Critical Stack

Intel Framework

Bro 2.3 Training

What is intelligence?

Intel framework defines intelligence as an atomic bit of data with associated metadata.

Things you want to know about!

Atomic Indicators

Type	Sample
File Hash (md5, sha1...)	2420fb71d32b61b886177b20b4159a7f
Address (IPv4 & IPv6)	67.210.170.169
URL	173.208.201.158/office/bails/server/bot.exe
URL	xvident.pw/adm.php
Domain	249.jumpingcrab.com
File Name	ja33kk.exe
Email	vlad@broala.com
Software	DirBuster
Certificate Hash	x509 Certificate Hash

Atomic Indicators

Are Extendable

Motivations

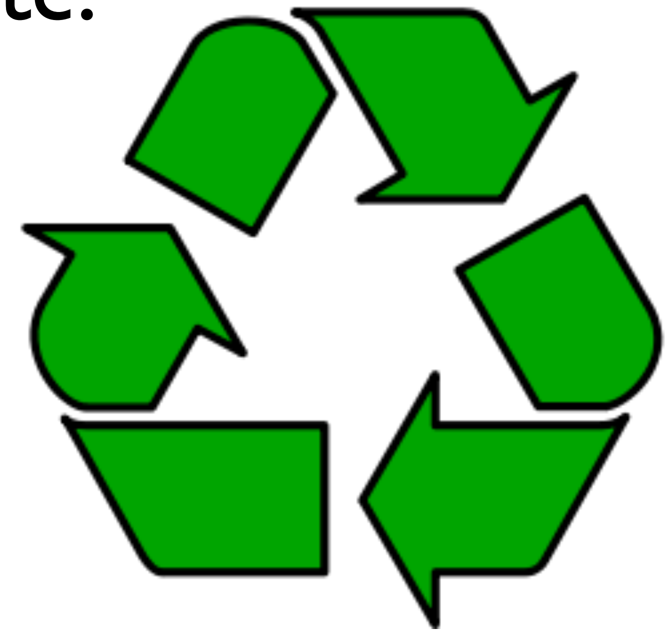
- Intelligence based searching is **incredibly** common.
- Through abstraction we can expand the utilization of intelligence.
- Creating a format for importing intelligence makes Bro target-able for intelligence providers.

How common is it?

- Numerous open intelligence feeds.
- Numerous security industry reports.
- Numerous private intelligence sharing communities.
- Many organizations are building their own internal intelligence teams.

Benefits of Abstraction?

- **Reduce**
  - If multiple feeds have the same data, we don’t need to store it multiple times.
- **Reuse**
  - Look for IP addresses anywhere they show up instead of just in IP headers, etc.
- **Optimize**
  - There will be memory and performance optimizations we’ll do under the hood.



Check All the Places

Protocol	Location	Intel Type
IP	Connection	Address
DNS	Request, Reply	Address, Domain
File	Hashes Generated	Hash
File	Name	Name
HTTP- HEADER	HOST	Domain
HTTP- HEADER	REFERER	Domain
HTTP- HEADER	X-FORWARDED-FOR	Domain
HTTP- HEADER	USER-AGENT	Software
SMTP-HEADER	FROM	Domain

.. exhaustive to list all the permutations!

Intelligence Format

- Bro's intelligence indicator format is incredibly terse by default but extensible.
- Data can be stored in a database or text files and updates at runtime.

```
#fields     indicator     indicator_type    meta.source       meta.desc   meta.url
1.2.3.4     Intel::ADDR       source1       Sending phishing email http://source1.com/badhosts/1.2.3.4
a.b.com     Intel::DOMAIN     source2       Name used for exfiltration   -
```

Design Limitation

- Asynchronous lookups
  - You can’t use “do I know about this?” in a normal if statement.

Currently Deployed

- 200,000+ Indicators *at scale*
- Running at a few sites.
- Seems to be working well.
- Data feeds have issues of lack of context and sometimes old data.

Questions?

- Code Review
- Exercises.