Cybercrime, Cyber-Espionage, Information Warfare and "Cyber War": the fil-rouge which connects the dots

ENHANCING CYBER SECURITY

ENCYSEC

Raoul "Nobody" Chiesa

Expert

EXPERTISE FRANCE

CIVIPOL

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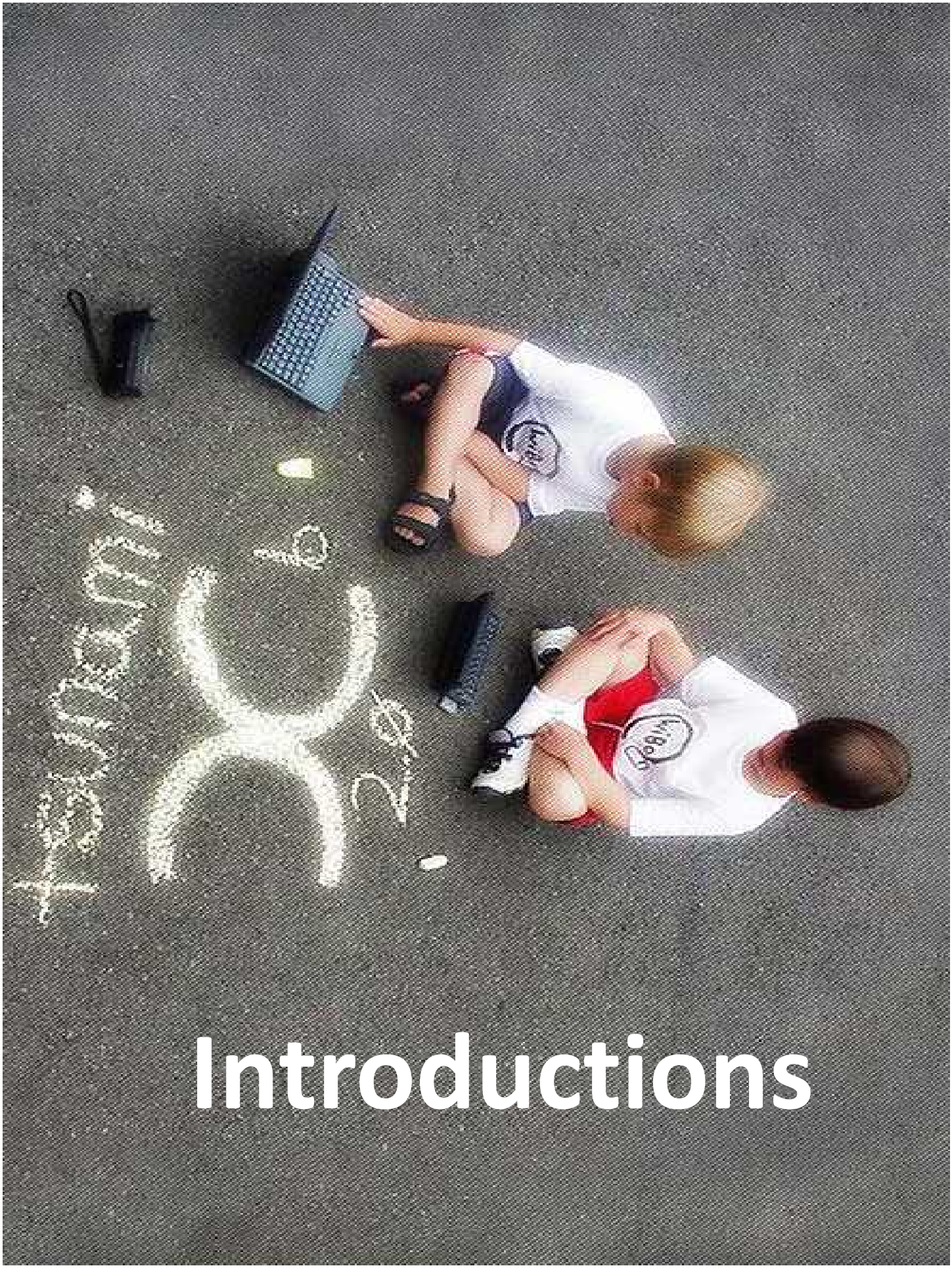
Agenda

- Introductions
- The scenarios and the Actors
- Profiling «Hackers»
- Information Warfare
- Cyber Espionage case study
- Conclusions
- References, Q&A



Introductions

The Speaker

- President, Founder, **Security Brokers**
- Principal, **CyberDefcon Ltd.**
- Independent Senior Advisor on Cybercrime @ **UNICRI (United Nations Interregional Crime & Justice Research Institute)**
- Former PSG Member (2010-2012 / 2013.2015) @ **ENISA (Permanent Stakeholders Group @ European Union Network & Information Security Agency)**
- Founder, Board of Directors and Technical Commitee Member @ **CLUSIT** (**Italian Information Security Association**)
- Steering Committee, **AIP/OPSI**, **Privacy & Security Observatory**
- Former Member, Co-coordinator of the **WG «Cyber World»** @ **Italian MoD**
- Cultural Attachè, **APWG European Chapter** (**APWG.EU**)
- Board of Directors, **ISECOM**
- Board of Directors, **OWASP Italian Chapter**
- **Supporter at various security communities**

Committed to Wiping Out Internet Scams and Fraud

The Security Brokers

- We deal with **extremely interesting, niche topics**, giving our strong know-hows gained from **+20 years of field experience** and from our **+30 experts**, very well known all over the world in the'**Information Security** and **Cyber Intelligence** markets.
- Our **Key Areas** of services can be resumed as:
  - **Proactive Security**
    - With a deep specialization on TLC & Mobile, SCADA & IA, ICN & Trasportation, Space & Air, Social Networks, e-health, […]
  - **Post-Incident**
    - **Attacker's profiling**, Digital Forensics (Host, Network, Mobile, GPS, etc..), Trainings
  - **Cyber Security Strategic Consulting** (Technical, Legal, Compliance, PR, Strategy)
    - On-demand «Ninja Teams»
    - Security Incident PR Handling & Management
  - **Psychological, Social and Behavioural aspects (applied to cyber environments)**
  - **Cybercrime Intelligence**
    - Botnet takeovers, takedowns, Cybercriminals bounting, Cyber Intelligence Reports, Technical & Operational support towards CERTs and LEAs/LEOs,[…]
  - **Information Warfare & Cyber War** (only for MoDs & Intelligence Agencies)
    - Specialized Trainings, Attack&Defense Labs, more…
    - 0-day and Exploits – Digital Weapons
    - OSINT


interest
mainstream
subculture
ways
now
found
means
Hacker
vulnerabilities
tools
usually
programming
enumeration
controls
computer
Network
gaining
described
achieve
source
uses
Discovering
referred
intended
used
large
unconcerned
Exploitation
underground
open
people
hackers
security
person
community
Attempting
employing
Vulnerability
rarely
ends
Internet-con
information
system
computers
cyber-c
trade
common
creating
criminals considered
media
programmer
techniques
Proponents
breaks
compromise
typical
Identifying
administrative
evolved
hobbyists
political
home
crackers
related
argue
artistic
target
approach
exist
usage
recurring
refer
several
order
around
claim
illegal
attack
software
access
analysis

Terminologies!

- In the Information Security (InfoSec) world, we have a tremendous problem: the **terminology.**
  - **Each term** has different meanings, depending on the **context** and the **actor**

- This is not enough, tough: in the last years a **new trend** come out, which is adding the prefix "**cyber**" to **most of the terms**.
  - **Nevertheless,** a lot of (huge) **doubts still persist**, even in your own **national language!**

No common spelling…

„Cybersecurity, Cyber-security, Cyber Security ?”

No common definitions…

Cybercrime is…?

No clear actors…

Cyber – Crime/war/terrorism ?

No common components?…

- In those non English-speaking countries, problems with correctly understanding words and terms **rise up**.

The scenario(s) and the Actors

Crime -> Today

*You got the **information**, you got the **power**..*

(at least, in **politics**, in the **business world**, in our **personal relationships…**)

- Simply put, this happens because the "*information*" can be **transformed at once** into "something else":

1. **Competitive advantage**
2. **Sensible/critical information (blackmailing)**
3. **Money**

- … **that's why** all of us we want to "*be secure*".

- It's not by chance that it's named "IS": **Information Security** ☺

Cybercrime

- **Cybercrime**:

  *"The use of IT tools and telecommunication networks in order to **commit crimes** in **different manners**".*

- **The axiom of the whole model:**

  *"acquiring different types of **data** (information), which can be transformed into **money**."*

- **Key points**:
  - **Virtual** (pyramidal approach, anonimity, C&C, flexible and scalable, moving quickly and rebuilding fast, use of "cross" products and services in different scenarios and different business models)
  - **Transnational**
  - Multi-market (**buyers**)
  - **Differentiating** products and services
  - **Low** "entry-fee"
  - **ROI** /Return of Investment (on each single operation, which means that, exponentially, it can be industrialized)
  - Tax & (cyber) Law **heaven**

Why?

"2013 Cybercrime financial turnover apparently scored up more than Drugs dealing, Human Trafficking and Weapons Trafficking turnovers"

Various sources (UN, USDOJ, INTERPOL, 2013)

Financial Turnover, estimation: 12-18 BLN USD$/year

«Cybercrime ranks as one of the top four economic crimes»

PriceWaterhouseCoopers LLC Global Economic Crime Survey 2011

From Cybercrime to…

- We are speaking about an ecosystem **which is very often underevaluated**: most of times, Cybercrime is the **starting** or **transit point** towards different ecosystems:
  - **Information Warfare**
  - **Black Ops**
  - **Cyber Espionage**
  - Hacktivism
  - (private) **Cyber Armies**
  - **Underground Economy** and **Black/Grey Markets**
    - Organized Crime
    - Carders
    - Botnet owners
    - 0days
    - Malware factories (APTs, code writing outsourcing)
    - Lonely wolves
    - “cyber”-Mercenaries

Profiling Actors

New Actors joined in

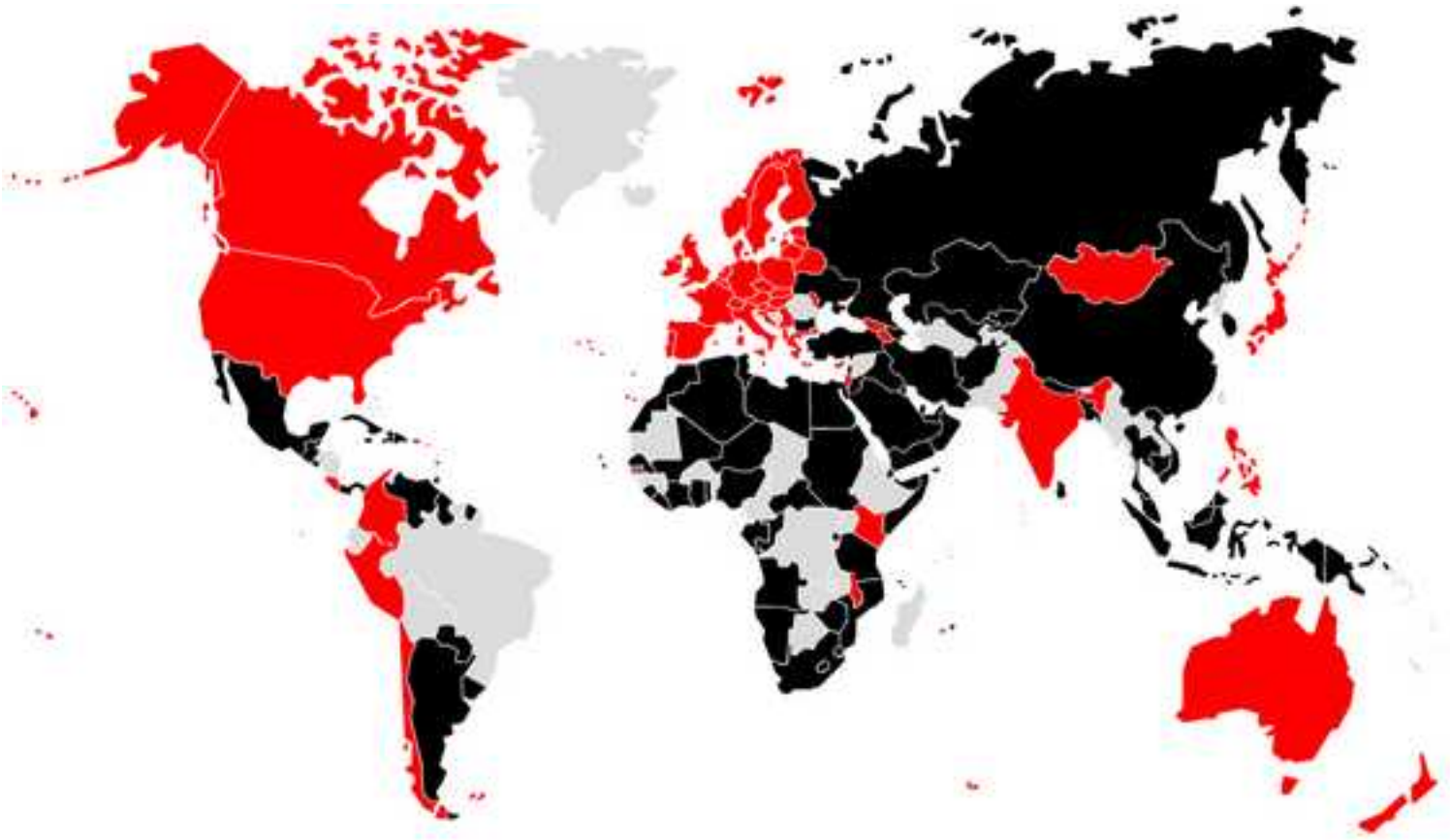
- **Cybercrime and Information Warfare** have a **very wide spectrum of action** and use **intrusion techniques** which are nowadays, somehow, available to a **growing amount of Actors**, which use them in order to **accomplish different goals**, with **approaches and intensity which may deeply vary**.

- **All of the above is launched against any kind of targets:** Critical Infrastructures, Governative Systems, Military Systems, Private Companies of any kind, Banks, Medias, Interest Groups, Private Citizens....
  - National States
  - IC / LEAs
  - Organized Cybercrime
  - Hacktivists
  - Industrial Spies
  - Terrorists
  - Corporations
  - Cyber Mercenaries

Everyone against everybody

The world is changing… (?)

→ Geopolitical shift : 2013 - Map of ITU Dubai General Assembly December (red=not signed; black=signed)

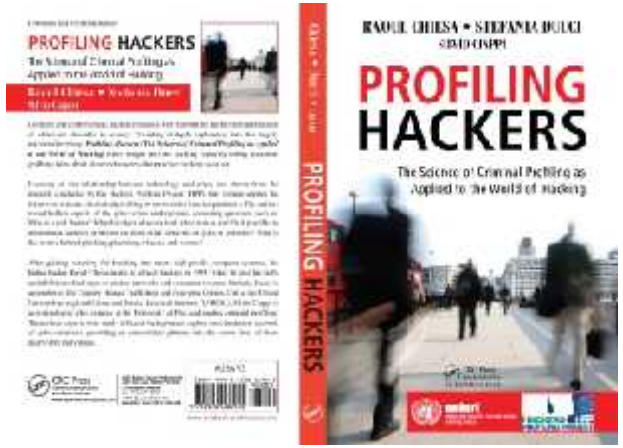


Source: Flavia Zappa, Security Brokers, 2013

Welcome to HPP!

HPP V1.0

- Back in **2004** we launched the Hacker's Profiling Project - HPP: http://www.unicri.it/special_topics/cyber_threats/
- Since that year:
  - **+1.200 questionnaires** collected & analyzed
  - **9 Hackers profiles** emerged
  - **Two books** (one in English)
    - Profilo Hacker, Apogeo, 2007
    - Profiling Hackers: the Science of Criminal Profiling as Applied to the World of Hacking, Taylor&Francis Group, CRC Press (2009)



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Evaluation & Correlation standards

- Modus Operandi (MO)
- Lone hacker or as a member of a group
- Motivations
- Selected targets
- Relationship between motivations and targets
- Hacking career
- Principles of the hacker's ethics
- Crashed or damaged systems
- Perception of the illegality of their own activity
- Effect of laws, convictions and technical difficulties as a deterrent

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The scenario

- **Everything** «evolved», somehow…
- Here's what the **United Nations** says (Hacker's Profiling Project):

	OFFENDER ID	LONE / GROUP HACKER	TARGET	MOTIVATIONS / PURPOSES
Wanna Be Lamer	9-16 years "I would like to be a hacker, but I can't"	GROUP	End-User	For fashion, It's "cool" => to boast and brag
Script Kiddie	10-18 years The script boy	GROUP: but they act alone	SME / Specific security flaws	To give vent of their anger / attract mass-media attention
Cracker	17-30 years The destructor, burned ground	LONE	Business company	To demonstrate their power / attract mass-media attention
Ethical Hacker	15-50 years The "ethical" hacker's world	LONE / GROUP (only for fun)	Vendor / Technology	For curiosity (to learn) and altruistic purposes
Quiet, Paranoid, Skilled Hacker	16-40 years The very specialized and paranoid attacker	LONE	On necessity	For curiosity (to learn) => egoistic purposes
Cyber-Warrior	18-50 years The soldier, hacking for money	LONE	"Symbol" business company / End-User	For profit
Industrial Spy	22-45 years Industrial espionage	LONE	Business company / Corporation	For profit
Government Agent	25-45 years CIA, Mossad, FBI, etc.	LONE / GROUP	Government / Suspected Terrorist/ Strategic company/ Individual	Espionage/ Counter-espionage Vulnerability test Activity-monitoring
Military Hacker	25-45 years	LONE / GROUP	Government / Strategic company	Monitoring / controlling / crashing systems

HPP V2.0: what happened?

- VERY **simple**:
- **Lack of funding**: for phases 3&4 we need support!
  - HW, SW, Analysts, Translators
- We started back in **2004**: «romantic hackers», + we foreseen those «new» actors tough: **.GOV**, **.MIL, Intelligence.**
- We **missed out**:
  - Hacktivism (!);
  - Cybercriminals out of the «hobbystic» approach;
  - OC;
  - The financial aspects (Follow the Money!!);
  - Cyberterrorists (do they really exist?)

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Information Warfare (Cyberwar?) and the evolution of the 0-days market


HEY
WE GOT NEW
GAME TO PLAY
CY8ER
WAR
yo
It's Child Play Now

The DUMA knew it, long time ago….

"In the very near future many conflicts will not take place on the open field of battle, but rather in spaces on the Internet, fought with the aid of information soldiers, that is hackers
This means that a small force of hackers is stronger than the multi-thousand force of the current armed forces.

Former Duma speaker Nikolai Kuryanovich, 2007

Hackers as a National Resource?

- A couple of years ago I've dig into a research from an **Hungarian security researcher** from **HP**
- His **idea** was **weird**!

- Should we **consider hackers** as "the enemy" / "troubles"…
- …Or, may they represent an **opportunity for Governments**??
  - ✓ **Patriot's** Hackers
  - ✓ Think about **bloggers** and **North Africa** (Egypt, Tunisia, Morocco) **/ GCC Area** (Gulf Countries)
  - ✓ Think about **IRAN** and **Twitter**
  - ✓ See the **potentialities**?

Feds Seek a Few Good Hackers

War on terrorism distracts cybercops from routine hacking, and even encourages alliances.

By Andrew Brandt, PCWorld Aug 4, 2004 4:00 am

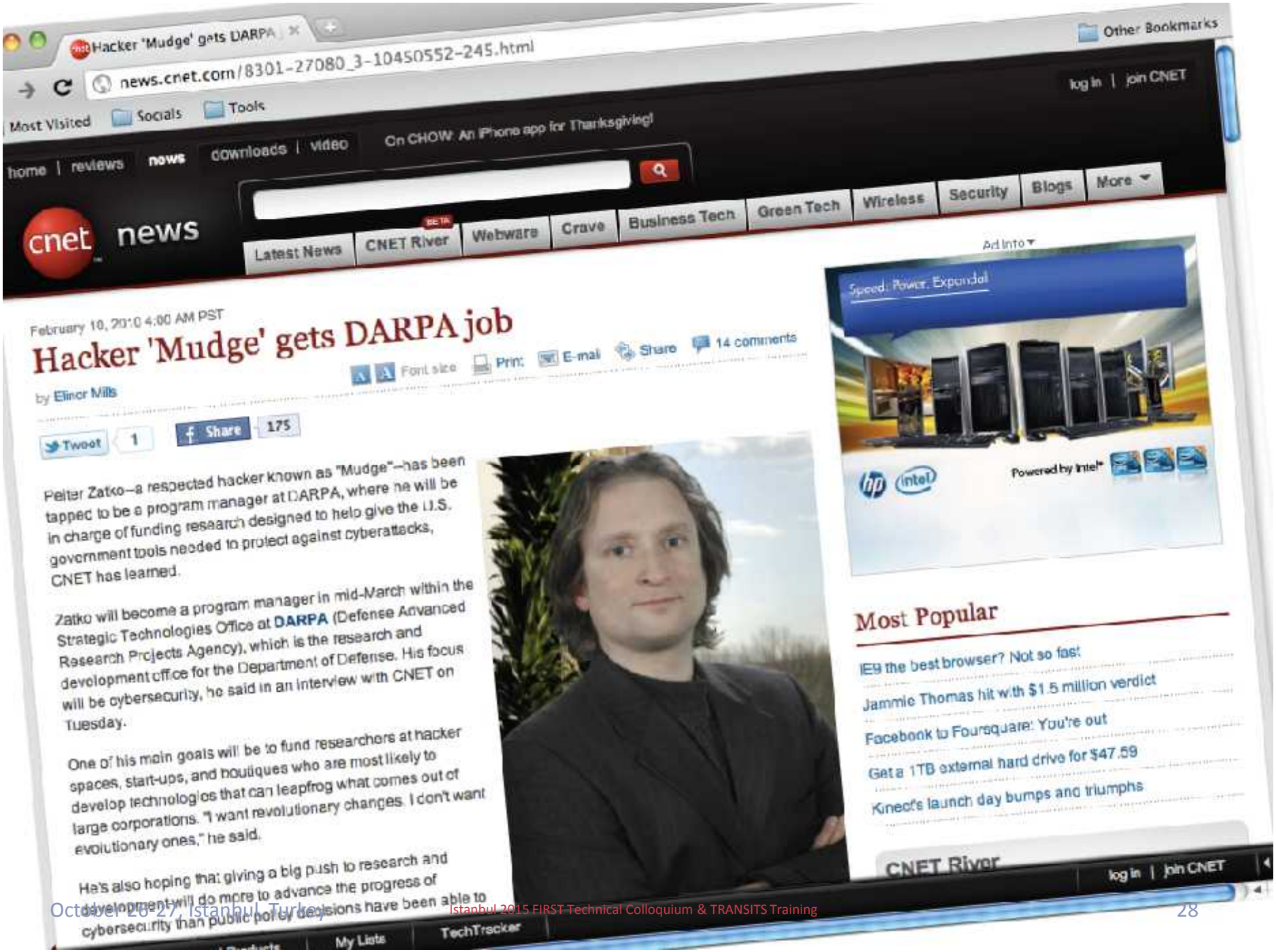
Attention, hackers: Uncle Sam wants you.

And hackers are answering the call, or at least listening. A well-attended session at the recent Defcon 12 hackers' conference was "Meet the Feds," a recruitment presentation by a group of federal cybercrime law enforcement agents, who fielded questions from would-be cybercops.

"We're looking for good, talented people. We need a lot of help," said Jim Christy, director of the Defense Department's Cyber Crime Center.

"The Department of Defense understands how important computers are to defending the United States, and is always on the lookout for good people," said Alvin Wallace, a supervisory special agent with the Air Force's Office of Special Investigations.

Patriotic Hackers Sought



Hacker 'Mudge' gets DARPA

news.cnet.com/8301-27080_3-10450552-245.html

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On CHOW: An iPhone app for Thanksgiving!

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February 10, 2010 4:00 AM PST

Hacker 'Mudge' gets DARPA job

by Elinor Mills

Font size | Print | E-mail | Share | 14 comments

Tweet 1 | Share 175

Peiter Zatko—a respected hacker known as "Mudge"—has been tapped to be a program manager at DARPA, where he will be in charge of funding research designed to help give the U.S. government tools needed to protect against cyberattacks, CNET has learned.

Zatko will become a program manager in mid-March within the Strategic Technologies Office at DARPA (Defense Advanced Research Projects Agency), which is the research and development office for the Department of Defense. His focus will be cybersecurity, he said in an interview with CNET on Tuesday.

One of his main goals will be to fund researchers at hacker spaces, start-ups, and boutiques who are most likely to develop technologies that can leapfrog what comes out of large corporations. "I want revolutionary changes. I don't want evolutionary ones," he said.

He's also hoping that giving a big push to research and development will do more to advance the progress of cybersecurity than public policy decisions have been able to

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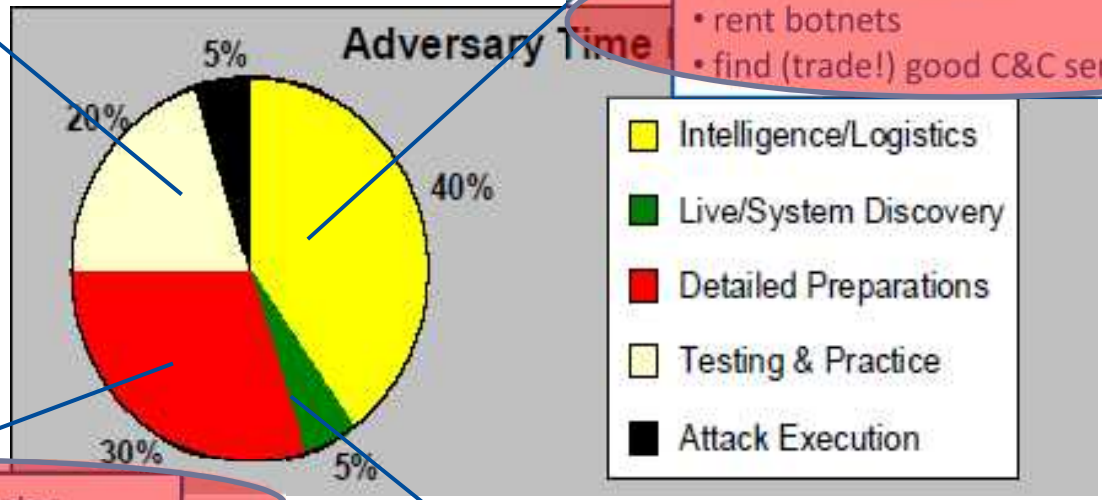
Making "Cyber War"…

- equipment to mimic target network
- dummy run on similar network
- sandbox zerodays

- „dummy list" of „ID-10T" for phishing
- background info on organisation (orgchart etc.)
- Primer for sector-specific social-engineering
- proxy servers
- banking arrangements
- purchase attack-kits
- rent botnets
- find (trade!) good C&C server



- purchase 0-days / certificates
- purchase skill-set
- bespoke payload / search terms

Alexander Klimburg 2012

- Purchase L2/L3 system data

Mistyping may lead to (very) different scenarios…

Non-state proxies and "inadvertent Cyberwar":

„ During a time of international crisis, a [presumed non-state CNE] proxy network of country A is used to wage a „serious (malicious destruction) cyber-attack" against country B."

How does country B know if:

*a) The attack is conducted with consent of Country A (**Cyberwar**)*

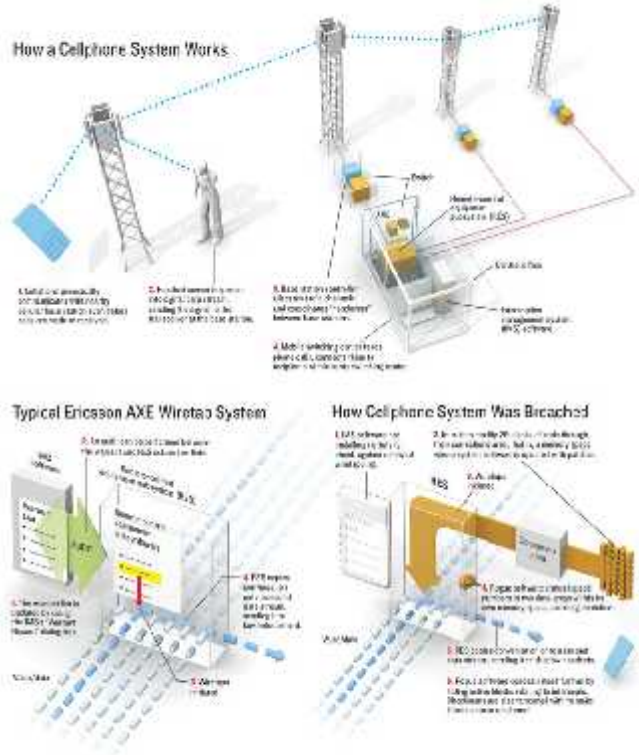
*b) The attack is conducted by the proxy network itself without consent of Country A (**Cyberterrorism**)*

*c) The attack is conducted by a Country C who has hijacked the proxy network? (**False Flag Cyberwar**)*

Back in 2005

- Vodafone Greece 2004 ("The Athens affair")
  - ✓ Rootkit on MSC Ericsson AXE
  - ✓ Inbound and Outbound Voice calls, SMS in/out, forwarded to 14 "pay-as-you-go" SIM cards (anonymous ones)
  - ✓ Olympic Games
  - ✓ 14 DEC 2007: Vodafone GR fined with 76M€
  - http://spectrum.ieee.org/telecom/security/the-athens-affair
  - http://en.wikipedia.org/wiki/Greek_telephone_tapping_case_2004-2005

The illegally wiretapped cellphones in the Athens affair included those of the prime minister, his defense and foreign affairs ministers, top military and law enforcement officials, the Greek EU commissioner, activists, and journalists.



Ahhhhh…. now I get it!

- PRISM and other secret project's scandals ("the Snowden case")
- NSA's budgets for black operations revealed

- http://rt.com/usa/snowden-leak-black-budget-176/
- http://rt.com/usa/us-hacking-exploits-millions-104/
- http://www.lemonde.fr/technologies/visuel/2013/08/27/plongee-dans-la-pieuvre-de-la-cybersurveillance-de-la-nsa_3467057_651865.html

Will this ever end up? ☹

Costas Tsalikidis,
Network Planning Manager,
Vodafone-Panafon

Vodafone Greece CEO George Koronias holds documents in April 2006 before the start of a parliamentary committee hearing investigating the phone-tapping scandal.
Photo: Louisa Gouliamaki /AFP/Getty Images

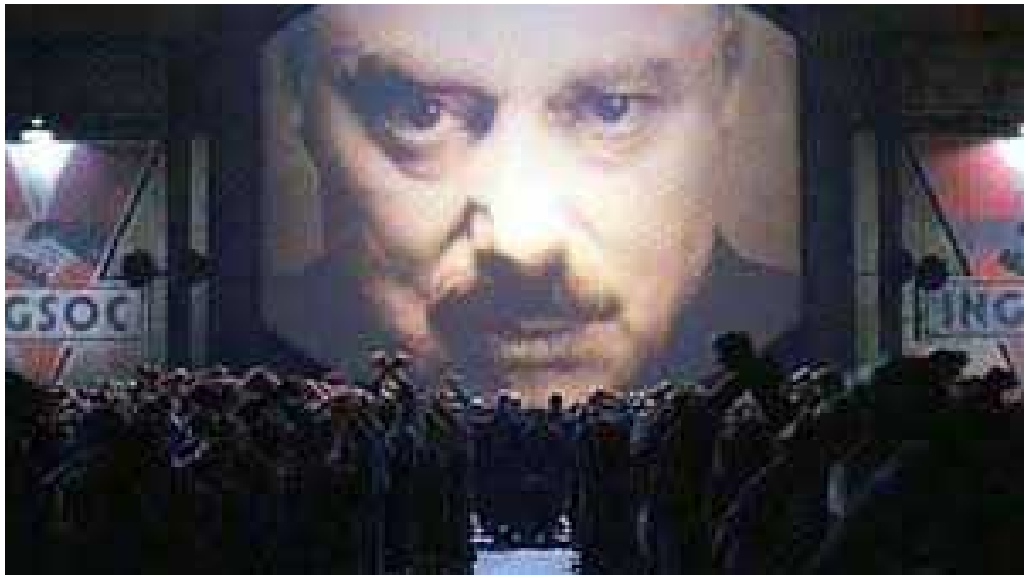
Budgets, Black Ops

NSA «black-ops Budget» exposed

- NSA's "black budget": 652M$ (2011)
- **231 black operations** known as of today (2011)
- 16 US agencies involved from the US Intelligence community (107.035 employees)

- Targets: US intelligence agencies high priority:
  - ✓ Iran
  - ✓ Russia
  - ✓ China
  - ✓ Afghanistan
  - ✓ North Korea
  - ✓ Syria
  - ✓ ……
- Cyber Attacks Unit "GENIE"
- Hacking into foreign systems in order to spy on contents, controlling functions
- http://articles.washingtonpost.com/2013-08-29/world/41709796_1_intelligence-community-intelligence-spending-national-intelligence-program

The Washington Post




NOVEMBER 21, 1983
$1.75
TIME
1984
Big Brother's Father
Author
George Orwell
NUCLEAR ARMS
Troubled Talks
And Angry
Protests


The Intercept_
UNOFFICIAL
_SOURCES
U.N. Report Calls on Governments to Protect Whistleblowers Like Snowden, Not Prosecute Them


NATIONAL SECURITY AGENCY
UNITED STATES OF AMERICA

Maybe……. ☺


NOBEL
PRIZE
WINNER


TIME
PERSON OF THE YEAR


NATIONAL SECURITY AGENCY
UNITED STATES OF AMERICA

The «last» one

What happened on September 2013?

Belgian Telco says it was hacked, while reports point to NSA or GCHQ as culprit

http://gigaom.com/2013/09/16/belgian-telco-says-it-was-hacked-while-reports-point-to-nsa-or-gchq-as-culprit/

The on-going one…

blogs.wsj.com/cio/2014/03/04/the-morning-download-ukraine-claims-telecom-system-hacked/

CIO Journal.

CIO Report | Consumerization | Big Data | Cloud | Talent & Management | Security

March 4, 2014, 8:30 AM ET

The Morning Download: Ukraine Claims Telecom System Hacked

Article | Comments

By MICHAEL HICKINS CONNECT

Editor

And the Police, too!

Home > Security > Cybercrime and Hacking

News

Dutch bill would give police hacking powers

Dutch law enforcement should be allowed to break into computers outside the Netherlands when necessary, the draft bill said

By Loek Essers

May 2, 2013 06:47 AM ET Add a comment

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IDG News Service - The Dutch government today presented a draft bill that aims to give law enforcement the power to hack into computer systems -- including those located in foreign countires -- to do research, gather and copy evidence or block access to certain data.

Law enforcement should be allowed to block access to child pornography, read emails that contain information exchanged between criminals and also be able to place taps on communication, according to a draft bill published Thursday and signed by Ivo Opstelten, the Minister of Security and Justice. Government agents should also be able to engage in activities such as turning on a suspect's phone GPS to track their location, the bill said.

Opstelten announced last October he was planning to craft this bill.

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Dutch Government Seeks to Let Law Enforcement Hack Foreign Computers

Dutch government wants to give law enforcement agencies investigative powers that involve hacking, installing spyware and destroying data

By Lucian Constantin
Fri, October 19, 2012

1 Comment

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IDG News Service — The Dutch government wants to give law enforcement authorities the power to hack into computers, including those located in other countries, for the purpose of discovering and gathering evidence during cybercrime investigations.

In a letter that was sent to the lower house of the Dutch parliament on Monday, the Dutch Minister of Security and Justice Ivo Opstelten outlined the government's plan to draft a bill in upcoming months that would provide law enforcement authorities with new investigative powers on the Internet

According to the letter, the new legislation would allow cybercrime investigators to remotely infiltrate computers in order to install monitoring software or to search them for evidence. Investigators would also be allowed to destroy illegal content, like child pornography, found during such searches

These investigative powers would not only cover computers located in the Netherlands, but also computers located in other countries, if the location of those computers cannot be determined.

21 Suspected Government Users of RCS

HACKING TEAM RCS

Suspected Government Users Worldwide

Citizen Lab 2014

Bill Marczak, Claudio Guarnieri, Morgan Marquis-Boire & John Scott-Railton

21 SUSPECTED GOVERNMENT USERS

AMERICAS	EUROPE	MIDDLE EAST	AFRICA	ASIA
Mexico	Hungary	**Oman**	Egypt	**Azerbaijan**
Colombia	Italy	**Saudi Arabia**	Ethiopia	**Kazakhstan**
Panama	Poland	**UAE**	Morocco	Malaysia
	Turkey		**Nigeria**	Thailand
			Sudan	South Korea
				Uzbekistan

CAUSE FOR CONCERN

52% (in bold) fall in the bottom 3rd of a World Bank ranking* of freedom of expression and accountability

29% are in the bottom 3rd for Rule of Law

*World Bank 2012 WGI

Finfisher


FINFISHER BY REGION
Americas 4
Asia / Pacific 12
Africa 3
Europe 13
Middle East 4
Total 36
SCAN RESULTS
None Found
Prior Finding
New Finding
FINFISHER'S GLOBAL PROLIFERATION: APRIL 2013 UPDATE
LITHUANIA
AUSTRIA
ROMANIA
BULGARIA
MACEDONIA
TURKEY
PAKISTAN
PANAMA
NIGERIA
SOUTH AFRICA

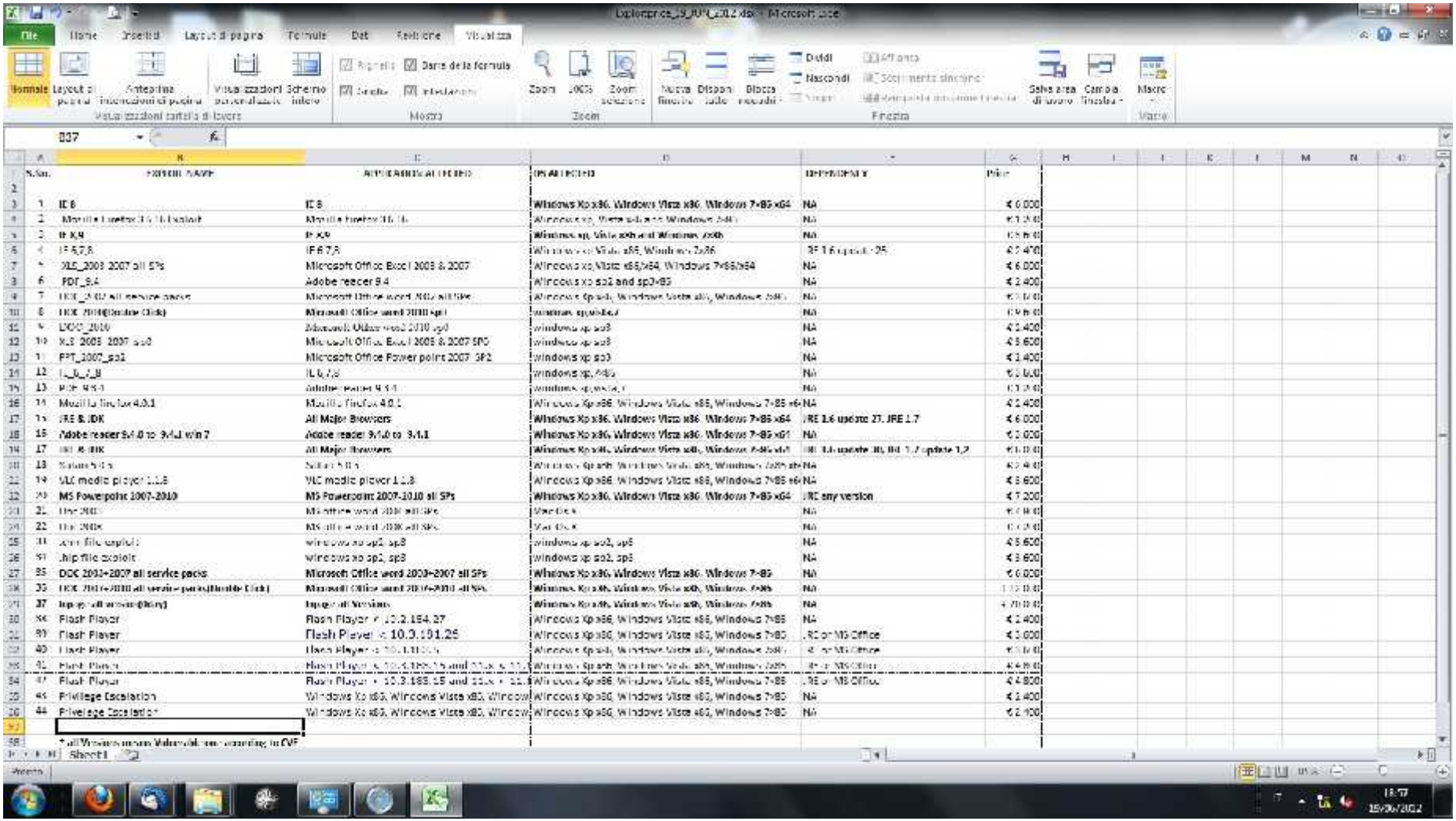
Global, dirty business

- "Mass interception of entire populations is not only a reality, it is a secret new industry spanning **25 countries**."
- "It's estimated that the global computer surveillance technology market is worth **$5 billion a year**."
  - ITALY: >**300M/year**

Who do you wanna sell (your 0days) to?

The pricing debate

- What about this? (CHEAP but LAME, India's ones)



N.Sn.	EXPLOIT NAME	APPLICABILITY (OS)	OS AFFECTED	DEPENDENCY	Price
1	IE 8	IE 8	Windows Xp x86, Windows Vista x86, Windows 7+85 x64	NA	€ 6.000
2	Mozilla Firefox 3.6.13 Exploit	Mozilla Firefox 3.6.13	Windows xp, Vista x86 and Windows 2k8	NA	€ 1.200
3	IE K9	IE K9	Windows xp, Vista x86 and Windows 2k8	NA	€ 5.600
4	IE 6,7,8	IE 6 7,8	Windows xp Vista x86, Windows 2k86	IE 1.6 update 25	€ 2.400
5	XLS_2003 2007 all SPs	Microsoft Office Excel 2003 & 2007	Windows xp,Vista x86/x64, Windows 7+85/x64	NA	€ 6.000
6	PDF_9.4	Adobe reader 9.4	Windows xp sp2 and sp3+85	NA	€ 2.400
7	DOC_2007 all service packs	Microsoft Office word 2007 all SPs	Windows Xp x86, Windows Vista x86, Windows 2k8	NA	€ 5.600
8	DOC 2010(Double Click)	Microsoft Office word 2010 sp1	windows xp,vista,7	NA	€ 9.600
9	DOC_2010	Microsoft Office word 2010 sp0	windows xp sp3	NA	€ 2.400
10	XLS 2003 2007 sp0	Microsoft Office Excel 2003 & 2007 SP0	windows xp sp3	NA	€ 5.600
11	PPT_2007_sp3	Microsoft Office Power point 2007 SP2	windows xp sp3	NA	€ 2.400
12	IE 6,7,8	IE 6,7,8	windows xp, 7+85	NA	€ 1.600
13	PDF 9.5.1	Adobe reader 9.5.1	windows xp,vista,7	NA	€ 1.200
14	Mozilla firefox 4.0.1	Mozilla Firefox 4.0.1	Windows Xp x86, Windows Vista x86, Windows 7+85 x64	NA	€ 2.400
15	JRE & JDK	All Major Browsers	Windows Xp x86, Windows Vista x86, Windows 7+85 x64	JRE 1.6 update 27, JRE 1.7	€ 6.000
16	Adobe reader 9.4.0 to 9.4.1 win 7	Adobe reader 9.4.0 to 9.4.1	Windows Xp x86, Windows Vista x86, Windows 7+85 x64	NA	€ 2.000
17	JRE & JDK	All Major Browsers	Windows Xp x86, Windows Vista x86, Windows 7+85 x64	JRE 1.6 update 30, JRE 1.7 update 1,2	€ 1.000
18	Solaris 5.9	Solaris 5.9	Windows xp sp3, Windows 2k8 x86	NA	€ 2.400
19	VLC media player 1.1.8	VLC media player 1.1.8	Windows Xp x86, Windows Vista x86, Windows 7+85 x64	NA	€ 3.600
20	MS Powerpoint 2007-2010	MS Powerpoint 2007-2010 all SPs	Windows Xp x86, Windows Vista x86, Windows 7+85 x64	JRE any version	€ 7.200
21	Mac OS X	MS office word 2008 all SPs	Mac OS X	NA	€ 1.000
22	Mac OS X	MS office word 2008 all SPs	Mac OS X	NA	€ 1.000
23	Jpeg file exploit	windows xp sp2, sp3	windows xp sp2, sp3	NA	€ 5.600
24	Zip file exploit	windows xp sp2, sp3	windows xp sp2, sp3	NA	€ 3.600
25	DOC 2003+2007 all service packs	Microsoft Office word 2003+2007 all SPs	Windows Xp x86, Windows Vista x86, Windows 7+85	NA	€ 6.000
26	DOC 2003+2010 all service packs(Double Click)	Microsoft Office word 2003+2010 all SPs	Windows Xp x86, Windows Vista x86, Windows 7+85	NA	€ 10.000
27	Jpeg all versions(Dirty)	Jpeg all Versions	Windows Xp x86, Windows Vista x86, Windows 7+85	NA	€ 7.000
28	Flash Player	Flash Player < 10.2.154.27	Windows Xp x86, Windows Vista x86, Windows 7+85	NA	€ 2.400
29	Flash Player	Flash Player < 10.3.181.26	Windows Xp x86, Windows Vista x86, Windows 7+85	JRE or MS Office	€ 1.600
30	Flash Player	Flash Player < 10.3.181.23	Windows Xp x86, Windows Vista x86, Windows 7+85	JRE or MS Office	€ 1.000
31	Flash Player	Flash Player < 10.3.183.15 and 11.x < 11.1	Windows Xp x86, Windows Vista x86, Windows 7+85	JRE or MS Office	€ 4.800
32	Privilege Escalation	Windows Xp x86, Windows Vista x86, Windows	Windows Xp x86, Windows Vista x86, Windows 7+85	NA	€ 2.400
33	Privilege Escalation	Windows Xp x86, Windows Vista x86, Windows	Windows Xp x86, Windows Vista x86, Windows 7+85	NA	€ 2.400

* all Versions means Vulnerability according to CVE

The pricing debate

http://www.theregister.co.uk/2014/11/11/german_spooks_want_millions_to_buy_0day_vulns/

The pricing debate

German spies want millions of Euros to buy zero-day code holes

Because once we own them, nobody else can ... oh, wait

By Richard Chirgwin, 11 Nov 2014 Follow 2,707 followers

8

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Adaptable System Recovery (ASR) for Linux virtual machines

Germany's spooks have come under fire for reportedly seeking funds to find bugs – not to fix them, but to hoard them

According to *The Süddeutsche Zeitung*, the country's BND – its federal intelligence service – wants €300 million in funding for what it calls the Strategic Technical Initiative. *The Local* says €4.5 million of that will be spent seeking bugs in SSL and HTTPS.

The BND is shopping for zero-day bugs not to fix them, but to exploit them, the report claims, and that's drawn criticism from NGOs, the Pirate Party, and the Chaos Computer Club (CCC). German Pirate Party president Stefan Körner told *The Local* people should fear governments more than cyber terror.

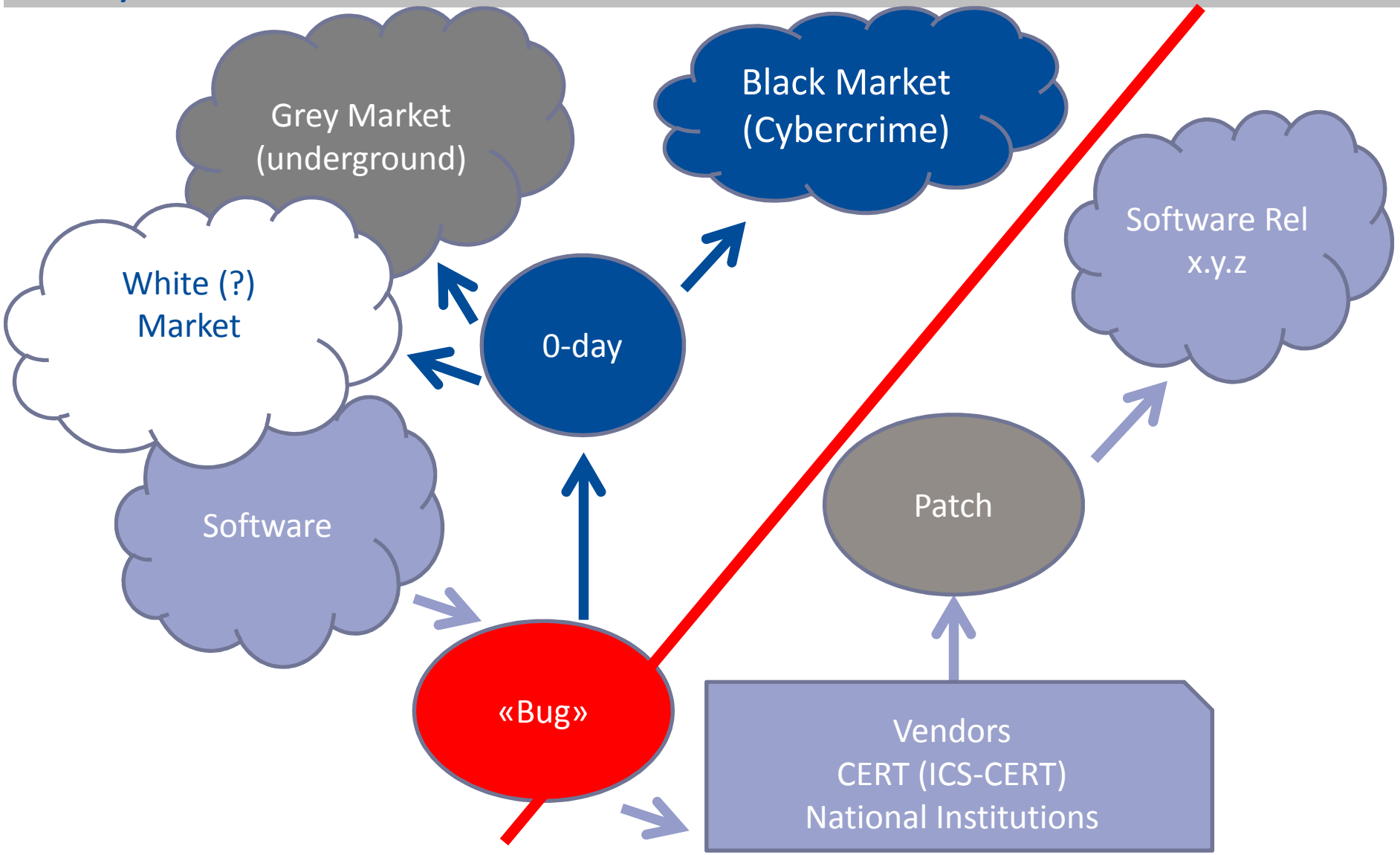
Körner is also critical of the strategy on the basis that governments shouldn't be helping fund the grey market for security vulnerabilities, a sentiment echoed by the CCC

http://www.theregister.co.uk/2014/11/11/german_spooks_want_millions_to_buy_0day_vulns/

Black Market?
Grey Market?
White Market?
Prices ranging from thousands to millions?

WTH?!?!?!

→ 0-day Markets



A different (more serious?) approach

Public Knowledge of the vulnerability	Buyer's typology IS = IT Security companies INT = Intelligence Agencies for Governmental use (National Security protection) MIL = MoD/related actors for warfare use OC = Cybercrime	0-day Exploit code + PoC Cost: Min/Max
Y	IS	10K – 50K USD
Y	INT	30K – 150K USD
Y	MIL	50K – 200K USD
Y	OC	5K – 80K USD
N	ALL	X2 – X10

A different (more serious?) approach

Public Knowledge of the vulnerability	Vulnerability relays on: Operating System (OS) Major General Applications (MGA) SCADA-Industrial Automation (SCADA)	Buyer's typology IS = IT Security companies INT = Intelligence Agencies for Governmental use (National Security protection) MIL = MoD/related actors for warfare use OC = Cybercrime	0-day Exploit code + PoC Cost: Min/Max
Y	OS	OC	40K – 100K
Y	MGA	INT	100K – 300K
Y	SCADA	MIL	100K – 300K
N	OS	MIL	300K – 600K
N	SCADA	MIL	400K – 1M

Cyber Espionage: a case study from India

Cyber Espionage

- The **complexity** and the **infrastructural and operating costs** of espionage (in the wide sense of the term) dramatically lowered down along the years, because of the IT revolution and the so-called "Digital Society".
- In most of the cases, the **information** sits on (also, or "just") on **digital storages** and **travels over the Net**.
- As a first effect, the **concept of "stealing" doesn't exist anymore** (it's virtual) and we must speak about **copying** the information (espionage approach):
  - What is "still there", is "safe";
  - More time needed to realize the "theft";
  - Less time needed to transfer or reselling the information -> cashing out.
- (public) incidents do happen both in the **private** and **public** (even **Military** and **Governmental**) business:
  - insiders (drivers: political, ethics, religious, fame and mass media, corruption, blackmail, ignorance);
  - contractors (external suppliers, consultants, VPN and RAS access, etc);
  - "competitors" (civilian and military) both *State-Sponsored* and *Independent.*

Massive Cybercrime + Industrial Espionage

❑ The case study

▪ Our counter-cybercrime internal team works closely with different **security communities** (APWG, Host Exploit, Global Security Map, Team Cymru, etc…) which run **concrete actions** such as **information sharing**, botnets takedowns, international digital investigations, **supporting and coordinating with different Law Enforcement Agencies** in those **involved countries** (since the **crime is global**).

▪ **+One year ago**, some members of these communities alerted about **suspicious activities**, not public known.

❑ Weird aspects

✓ **The world-famous «Chinese espionage»** wasn't involved

✓ **Technical level and quality of the used tools: medium-low**.

✓ **Serial industrialization** of the whole operational chain of the APT attacks (Advanced Persistent Threats).

✓ **Full outsourcing of the attack**.

✓ **MO** (Modus Operandi) organized by **steps**: **Social Engineering** based (phone calls, emails), then **target exploitation** (**spear phishing**).

✓ A very important and scaring sign of those **synergies** between Cybercrime and Cyber Espionage worlds.

✓ Something like a «prét à portér» of **digital espionage**.

Operation Hang Over

- **Repeated, targeted malicious activities,** "targeted attack infrastructure" type.
  - **New and different** MO:
    - low-quality (.doc + .exe!!)
    - Very noisy;
    - persistant;
    - **Not executed by a single person**.
  - Attacks and actions (apparently) originated from **India**.
  - **Operating infrastructure** since at least **3 years** (mostly 4).

- We are speaking about a **specific cybercrime service** sold by an **IT Security company** based in **India** (AppPin Security Group…ever heard about?).

- **Targets public known**:
  - Telenor (Norway)
  - Bumi PLC (Indonesia)
- **Targets found later**:
  - ENRC (UK) – Energy National Research Center
  - Porsche (Austria)
  - Private companies from different markets in USA, Germany, etc

How this started?

- Snorre, team leader, told us the following

"The op started with **Telenor intrusion**, we **received** md5s and cc info **from TN via NorCert**.

We then **started looking into the case** on our own initiative.

We were **quickly able** to connect the case **with others**, just **googling the http request string** returned lots of hits, and we used **our own databases** to get a lot more.

Dns reqs in combination w malware behavior info was one of the main **mapping methods**, but we also used other tricks, for example tracking bad guys through **shodan**.
They often tanked their **vps images identically**, meaning we could see identical esmtp banners on **different ip ranges**.

Generally, the **Hangover op was large-scale**, over many arenas, but **minimal complexity**.

And I suspect it is not the only one ongoing in that region.

Snorre"

(Source: email exchange with Snorre Fagerland, Norman Shark, May-June 2013)

GUI pret-à-portèr

aMatrix Help

How to use aMatrix software

Direction to use aMatrix software

(1) In First step,you start with **Server Configeration** module,where you can configure Payloads,exploits and social engineering webpage,also create folder according to corresponding Payload,Exploits and social Engineering webpage on FTP server using it's credentials and upload its exe's,html's and any other files inside the folder.

(2) In second step,you start with **New project** and following the preceeding steps to perform attack on victim. OR you can start with **Existing project** ,if you want to use the existing project.

(3) In third step,**Report** viewing,here you can see the complete details of sender,targetted person,types of attack etc.

(4) In fourth Step,You can starts with **Monitor** section:-
FTP Server Management -Here you can see the details of created folders and uploaded files inside the folder.
RAT(Remote Administration Tool)- With this,you can use Dragon Eye to take any desktop remotely,command shells are also provided to take control of remote machine.

(5) In fifth steps,it contins **Utilities** Section where different tools are provided to perform operation.

(6) In sixth step,you can start with **Web Scanner & Web Attack** ,which helps you to scan any URL and helps in getting it's request and response URL,through this you can also perform attack by exploiting them.For more about this,you can learnt it from help section of Web scanner & Web Attack of aMatrix software.

NOTE:- We have provided you about 50 templetes in (C:\Program Files\Matrix frm)folder to use it while sending mail to the victim.You can also add some new templetes according to your convenience while performing attack.

aMatrix Help

Exploits

Exploit Server Configuration

In Server Configuration of Exploit,you can create the exploit by choosing payload server userName,providing Exploit name,browse to choose .bin file and select payload link from the combobox and then click on OK and then Create button.After that choose Exploit server User Name and providing Exploit description You can also Create a folder on local machine as well as on server through FTP and upload File inside it.

New Project | Existing Project | Monitor | Server Configuration | Report | Utilities | Exit

Social Engineering Webpages | Exploits | Payloads

Exploit

Server : [redacted]

User Name : [redacted]

Password : **********

Add User | Delete | Edit | refresh

ExploitServer UserName: [redacted]

PayloadServer UserName: [redacted]

Exploits Name: muse

Add New Exploits

Payload Link : http:/[redacted]

Exploit Description : ffer overflov

CompaitiableOS : 6:Eng with MUSE version 4.9.0.006

OK | Create

C:\Program Files\Matrix frm\Expl

Browse

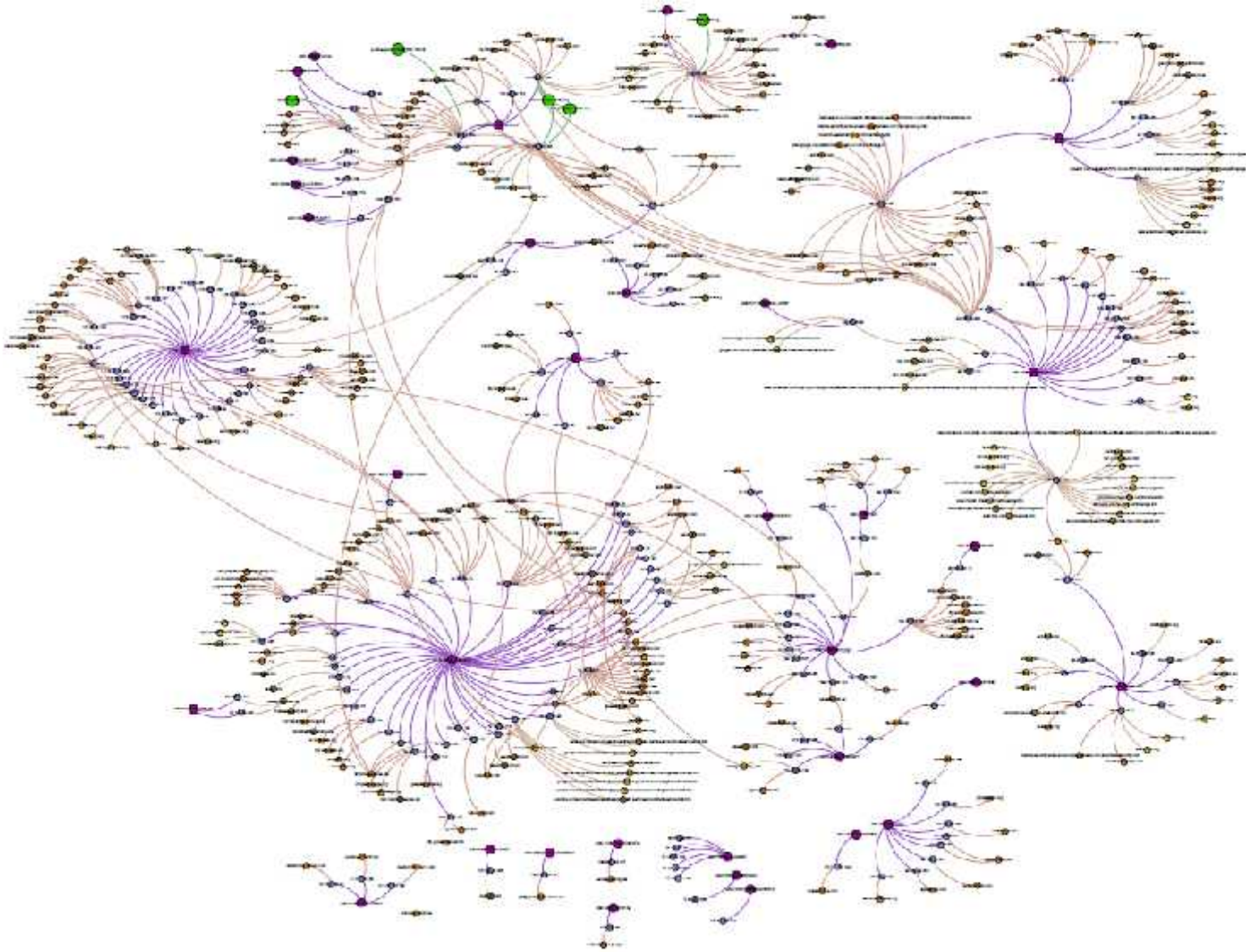
Folder Exists,Please Upload File

OK

MUSE is vulnerable to a stack-based buffer overflow, caused by improper bounds checking when processing .pls files. By persuading a vict to open a specially-crafted .pls playlist file, a remote attacker could overflow a buffer and execute arbitrary code on the system or cause the application to crash.MUSE is vulnerable to a stack-based buffer overflow, caused by improper bounds checking when processing .pls files. persuading a victim to open a specially-crafted .pls playlist file, a remote attacker could overflow a buffer and execute arbitrary code on the system or cause the application to crash.

The «Big Picture»

*Domain map of the attack infrastructure. Yellow and orange nodes constitute **domains**, blue are **IP addresses**, and purple are **autonomous systems** (AS). Green nodes are domains that are not part of any attack pattern, but are interesting in this context.*



Conclusions

Conclusions

- **Everything has changed**.
- You just **cannot fight on your own** this war anymore. You may win a single battle, while **it won't be enough**.
  - **If you are insecure, I will be insecure too**….
- Information Sharing, Security Awareness, Attacker's Profiling, balanced InfoSec approach & processes: **this is what you need**.
- Ask for technical solutions from the Security Industry, be compliant with security standards and regulations, but **don't forget both taking from and giving back to the security communities**.

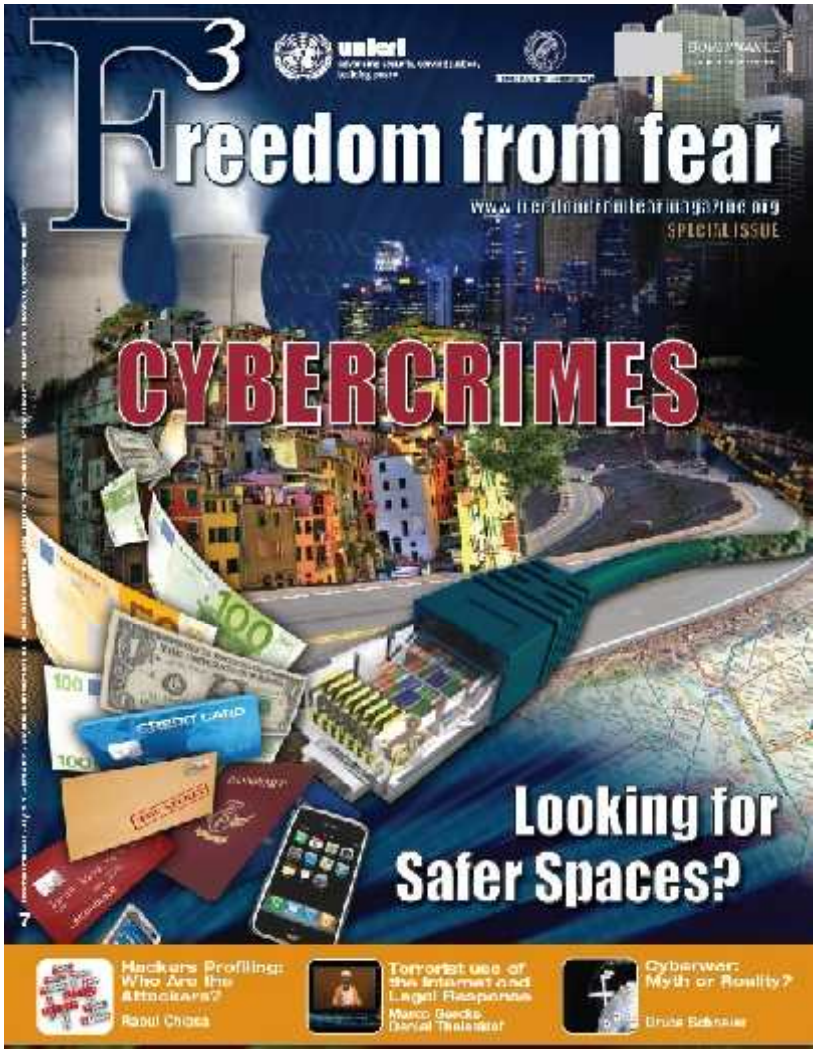
A gift for you all here! ☺

Get your own, FREE copy of “F3” (Freedom from Fear, the United Nations magazine) issue #7, <u>totally focused</u> on Cybercrimes!

DOWNLOAD:

www.FreedomFromFearMagazine.org

Or, email me and I will send you the full PDF (10MB)



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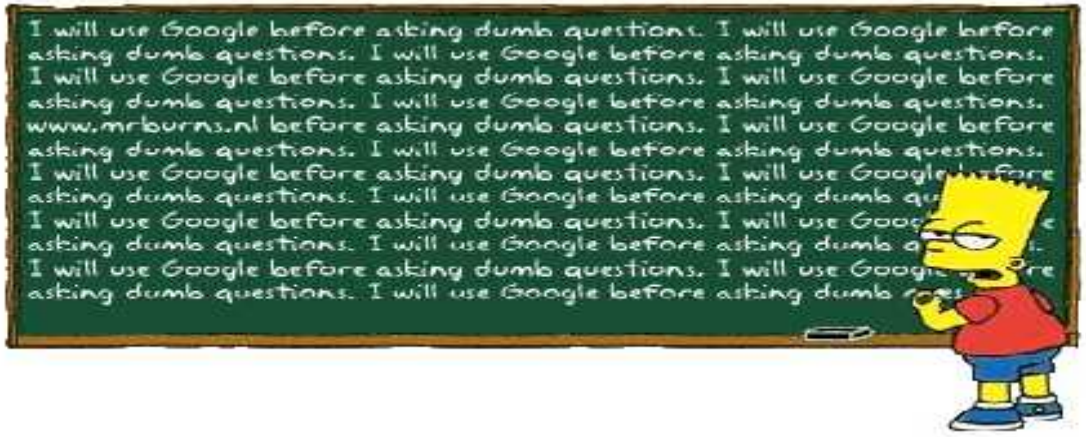
Contacts, Q&A

- **Need** anything, got **doubts**, wanna **ask me smth**?
  - rc [at] security-brokers [dot] com
  - Pub key: http://www.security-brokers.com/keys/rc_pub.asc

Thanks for your attention!

QUESTIONS?



EXTRA Material

HPPV1.0 - Zoom: correlation standards

Gender and age group
Background and place of residence
How hackers view themselves
Family background
Socio-economic background
Social relationships
Leisure activities
Education
Professional environment
Psychological traits
To be or to appear: the level of self-esteem
Presence of multiple personalities
Psychophysical conditions
Alcohol & drug abuse and dependencies
Definition or self-definition: what is a real hacker?
Relationship data
Handle and nickname
Starting age
Learning and training modalities
The mentor's role
Technical capacities (know-how)
Hacking, phreaking or carding: the reasons behind the choice
Networks, technologies and operating systems
Techniques used to penetrate a system

Individual and group attacks
The art of war: examples of attack techniques
Operating inside a target system
The hacker's signature
Relationships with the System Administrators
Motivations
The power trip
Lone hackers
Hacker groups
Favourite targets and reasons
Specializations
Principles of the Hacker Ethics
Acceptance or refusal of the Hacker Ethics
Crashed systems
Hacking/phreaking addiction
Perception of the illegality of their actions
Offences perpetrated with the aid of IT devices
Offences perpetrated without the use of IT devices
Fear of discovery, arrest and conviction
The law as deterrent
Effect of convictions
Leaving the hacker scene
Beyond hacking

unicri
advancing security, serving justice, building peace

DETERRENCE EFFECT OF:	LAWS	CONVICTIONS SUFFERED BY OTHER HACKERS	CONVICTIONS SUFFERED BY THEM	TECHNICAL DIFFICULTIES
Wanna Be Lamer	NULL	NULL	ALMOST NULL	HIGH
Script Kiddie	NULL	NULL	HIGH: they stop after the 1st conviction	HIGH
Cracker	NULL	NULL	NULL	MEDIUM
Ethical Hacker	NULL	NULL	HIGH: they stop after the 1st conviction	NULL
Quiet, Paranoid, Skilled Hacker	NULL	NULL	NULL	NULL
Cyber-Warrior	NULL	NULL	NULL	NULL: they do it as a job
Industrial Spy	NULL	NULL	NULL	NULL: they do it as a job

EXTRA MATERIAL

→ Lesson learned?

I. **Information Sharing and PPP (Public, Private Partnerships) are "must-have" in the InfoSec (and "Cybersecurity" ☺) world**
   - Gov CERTs
   - Independent Security Communities
   - Investigation speed:
     - Knowing procedures
     - Direct, field experience
     - Network of contacts
   - Concrete and operative collaboration among victims, ISPs and ICT security experts

II. **If this happed to a TLC operator in Northern Europe, possibly it happened also in other countries?**

✓ Did we know it? Did we realized we have been attacked, breached, exfiltrated?

III. **The Cyber Espionage world is moving towards the outsourcing of "APT-based" attacks…**

✓ … which was already there! The difference is that, **now**, is incredibly cheap and is coming from India, a country with a hacking know-how which is average good, and has huge experiences with IT outsourcing, very famous because of their prices, much lower than other markets;

✓ Sold by a private company: did we investigated on a special, single, isolated case study? Are these the first steps of something bigger?

→ Solutions

- Despite being or not APTs, over the last **3-4 years** attacks evolved, focusing on the **human factor** when dealing with **targeted espionage**, getting benefits from:
  - Ignorance of the victims (lack of education, basic training, security awareness, simulations);
  - Exposure and visibility on the Social Networks of the companies and its employees;
  - contractors and external suppliers;
  - BYOL (Bring your own device: smartphones, tablets;
  - "remote working";
  - Lack of dialogue and information exchange with other market players (even competitors!);
  - Lack of procedures (approved, ready-to-go, tested) for Incident Handling, **Digital Forensics** e **overall** the "PR Security Management".

- The "solution?"? There is not a panacea which "fixes everything". But, **good sense**, **personnel education** and **being ready** to manage such incidents.
  - ✓ Speaking with the **management, getting the authorizations approved**
  - ✓ Security **Awareness to all of the company's levels**
  - ✓ **Specific trainings** (IT department, software developers, Security department, Blue Team) and **practical simulations** (at least) yearly (2-3 /year=better)
  - ✓ The <u>most important thing</u>: **work along with colleagues** from **different departments**, such as Legal, Human Resources, Marketing, Sales!!