# EyjafjallajöKull Framework

## *(aka: Exploit Kits Krawler Framework)*

*Updated Version (includes a working demo video)*

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### Seeking Exploit Kits at Large Scale Made Easy

By **Sébastien Larinier** / **@Sebdraven** & **Guillaume Arcas** / **@y0m**

sekoia
#CYBERSECURITY


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**9th edition of the infosec conference**

**"We're not computers, Sebastian, we're physical"**
Roy Batty in Blade Runner

**This Slide Intentionally Left (almost) Black.**

# Who Are We?

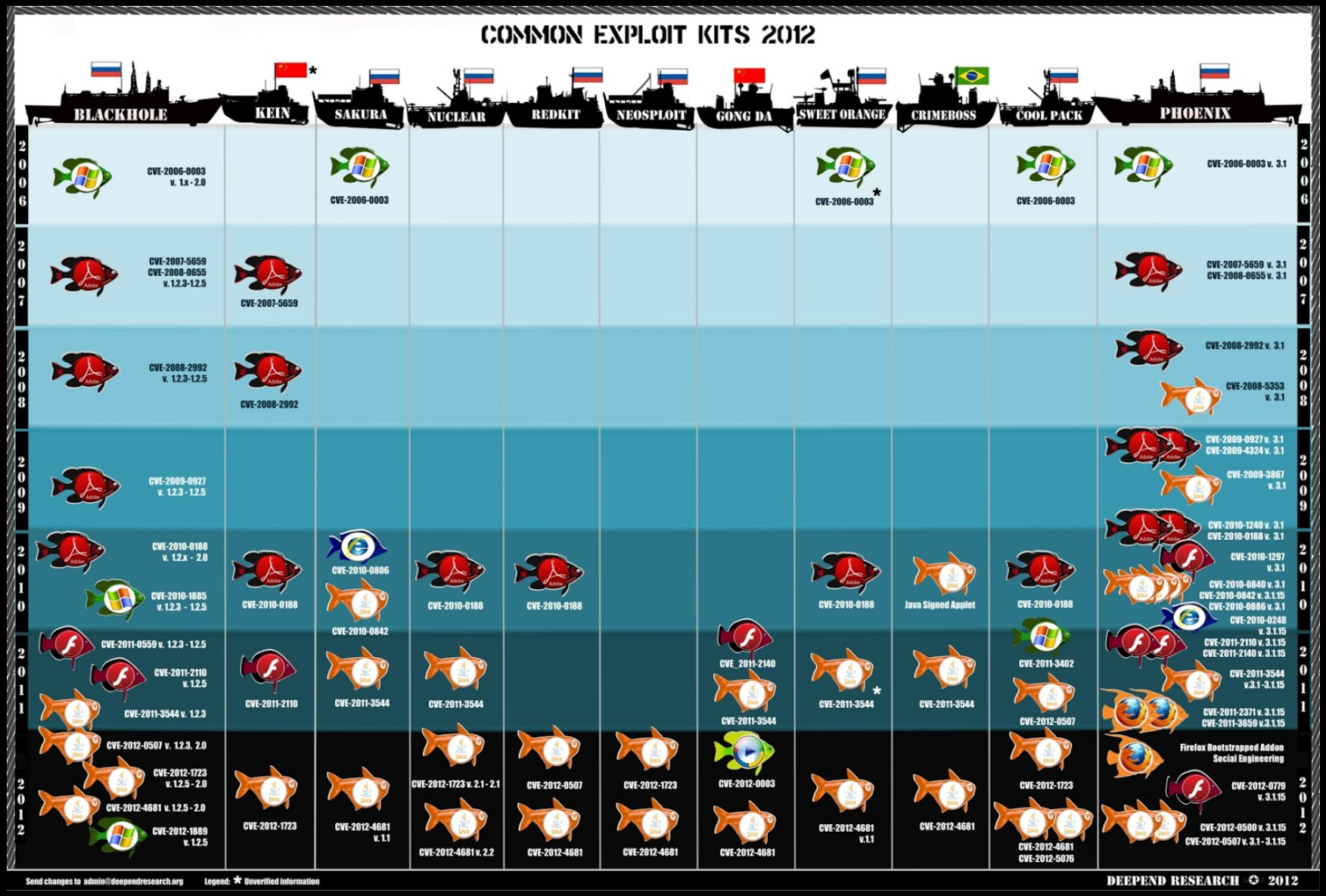
- Curious guys
- Years of experience in Network Analysis (we <3 PCAP!)
- and Python coding (well... Especially Sébastien)

# Sorry, We are French!

# From Russia with Sploits

What is an Exploit Kit (EK, sometimes also called Exploit Pack)?

- Malicious software used to conduct "drive-by" attacks
- Targeting flaws in browsers & add-ons/plugins (most often Java, PDF, Flash)
- User just has to browse a malicious page to get infected if his/her browser is vulnerable
- Used to spread banking malware (ZeuS, etc) but also during APT attacks #BuzzWord




Source: http://www.deependresearch.org/

# BlackHole Exploit Kit

- Born on 2010
- Coded by "Paunch" and ""HodLuM"
- One of the most popular EK ever
- PHP + HTML + JavaScript
- Exploits for Java + PDF + Flash + IE + MS Windows
- Exploits updated on a daily basis
- Advanced Obfuscation Techniques (#BuzzWord) for JS & PDF
- URLs spread by spam campaigns
- SaaS business model ($1500 / year)

# Bad Times for Bad Guys

- Phoenix Exploit Kit author arrested in Russia in April, 2013
- One of the BHEK authors arrested in Russia in October, 2013

# Why Studying Exploit Kits?

- Look for similarities: do some EKs "share" same exploits? If yes, which ones?
- Understand URLs diffusion methods, especially when URLs are spread in webpages
- Understand targeting system: which countries, which browsers are targeted, which malware are sent?
- Understand Obfuscation methods
- Mapping EK targets & payloads
- Identifying EK authors (... just joking!)

# How to Find EK - The Lazy Way

1. Browse http://www.malwaredomainlist.com/update.php
2. Pick a URL & pray for it to be still active
3. Run a VM embedding a supposedly vulnerable browser
4. Open the URL from the VM
5. Cross fingers & see if the VM gets infected.

# Well, it looks easy!

But failure can occur at each of these steps...

- URL can already be offline
- Triggers only if request is coming from a speficic page (Referer)
- Or with "valid" Cookies
- Only triggers once: the next request from the same IP will be discarded
- Only triggers if User-Agent matches with available exploits
- Only triggers if IP belongs to a specific geographic area
- Use of Evasion & Obfuscation techniques
- Use of Anti-robot & Anti-spider techniques
- Check that a human is browsing the malicious page.

So, it looks like wget or curl won't fit...

# Automating EK Browsing?

## Challenge accepted!

# What Do We Need?

- Finding malicious webpages
- Browsing the found webpages with vulnerable browsers
- Avoiding failure (see previous slide)
- Running exploits
- A (hopefully) good coder.

# Finding Malicious URLs

1. **Spam Campaign**
   - **Using SpamBoxes**
   - **Extracting good candidates URLs**
   - **Feed a spider**
2. **Malicious URLs**
   - **Spamvertizing**
   - **Search Engines & keywords**
   - **Twitter Trends**
   - **Facebook Messages**
3. **Online submission**

# Browsing Malicious URLs

- What if some websites requires authentication?
- How to preserve HTTP Referer & Cookies?
- How to know what specific browsers are vulnerable?
- Geolocation

# Running Exploits & Payloads

- OK, my browser is vulnerable but what kind of malware is run?
- In some cases, a same malicious page distributes different payload: trojan horse or ransomware

# Why EK Krawler Framework?

- It's easier to pronounce that EyjafjallajöKull Framework.
- Is it a spider? No, it's Selenium driven browsers fed with different sources.
- Is it a sandbox? No, it is a collection of VMs from various types
- Is it a proxy? Kind-of, but collecting all objects (files, HTTP headers, etc) with SSL MiTM capabilities
- *It's Exploit Kit Krawler!*

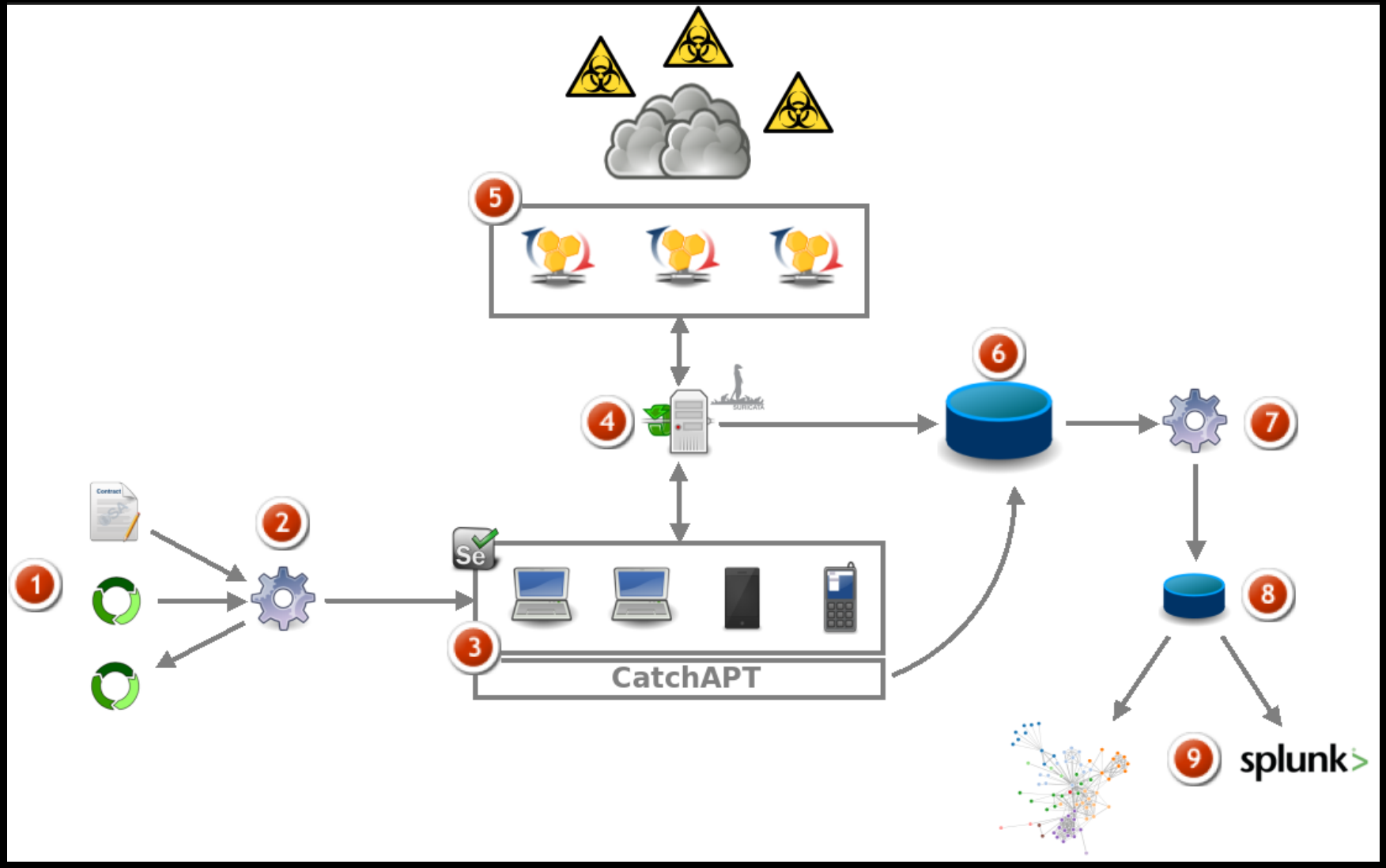
It's Spiderman, Batman & Superman working in team!
(with Robin preparing coffee)

# How Do We Do That?

- Python
- Selenium
- Virtual Machines. Currently VirtualBox.
- Python again
- HoneyProxy (well, Python, once more...)
- Reddis & MongoDB for data storage

# 圖勝萬言

"One picture worth thousands words." (Chinese proverb)


1
2
3
CatchAPT
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splunk>

1. **URLs: from files, grabbed on twitter/facebook/google, submitted, from logfiles**
2. **Dispatching engine: sends URIs to appropriate VMs (Selenium)**
3. **Pool of VMs from various types (note: the Vms may be dispatched on different location)**
4. **Pcap Factory: capture network traffic from/to the VMs, processes it with Suricata**
5. **Honeyproxy instances, geographically dispatched (exit nodes)**
6. **Big database: store all collected artifacts (files, http requests, exploits, etc)**
7. **Posst-processing (data reduction, correlation)**
8. **Smaller database**
9. **Visualisation interfaces**

# Lot of stuff still "under coding"

# Demo

http://youtu.be/NnHQOJjdnVk

# Sorry, Demo failed

# Todo List

- Multi-hypervisor support
- Integration of Acteon (Volatility plugin)
- Front-end Web "à la urlQuery"
- Integration of VADtools
- JS Deobfuscation
- Bubbling output

# Thank You!