Entry-level Cyber Cyber Security Analyst Skill Development

Brian Ford
Consulting Engineer, CISSP
bford@cisco.com

James Risler
Technology Education Specialist, CCIE# 15412
jarisler@cisco.com
Overview

• Security Analyst Challenge

• Security Analyst skill Development
  • Competency areas
  • Facilitation of Knowledge

• Complex job of a Security Analyst
  • Tools used by Security Investigators

• Course development process

• Lab infrastructure

• Lessons Learned
IAT Roles & Relationships

Data

Intel & Research

Analysis

Tools

Investigate

Evidence & Information

SIEM, Packet Capture & Flow Tools

Data Analysis, Collaboration, & Case Tools
Perimeter security stops many threats but sophisticated Cyber threats evade existing security constructs.

Fingerprints of threats are often found in network fabric.
Security Analyst Skills

• What Skills to Develop?
  Major areas of competency
  • Understanding security policy
  • Data & Traffic Analysis
  • Identifying Security Events → How & when to alarm
  • Incident Response

• Foundation/Background
  • Network infrastructure knowledge
  • Diverse device configuration ability
  • Security configuration knowledge
  • Data management & teamwork

• Challenge is Arming Security Investigators
  • Not tied to a product or solution
  • Complex knowledge – Not one specific process is correct or product solution
  • Diverse set of skills are needed
Security Investigation Process

Start

Solutions Components

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Prevent

Detect

Collect

Analyze

Mitigate

Foundations

End
Example: SIEM tool identifying a Worm

Alarm indicating this host touched another host which then began exhibiting the same suspicious behavior.

Suspicious activity that triggered the alarm.

IP Address
Goal – Train IAT & Security Analysts

• IAT – Information Assurance Technicians
  Also known as Network & Security Analysts
  Assess the state of the network based on established policies
  Work in Network & Security Planning, Operations, Audit, and IRTs

• These are not entry level positions
  Requires base knowledge of network and computer operations
  Launching pad to many roles in IT
  IT need in .mil, .gov, & .com environments

• The Challenge of being a Vendor & Practitioner
  Cisco develops and sells routers, switches, & network equipment
  Cisco has well established IT, NOC, SOC, PSIRT, & CSIRT
Complex Threat Puzzle

Use Netflow data to extend visibility to the Access Layer

Unite Flow data with identity, reputation, application for context

Network switches as enforcement points for increased control
Example of a Complex Threat Visibility Concept

Leveraging Netflow to investigate a potential IT policy violation

Attack bypasses perimeter and traverses network

Netflow at the access layer provides greater granularity

Cisco Threat Context Grid – Automating Context Collection

ACTIVE FLOWS: 23,892
SRC/65.32.7.45
DST/171.54.9.2/US : HTTP
DST/34.1.5.78/China : HTTPS
DST/165.1.4.9/Uzbekistan : FTP
DST/123.21.2.5/US : AIM
DST/91.25.1.1/US : FACEBOOK

The need for visibility could/should drive information sharing!
Key Challenges: Complex Threat Visibility

- **Breached but How, Where and Who?**
  - Often very difficult to find
  - High value assets – major consequences
  - Network flow analysis is central to this process—throughout the network

- **Context is Critical**
  - No single system provides all data to decipher an attack
  - Related threats, identity, reputation, vulnerability, device type…

- **Disparate Data Sources, Manual Assembly**
  - Analysts collect and assemble contextual information from a variety of systems
  - Requires expensive analysts—round-the-clock coverage
What did Cisco Learn?

- Complex problem
- Sources of Data and Baseline
- Deep Packet Analysis needed
- Levels of Skill – Associate vs. Professional
- Log Analysis with correlation
- Where on the network to Monitor? (Key)
- Operational Process tied into Monitoring
- Incident classifying
What did Cisco Learn? – continued

• Investigating Security Incidents
  Structure, process, and tools

• Necessary tools
  Packet analysis, SIEM, Flow Analysis
  Collaboration & Teaming
  Mix of COTS & Open Source

• Mentoring during the Learning process
  • Using PCAP files with known complex threats
  • Netflow outputs tied to investigations
  • Historical threat signatures and packet payloads to develop individual capabilities
Conclusion

• Security Analyst competency areas - Key

• Skillset complexity (Where to Look)

• Course Development Process

• Labs – Build skills with a mix of COTS and open source tools

• Lessons Learned
Questions/Discussion?

Thank You