- Straight leg
- Boot cut
- Men's jeans

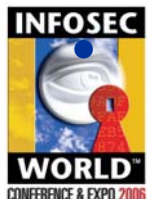
Internet

More Cybercrime

- Advance Fee Frauds (419)
 - Gangs mostly operate from Nigeria
 - Internet application of 'Spanish prisoner' fraud dating to the crusades
 - New variant involves fake cashiers checks
- Extortion / Protection
 - Attacker compromises web site, offers consulting to solve security issue

Phishing Attack Components

- Capture Site
 - Usually a Zombie host or ISP account bought with phished card#
 - Impersonates a merchant or trusted brand
 - Takes the username/password, card #s, SSN, etc.
- Means of Advertising Capture Site
 - Usually Spam sent out from Zombie hosts
 - Often uses misleading domain name [payments@*brand-billing.com*]
- Means of Covering Tracks
 - Recover data from the capture site
 - Often use US hosted email provider
 - Internet Cafes are popular



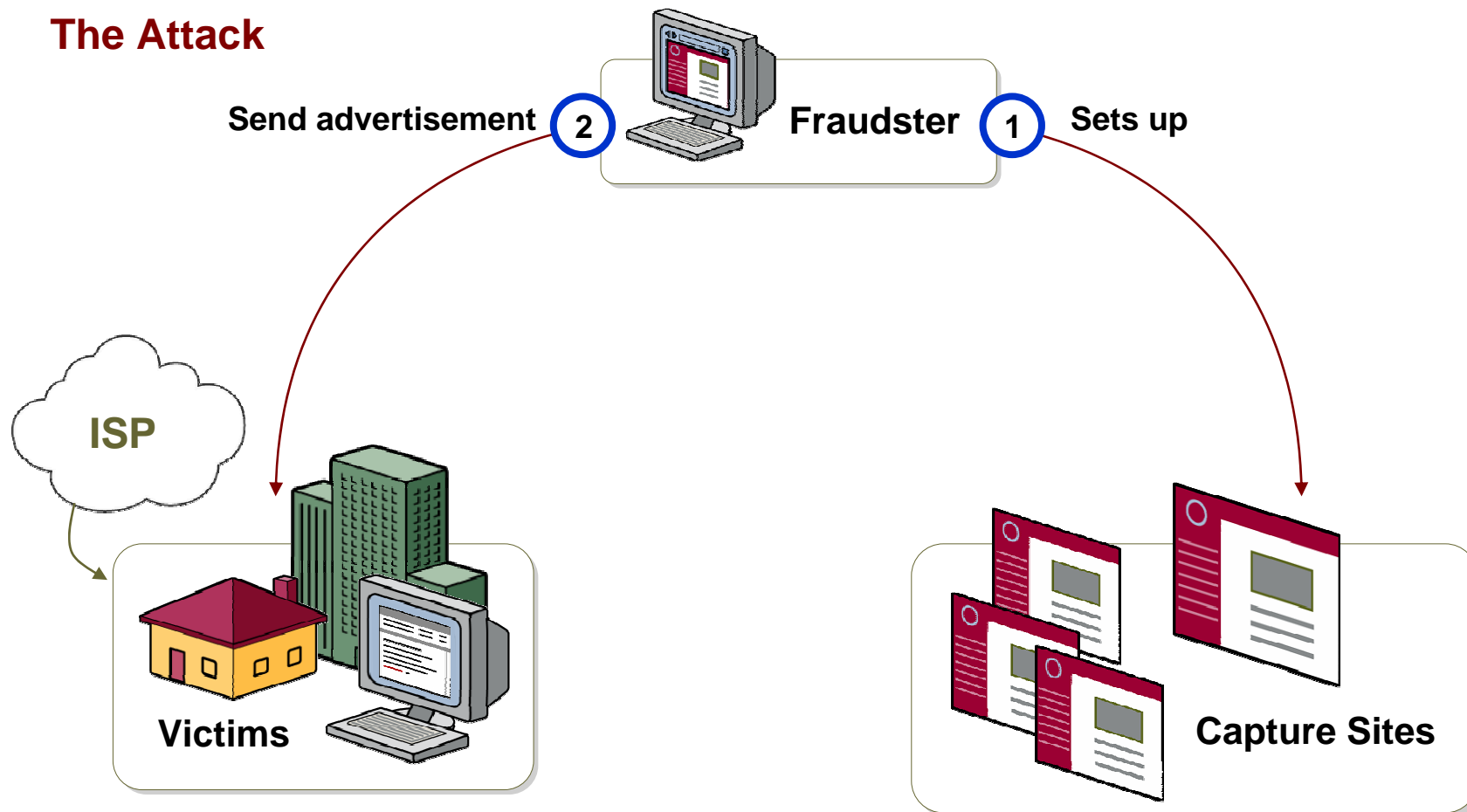
It's Easy to get Caught

- Several successful phishing prosecutions, many pending



Anti-Phishing/Anti-Pharming

The Attack

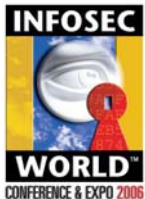


Phishing Tactics

- Hack a Merchant Site
 - **Hope the merchant is silly enough to leave database of plaintext card #s**
- Pretend to be a Merchant
 - **You give me your credit card number, I will give you hijacked software**
 - **Old tactic, spam filtering may have made it unprofitable**
- Pretend to be a Trusted Brand
 - **Or how to get the undivided attention of the brand owner**
 - **Risky, but can be profitable**
- Trojan a Machine
 - **Load spyware onto a consumer machine**
 - **Currently a boutique approach**

"Spear" Phishing

- Dangerous form of e-mail phishing, from a person you know (social engineering aspects)
 - Many times the result of a hacked online company
 - Information is used to target the individual's who's information was stolen
- + Already knows some information about you AND who you do business with



Pharming

Pharming

- + **Virus' modifying host file (using malware)**
 - + Does not rely on phony emails to lure the user
 - + Pharming uses Trojan horse viruses that change the behavior of web browsers.
 - + User attempts to access an online banking site or one of the other target sites actually trigger the browser
 - + To redirect to a fraudulent site. Once a machine is infected, a user can type the correct URL and still end up at the fraudulent site.

Pharming

Pharming

+ **Why use malware?**

- + More relevant data
- + Yields a far greater number of victims (500,000 vs 100 for standard phishing emails)
- + Generates a lot more data, most of it irrelevant
- + Good for about a week before A/V vendors release signatures

Pharming (Malware)

Pharming

- + **New variant hides 'elaborate' eBay fraud**
 - + Security experts have warned web users to guard against a newly intercepted Mutant of the Feebs trojan that attempts to dupe eBay users with an "elaborate" fraud (identified by Aladdin)
 - + Disable the system's antivirus and other security-related products as well as executing other malicious code.
 - + JS.Feebs usually arrives by email, but it could also exist in websites that would infect visitors upon access, Aladdin warned.
 - + **The script modifies the HOSTS file found on the compromised target PC, thus overriding the default DNS servers**
 - + Leads users to enter info at fraudulent site, and upon entering credentials takes the user to the legitimate EBay site.
 - + Source: <http://www.scmagazine.com/us/news/article/540214/?n=us>

Pharming

Pharming

+ **DNS Cache Poisoning**

- + Attacker exploits a flaw in the DNS server software that can make it accept incorrect information
- + Server does not correctly validate DNS responses to ensure that they have come from an authoritative source
- + The server will end up caching the incorrect entries locally and serve them to users that make the same request.

+ **DNS Hijacking**

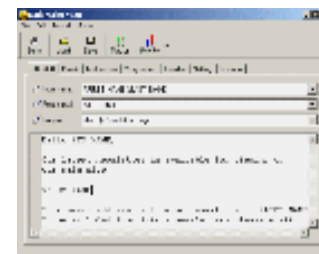
- + Hacking into DNS Servers and change IP addresses
- + Users automatically redirected to bogus site

Phishing Attack Components

- Distributing Mass Emails

- Mailer Tools

- Darkmailer
- Sendsafe
- mailerboy



- Means of Advertising Capture Site

- Built-in mail server
- Email database
- Personalization of macro tags
 - User can create more convincing phishing emails
- Support for text and HTML emails

Attack Impersonation & URL Obfuscation

- Bogus Auth Info
 - <http://www.cnn.com@www.PCGuide.com>
- Deceptive Char Encoding
 - <http://%57%57%57.%50%43%47%55%49%44%45.%43%4F%4D>
- Dotted Octal IP address (leading "0" = octal)
 - <http://0321.0104.016.0120>
- Dotted Hexidecimal IP address (leading "0x" = hexadecimal)
 - <http://0xD1.0x44.0x0E.0x50>
- Single Number (Decimal)
 - <http://3510898256/>

Source: http://www.tcpipguide.com/free/t_URLObscurationObfuscationandGeneralTrickery-3.htm

IP Obfuscation

- IP Obfuscator
- stevegibson.com

The screenshot shows a web browser window titled "SteveGibson.com - IP Obfuscator - Microsoft Internet Explorer provided by VeriSign". The address bar shows the URL "http://www.stevegibson.com/pages/ip-obfuscator". The page has a dark red header with the text "SteveGibson.com | IP Obfuscator". Below the header, there is a navigation menu with links: "Home", "WHOIS Search", "IP Obfuscator" (highlighted), and "Software". On the left side, there is a "LOGIN" section with fields for "Username:" and "Password:", a "LOGIN" button, and a link "Forgot Details?". On the right side, there are three conversion tools: 1. "dword:" with an input field containing "192.168.1.2" and a dropdown set to "0", followed by a "convert to dword" button. 2. "hexed ip's:" with an input field containing "127.0.0.1" and a "convert to hex" button. 3. "octal ip's:" with an input field containing "127.0.0.1" and a "convert to octal" button. The browser's status bar at the bottom shows "Internet".

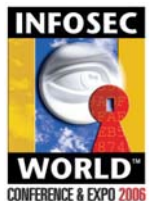
Mirroring

- What it does

- A web crawler that crawls a particular site, recursively looks for hyperlinks, and makes an offline copy on the user's hard drive
- Used for making a Mirror of the site, that looks very similar to the actual site
- Download all or part of a website to your computer, enabling you to browse the site directly from your hard disk at much greater speeds than if you were to browse the site online
- Create an exact duplicate, or mirror of a website, complete with subdirectory structure and all required files
- Download a list of files at known addresses
- Explore every website linked from a central website
- Make a list of all pages and files on a website

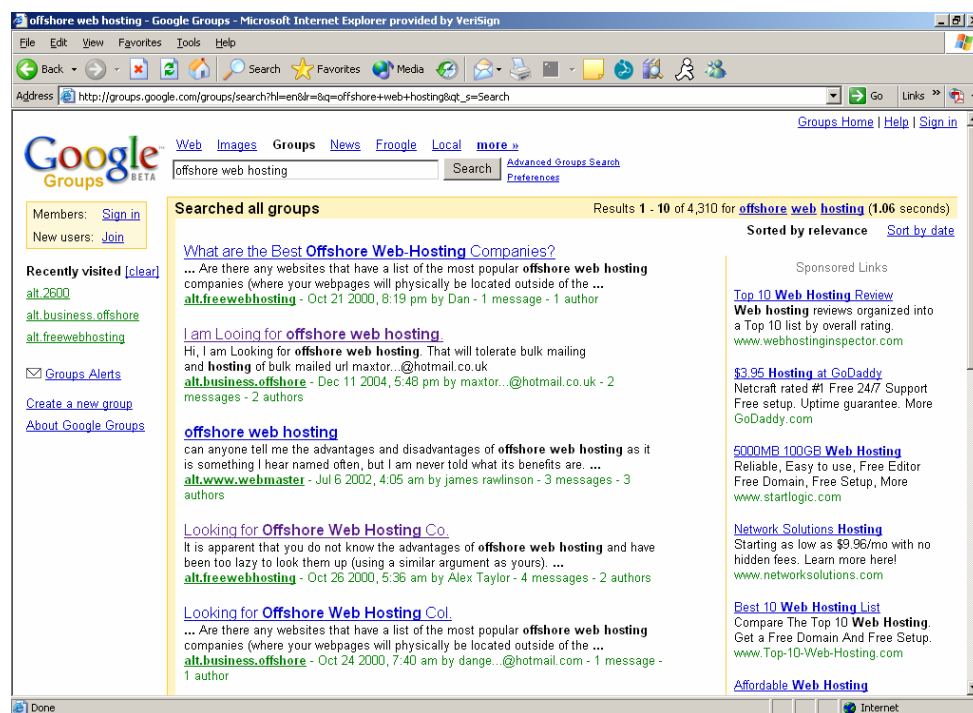
- Tools

- Wget
- Teleport (<http://www.tenmax.com>)
- Black Widow



Hosting the Phishing Site

- Legitimate Server with root access
 - ISP
 - Vulnerable server hosted by someone else
- Anonymous Hosting
 - Offshore hosting
 - Purchase with e-gold
 - Webmoney.ru
 - Western Union



DIY Phishing Kits

- A kit that includes files for impersonating a legitimate site
 - Targeting major sites (PayPal, Citibank, Barclays, etc.)
 - Shadowcrew.com & carderplanet.com
 - Back-end (PHP code) for processing logons IDs and passwords
 - May include list of email addresses

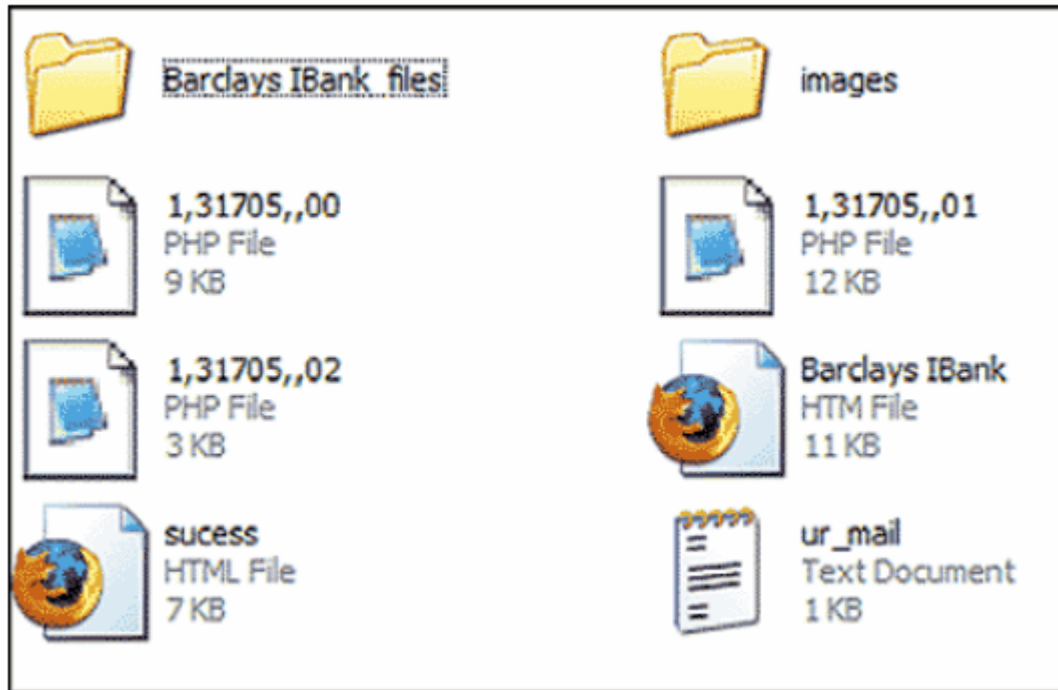
DIY Phishing Kits

- Downloads

Index of /Free-Scams			
<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>D</u>
 Parent Directory	25-Jan-2006 23:44	-	
 2-Pages-Barclays-uk-..>	18-Jan-2006 04:16	64k	
 365online.com.zip	18-Jan-2006 04:16	15k	
 Bank-OfAmerica-2005.zip	18-Jan-2006 04:16	48k	
 Bank-of-America-2005..>	18-Jan-2006 04:16	45k	
 Bank-of-Oklahoma.zip	18-Jan-2006 04:16	16k	
 Barclays-UK.zip	18-Jan-2006 04:16	77k	
 Bureau.zip	18-Jan-2006 04:16	28k	

DIY Phishing Kits

- Inside the zip



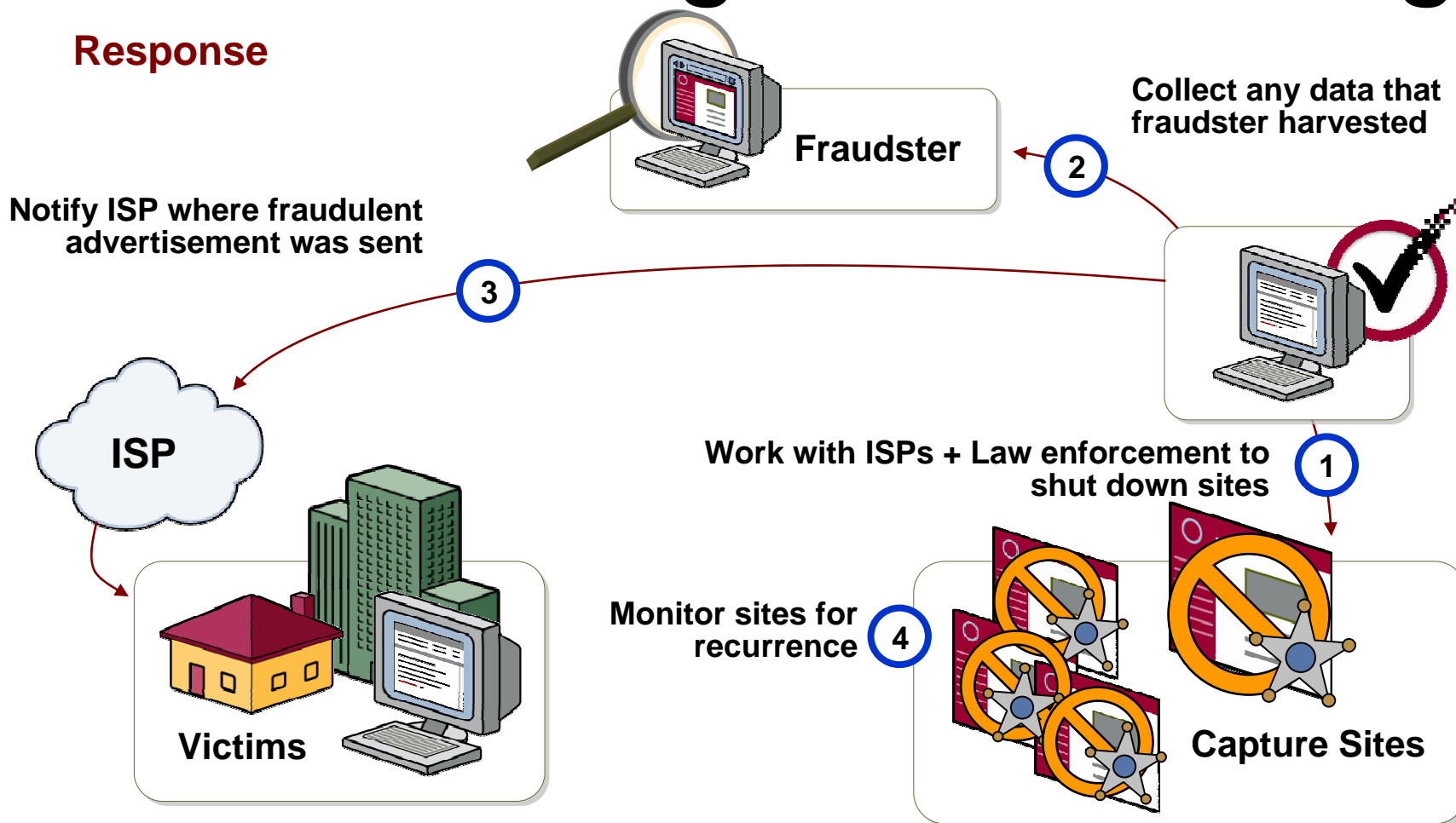
DIY Phishing Kits

- Setting up the site

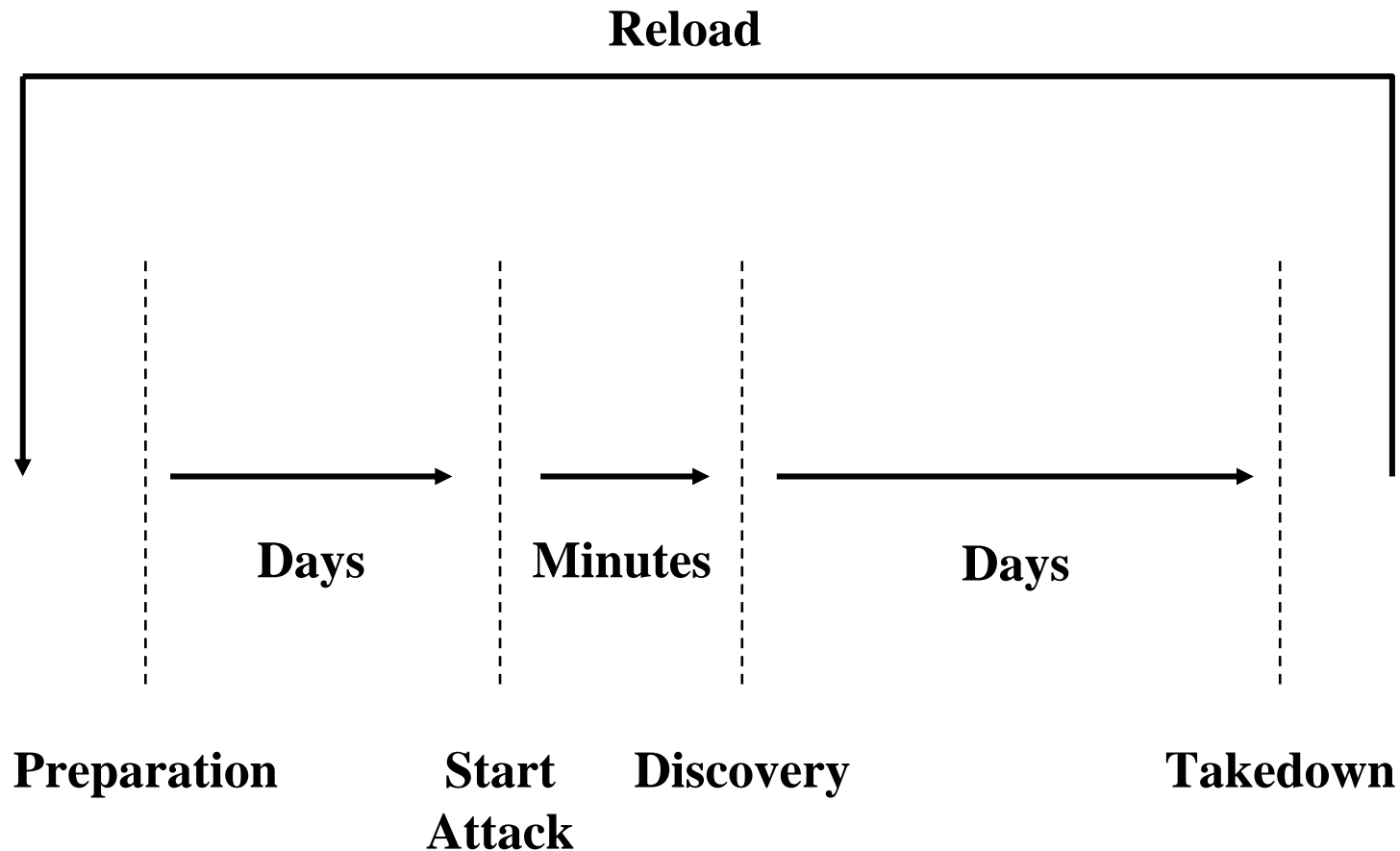
The screenshot shows a phishing page designed to look like the Barclays online banking login interface. At the top, the Barclays logo is displayed. The page is titled 'Log-in Step 1 of 2'. On the left, a sidebar lists navigation links: 'Your Details', 'Security Check', 'Online Banking', 'About log-in', 'First time users', 'Forgotten log-in details', 'Log-in tips', and 'Security'. The main content area features a warning box with the text 'Be on your guard - beware of fraudsters' and a link to 'Scams & Security'. Below this, the 'Your Details' section prompts the user to enter their membership details, with fields for 'Surname' and 'Membership number'. A 'Next' button is visible. To the right, a blue box encourages users to 'Re-order your details online' with a 'Find out more' link. The page is designed to collect user credentials and redirect them to a malicious site.

Anti-Phishing/Anti-Pharming

Response



Phishing Attack Timeline



Phishing Case Study

- + **The Preparation – Approximately 4:00 am PST**
 - + **Anonymous host server at an ISP in Tacoma, Washington on unprotected FTP share**
 - + **Uploaded a rootkit onto the server**
 - + **Created new logins into the terminal services for the server**
 - + **The capture site was unlinked page off of an otherwise legitimate website**
 - + **No cousin domains**
 - + **Used a standard PERL mailer utility to send out the fraudulent advertisements.**

Phishing Case Study (Continued)

- + **Attack Begins at 9:17 am PST**
- + **Fraudulent Advertisement sent to customers**
- + The time between when the phisher gained access to the anonymous host and uploaded the rootkit to mails sent is ***under 5 hours***
- + The phisher covered his tracks by deleting the mail list once the emails went out

Phishing Case Study (Continued)

- + **Discovery – 9:42 am PST**
 - + VeriSign became aware of the scam email 25 minutes after attack launched
 - + Link took the victim to a site that looked like the login page. No matter what data was entered for username and password, the phisher's site then took the victim to a page that collected further information.

Phishing Case Study (Continued)

- + **The Take Down – 9:47 am PST**
 - + **First try - ARIN “abuse@” contacts but only got voice mail**
 - + **Leveraging our extensive database of contacts, our next attempt to contact them got us to a live person.**
 - + **By 9:47 (5 minutes after VeriSign became aware of the attack) the scam page is taken down.**
 - + **We were able to get the site down so quickly in part because the site was domestic and because of the quick response of our fraud team.**
- + **Forensics Investigation**
 - + **Copy of the scam site payload**
 - + **We also had the FTP logs to give us details of where and when the phisher started this from.**
 - + **FTP logs show that he accessed the servers from 3 separate IP’s, two from Romania and one from Spain. Harvested data and sent it to a free web email account.**

Anti-Phishing Solution



Prevention

- Security Consulting
 - **Vulnerability and application assessments – Penetration Test!**
 - **Assess current Incident Response processes, policies, and vulnerabilities**
 - **From gap analysis, recommend and create optimal Incident Response policies**
 - **Implement educational programs – send updates to customers/users**
- Authentication Services
 - **Prevent email spoofing**
 - Sender ID (Microsoft)
 - DomainKeys Identified Mail (Yahoo! & Cisco)
 - **Browser-based protection (prevention & detection)**
 - Netcraft Toolbar
 - WholeSecurity Web Caller-ID
 - TrustBar
 - **Digital signatures for outgoing emails, providing sender validation**
 - **Strong Authentication for bank site login**

Blocklists

SURBL - Spam URI Realtime Blocklists

SURBL:

- [Quick Start](#)
- [News & Notes](#)
- [Introduction](#)
- [Usage](#)
- [SC Data](#)
- [Lists](#)
- [Implementation Guidelines](#)
- [FAQ](#)
- [Nameserver Status](#)
- [Lookup](#)
- [Links](#)
- [Contacts](#)

are these lists publically available?

Yes, the domain-based lists can be used freely at this time. We merely ask you mention **MailPolice.com** on your website. You can use the graphic buttons below if you like.

These lists can be used to block e-mail:

- [bulk.rhs.mailpolice.com](#) - spam, bulk-senders, unconfirmed mailing-list, unsolicited advertising sites
- [porn.rhs.mailpolice.com](#) - pornographic (18+) sites
- [fraud.rhs.mailpolice.com](#) - domains and IPs hosting fraudulent content, aka "phishing"
- [block.rhs.mailpolice.com](#) - consolidated list of bulk-senders, pornographic, and fraud sites
- [dynamic.rhs.mailpolice.com](#) - dynamic PPP/DSL/cable reverse DNS hostnames, useful for stopping spam from broadband proxies
- [adult.rhs.mailpolice.com](#) - adult-oriented sites (**new**)

The following lists should never be used to block e-mail in site-wide configurations, because legitimate e-mail **will** be blocked. It is recommended for per-user configurations only!

- [adv.rhs.mailpolice.com](#) - domains of e-mail marketers, such as opt-in advertisers and newsletters
- [webmail.rhs.mailpolice.com](#) - domains used by webmail services
- [redir.rhs.mailpolice.com](#) - website redirectors (**new**)

Please note that none of these lists, with the exception of [fraud](#), contain IP addresses, only domain names.

Queries can be made in the form `example.tld.bulk.rhs.mailpolice.com` where example.tld is the domain name to check. All entries return 127.0.0.2. The lists can be tested by querying for `example.tld`.

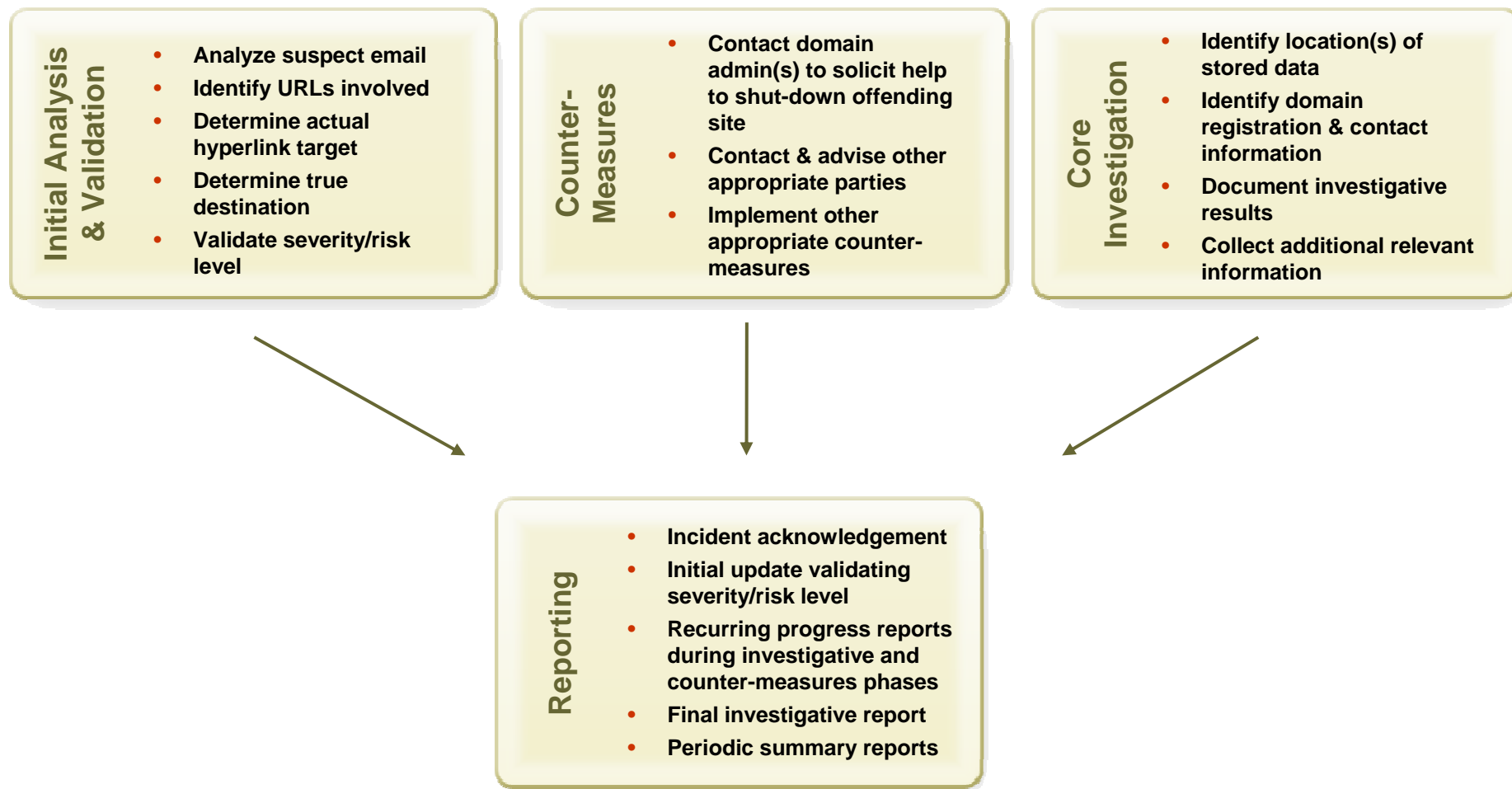
TXT records are available. Listing data can be obtained by using an online lookup on

Detection - Digital Brand Management

- + Brand Equity
 - + **Misuse of a company's trademarks, logos, and intellectual property online**
 - + Logo copied and stolen
 - + Logo altered
 - + Objectionable content
 - + Unauthorized distributors of products or intellectual property
 - + **Monitor and protect trademarks, logos, and intellectual property online**
 - + Online global monitoring – brand audit of worldwide domain name registrations
 - + Identify and shutdown unauthorized distributors of products or intellectual property – Renegade Sites
 - + Identify and shutdown objectionable sites using company trademarks and logos

Are you in control of your brand in the digital world? Over 70% of the URLs associated with world's top 25 brands are not owned by those brands!

Response: Phishing Response Methodology



Resources & References

- Phishing Exposed by Lance James
- Anti-Phishing Workgroup
 - <http://www.antiphishing.org/>
- Tools and Resources
 - <http://www.scientis.com/Security/Phishing.html>
- Up to date scam listing
 - <http://www.millersmiles.co.uk/archives/17>

Q&A



Session #
Title of Your Presentation