LOG ANALYSIS FOR DETECTION AND RESPONSE

EXP.NO: 9 **DATE:25-03-2025**

AIM:

The primary aim of the Log Analysis for Detection and Response is to equip learners with the knowledge and practical skills required to analyze system and network logs effectively. This is to identify potential security incidents, respond to threats, and enhance the overall security posture of an organization.

OBJECTIVE:

1. Introduction to Logs: A log is a stream of time-sequenced messages that record occurring events. Log analysis is the process of making sense of the events captured in the logs to paint a clear picture of what has happened across the infrastructure.
2. Importance of Logs:

   System Troubleshooting: Analyzing system errors and warning logs helps IT teams understand and quickly respond to system failures, minimizing downtime, and improving overall system reliability.

   Cyber Security Incidents: In the security context, logs are crucial in detecting and responding to security incidents. Firewall logs, intrusion detection system (IDS) logs, and system authentication logs, for example, contain vital information about potential threats and suspicious activities. Performing log analysis helps SOC teams and Security Analysts identify and quickly respond to unauthorized access attempts, malware, data breaches, and other malicious activities.

   Threat Hunting: On the proactive side, cyber security teams can use collected logs to actively search for advanced threats that may have evaded traditional security measures. Security Analysts and Threat Hunters can analyze logs to look for unusual patterns, anomalies, and indicators of compromise (IOCs) that might indicate the presence of a threat actor.

   Compliance: Organizations must often maintain detailed records of their system's activities for regulatory and compliance purposes. Regular log analysis ensures that organizations can provide accurate reports and demonstrate compliance with regulations such as GDPR, HIPAA, or PCI DSS.
3. Different Types of Logs

TASK 1: INVESTIGATION THEORY

Understand the concepts of timelines, data visualisation and threat intelligence.

TASK 2: DETECTION ENGINEERING

This task encompasses common log file locations on Linux systems, common patterns for identifying suspicious behaviour, and common attack signatures.

TASK 3: AUTOMATED VS. MANUAL ANALYSIS

This short task explains the pros and cons of automated and manual analysis. Manual analysis is the process of examining data and artifacts without using automation tools, whereas automated analysis involves tools.

TASK 4: LOG ANALYSIS TOOLS USING LINUX COMMAND LINE

TASK 5: LOG ANALYSIS USING REGULAR EXPRESSIONS TASK 6: LOG ANALYSIS USING CYBERCHEF TASK 7: LOG ANALYSIS TOOLS: YARA AND SIGMA

Answer the questions below

What's the term for a consolidated chronological view of logged events from diverse sources, often used in log analysis and digital forensics?

Super Timeline — ✓ Correct Answer

Which threat intelligence indicator would `5b31f93c09ad1d065c0491b764d04933` and `763f8bdbc98d105a8e82f36157e98bbe` be classified as?

File Hashes — ✓ Correct Answer

What is the default file path to view logs regarding HTTP requests on an Nginx server?

/var/log/nginx/access.log — ✓ Correct Answer

A log entry containing `%2E%2E%2F%2E%2E%2Fproc%2Fself%2Fenviron` was identified. What kind of attack might this infer?

Path Traversal — ✓ Correct Answer

A log file is processed by a tool which returns an output. What form of analysis is this?

Automated — ✓ Correct Answer

An analyst opens a log file and searches for events. What form of analysis is this?

Manual — ✓ Correct Answer

Use `cut` on the `apache.log` file to return only the URLs. What is the flag that is returned in one of the unique entries?

c701d43cc5a3acb9b5b04db7f1be94f6 — ✓ Correct Answer — Hint

In the `apache.log` file, how many total HTTP 200 responses were logged?

52 — ✓ Correct Answer — Hint

In the `apache.log` file, which IP address generated the most traffic?

145.76.33.201 — ✓ Correct Answer — Hint

What is the complete timestamp of the entry where `110.122.65.76` accessed `/login.php`?

31/Jul/2023:12:34:40 +0000 — ✓ Correct Answer — Hint

How would you modify the original `grep` pattern above to match blog posts with an ID between 20-29?

post=2[0-9] — ✓ Correct Answer — Hint

What is the name of the filter plugin used in Logstash to parse unstructured log data?

Grok — ✓ Correct Answer

Locate the "loganalysis.zip" file under `/root/Rooms/introloganalysis/task8` and extract the contents.

No answer needed — ✓ Correct Answer

Upload the log file named "access.log" to CyberChef. Use regex to list all of the IP addresses. What is the full IP address beginning in 212?

212.14.17.145 — ✓ Correct Answer

Using the same log file from Question #2, a request was made that is encoded in base64. What is the decoded value?

THM{CYBERCHEF_WIZARD} — ✓ Correct Answer

Using CyberChef, decode the file named "encodedflag.txt" and use regex to extract by MAC address. What is the extracted value?

08-2E-9A-4B-7F-61 — ✓ Correct Answer

What languages does Sigma use?

YAML — ✓ Correct Answer

What keyword is used to denote the "title" of a Sigma rule?

title — ✓ Correct Answer

What keyword is used to denote the "name" of a rule in YARA?

rule — ✓ Correct Answer

RESULT:

After completing this, got a solid foundation in log analysis, a critical skill in cybersecurity for identifying, investigating, and responding to security threats efficiently.