IID

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UNIFIED SECURITY: IMPROVING THE FUTURE

Presented by Rod Rasmussen

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Quality Over Quantity

CUTTING THROUGH
CYBERTHREAT INTELLIGENCE NOISE

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ICANN's Security and Stability Advisory Committee

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FCC Communications Security, Reliability and Interoperability Council

Messaging Malware Mobile Anti-Abuse Working Group

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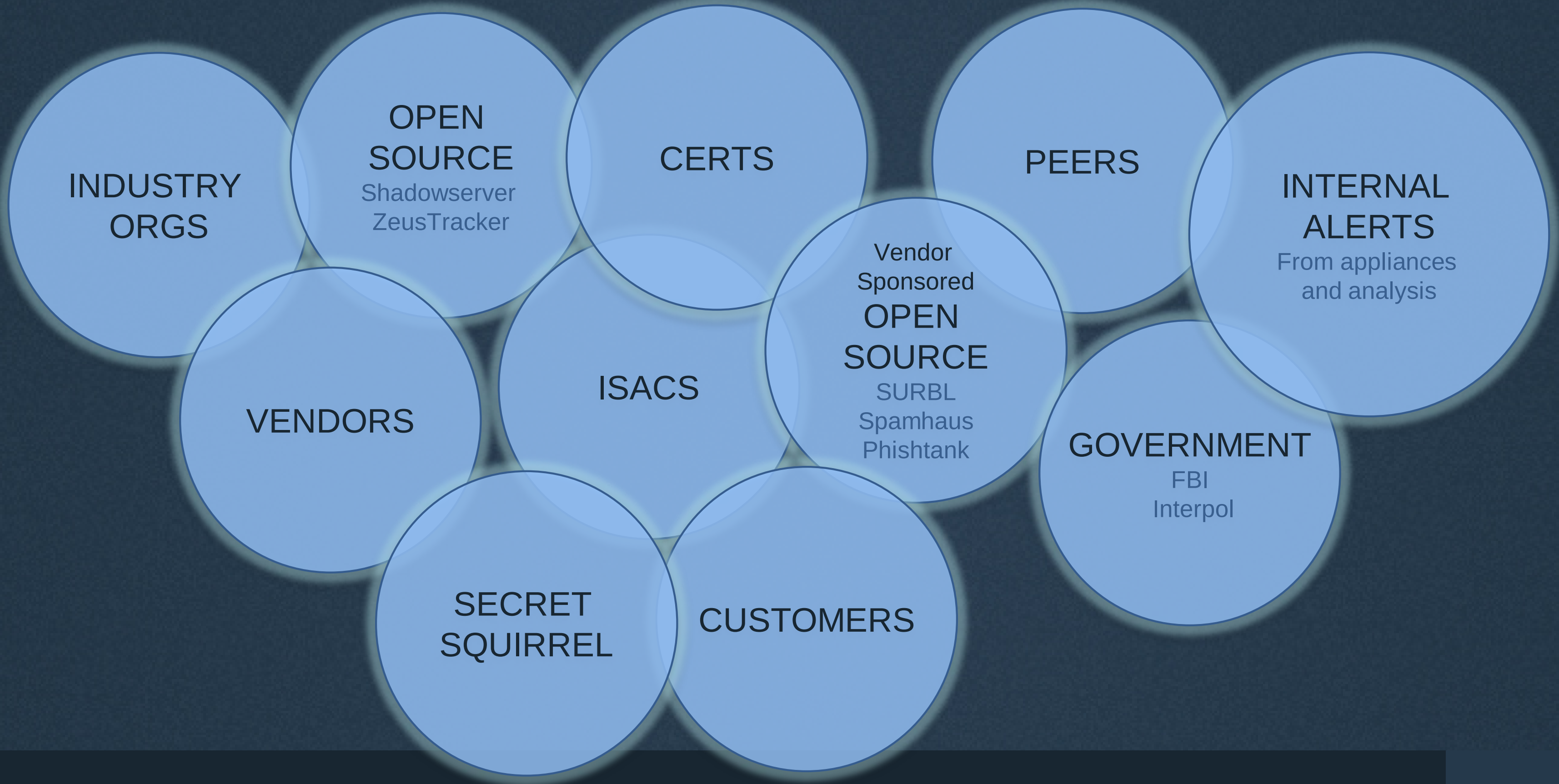
Cutting through cyberthreat intel noise

- Threat intel source overload
- How to cut out noise
- Threat intel plug and play with security appliance

Problem

- Over 90% of data breaches in 1H 2014 could have been avoided with simple controls and best practices*
- Security controls and best practices are valuable but only you have the right threat intelligence
- How to choose data from thousands of threat intelligence sources
- *SOURCE: Online Trust Alliance 2015 Data Protection Best Practices and Risk Assessment Guides

Threat intel source overload



INDUSTRY ORGS

OPEN SOURCE
Shadowserver
ZeusTracker

CERTS

PEERS

INTERNAL ALERTS
From appliances and analysis

VENDORS

ISACS

Vendor Sponsored OPEN SOURCE
SURBL
Spamhaus
Phishtank

GOVERNMENT
FBI
Interpol

SECRET SQUIRREL

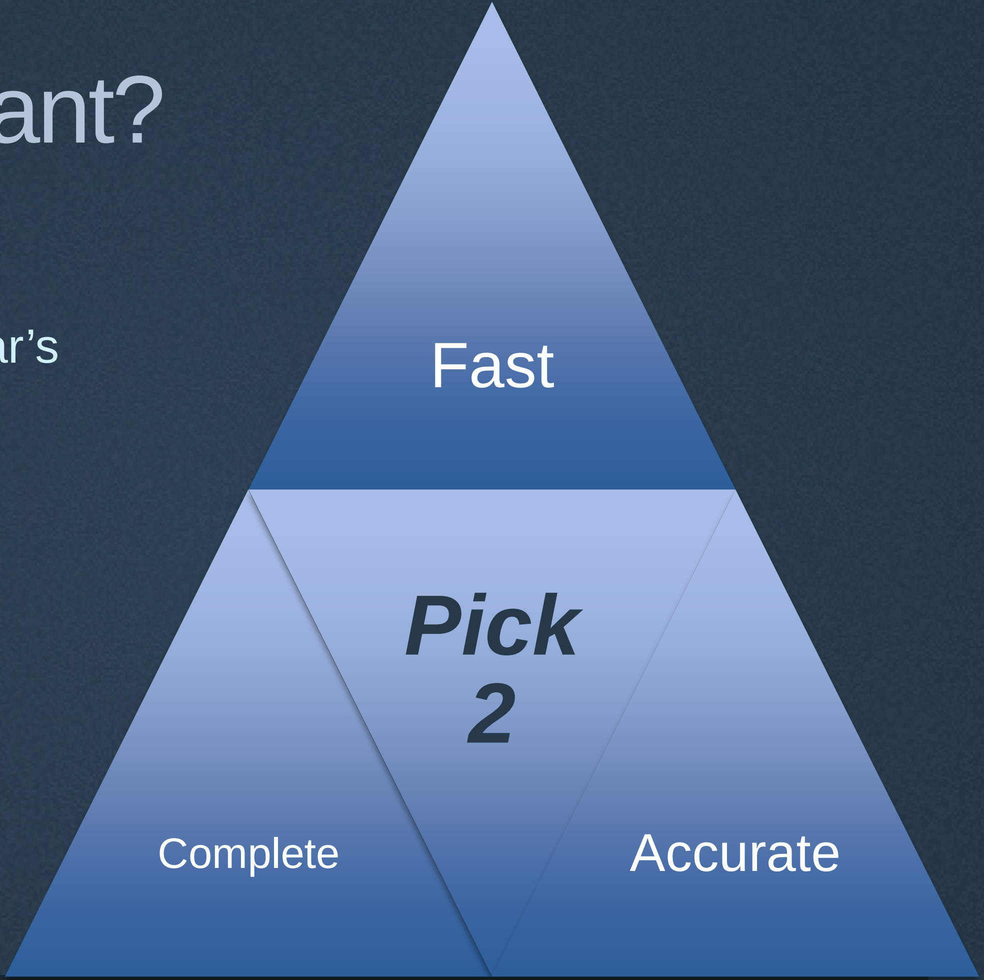
CUSTOMERS

Sources cover many important things

- IPs, hosts, malware hashes, TTP’s, e-mail, account info, etc.
- Recent CERTCC study showed amazing lack of overlap amongst most popular “open source” data feeds
    - Over 96% of hostnames were unique to one feed only (sample size >30 million hosts on 13 lists)
    - Over 82% of IP addresses were unique to one feed only (sample size >120 million IPs on 38 lists)
    - http://resources.sei.cmu.edu/asset_files/WhitePaper/2015_019_001_428614.pdf

What do you want?

Totally stolen from Tom Millar’s lightning talk yesterday!



Fast

Pick 2

Complete

Accurate

Even less capacity to *use* data

Product	Rule/protection type	Max Entries
Firewall vendor 1	Security rules (IPs/ASNs)	40,000
Firewall vendor 2	Maximum Firewall Policies	100,000
Firewall vendor 3	Maximum Firewall Policies	40,000

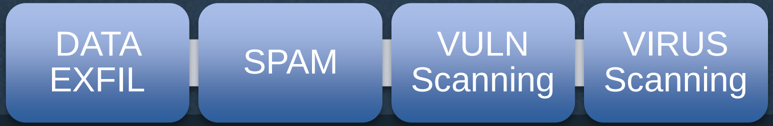
- IDS systems have rule or practical performance limits that kick in depending on hardware
- RBL’s, DNSBL’s, web proxies, and other in-line products that match against known threats all run into capacity and performance problems eventually
- Flexible analysis tools (e.g. Splunk) have cost considerations for large sets

All intel is useful for something—use case matters most!

- Life is shades of gray, not black and white
- Reputation and context are key for use
- Block | Alert | Inform scoring | “Fits a pattern” | “Kill Chain” point
- For example, google.com

  In an ISP blacklist = disaster.

  In a malware analysis tool doing wireshark on
  a bare-metal honeypot = sign of malware activity
- Fit the data to your purpose



DATA EXFIL

SPAM

VULN Scanning

VIRUS Scanning

Dangers of threat intel that’s just noise

- False positives
- Incomplete or missing context
- No concept of TTL or useful life
- Lack of understanding good applications for data
- Not relevant to your risk situation (one size fits all data)

Noiseworthy vs. noise

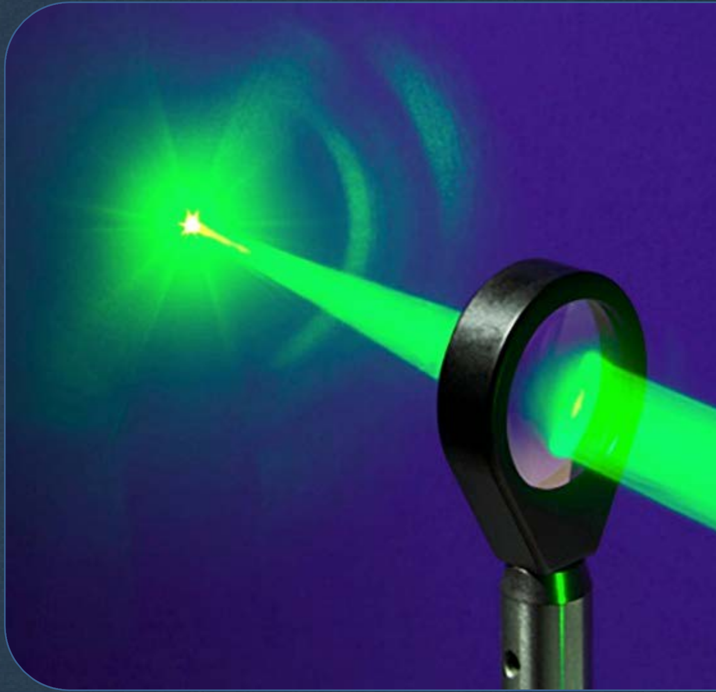
Determine trustworthiness of source

Use internal threat intel and reputation to determine false positives

Analyze metrics across all data

Increase confidence with correlation, frequency and source reputation

Expand context by linking related data points to previous unknowns



Example: Conficker

- Nasty malware, but never really exploited by bad guys
- 50,000+ rendezvous domains per day (DGA)
- Most never resolve, those that do are legit sites and security sinkhole operators
- Your infected hosts will still ping a random set every day
- High volume, extremely accurate indicator, but also a false-positive generator – what to do?
- Dozens more DGA’s out there…

Um, that’s a lot of data…

- Appliances can only handle so much data
- Prioritize based on problem you’re solving and implementation ease
- Refresh rates
  - Performance
  - Timeliness
  - Cost/bandwidth

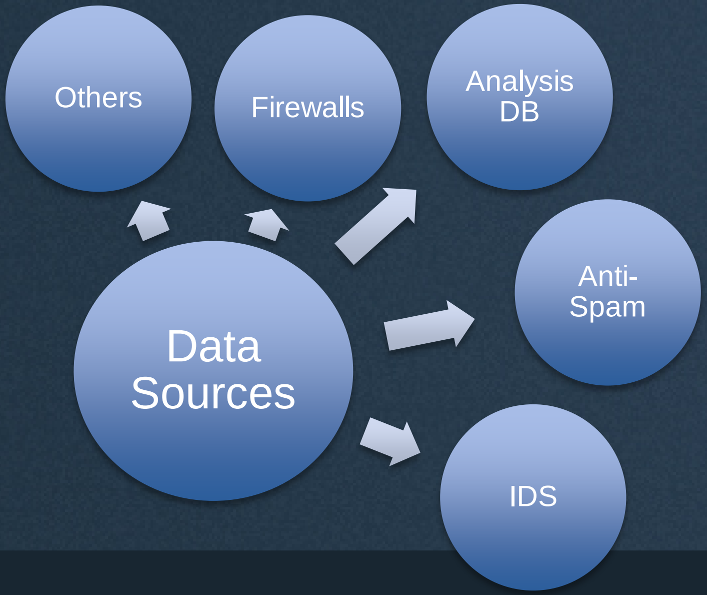
So what do you need?

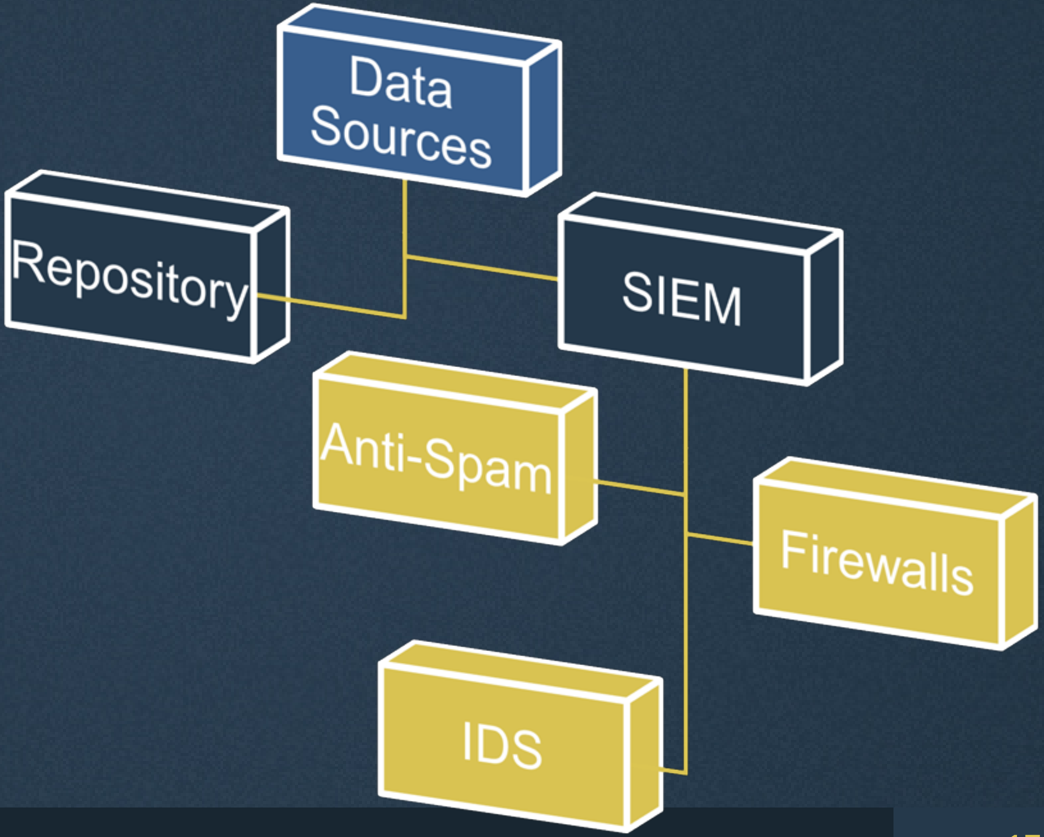
- Research tools/repositories – give me everything!
- RBL’s/RPZ’s/DNBL’s, Firewall rules
  - Just the facts get delivered (hosts/IPs/TTLs)
- Still need context for making decisions about what to do
  - Give me the necessary context and I’ll decide
  - Provide your data in a “pure” form that is well described
  - I’ll give you my rules & criteria – you give just that data

Machine to machine delivery

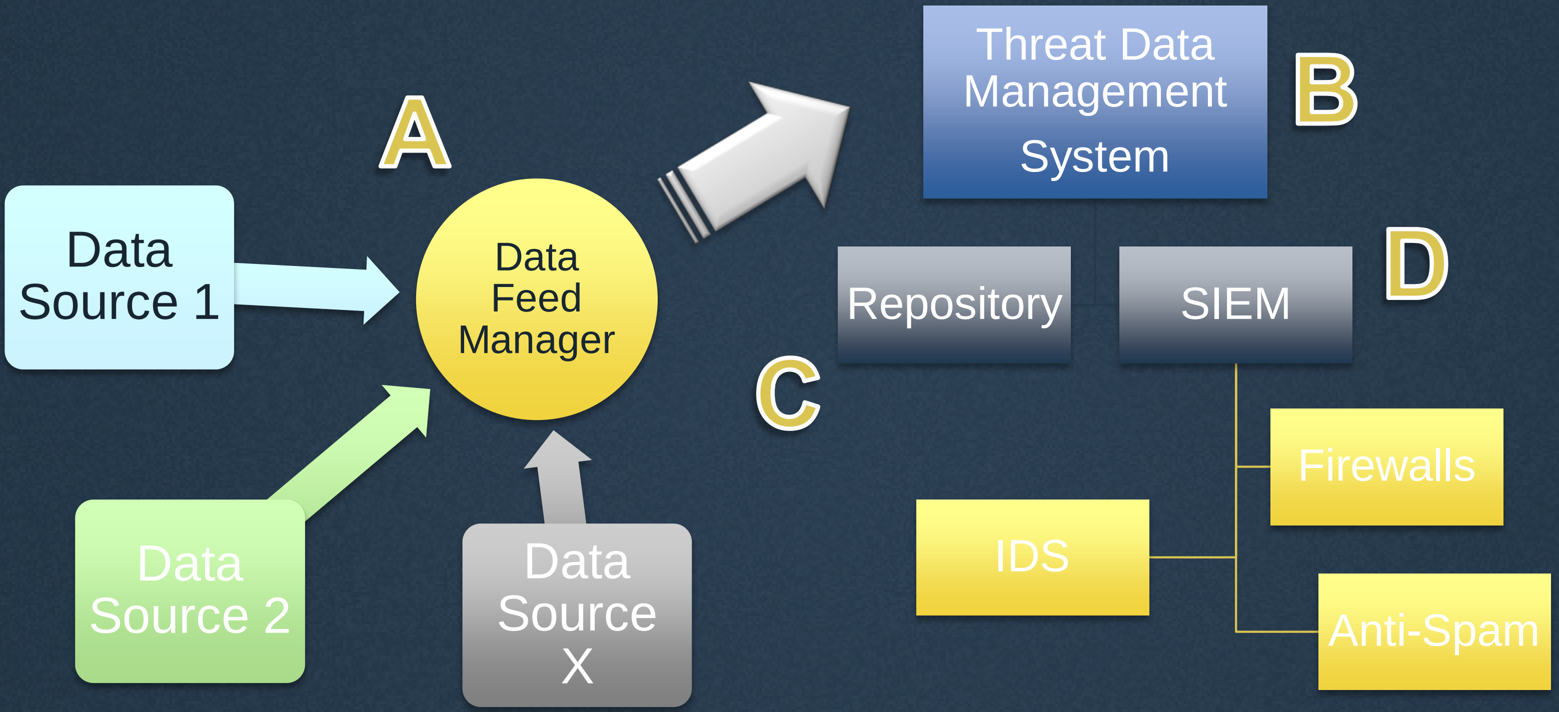
- With your game plan set, how to get data into security appliances and analysis tools
- Scale is key–attacks are ubiquitous
- Hub and spoke vs. peer to peer
- Correlation, analysis, prioritization
- Feedback loops

Architecture may get complicated



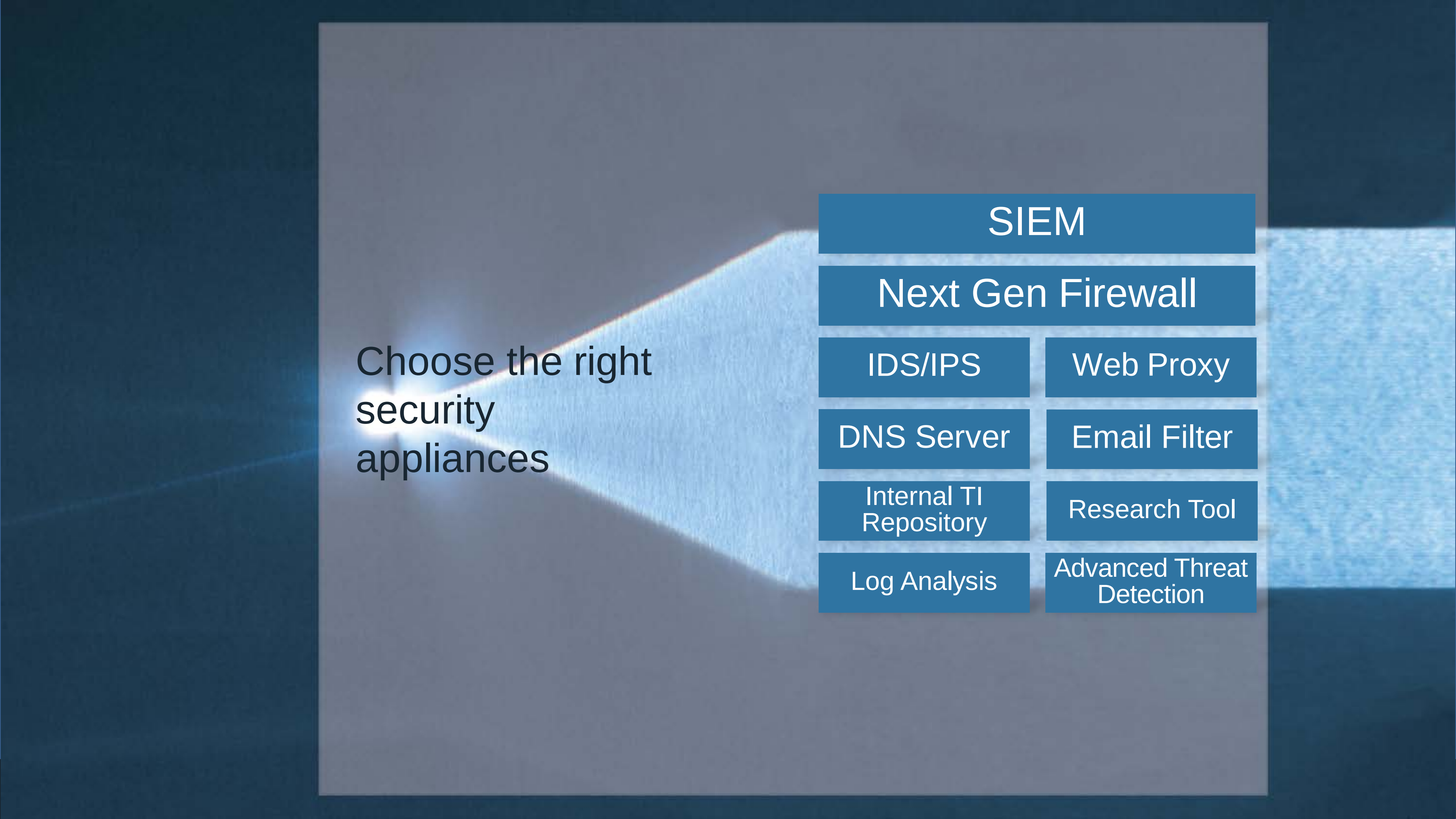


Probably going to end up here some day…



You still need manual data in production

- Translating a research project or buddy’s email into network protection
- That latest security report (PDF!) from vendor X
- Inventory how you do (or wish you did) things today
- Automating a bunch of manual processes



Choose the right security appliances

- SIEM
- Next Gen Firewall
- IDS/IPS
- Web Proxy
- DNS Server
- Email Filter
- Internal TI Repository
- Research Tool
- Log Analysis
- Advanced Threat Detection

Choose the right data format

- STIX
- CSV
- JSON
- XML
- Open IOC
- NMSG
- IODEF
- XLS
- CEF

Working with various formats

Battle plan: format that delivers for the given use case

The right tools to translate

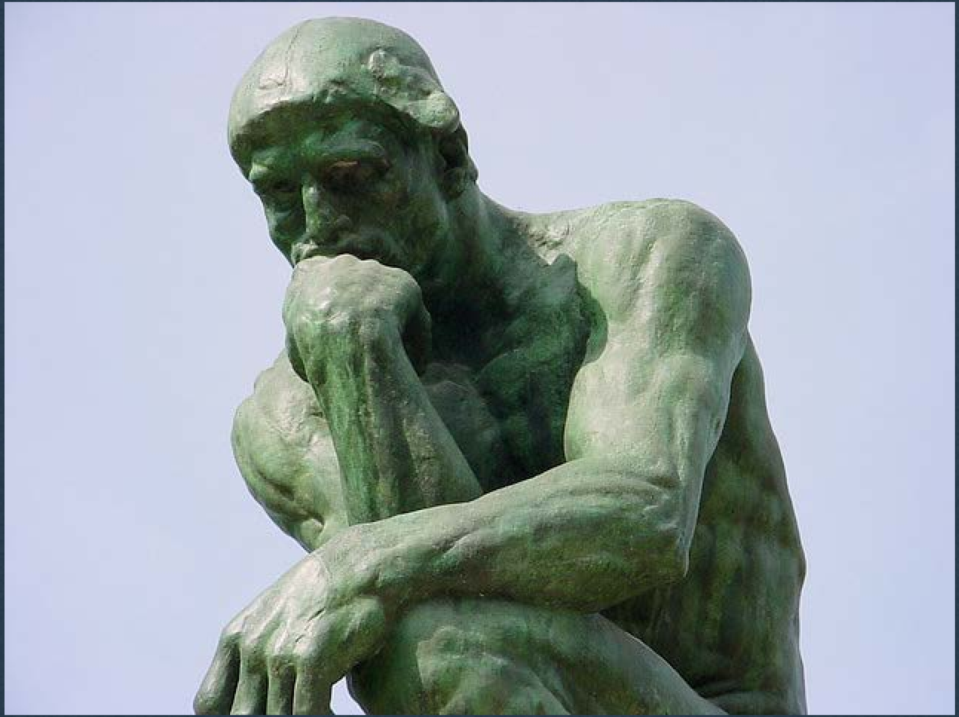
Push through repositories or services to normalize

Hook up to the right “pipes” to put in play with your security systems

So how easy is this?

- Bad news – it isn’t easy
  - Lots of custom, manual processes for each environment
  - Spot solutions – no comprehensive tools
  - Lots of standardization problems still beyond data format (taxonomy, reputation, BCP’s for handling)
- Good news – lots of people working on the problems
  - Open source and commercial efforts
  - Governments and industry organizations driving standards forward

Some further thoughts



What tools and staff do you have?

- People to build scripts to automate
- Investigators to look at things in-depth
- Big commercial repository, homegrown system or spreadsheets?
- Lots of bandwidth?
- Can you put things in the cloud?

Why do you need ALL the data attributes from one source?

- Many data sources don’t provide “feeds”
- Reputation and context for the indicators you see can be found in many places
- Utilize API’s, scraping (if ok) and subscriptions
- “Fractional Access” – i.e. get just what you need, just in time
  - Saves time/money/equipment/
  - Flesh out your stored data with attributes for further work

Whois

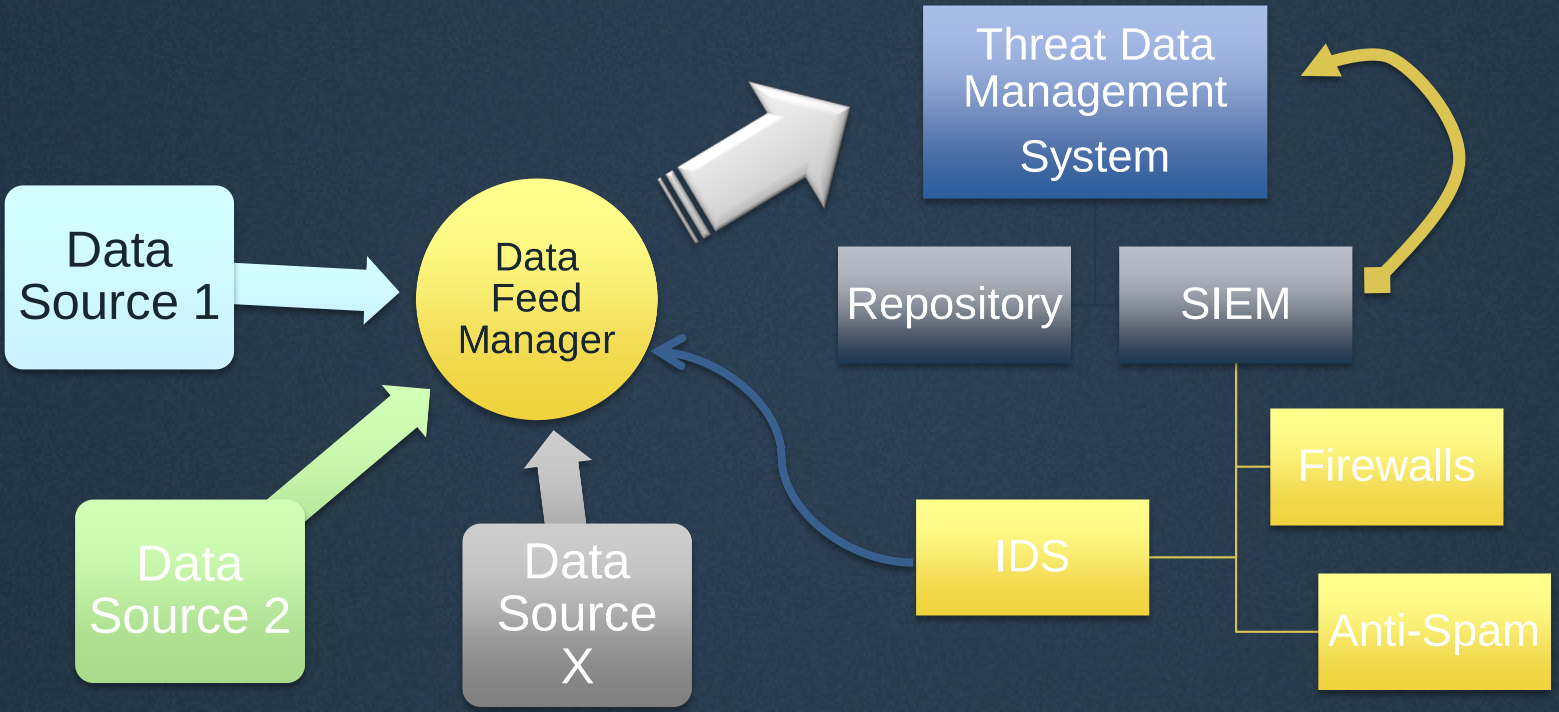
PDNS

File Hashes

Reputation Score

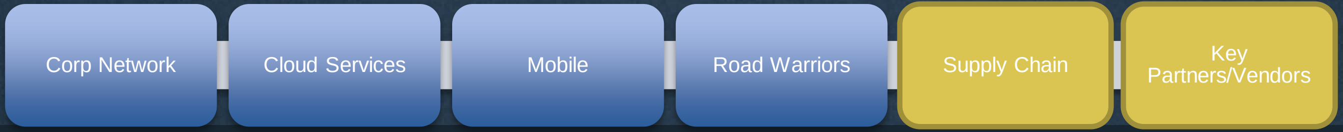
Geo-location

How about your own alerts/data?



Ubiquity of “baseline” threat intelligence data

- Not all of your valuable assets are “on network” anymore
- Different device profiles and access methods
- Different security vendors have different TI incorporated in-device or on-path
- How can you guarantee protection against “threat X” across all?
- You will HAVE to insert data across all environments - eventually



Corp Network

Cloud Services

Mobile

Road Warriors

Supply Chain

Key Partners/Vendors

Questions

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