
From: "Greg Hoglund" <greg@hbgary.com>
To: "Aaron Barr" <aaron@hbgary.com>
Sent: Friday, February 19, 2010 7:30 PM
Attach: Advanced Persistent Threat.pptx
Subject: Aaron, here are the raw slides of the ISSA talk

The PPT is attached. Feel free to rob and steal to your hearts content.

-Greg

Advanced Persistent Threat

What APT Means To Your Enterprise

Greg Hoglund

APT – What is it?

- A human being or organization, who operates a campaign of intellectual property theft using cyber-methods
 - Malware, malware, malware
- Basically, the same old problem, but it's getting far worse and far more important than ever before

Wake Up

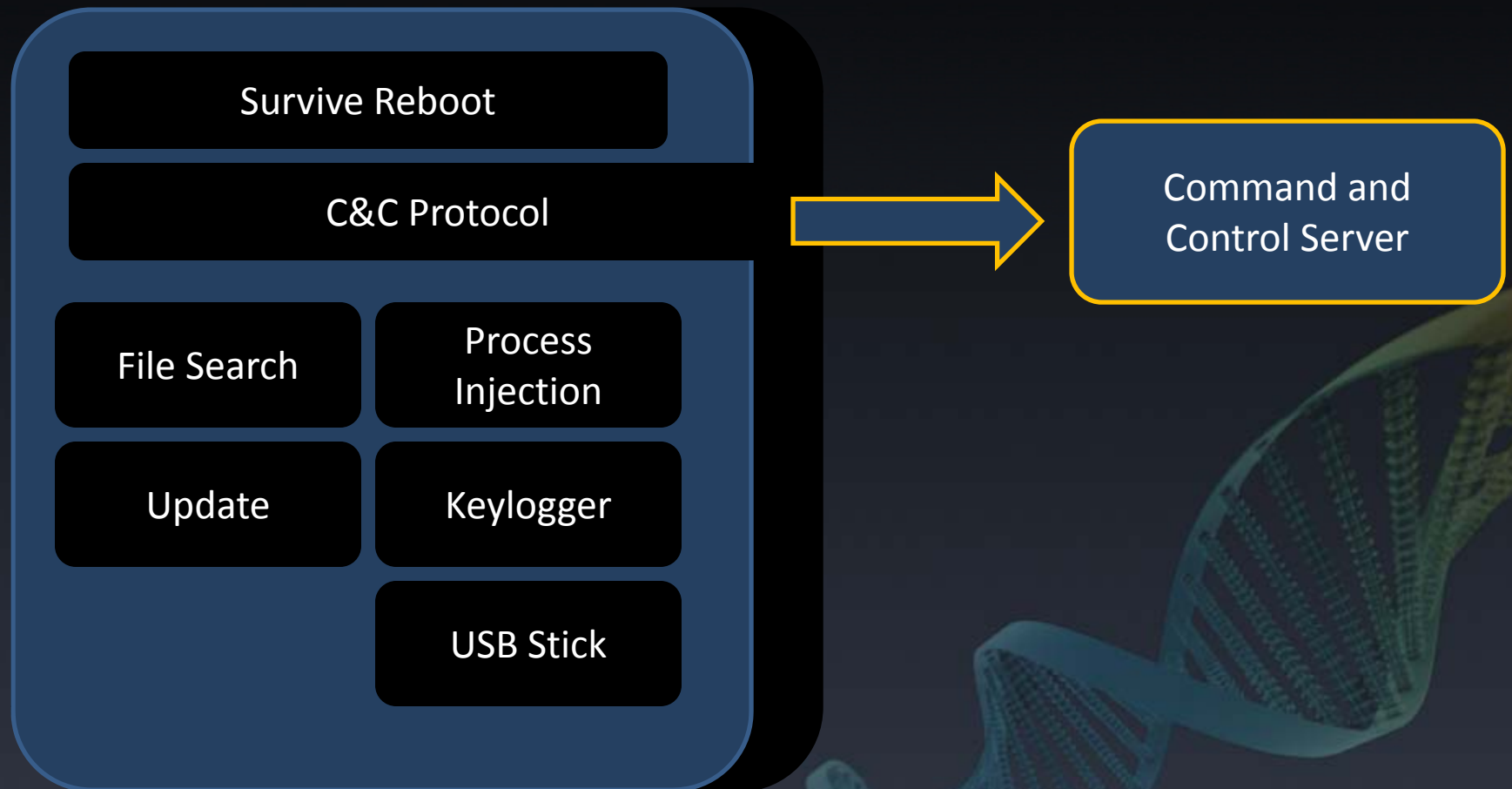
Google cyber attacks a 'wake-up' call

-Director of National Intelligence Dennis Blair



<http://www.csmonitor.com/USA/2010/0204/Google-cyber-attacks-a-wake-up-call-for-US-intel-chief-says>

Anatomy of APT Malware



IP is Leaving The Network Right Now

- Everybody in this room who manages an Enterprise with more than 10,000 nodes

YOU ARE ALREADY OWNED

They are STEALING right now, as you sit in that chair.

The Coming Age

- Advanced nations are under constant cyber attack. This is not a future threat, this is now. This has been going on for YEARS.
- Cyber Cartels are rapidly going to surpass Drug Cartels in their impact on Global Security
 - The scope of finance will surpass drug cartels
 - The extent of the operation internationally

Economy

- Russian Mafia made more money in online banking fraud last year than the drug cartels made selling cocaine
- An entire industry has cropped up to support the theft of digital information with players in all aspects of the marketplace



Espionage

Countries Developing Advanced Offensive Cyber Capabilities

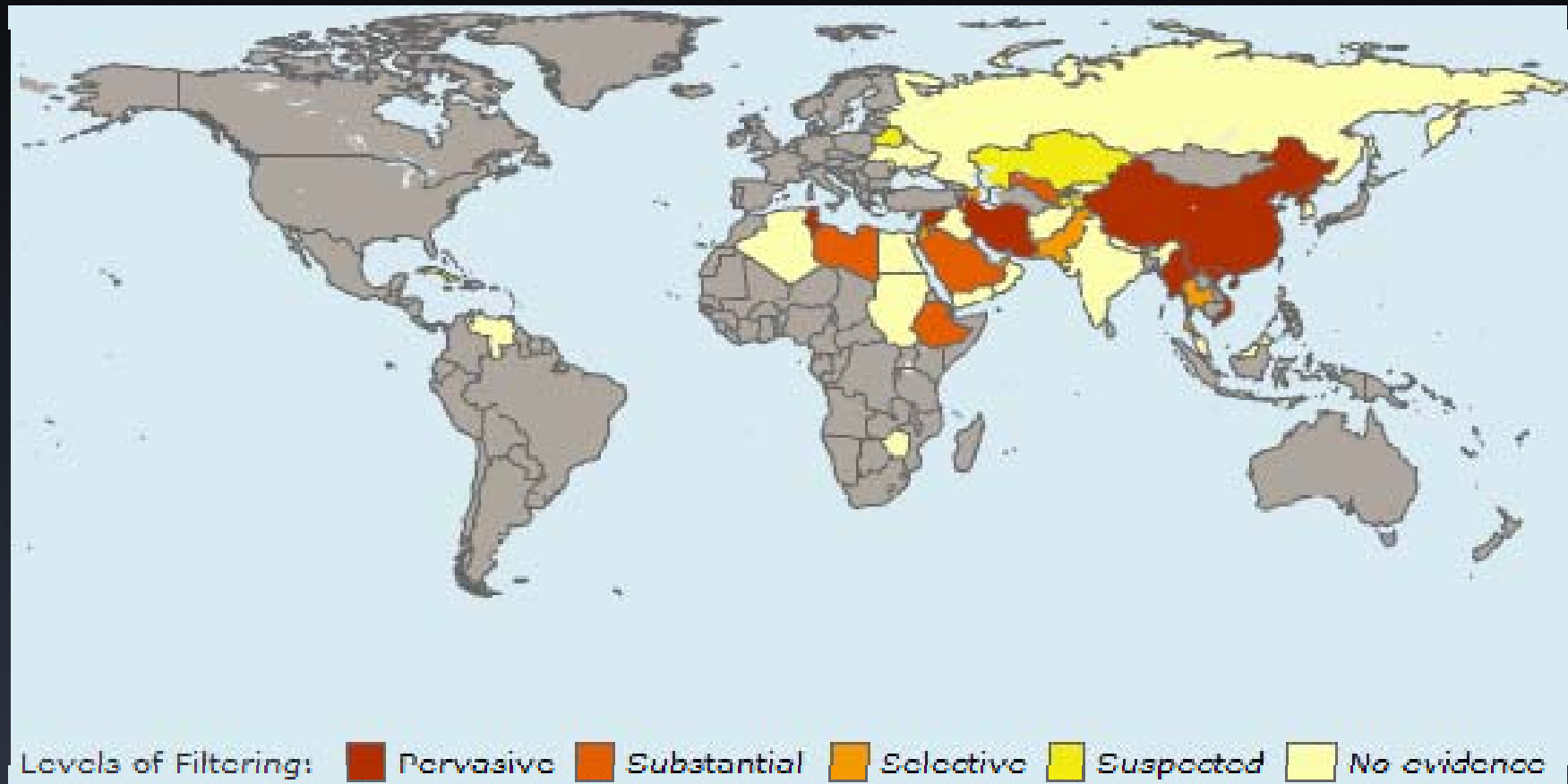


MI5 says the Chinese government “represents one of the most significant espionage threats”



<http://www.timesonline.co.uk/tol/news/uk/crime/article7009749.ece>

Big Brother



Cash is not the only motive

- State sponsored (economic power)
- Stealing of state secrets (intelligence & advantage)
- Stealing of IP (competitive / strategic advantage – longer term)
- Infrastructure & SCADA (wartime strike capable)
- Info on people (not economic)
 - i.e., Chinese dissidents

Why Enterprise Security Products DON'T WORK

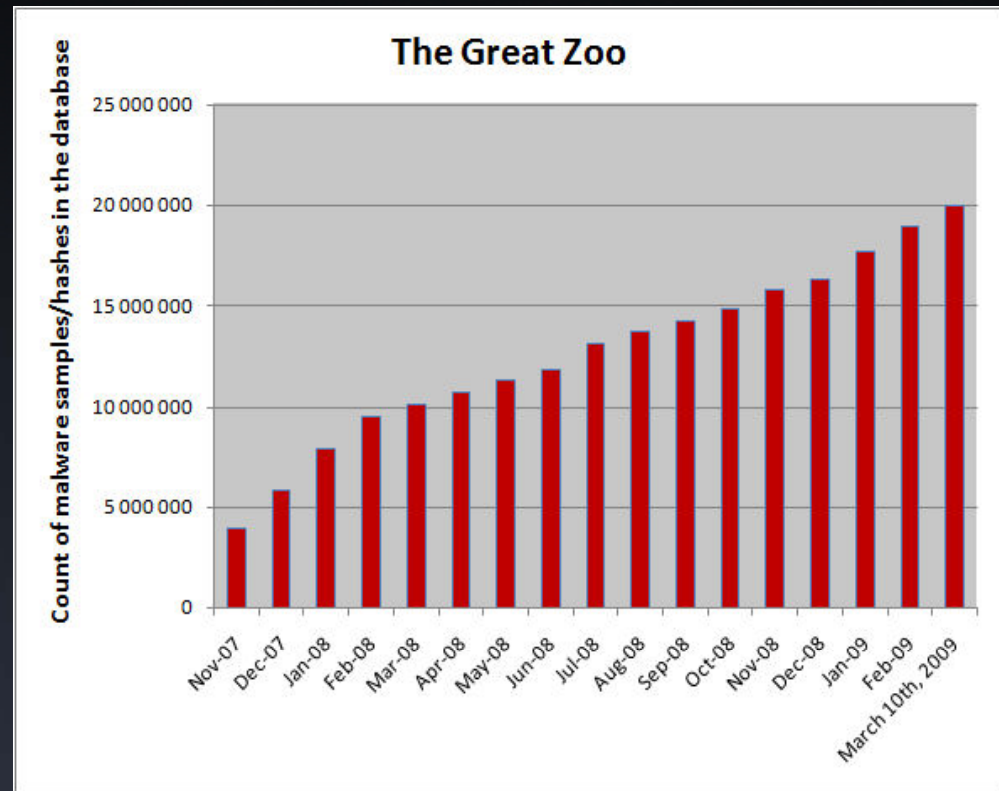


The True Threat

- Malware is a **human** issue
 - Bad guys are targeting your digital information, intellectual property, and personal identity
- Malware is only a vehicle for intent
 - Theft of Intellectual Property
 - Business Intelligence for Competitive Advantage
 - Identity Theft for Online Fraud

The Scale

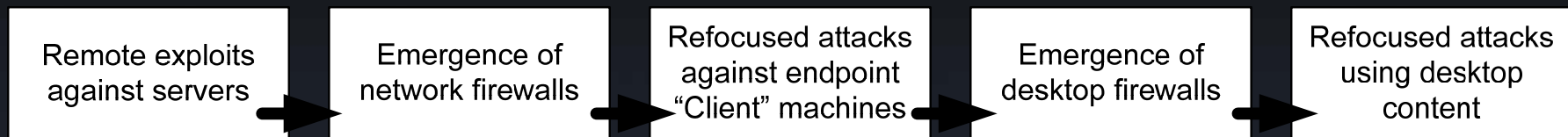
Over 100,000 malware are automatically generated and released daily. Signature based solutions are tightly coupled to individual malware samples, thus cannot scale.



<http://www.avertlabs.com/research/blog/index.php/2009/03/10/avert-passes-milestone-20-million-malware-samples/>

Surfaces

- The attacks today are just as effective as they were in 1999

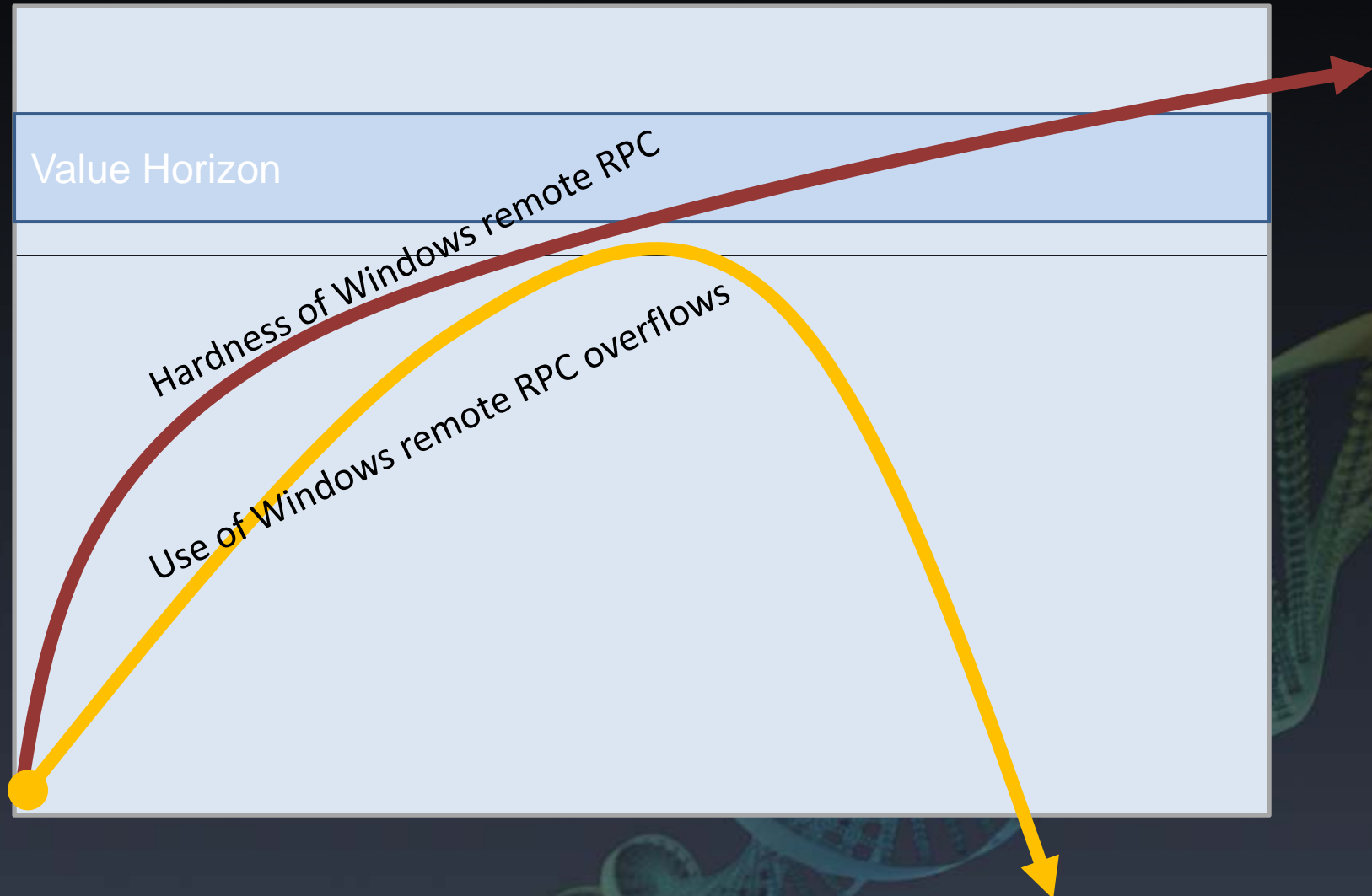


The bad guys STILL HAVE their zero day, STILL HAVE their vectors, and STILL HAVE their malware

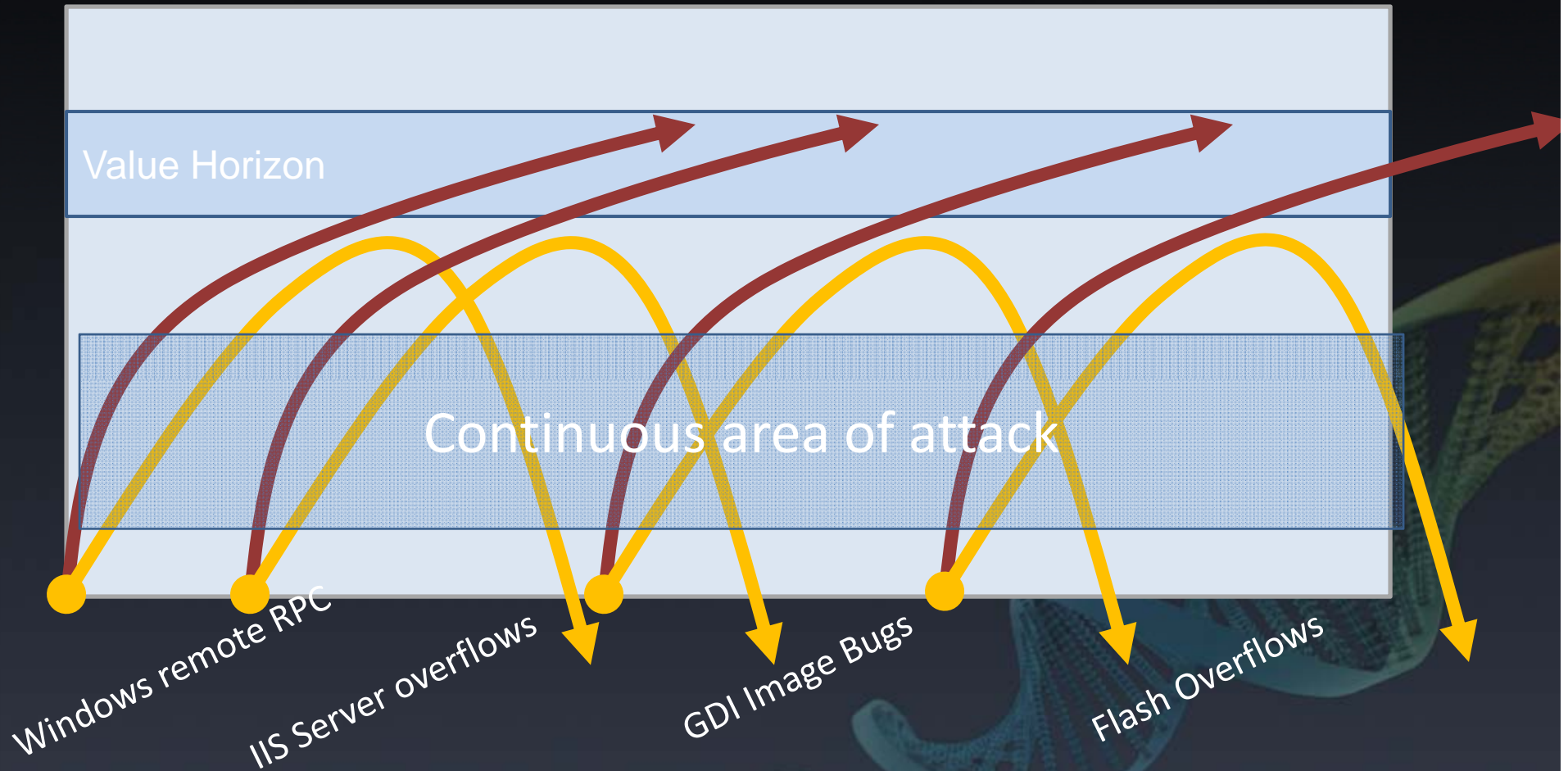
Not an antivirus problem

- Malware isn't released until it bypasses all the AV products
 - Testing against AV is part of the QA process
- AV doesn't address the actual threat – the human who is targeting you
- AV has been shown as nearly useless in stopping the threat
 - AV has been diminished to a regulatory checkbox – it's not even managed by the security organization, it's an IT problem

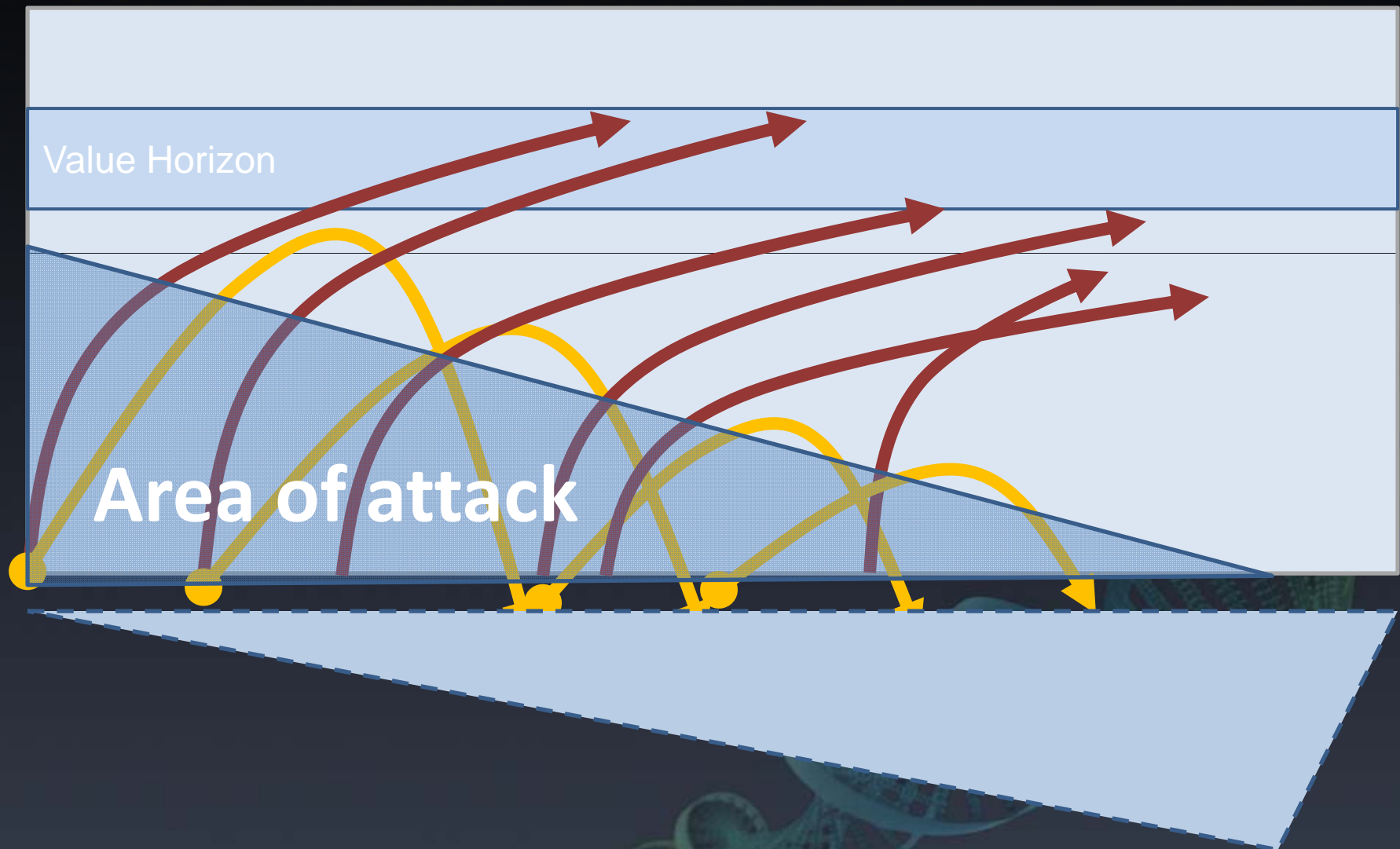
Annealing



Continuum

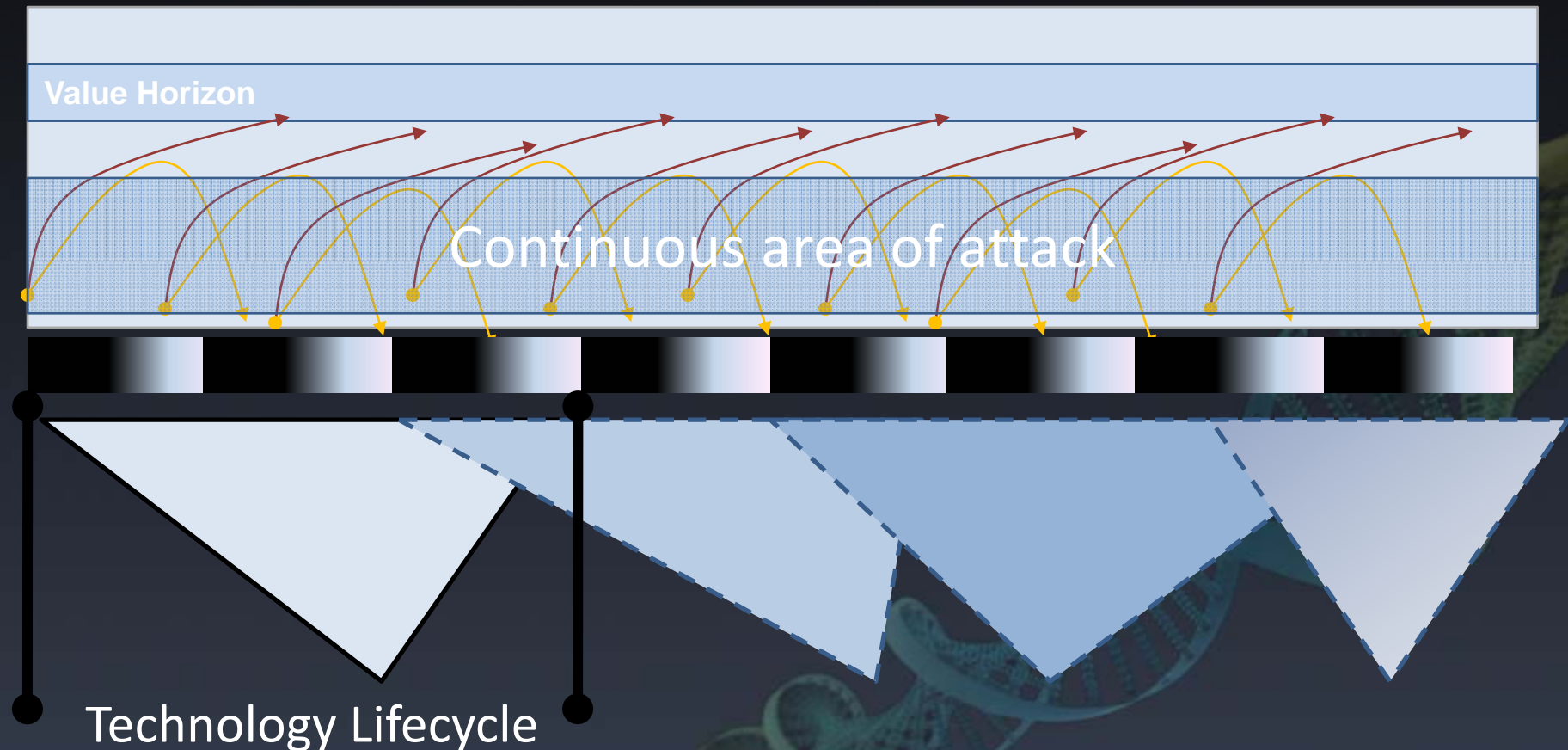


Technology Lifecycle



Continuous Area of Attack

By the time all the surfaces in a given technology are hardened, the technology is obsolete



The Global Malware Economy

A Global Theatre

- There are thousands of actors involved in the theft of information, from technology developers to money launderers
- Over the last decade, an underground economy has grown to support espionage and fraud
- This “malware ecosystem” supports both Crimeware and e-Espionage

Crimeware and the State

- Using crimeware collected from the underground makes it harder to attribute the attack, since it looks like every other criminal attack
 - There is no custom code that can be fingerprinted

China

“There are the intelligence-oriented hackers inside the People's Liberation Army”

“There are hacker conferences, hacker training academies and magazines”

“Loosely defined community of computer devotees working independently, but also selling services to corporations and even the military”

When asked whether hackers work for the government, or the military, [he] says "yes."

http://news.cnet.com/Hacking-for-fun-and-profit-in-Chinas-underworld/2100-1029_3-6250439.html



Crimeware Affiliate Networks

- Grown out of older adware business models



Pay-per-install.org

Pay-Per-Install.org

The Pay Per Install Affiliate Forum



**LIKE MONEY?
WORK WITH US!**

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Pay Per Install Programs

[Cashboom](#)

[Zangocash](#)

[Earning4u](#)

[Exerevenue](#)

[YA!Bucks](#)

[InstallConverter](#)

Zangocash is now Pinball Publisher Network

Pay Per Install

User Name ☐ Remember Me?

Password

Welcome to the Pay Per Install Forums

If this is your first visit, be sure to check out the [FAQ](#) by clicking the link above. You may have to [register](#) before you can post: click the register link above to proceed. To start viewing messages, select the forum that you want to visit from the selection below.

	Forum	Last Post	Threads	Posts
	Pay-Per-Install.org			
	Pay Per Install Everything Pay Per Install related	Donations and JNR VIP by Blademaster Yesterday 07:29 PM »	623	5,461

Earning4u

The screenshot shows the Earning4u website interface. At the top, there's a navigation bar with links: MAIN, ABOUT US, CONDITIONS, RATES, FAQ, and CONTACTS. A large orange banner features the text "EARNING 4 U .COM" and "ENTER STATS". Below this, a "REGISTER TODAY" button is highlighted with a hand cursor. To the right of the button is a cartoon robot character. The main content area contains the following text: "The partnership program «Earning4u» is the easiest way to earn money. All you need to do to start working with us is register." Below this, it states: "You will earn from 6\$(Asia) to 140\$(USA) per 1000 installs. You can view all prices in the «Rates» section." A section titled "Key Features" lists several benefits: "Thanks to an individual approach to each client when you work with our system you have:" followed by a bulleted list: "• Online statistics updated in real time", "• A 24-hour support service ready to answer all your questions", "• Absolutely no shaving and total independence of your statistics from other system users", "• Stable weekly payments on virtually all payment systems: Fathard, WebMoney, Wire, e-gold, Western Union (WU), MoneyGram, Anelik and ePassporte, and PayPal", and "• For regular clients and for those making more than 5000 installs per day – higher rates for all countries and special working conditions". To the right of the list is an illustration of falling money.

Pays per 1,000 infections

PPI Programs

YAIBUCKS
YOUR TRUSTED PARTNER

HOME REGISTER FAQ CONTACTS

ABOUT
YAIBUCKS is pay per install affiliate program.

Unlike others we not paying fixed rate for install and not share install. We share our profit with you. Yes, that's true - we really giving you a share - 75% from revenue. Our software can live a lot of months on user PCs and you earn money every day and every hour, doesn't matter - if you already stop sending install - you still earning money with us. In typical pay per install partnership programs everyone get some CPC, to be a case some affiliates with "good quality" install become banned after few days/weeks, months) and without payout, and some affiliates with "good quality" install not receiving as much money as they really really worth. And PPI company closes business after some time we know a lot of examples. Only revenue share model is really fair and can bring really big revenue to affiliates. That's all what we can say. Now - you can join us and try to leave our site - it's up to you, but we suggesting - give us a try and you will be amazed with result!

LOG IN
Username:
Password:
LOG IN

YOUR OPINION
Do you have a suggestion? Or suggest? Send it anonymously to us!
 SEND

WHAT WE CAN DO FOR YOU?

- 75% REVENUE
- SOFTWARE LIFETIME PAYOUT
- MONETIZING ALL COUNTRIES
- BI-WEEKLY PAYMENTS
- 100% REFERRAL COMMISSIONS
- 24 HOUR MONITOR
- SUPPORT VIA TICKETS
- FREE TOOLS FOR OUR PARTNERS
- DIFFERENT LANDINGS
- 10% REFERRAL COMMISSIONS
- A 24 HOUR MONITOR

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Contact Us and Get
a Quote For Your
Project
- Products**
Some of Our Own
Popular Software
Project

Welcome

December 14, 2009 -- Posted by: **Santasack**
GeckoCode is a group of talented software developers who's skills cover a large range of software development, web design and graphics technologies. Our team of developers have extensive expertise in C/C++, legacy visual basic, .NET, Php, database design and implementation, company logo and banner design .. and much much more.

We work with all kinds of clients, from large businesses to individuals, and we believe that custom software and graphic design should be accessible and affordable to anybody that requires such services.

We pride ourself on taking a personal approach to our customers, no matter how small the job our main focus is that on completion our customer is happy and the solutions we provide fit their needs exactly.

We will develop you any kind of software you need, and operate an on (yes we are black hat friendly!)
WE DO NOT CHARGE BY THE HOUR!
OUR!!

Unlike other companies we will quote accepted you will know from the outset as near as possible to the total project cost!

We provide full rights and ownership to the software/graphics over to you on project completion, and will provide you with detailed technical documents, flowcharts and time lines throughout the development period.

NO JOB TOO LARGE OR TOO SMALL

As well as large project development, we accept any kind of software/graphics related jobs, From simple website banner and logo designs right down to trivial technical support.

OUR PRICES WON'T BE BEATEN

We believe that our personal approach to customers needs, and the fact we take every customers current situation and overall goals into account before we even consider our quote means that you will not find a cheaper more personal solution to your custom software needs.

INSTANT MESSENGER AND LIVE WEB CHAT SUPPORT

[Read more](#)

December 14, 2009

Anatomy of an APT Operation



Anatomy of an APT Operation

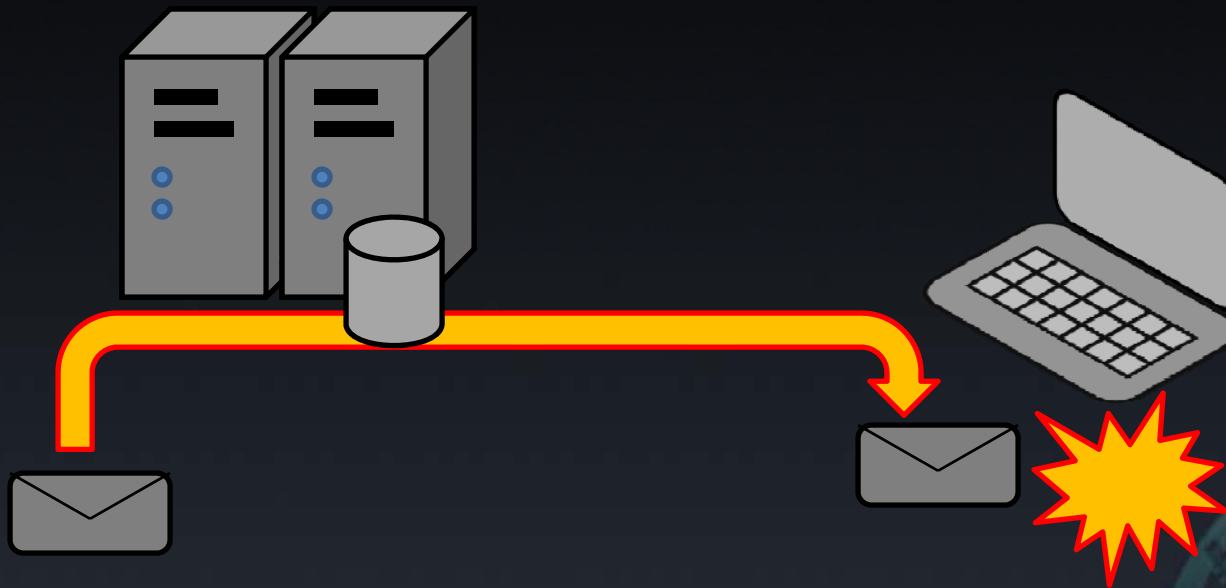
- You must understand that an ongoing operation is underway – this involves one or more primary actors, and potentially many secondary actors



Malware Distribution Systems

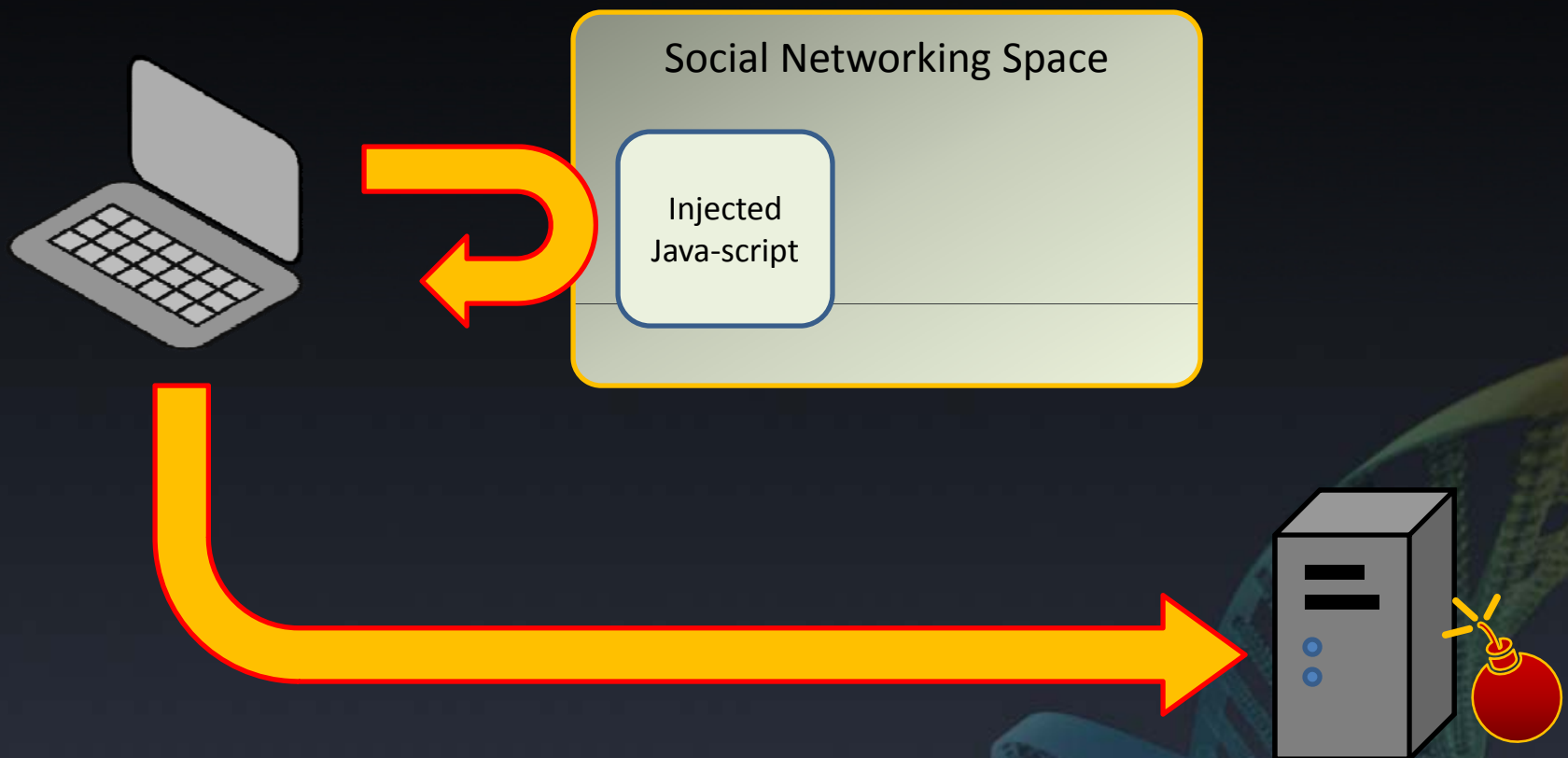
- Large scale systems to deploy malware
 - Browser component attacks
- Precise spear-phishing attacks
 - Contain boobytrapped documents
- Backdoored physical media
 - USB, Camera, CD's left in parking lot, 'gifts'

Boobytrapped Documents



- Single most effective *focused* attack today
- Human crafts text

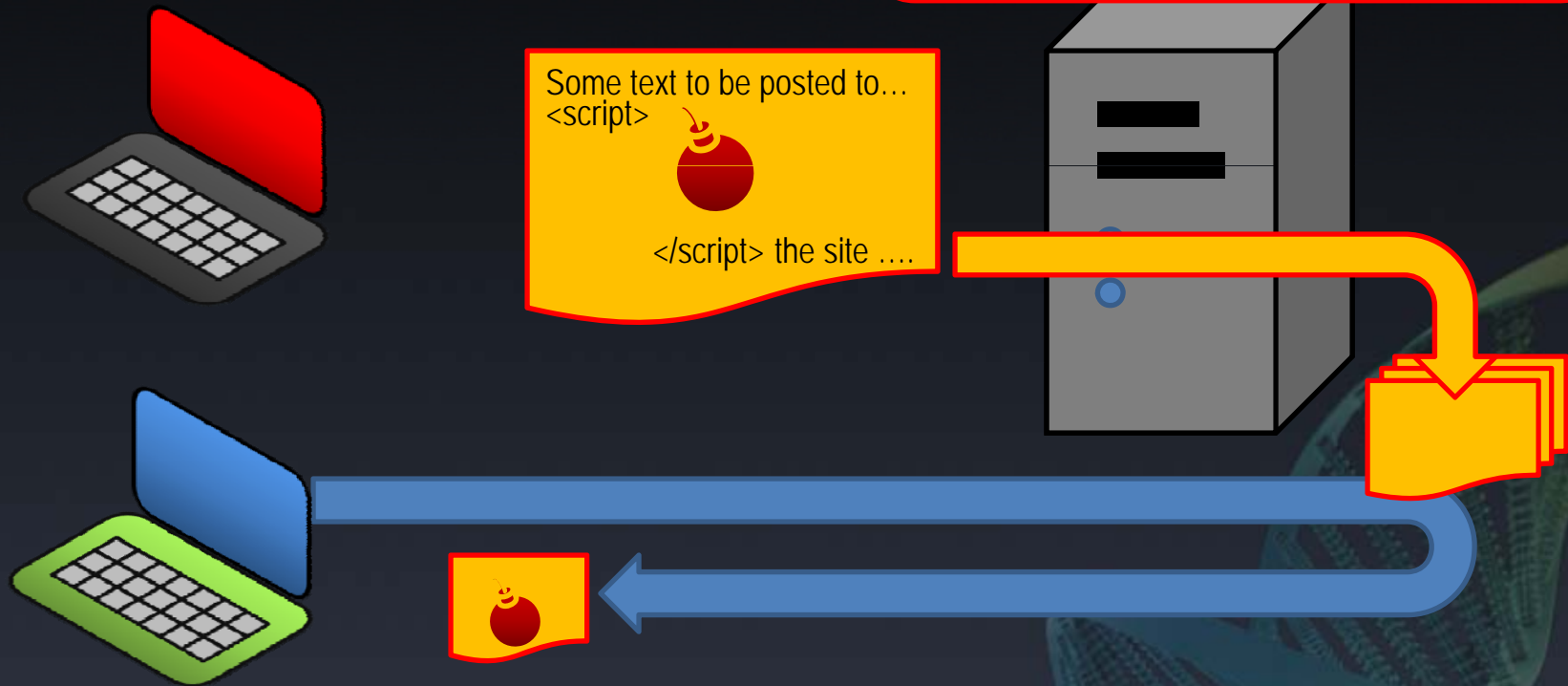
Web-based attack



- Used heavily for large scale infections
- Social network targeting is possible

Trap Postings I

www.somesite.com/somepage.php

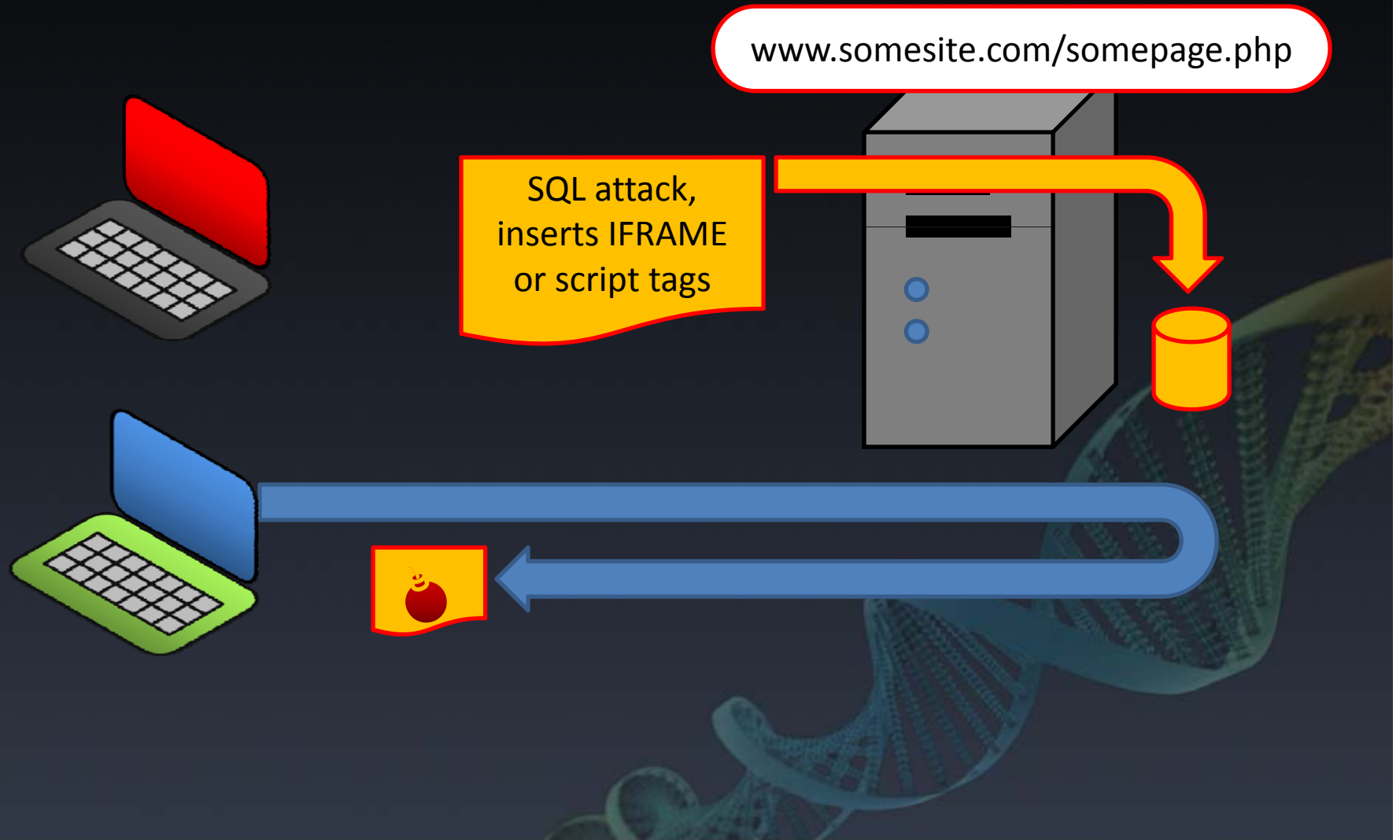


Trap Postings II

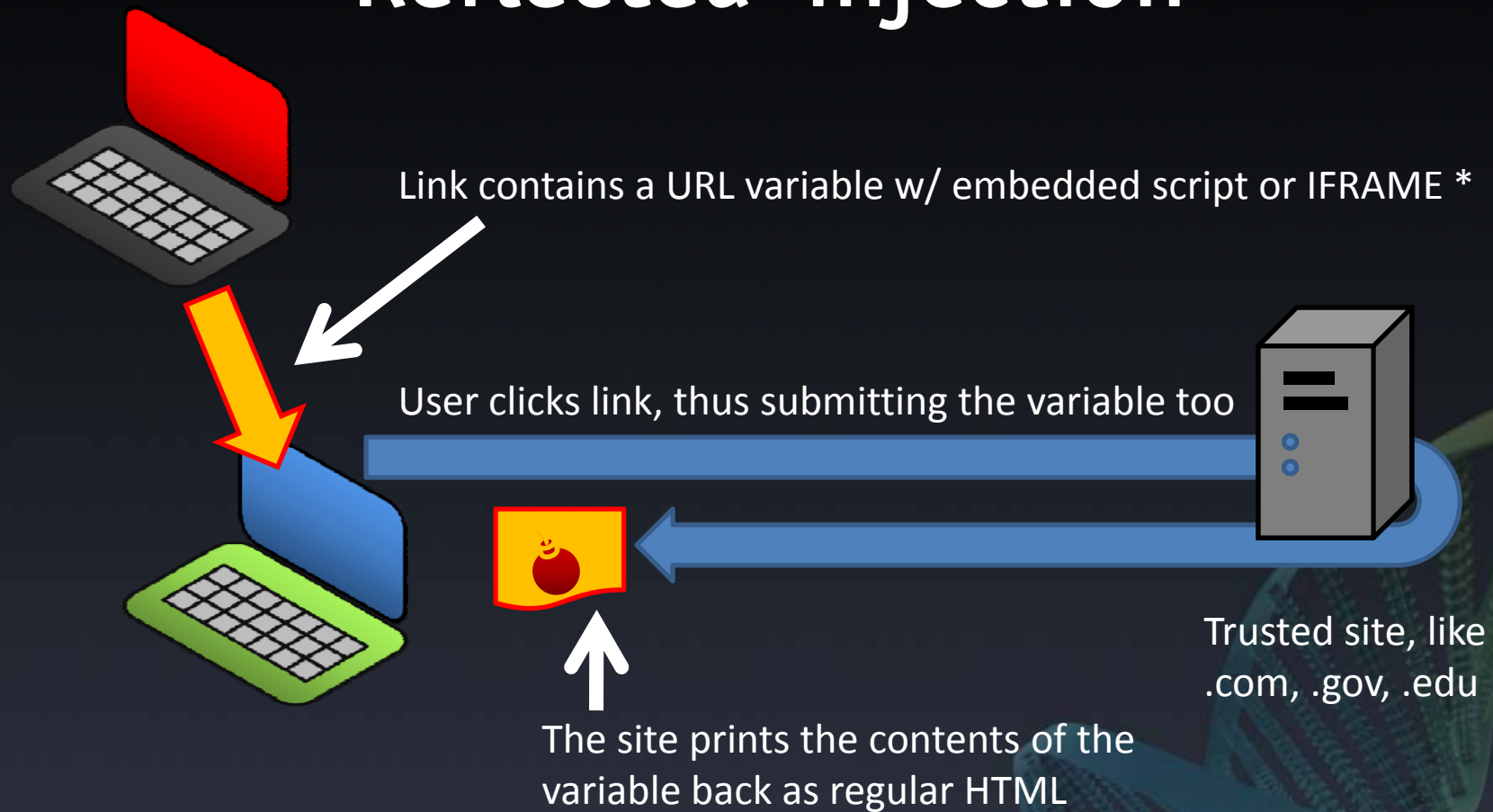
www.somesite.com/somepage.php



SQL Injection

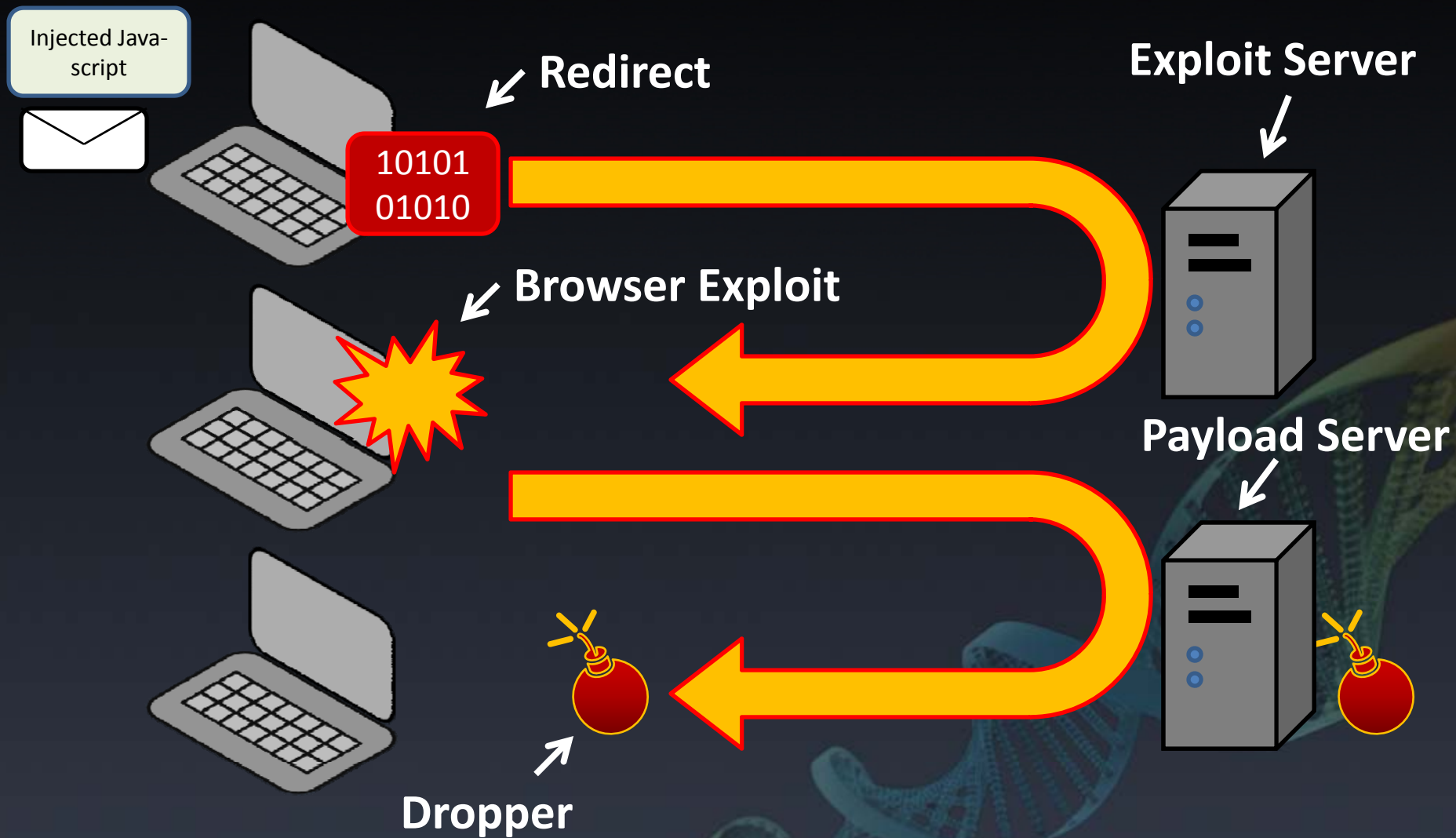


'Reflected' injection



*For an archive of examples, see xssed.com

A three step infection



Eleonore (exploit pack)



Windows 2003 1

Spoit:	Loads:
mem_cor	1
Font_FireFox	1
op_telnet	2
DirectX_DS	3
Spreadsheet	4
mdac	12
pdf	58

Browsers:	Traffic:	Loads:	Percent:
FireFox 1.0.7	2	0	0
FireFox 1.5.0	2	0	0
FireFox 2.0	2	0	0
FireFox 2.0.0	17	1	5.88
FireFox 3.0	1	0	0
FireFox 3.0.1	3	1	33.33

Tornado (exploit pack)

Exploits						
Status	Exploit	Exploited	Last 24h	Last 1h	Breaking	Loads
on	MDAC (RDS)	0 (0%)	0	0	0%	0 (0%)
on	WVFI SetSlice	0 (0%)	0	0	0%	0 (0%)
on	VML	0 (0%)	0	0	0%	0 (0%)
on	MS06-044	0 (0%)	0	0	0%	0 (0%)
on	WMF Firefox	0 (0%)	0	0	0%	0 (0%)
on	WMF Opera 7	0 (0%)	0	0	0%	0 (0%)
on	QuickTime	0 (0%)	0	0	0%	0 (0%)
on	WinZip	0 (0%)	0	0	0%	0 (0%)
on	Zenturi	0 (0%)	0	0	0%	0 (0%)
on	Yahoo Webcam	0 (0%)	0	0	0%	0 (0%)
on	Opera 9-9.20	0 (0%)	0	0	0%	0 (0%)
on	XML Core Services	0 (0%)	0	0	0%	0 (0%)
off	empty	0 (0%)	0	0	0%	0 (0%)
off	empty	0 (0%)	0	0	0%	0 (0%)
on	Java bytecode(*)	0 (0%)	0	0	0%	0 (0%)
on	.ANI(*)	0 (0%)	0	0	0%	0 (0%)
Totals:	0 active exploits	0 exploited systems			0%	0 loader
Exploits options						
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
MDAC (RDS)	WVFI SetSlice	VML	MS06-044	WMF Firefox	WMF Opera 7	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Zenturi	Yahoo Webcam	Opera 9-9.20	XML Core Services	empty	empty	Ja

Napoleon / Siberia (exploit pack)

Napoleon Sploit 1.0
by WennY

[Стата](#) [Страны](#) [Рефералы](#) [Настройки](#) [Очистить](#) [Выход](#)

Статистика

Логин (?):

Пароль (?):

MySQL

Сервер (?):

Пользователь (?):

Пароль (?):

Имя БД (?):

Имя таблицы (?):

Связка

Siberia Pack
by WennY

User:

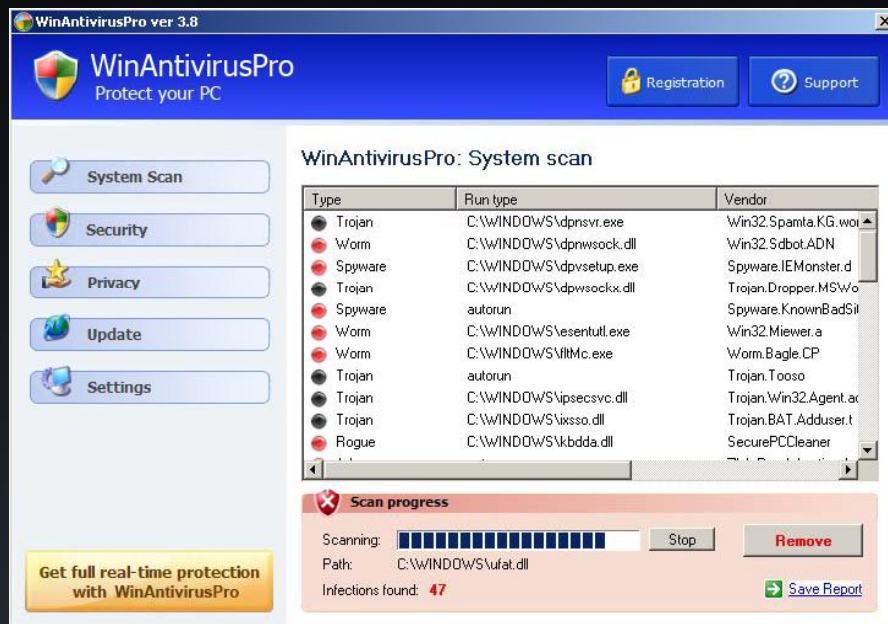
Pass:

[Login](#)

Rogueware

- 35 million computers infected every month with rogueware*
- Many victims pay for these programs, \$50-\$70, and stats show bad guys are making upwards of \$34 million dollars a month with this scam*
- Many are fake anti-virus scanners

Rogueware



Payload Server

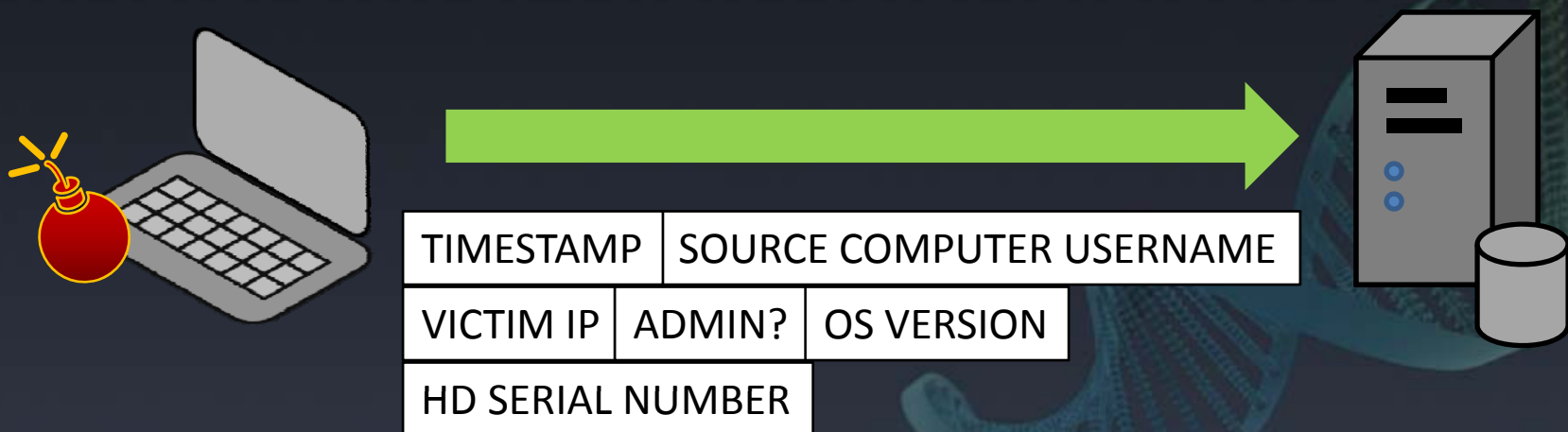
- A machine that has the actual malware dropper ready for download.
- The exploit server will redirect the victim to download a binary from this location



Command and Control



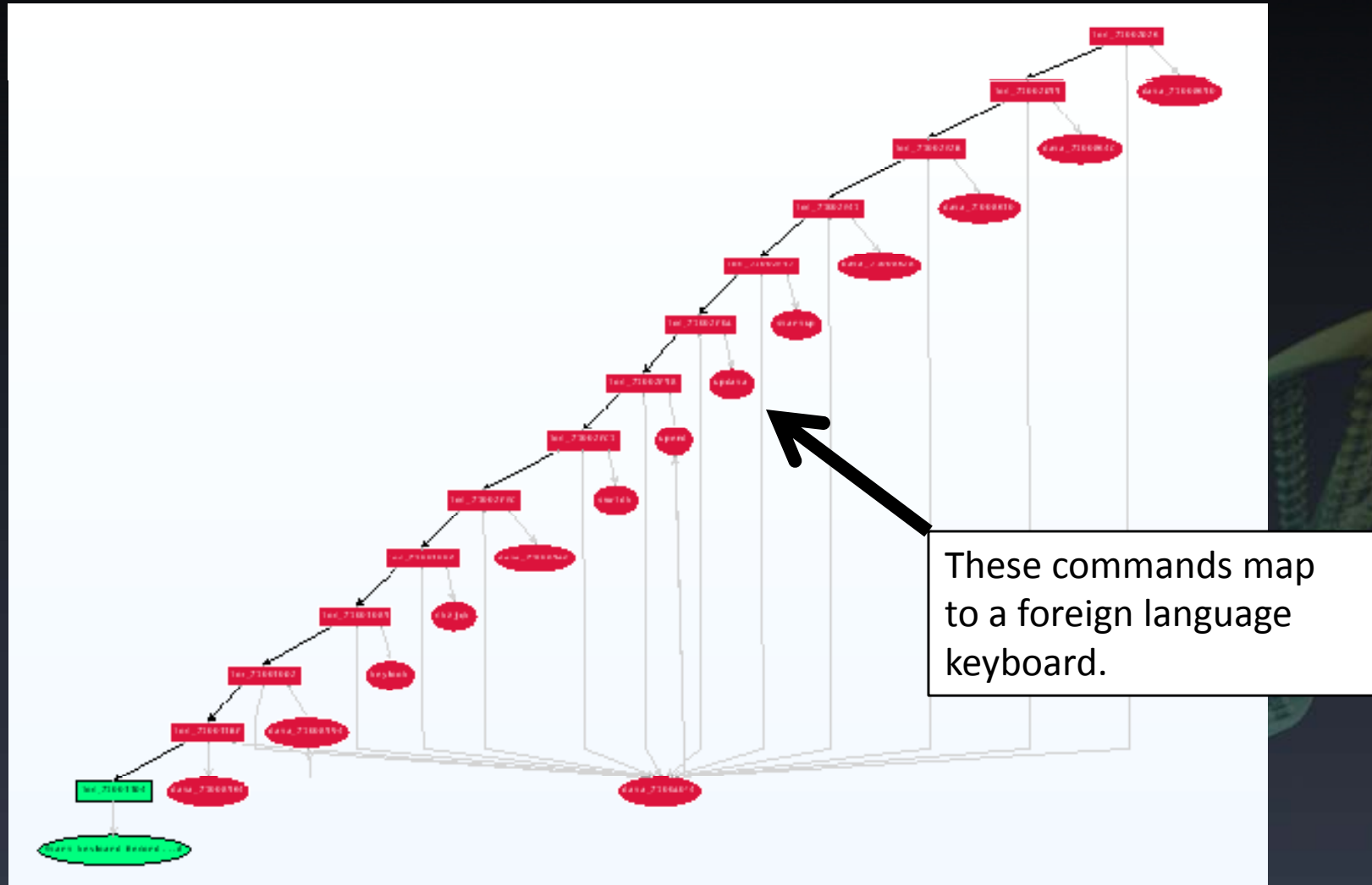
Once installed, the malware phones home...



Command and Control Server

- The C&C system may vary
 - Custom protocol (Aurora-like)
 - Plain Old Url's
 - IRC (not so common anymore)
 - Stealth / embedded in legitimate traffic
- Machine identification
 - Stored infections in a back end SQL database

Command and Control



IRC C&C

```
et PRIVMSG #b0tk3y# :.tcpflood syn 81.192.230.244 80 600  
net PRIVMSG #b0tk3y# :.tcpflood syn 62.75.220.123 80 200  
et PRIVMSG #linux :!syn @tcpflood 66.252.24.125 6667 2000  
 PRIVMSG #botnet :syn 217.111.100.210 80 200 200 200  
074ED56.3433FA26.IP PRIVMSG #linux :!say @udpflood 62.162.191.71 80 9999  
PRIVMSG #!spys!# :.wisdop.udp 212.72.103.60 80 8000
```

IRC control channel for a DDOS botnet
Most of the C&C has moved to the web.

Triad (botnet)

TRiAD HTTP Control System
[Set Command] [Statistics Table] [Help]

[Set Command for Machines:]

Bot IP ("all" - to all bots)

Command

ARGV[1]:

ARGV[3]:

[Sleep]-[time(in secs)]

[Sleep]-[time(in secs)]

[AckStorm]-[Host]-[Port]-[Nr of Packets]

[Reverse Shell]-[Host]-[Port]

[Bind Shell]-[Port]

[Delete Bot from remote machine]

[Shutdown Remote Machine]

[Reboot Remote Machine]

Zeus (botnet)

Zeus :: Options	
Information: Profile: admin GMT date: 26.04.2009 GMT time: 16:06:08	Screenshots Format: <input type="text" value="jpeg"/> Quality: <input type="text" value="80"/> %
Statistics: Summary	Local paths Reports: <input type="text" value="_reports"/>
Botnet: Online bots Remote commands	Other <input checked="" type="checkbox"/> Enable log write to database. <input checked="" type="checkbox"/> Enable log write to local path. Online bot timeout: <input type="text" value="30"/> Encryption key: <input type="text" value="2222"/>
Logs: Search Uploaded files	<input type="button" value="Update"/>
System: Profile → Options	
Logout	

Copyright © 2006-2009 Zeus Group

CP :: Bots

Information:

Current user: russian
GMT date: 15.10.2009
GMT time: 19:16:17

Statistics:

Summary
OS

Botnet:

→ Bots

Reports:

Search in database
Search in files

Logout

Filter

Bots:

Botnets:

IP-addresses:

Countries:

ru

NAT status:

Outsi

Online status:

Onlin

Install status:

-

Used status:

-

Comments status:

-

R

Result (31):

Bots action:

Check socks

>>

<input checked="" type="checkbox"/>	#	Bot ID	Botnet	Version	IPv4	Country	Online
<input checked="" type="checkbox"/>	1	server_01df59ed	tch	1.3.1.1	92.61.24.60	RU	81:2
<input checked="" type="checkbox"/>	2	microsof_f007b4_02660862	tch	1.3.1.1	77.245.119.153	RU	57:1
<input checked="" type="checkbox"/>	3	athlon_011fee44	tch	1.3.1.1	94.181.102.60	RU	38:5
<input checked="" type="checkbox"/>	4	microsof_ad86f1_00038ee3	tch	1.3.1.1	94.181.125.33	RU	16:0
<input checked="" type="checkbox"/>	5	dom_5404f68e72f_00036775	tch	1.3.1.1	95.78.86.81	RU	13:0
<input checked="" type="checkbox"/>	6	loner_xp_0001e25c	tch	1.3.1.1	88.80.39.164	RU	11:1
<input checked="" type="checkbox"/>	7	tycoon_ada54ca2_0001bf92	tch	1.3.1.1	81.20.174.80	RU	10:1
<input checked="" type="checkbox"/>	8	alexiz6_014408f1	tch	1.3.1.1	94.181.119.193	RU	10:1
<input checked="" type="checkbox"/>	9	microsof_1b0ea1_00026ff6	tch	1.3.1.1	94.181.111.163	RU	08:5
<input checked="" type="checkbox"/>	10	microsof_01fb7c_002d12a2	tch	1.3.1.1	92.241.227.220	RU	06:3
<input checked="" type="checkbox"/>	11	microsof_beb7c0_0001e867	tch	1.3.1.1	92.241.254.170	RU	06:3
<input checked="" type="checkbox"/>	12	microsof_658578_00006b7b	tch	1.3.1.1	78.85.109.72	RU	06:0
<input checked="" type="checkbox"/>	13	krasnoar_46e2cb_0040cb67	tch	1.3.1.1	92.241.251.131	RU	05:4

Fragus (botnet)



Авторизация

Логин:

Пароль:

Язык:

Войти

Implants



- The 'persistent' backdoor program
- Hide in plain sight strategy
- General purpose hacking tool
- Stealth capabilities
- In-field update capabilities

Poison Ivy (implant)

PoisonIvy Polymorphic Online Builder

Poison Ivy Server (binary) :

Parcourir...

Upload

Binary name: shellcode.bin

Binary size: 6215 bytes

Binary hexa: 558bec81c430f0ffff6033c08dbd84...

[OK] Binary unloaded

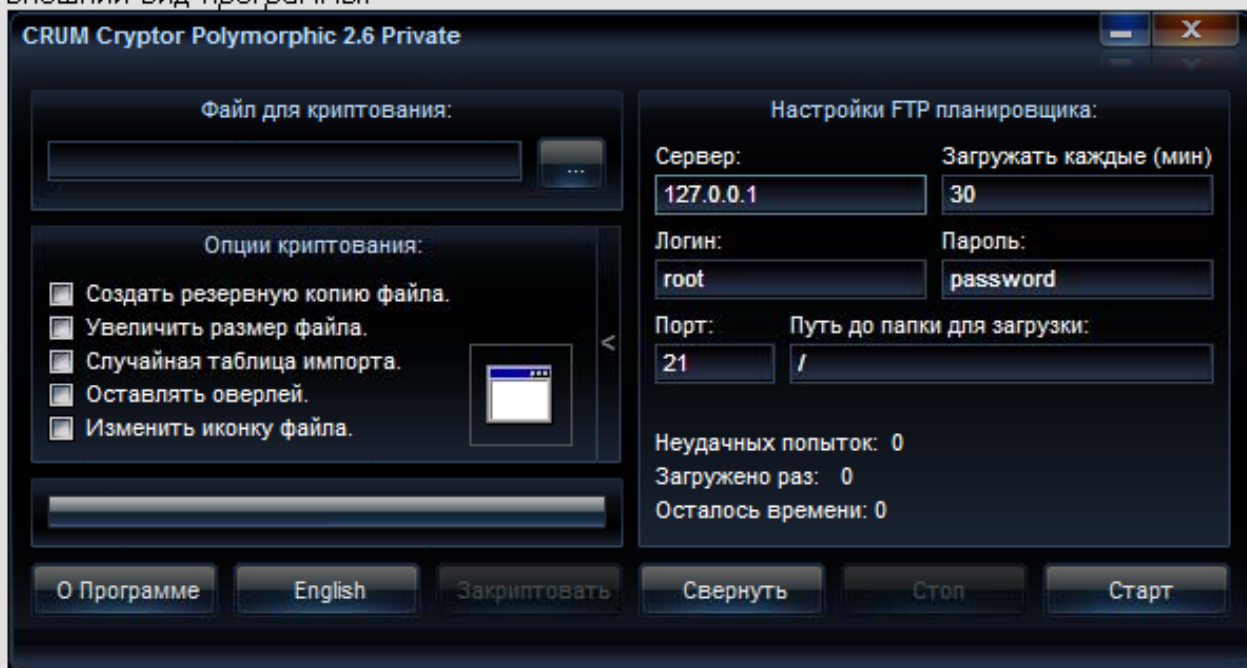
Features:

- Polymorphic encryption
- Polymorphic decryption routine
- Add junk code (not a block with a jmp)
- Add a unique trick to bypass Sandbox and Memory Scan on VT (found by me) (the server is slow to start)
- Add junk API call

CRUM (protector)

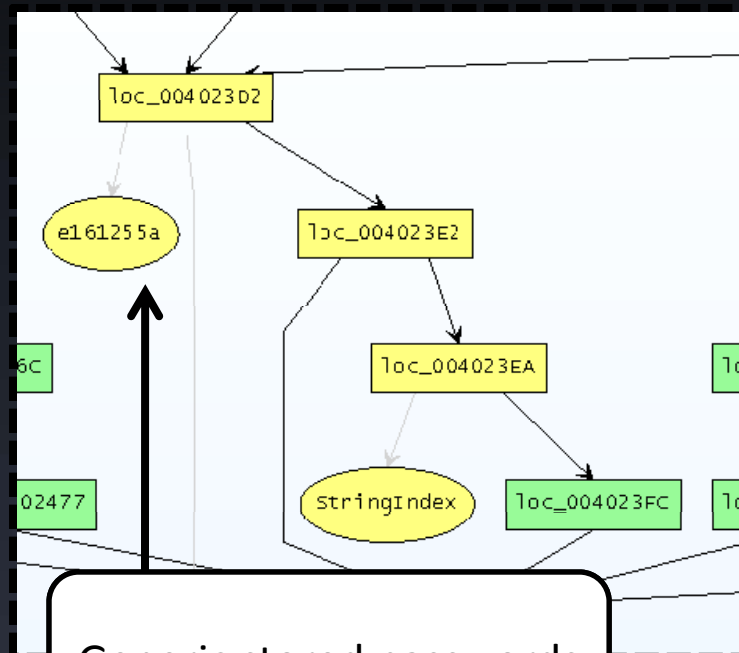
CRUM Cryptor Polymorphic v. 2.6 new!

Внешний вид программы:

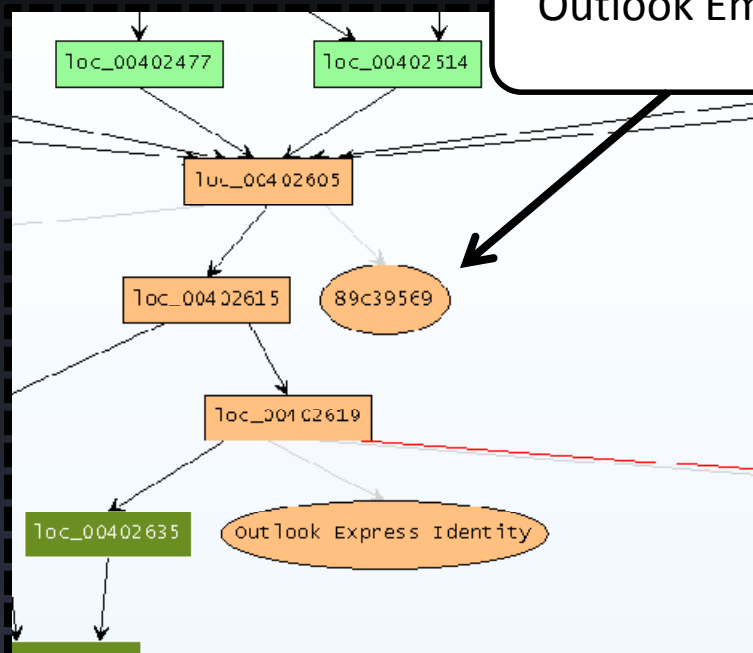


Цена: 200\$

Steal Credentials



Generic stored passwords



Outlook Email Password

Steal Files

The image shows a network analysis tool interface. At the top, a call graph displays several nodes: `loc_7_004294`, `loc_7_004298`, `207.43.230.21` (highlighted in a red box), `__imp_ws2_32.dll!inet_addr`, and `data_71008348`. A red arrow points from the `207.43.230.21` node in the call graph to the same IP address in the binary view window below.

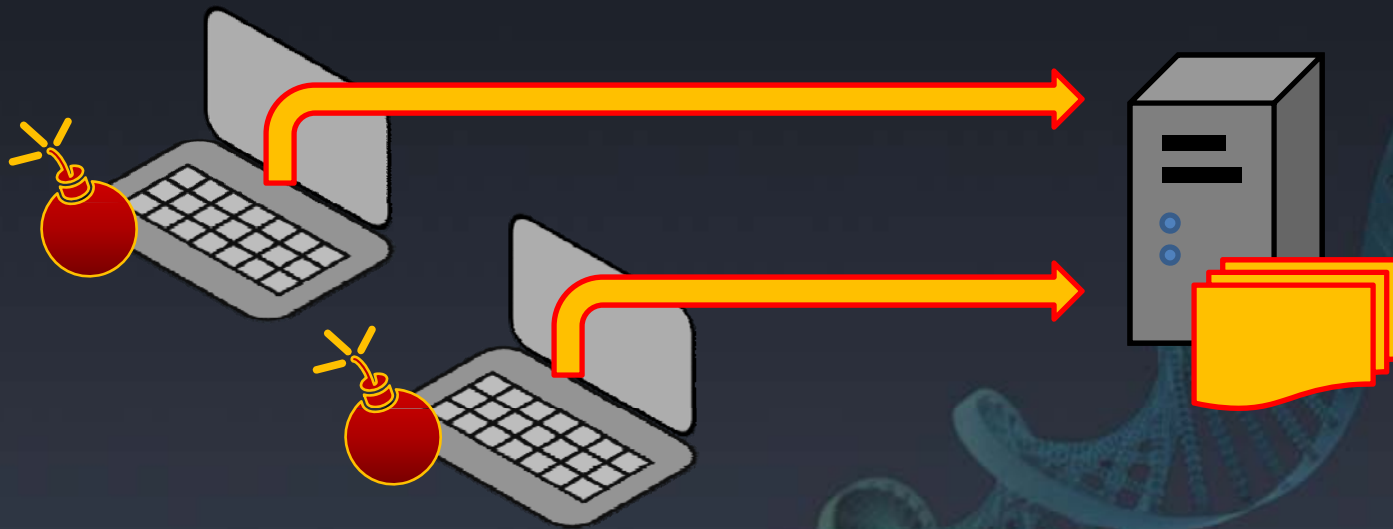
The **Binary View** window shows a list of file types that are exfiltrated, including:

- `regsvr.dll`
- `207.43.230.21...`
- `:\..%s..\drivers`
- `\own\...\...xls`
- `....XLS.....rar`
- `....RAR.....ZIP`
- `....PPT.....PDF`
- `....DOC.....zip`
- `....ppt.....pdf`
- `....doc.....`
- `*...List domain`
- `server ok!#..Ent`
- `ries enumerated:`
- `%d....Total en`
- `tries: %d....Mor`

A text box with the text "All the file types that are exfiltrated" is overlaid on the binary view window, with an arrow pointing to the list of file types.

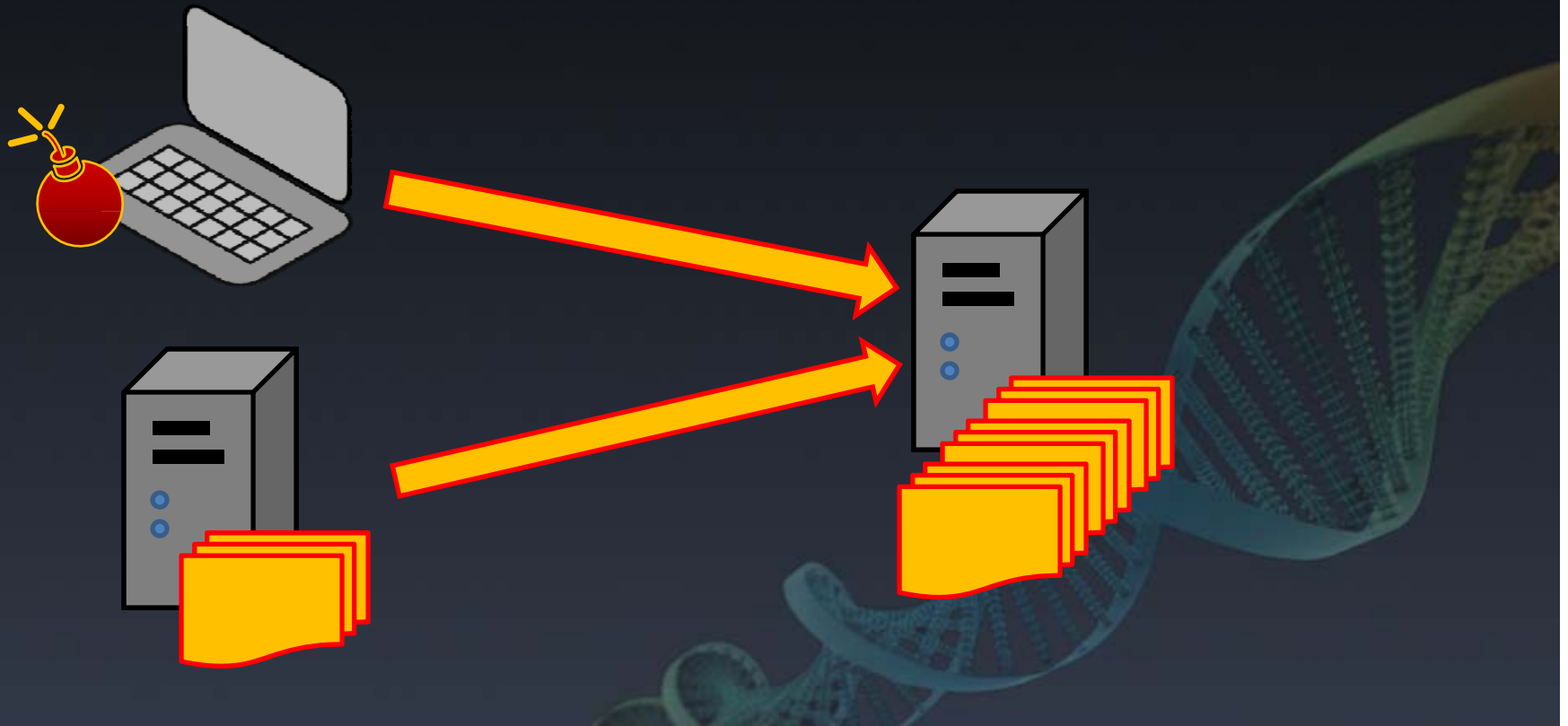
Staging Server

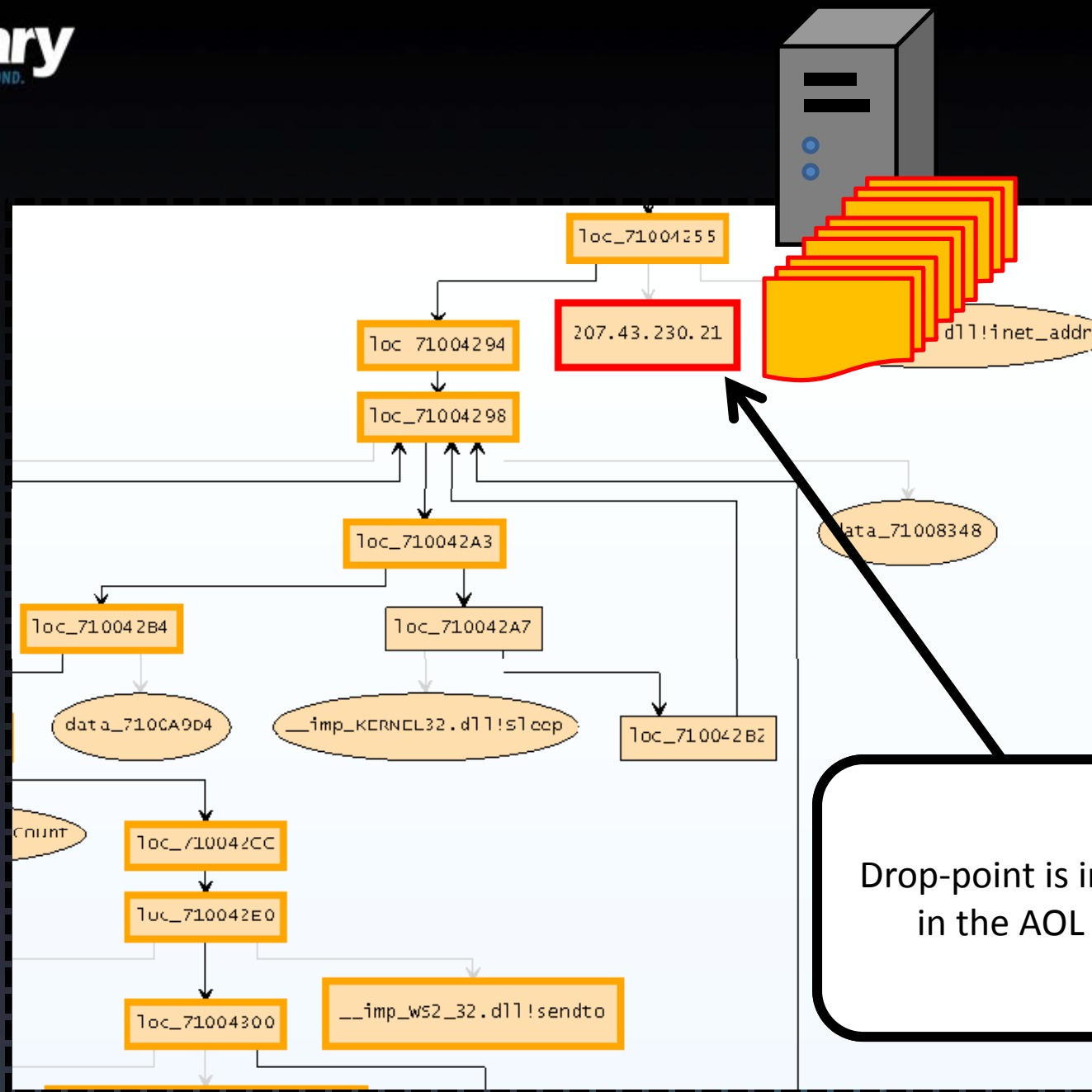
- A place to store all the stolen goods before it gets 'exfiltrated'
 - Data is moved off the network in a variety of ways – 'Hacking Exposed' level behavior



Drop Site

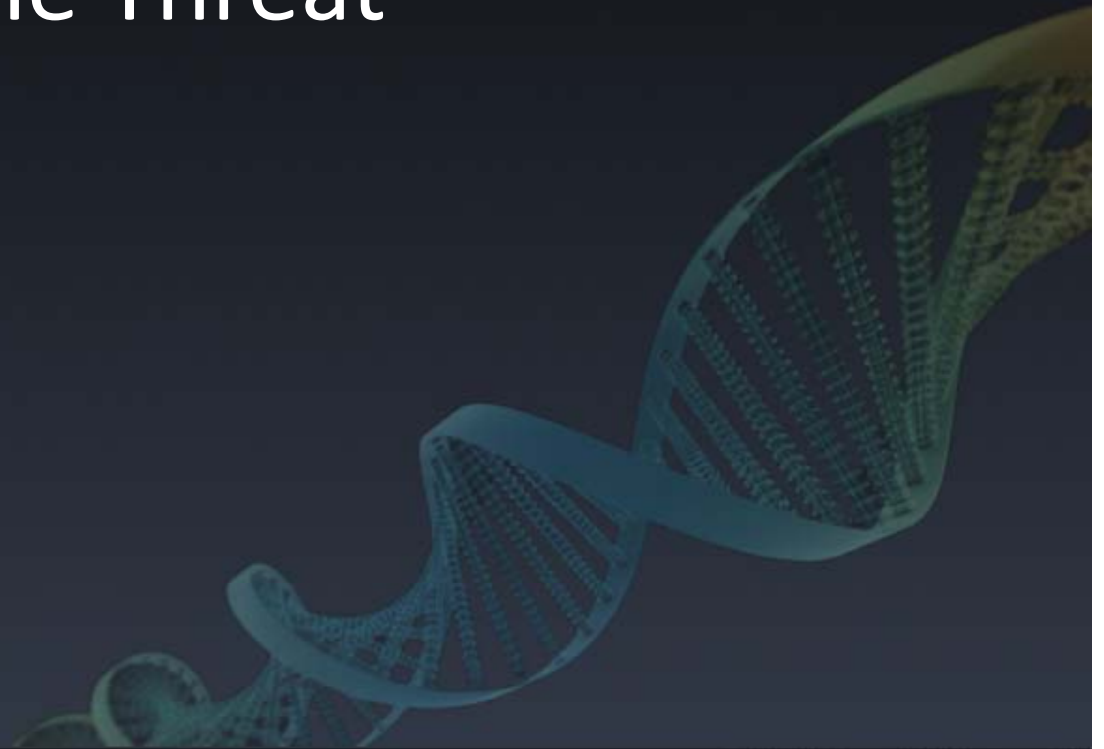
- Sometimes the stolen data is moved to a tertiary system, *not the same as the C&C*





Part II

Countering the Threat



Malware Threat Attribution



Why Attribution?

- The bad guy doesn't change that much
 - Repeated use of the same exploit methods
 - Repeated use of same C&C system
- His intention is singular
 - Identity theft, or IP-theft, you pick
 - If IP-theft, is it specific?
 - Insight into why someone is after you
 - You know what to protect

Threat Intelligence

- Who is targeting you?
- What are they after?
- Have they succeeded?
- How long have they been succeeding?
- What have I lost so far?
- What can I do to counter their methods?
- Are there legal actions I can take?

Enterprise Information Sources

- Endpoint, physical memory snapshot
 - Multiple endpoints will be involved, need to view them as a group
- Endpoint, live-state forensics, ongoing monitoring
- Message Archives (email)
- Netflow / Packet Archives

Information Points

- Dropsite where IP is being dropped
 - IP Address, Server Version, Country of Origin
- Command and Control Server
 - Version of C&C, Fingerprint
 - Designed to survive takedowns
 - Hot staged failovers likely
- Exploit Pack Server
 - Version of Exploit Pack, Fingerprint

Intel Feeds

- malwaredomainlist.com
- abuse.ch
- spamcop.net
- team-cymru.org
- shadowserver.org

Forensic Marks left by Actors

- Forensic marks occur at all points where software development occurs
- They also occur in less obvious places
 - All points where binary is translated into new forms (parsed, packed, packaged, etc)
- These forensic marks may identify the original developer of the software
- Obviously, only certain actors leave marks

Fingerprinting Actors within the Theatre



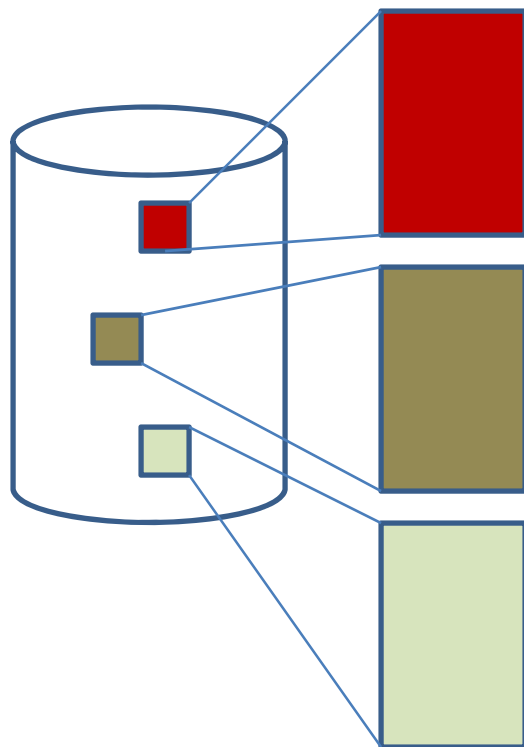
Digital Fingerprints

- Several actors in the underground economy will leave digital fingerprints
- What is represented digitally
 - Distribution system
 - Exploitation capability
 - Command and Control
 - Payload (what does it do once its in)

The developer != operator

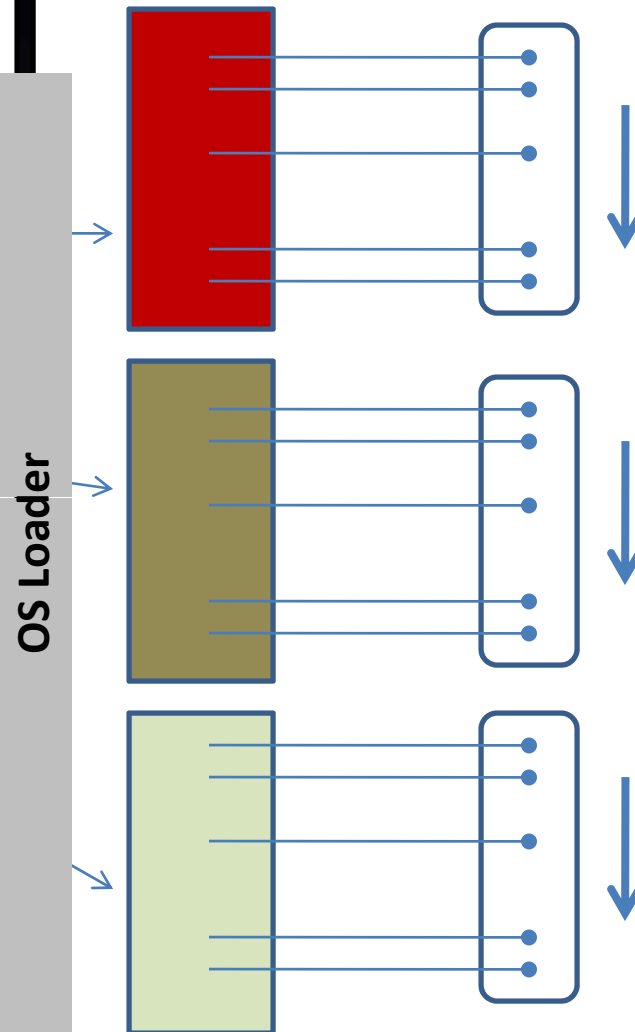
- The developer may not have any relation to those who operate the malware
- The operation is what's important
- Ideally, we want to form a complete picture of the 'operation' – who is running the operation that targets you and what their intent is

DISK FILE



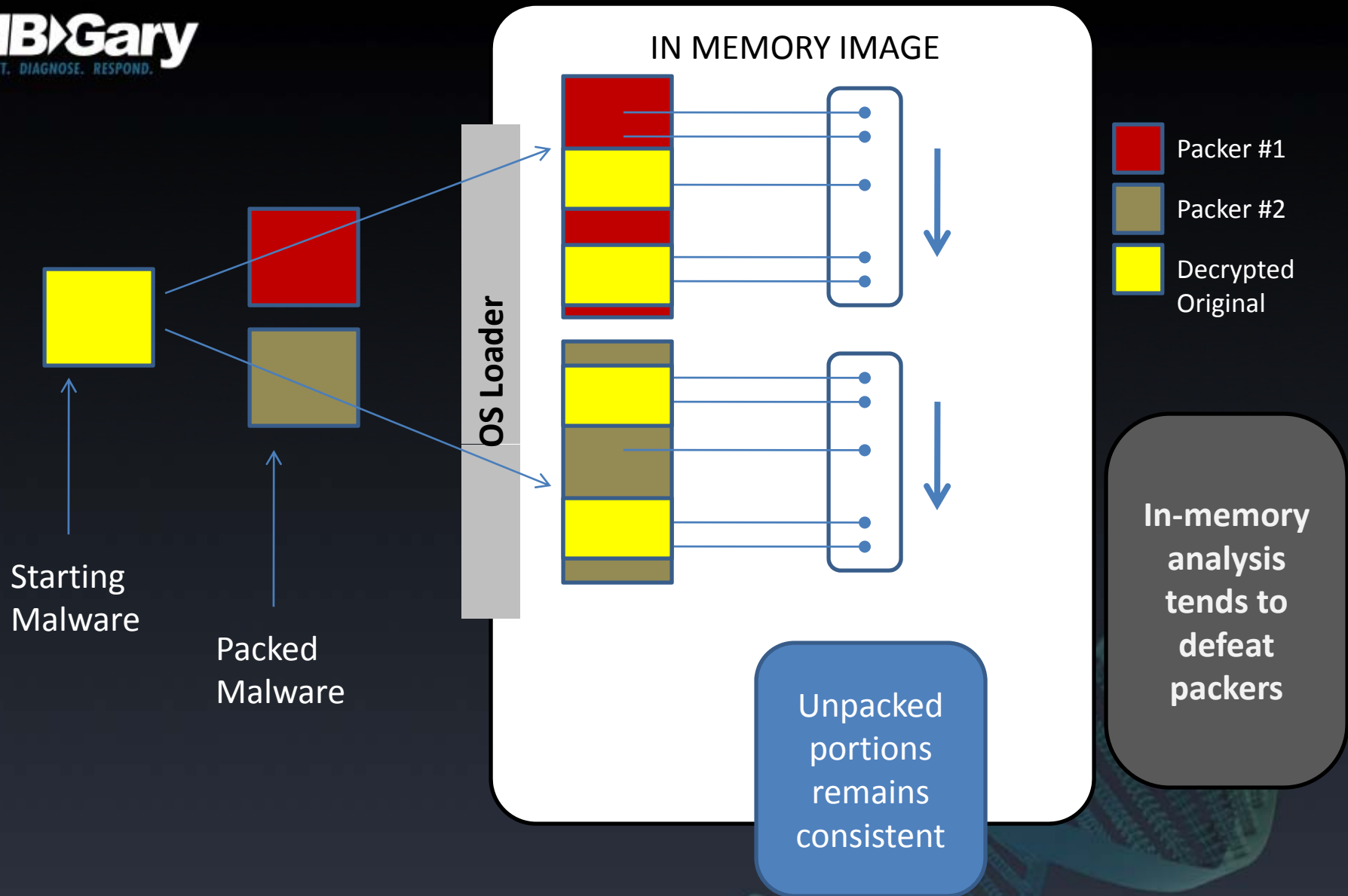
MD5
Checksums
all different

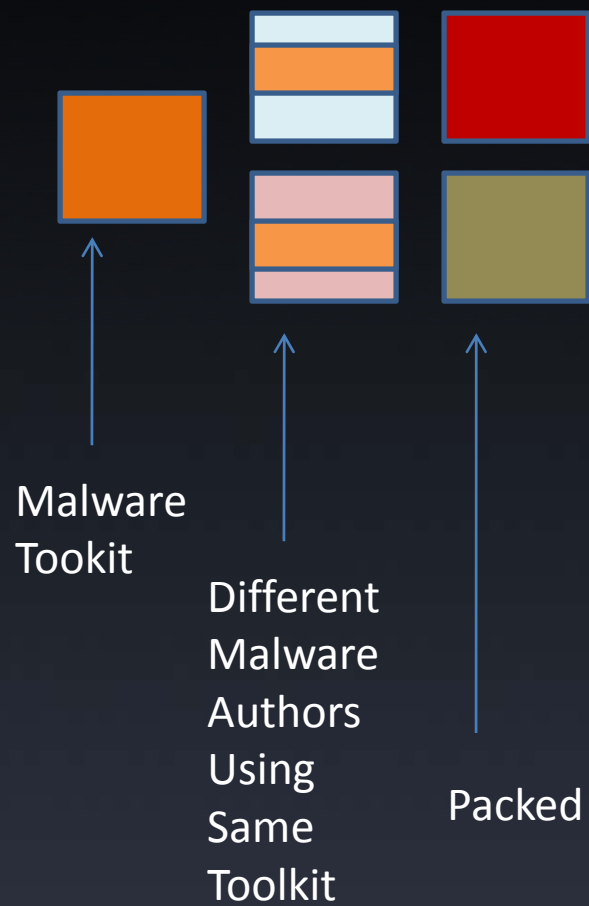
IN MEMORY IMAGE



Code idioms
remains
consistent

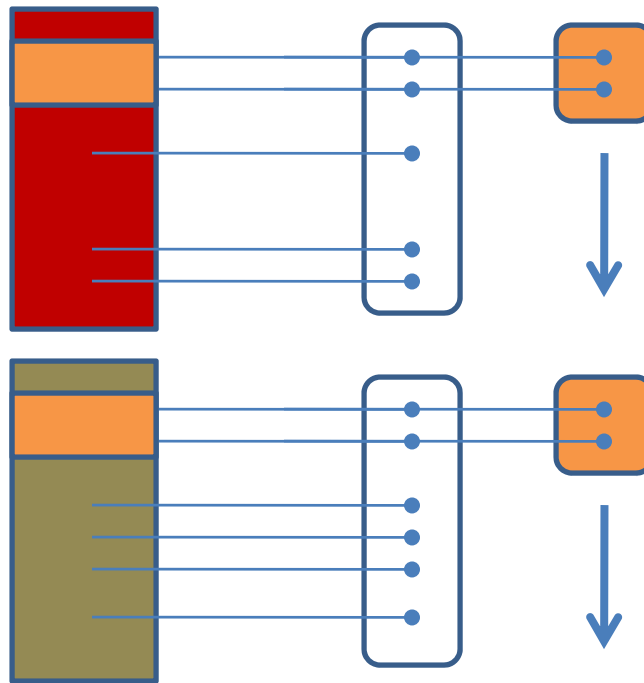
Same
malware
compiled in
three
different
ways





OS Loader

IN MEMORY IMAGE

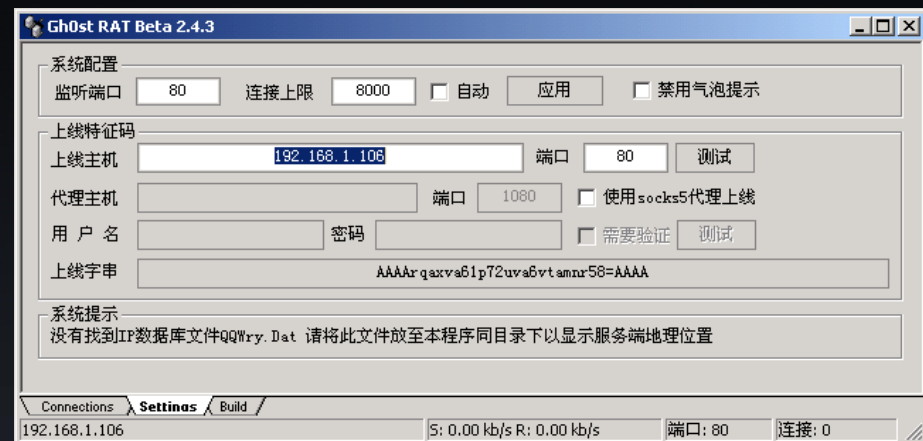


Toolkit Marks Detected

Toolkits and developer signatures can be detected

Country of Origin

- Country of origin
 - Is the bot designed for use by certain nationality?
- Geolocation of IP is NOT a strong indicator
 - However, there are notable examples
 - Is the IP in a network that is very unlikely to have a third-party proxy installed?
 - For example, it lies within a government installation



C&C map from Shadowserver, C&C for 24 hour period

Language

- Native language of the software, expected keyboard layout, etc – intended for use by a specific nationality
 - Be aware some technologies have multiple language support
- Language codes in resources

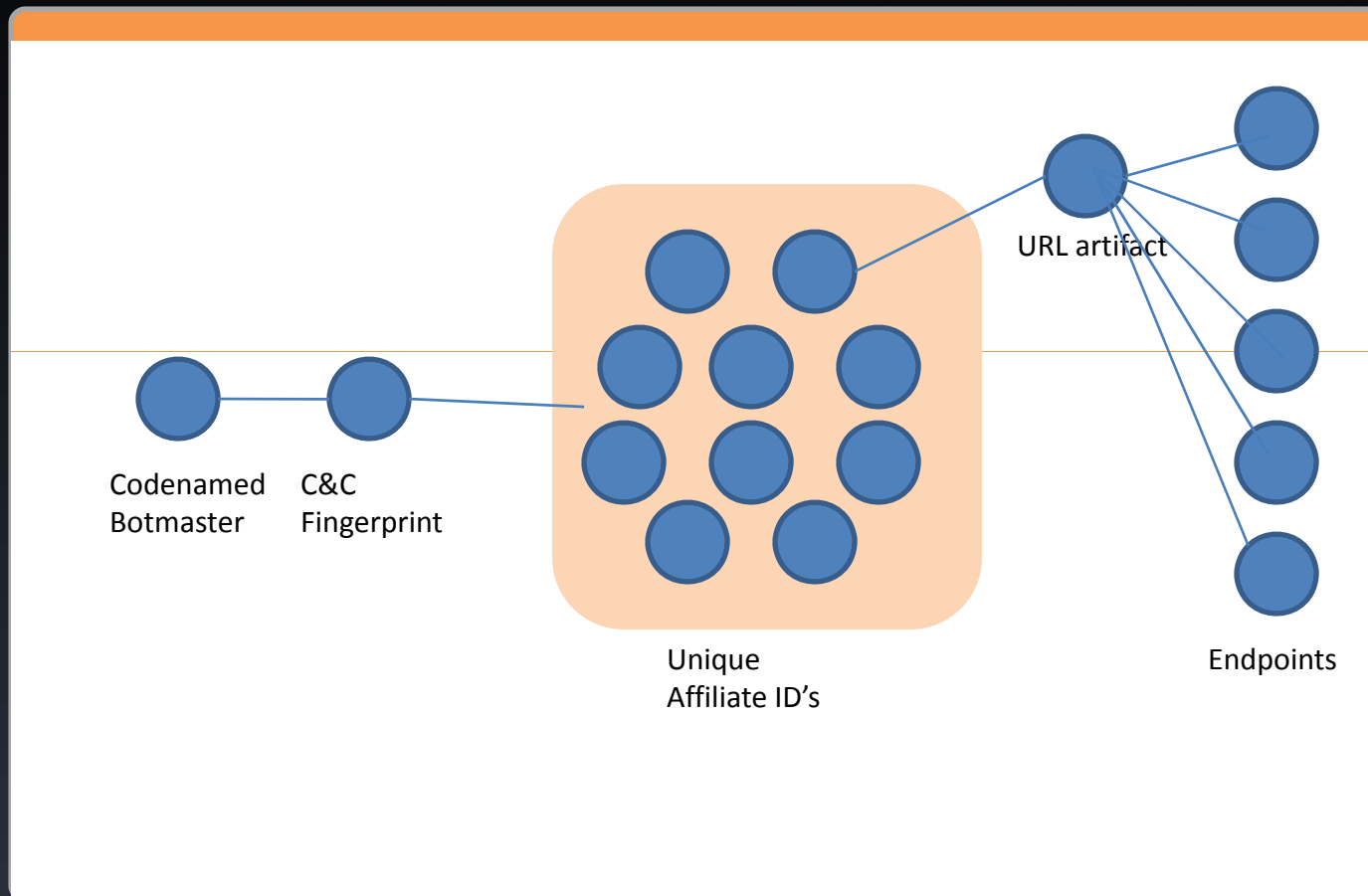


\$100.00
per 1000
infections

Endpoint
Exploiters

Actor: Endpoint Exploiter

- The exploiter of the end nodes, sets up the XSS or javascript injections to force redirects
- Newcomers can learn various attack methods from their PPI affiliate site (mini-training)
- These are generally recruited hackers from forums (social space)
- The malware will have an affiliate ID
 - “somesite.com/something?aflid=23857 ← look for potential ID’s – this ID’s the individual endpoint exploiter



Link Analysis

Actor: Bot Master

- Owns the box that accepts inbound infection requests, pays out by ID
 - Pays for numbers of collected credentials
 - Collect stolen identities and resell
 - Accounting system for all successful infections
- Pay-per-infection business model
 - This implies a social space
- Configuration settings on server will be reflected in client infections (additional resolution to differentiate multiple actors using the same bot technology)
- Version of bot system offers more resolution, and potential indicator of when it was stood up
- The Bot Master will have a preference for a particular bot control system – can be softlinked to this actor

Actor: Account Buyer

- Buy stolen creds from the collectors
- Use stolen credentials to move money out of victim bank accounts
 - These guys touch the victim accounts
- Source IP of transaction, Use of TOR / HackTOR, Use of botnet to redirect, etc.
 - This part is audited in your network logs, so ...
 - Multiple attacks by the same person are likely to be cross-referenced
 - Not a very strong fingerprint

Actor: Mules & Cashiers

- Accept stolen money into accounts in the native country of the subverted bank and redirect that money back out into foreign accounts
 - These transactions must stay below trigger levels
 - \$5,000 or less
- These actors do not leave forensic marks on the malware chain
 - Banking records only

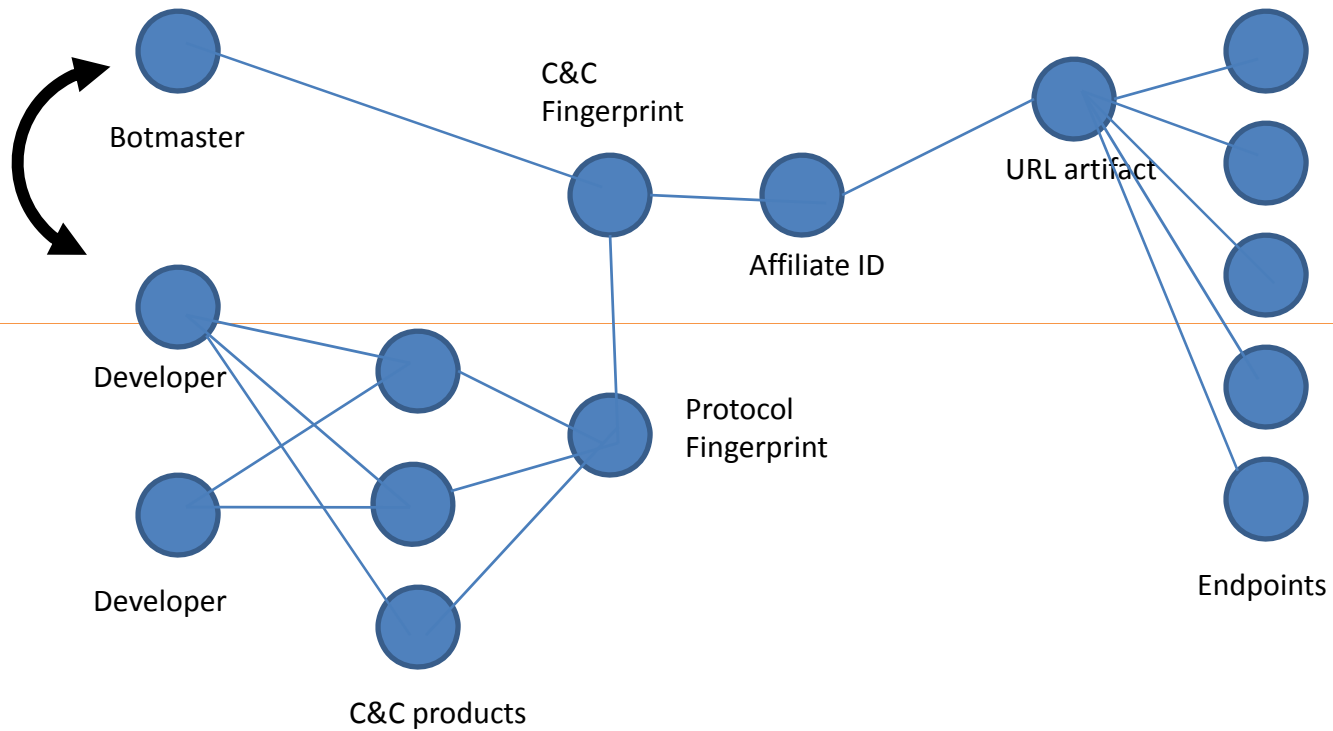
Actor: Wizards

- Move E-Gold into ATM accounts that can be withdrawn in the masters home country
- Will take a percentage of the money for himself
- This actor does not leave a forensic mark on the malware chain
 - Banking records typically don't even work here, as the transaction has already been processed thru e-Gold

Actor: Developers

- Sell bot systems for four figures
 - \$4,000 - \$8,000 with complete C&C and SQL backend
- Sell advanced rootkits for low five figures
 - Possibly integrated into a bot system
 - Possibly used as a custom extension to a bot, integrated by a botmaster, \$10,000 or more easily for this
- All of this development is strongly fingerprinted in the malware chain

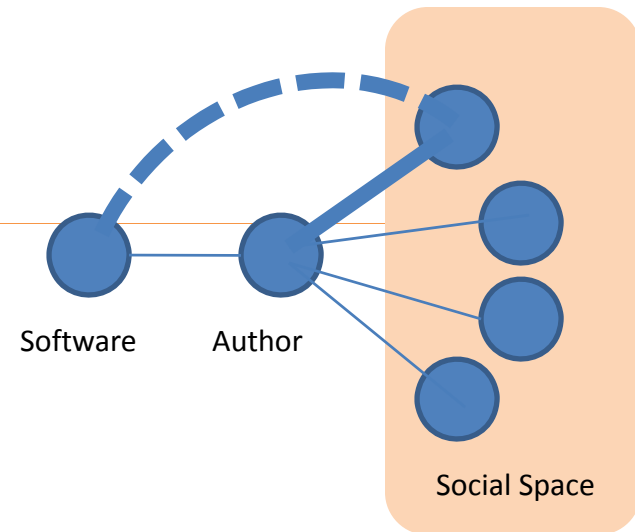
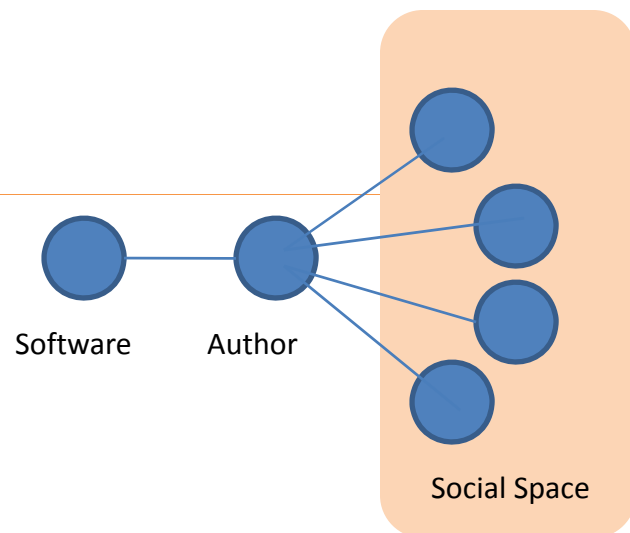
We want to
find a
connection
here



Link Analysis

Softlinking into the Social Space

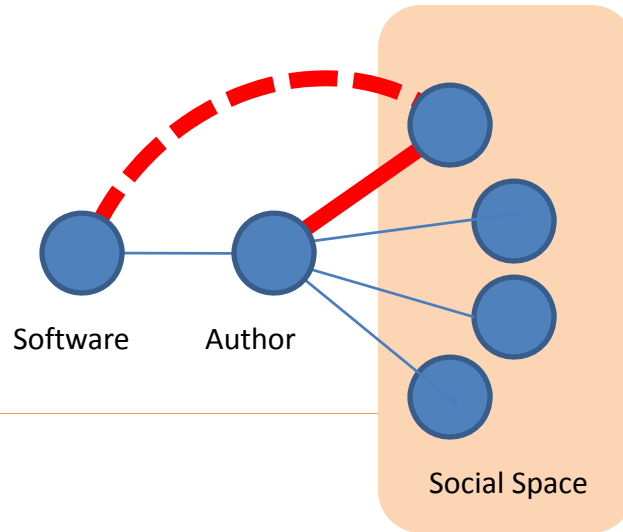
- Where is it sold, does that location have a social space?
 - If it has a social space, then this can be targeted
 - Forum, IRC, instant messaging
- Using link-analysis, softlink can be created between the developer of a malware product and anyone else in the social space
 - Slightly harder link if the two have communicated directly
 - If someone asks for tech support, indicates they have purchased
 - If someone queries price, etc, then possibly they have purchased



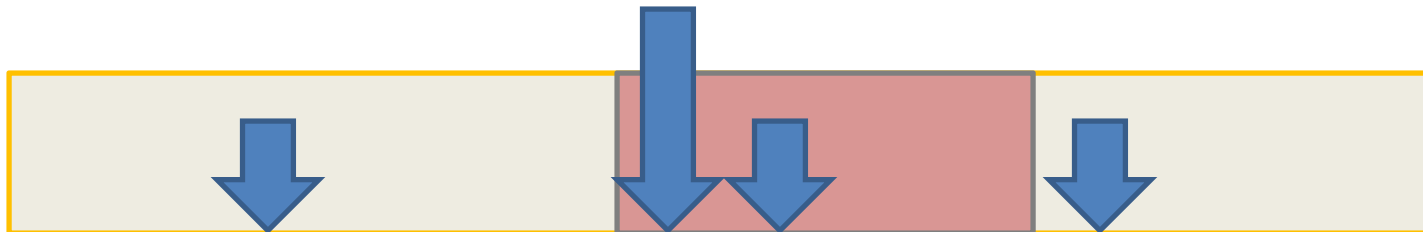
Link Analysis

Working back the timeline

- Who sells it, when did that capability first emerge?
 - Requires ongoing monitoring of all open-source intelligence, presence within underground marketplaces
 - Requires budget for acquisition of emerging malware products



i.e., Technical Support Query made
AFTER version 1.4 Release



Use of timeline to differentiate links

Link Analysis

Actor: Vuln Researchers

- Paid well into the five figures for a good, reliable exploit
 - \$20,000 or more for a dependable IE exploit on latest version
- Injection vector & activation point can be fingerprinted
 - Method for heap grooming, etc
 - Delivery vehicle

Conclusion



Take Away

- Existing security doesn't work
- Go 'beyond the checkbox'
- Funded adversaries with intent
- Need to focus on the criminal, not his tool

HBGary

- www.hbgary.com
- Solutions for enterprises
 - Digital DNA™ - codified tracking of malware authors
 - Integrated into several Enterprise products, McAfee ePO, Guidance EnCase, more to be announced
 - Responder™ – malware analysis and physical memory forensics