Making the Most of A Lot [of Data]: Netflow in US-CERT Operations

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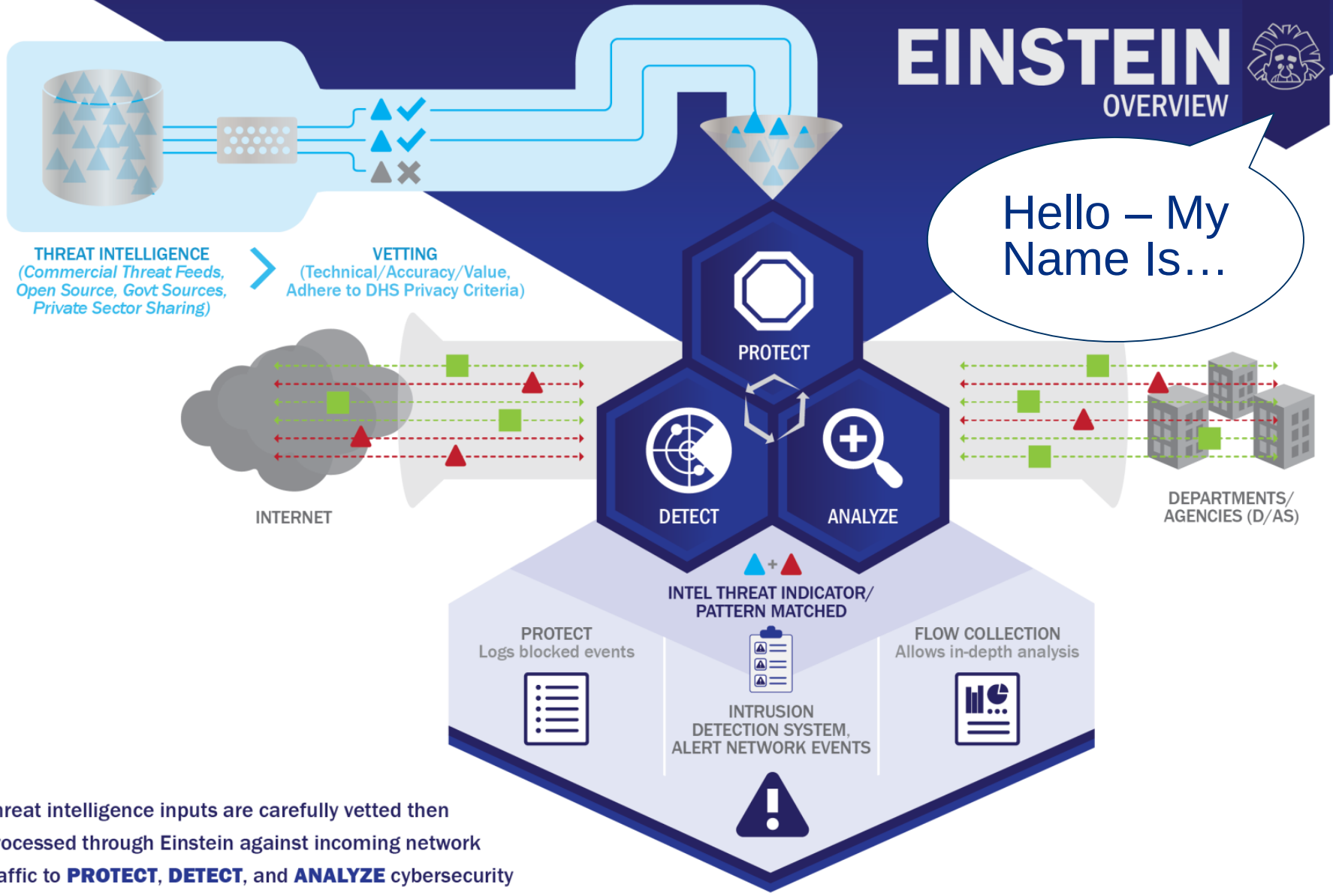
Homeland Security

National Cybersecurity and Communications Integration Center

“To-Do” List

- Who’s Einstein?
- A Lot of Data: Challenges of Scale and Diversity
- The Daily Grind
- The Art of the Possible
- Where We Go From Here

EINSTEIN
OVERVIEW



Threat intelligence inputs are carefully vetted then processed through Einstein against incoming network traffic to **PROTECT**, **DETECT**, and **ANALYZE** cybersecurity threats and suspicious activity. The Einstein capabilities allows analysts to detect & diagnose current threat activity, perform retrospective analysis on past activity, and mitigate current and future threat activity.

A *Lot* of Data: The Quantifiable

- Scale:
  - ~17B flows/day
  - decent chunk of storage
- Diversity:
  - 300+ sensors
  - 100+ organizations
  - ~39M IP addresses monitored
    - ~9M observed/day
  - ~45M IP addresses observed/day
  - ~3B IP addresses observed all-time

A Lot of *Different* Data: The Unquantifiable

Wide Range of Missions

Citizen Services, to Tourism, to Science and so much more.

Geographic Dispersion

National & International… every time zone.

Both a Large Producer & Large Consumer

Varied Usage & Security Filtering Policies

The Ever-evolving Network Landscape

- Thorns in the netflow analyst's side, some old, some more recent:
  - NATs/proxies
  - Cloud services / shared hosting
  - Protocol convergence – Everything is HTTP(S)
  - IPv6 – a briefer's nightmare
- Encryption? No content, no problem - right?
  - Depends on implementation and sensor placement
  - The NAT/proxy problem all over again

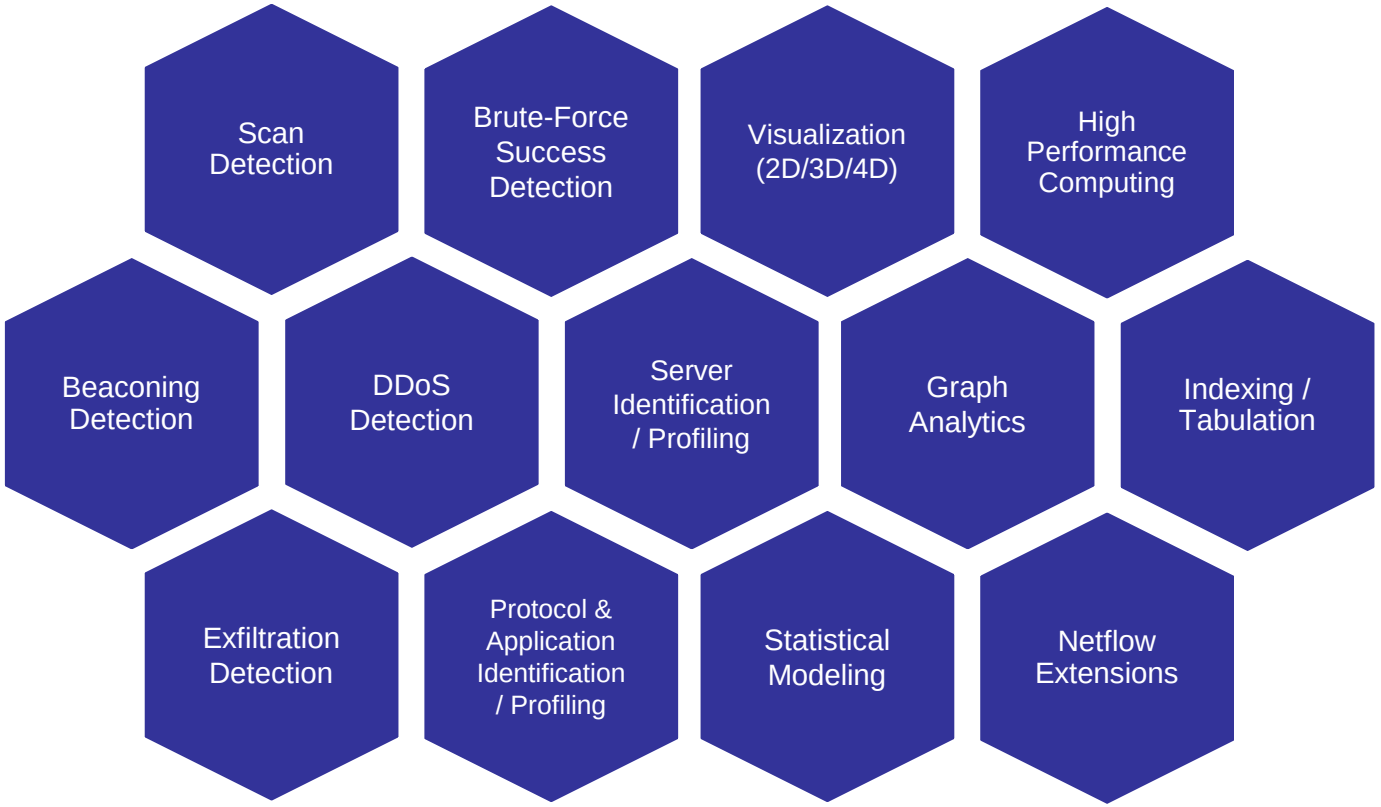
Yet Against All the Odds….

- Netflow remains an integral tool

Common US-CERT Use Cases	
	Augments signature-based alert data (detailed timestamps, pattern of activity vs. one-off, indicators of attack success)
	Retrospective analysis – particularly in support of deployed incident response teams
	Statistical/behavioral analysis still quite valid for certain types of threats (i.e. volume-based)
	Assess viability of new threat indicators
	Assess exposure / attack surface for new vulnerabilities

The Art of the Possible

- Our community has a wide body of fantastic research.
- Effective operational implementations are hard…but maybe we can help.



Where We Go From Here

- Questions/Discussion
- Help Us, Help You, Help Us

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