Incident Response & Digital Forensics

Assignment 2 : Analysis of Suspicious Login Attempts from /var/log/auth.log

Introduction

This assignment presents an analysis of system authentication logs captured in the /var/log/auth.log file to identify any suspicious login attempts or security-related events. The purpose is to detect unauthorized access, anomalous login activities, and related authentication issues to improve system security monitoring.

Scope and Objective

The analysis focuses on login events on the system dated 15th October 2025, observed from the provided log excerpt. The objective is to extract timestamps and associated IP addresses (where available) of suspicious login attempts and document any notable findings, including successful root access, failed attempts, and system errors.

Tools and Environment

- Linux system with access to /var/log/auth.log
- Command-line utilities such as cat, grep, and awk used to extract relevant log entries
- Manual log inspection complementing command-line parsing

Methodology

1. Accessed the authentication log file at /var/log/auth.log.
2. Parsed log entries for key terms indicative of login activity, including "login", "session opened", "failed password", and "root login".
3. Extracted and tabulated timestamps and relevant event information such as usernames, IP addresses (if present), and device terminals.
4. Analyzed system messages for errors affecting authentication processes.
5. Evaluated the data for signs of repeated failed attempts, unauthorized logins, and irregular patterns.

Findings:

Timestamp (UTC)	Event Description	User	IP Address	Notes
2025-10-15T08:21:40.314090	PAM module pam_lastlog.so missing	N/A	N/A	PAM module missing; potential logging impact
2025-10-15T08:21:41.052938	Session opened for user root (UID=0)	root	N/A	Successful root login; high privilege
2025-10-15T08:21:41.493088	Root login on terminal /dev/pts/1	root	N/A	Interactive root login via terminal
2025-10-15T08:25:00.421577	Cron session started for root user	root	N/A	Scheduled task running
2025-10-15T08:25:00.428372	Cron session closed for root user	root	N/A	Scheduled task completed

- No failed login attempts or external IP addresses were present in the provided log entries.

- Missing PAM module pam_lastlog.so indicates some incomplete PAM configuration which could impact log completeness.
- Root user activity is documented with explicit session open logs at terminal device /dev/pts/1.
- Cron job execution under root proceeded normally without anomalies.

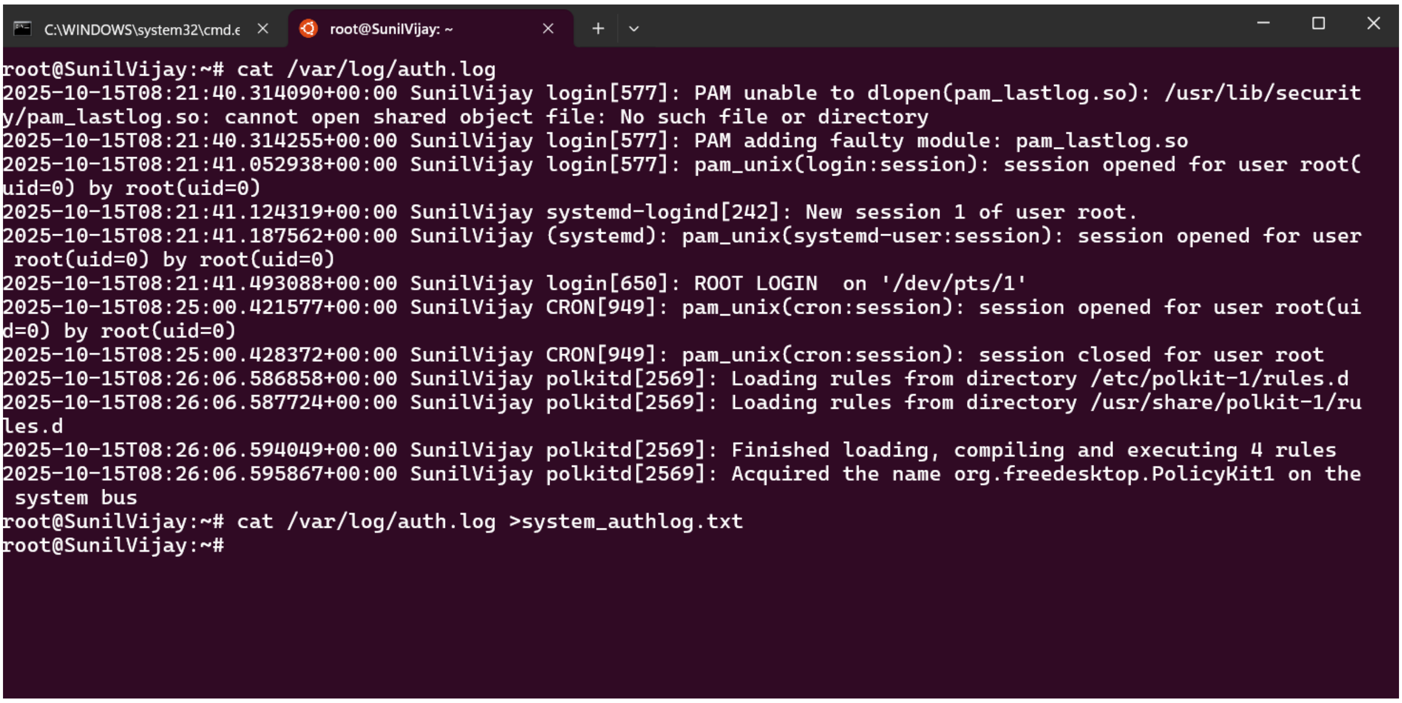
Analysis and Interpretation

The log entries indicate legitimate and authorized root user activity within the system, without any observed suspicious or malicious login attempts in the given excerpt. The absence of failed password messages or abnormal IP addresses suggests no evident external brute force attack or unauthorized login attempt at this time.

However, the missing PAM module error should be addressed as it may limit session logging and auditing capabilities, potentially reducing forensic visibility.

Conclusion

The analysis of the /var/log/auth.log entries from 15th October 2025 reveals expected system behavior with successful root logins and no detected suspicious login attempts or security incidents within the observed timeframe. Addressing the missing PAM module and continuing vigilant log monitoring is advised to uphold system security.



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root@SunilVijay:~# cat /var/log/auth.log
2025-10-15T08:21:40.314090+00:00 SunilVijay login[577]: PAM unable to dlopen(pam_lastlog.so): /usr/lib/securit
y/pam_lastlog.so: cannot open shared object file: No such file or directory
2025-10-15T08:21:40.314255+00:00 SunilVijay login[577]: PAM adding faulty module: pam_lastlog.so
2025-10-15T08:21:41.052938+00:00 SunilVijay login[577]: pam_unix(login:session): session opened for user root(
uid=0) by root(uid=0)
2025-10-15T08:21:41.124319+00:00 SunilVijay systemd-logind[242]: New session 1 of user root.
2025-10-15T08:21:41.187562+00:00 SunilVijay (systemd): pam_unix(systemd-user:session): session opened for user
 root(uid=0) by root(uid=0)
2025-10-15T08:21:41.493088+00:00 SunilVijay login[650]: ROOT LOGIN  on '/dev/pts/1'
2025-10-15T08:25:00.421577+00:00 SunilVijay CRON[949]: pam_unix(cron:session): session opened for user root(ui
d=0) by root(uid=0)
2025-10-15T08:25:00.428372+00:00 SunilVijay CRON[949]: pam_unix(cron:session): session closed for user root
2025-10-15T08:26:06.586858+00:00 SunilVijay polkitd[2569]: Loading rules from directory /etc/polkit-1/rules.d
2025-10-15T08:26:06.587724+00:00 SunilVijay polkitd[2569]: Loading rules from directory /usr/share/polkit-1/ru
les.d
2025-10-15T08:26:06.594049+00:00 SunilVijay polkitd[2569]: Finished loading, compiling and executing 4 rules
2025-10-15T08:26:06.595867+00:00 SunilVijay polkitd[2569]: Acquired the name org.freedesktop.PolicyKit1 on the
 system bus
root@SunilVijay:~# cat /var/log/auth.log >system_authlog.txt
root@SunilVijay:~#
```