Monitoring Overview

- Continuous monitoring
- Baselines allow for easy detection of anomalies
- Threats are changing constantly
  - New malware variants
  - Hardware and software vulnerabilities
  - Climate change

Incident Management

Assets worth protecting

Threat identification

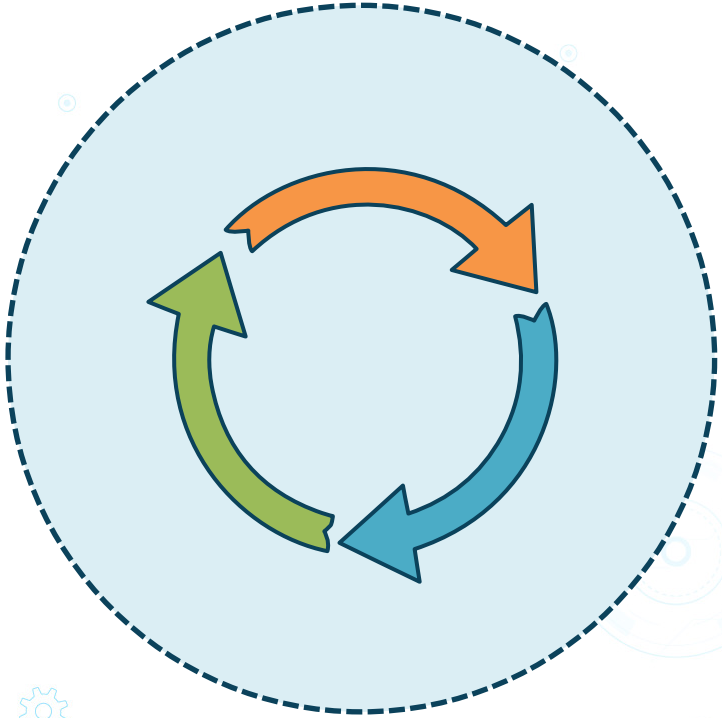
Threat detection

Threat response

Monitoring Overview

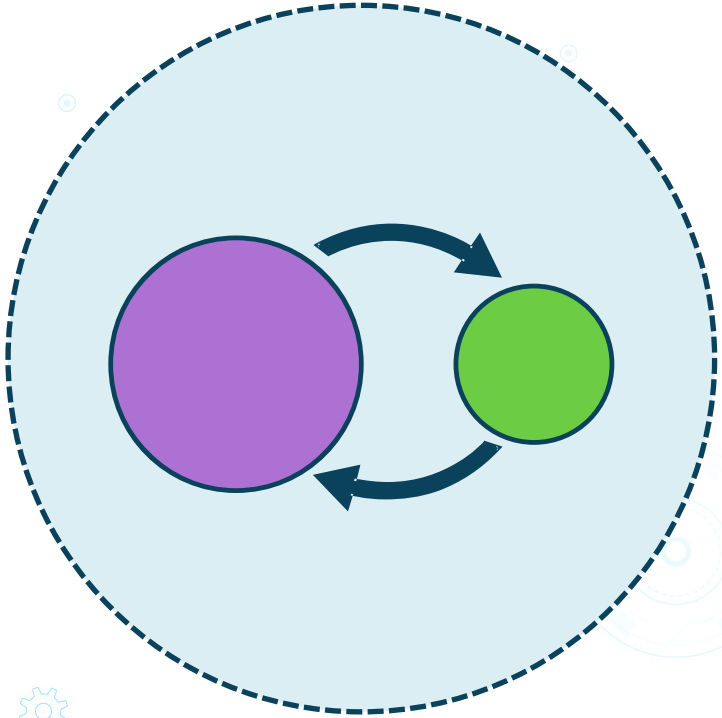
- Logging
- Alert notifications
- Network and host scans
- IT file and system auditing

Business Processes



- Driven by organizational objectives
- Interact with assets and personnel
- Defines *how* the organization implements business strategy

Business Processes



- Techniques and tools used to get things done
- Serve the business while ensuring compliance
- Ability to adapt to change
- Periodic review to ensure effectiveness

COBIT 5 Process Reference Model (PRM)

Processes for governance of enterprise IT		
Cost management	Resource optimization	HR management
Supplier management	Risk management	Security management
Project management	Change management	Asset management
Problem management	Business continuity	Process controls

Audit Sampling

- Assures that audit assertions are backed up by evidence
  - Confidence coefficient normally means a larger sample size
- May be impractical to examine all details
- Identify expected sample outliers
- Identify tolerable error

Audit Sampling Types

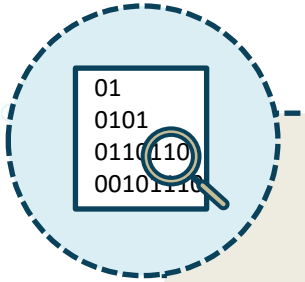
- Attribute sampling: presence or absence of characteristic
- Variable sampling: total or average value
- Discovery sampling: highlight deviations in a population
- Statistical sampling: mathematical calculations on data subset

Packet Capturing

Network traffic monitoring

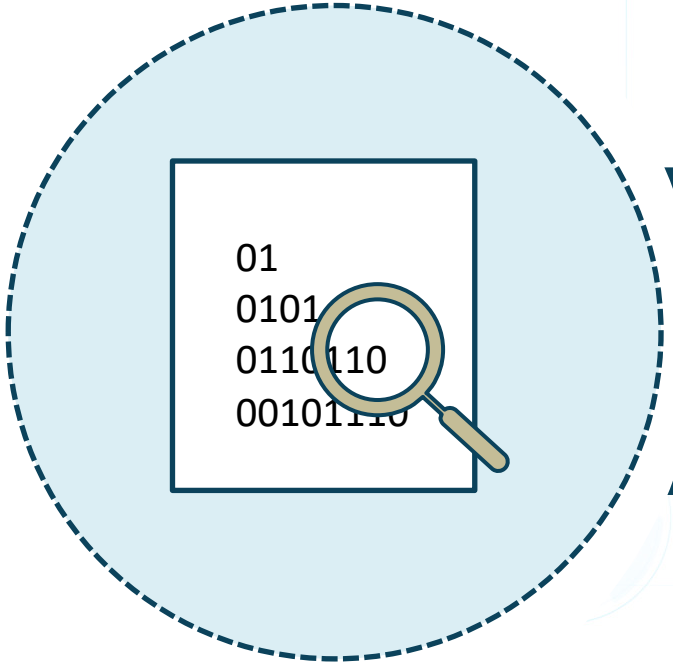
Hardware or software

Packet Capturing - Placement



- NIC promiscuous mode
- Wireless network "isolation" mode
- Network switch monitoring port
  - All switch port traffic is copied here
- Capture traffic on router
- Malicious user ARP poisoning or war flying

Packet Capturing



- Capture/display filters
- Amount of traffic needed for valid sample
- Baseline comparison

Security Information and Event Management (SIEM)

- Real-time security alerts
- Security events from multiple sources
- Event analysis and correlation

SIEM Data Sources

- Web applications
- Network infrastructure equipment
- Databases
- Shared folders
- Authentication servers

SIEM Configuration

- Each computing environment is different and the SIEM centralized solution will need to be tweaked
- Reduce false positives
- Baselines of "normalcy"
- Compliance with specific laws and regulations
  - Encryption strength
- Alert thresholds
  - After three incorrect login attempts

Intrusion Detection System (IDS)

- Host IDS (HIDS)
- Network IDS (NIDS)
- Hardware or software
- Detect anomalies
  - Log entries
  - Alarm is raised

Intrusion Prevention System (IPS)

- Host IPS (HIPS)
- Network IPS (NIPS)
- Hardware or software
- Detect anomalies and prevent further damage
  - Log entries
  - Alarm is raised
  - Block or reroute traffic
  - Run custom script

Intrusion Detection and Prevention Systems

- Consider placement
- Establish host and network baselines
- Consider encrypted network transmissions
- Monitor inbound and outbound traffic
- Must be tweaked for the environment

In this exercise, you will

- Describe the purpose of IS audit sampling
- Describe the purpose of SIEM
- List characteristics of an Intrusion Prevention System (IPS)
- Capture and filter HTTP network traffic using Wireshark

IS Audit Sampling

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SIEM

- Real-time security alerts
- Centralized
- Security events from multiple sources
- Event analysis and correlation

Intrusion Prevention System (IPS)

- Detect anomalies and prevent further damage
  - Log entries
  - Alarm is raised
  - Block or reroute traffic
  - Run custom script