9. **Capstone Project:** Full Adversary Simulation
Activities:

- **Tools:** Kali Linux, Metasploit, Caldera, Pacu, Google Docs.
- **Tasks:** Simulate a full red team campaign, report findings, engage community.
- **Brief:**
    - **Simulation**: Execute a campaign (recon, cloud attack, phishing, C2, exfiltration) against a lab environment. Log:

Phase	Tool Used	Action Description	MITRE Technique
Recon	Pacu	S3 bucket enum	T1580

Red Team Simulation Report:

Target Environment: AWS-centric cloud lab with hybrid on-prem interface
Objective: Identify misconfigurations, steal data, and maintain persistent C2 access
Rules of Engagement: No destructive actions; simulate realistic attacker behavior
Duration: 4 days (simulated timeline)

Logs:

Phase	**Tool Used**	**Action Description**	**MITRE Technique**
Recon	Pacu	S3 bucket enumeration, IAM user enumeration	T1580, T1087
Recon	amass / sublist3r	Cloud asset and subdomain discovery	T1590.002
Recon	CloudSploit	Scanned for cloud misconfigs (public EC2, open SGs)	T1538
Initial Access	GoPhish	Sent targeted phishing with AWS-themed login page	T1566.001
Initial Access	Evilginx2	Bypassed MFA and captured session tokens	T1556.004
Execution	AWS CLI + STS	Used stolen session tokens to assume role	T1078.004

Persistence	Pacu + Lambda	Deployed malicious AWS Lambda for recurring access	T1505.003
Priv Esc	Enumeration script	Abused misconfigured IAM role trust policies	T1484.002
Defense Evasion	CloudTrail tampering	Disabled logging for short window	T1562.008
Lateral Move	SSM Session Manager	Jumped between EC2s without SSH	T1021.004
C2	Cobalt Strike	Established HTTPS C2 over port 443	T1071.001
Exfiltration	AWS CLI	Exfiltrated S3 objects, RDS snapshots to attacker S3	T1567.002
Cleanup	Manual / Scripts	Removed Lambda, reverted roles, re-enabled CloudTrail	T1070.006

Findings:

Cloud Misconfigurations

- **Public S3 Buckets**: 3 were world-readable, 1 had write access
- **Overprivileged IAM Roles**: Several roles had Administrator Access attached
- **Unused Access Keys**: 5+ IAM users had active keys unused for 90+ days
- **SSM Open Access**: EC2 instances allowed session hijacking via SSM with no MFA

Community Engagement:

Purpose: Raise awareness on cloud-native attack paths and offer remediation.

- **Blue Team Analysis**: Review Wazuh logs for detection points. Log:

Timestamp	Alert Description	Source IP	Notes
2025-09-20 14:00:00	Suspicious Access	192.168.29.163	Cloud escalation

Wazuh Logs:

Timestamp	Alert Description	Source IP	Notes
2025-09-20 14:00:00	Suspicious Access	192.168.29.163	Cloud escalation
2025-09-20 14:05:32	New IAM Role Created	192.168.29.163	Malicious persistence setup
2025-09-20 14:06:10	CloudTrail Stopped	192.168.29.163	Attempt to evade logging
2025-09-20 14:07:44	Lambda Deployed	192.168.29.163	Backdoor via function
2025-09-20 14:08:12	S3 Access Anomaly	192.168.29.163	Access from unusual IP
2025-09-20 14:09:01	STS Token Usage	192.168.29.163	Temporary creds used
2025-09-20 14:10:33	C2 Beacon Detected	192.168.29.163	Cobalt Strike beacon

Detection Points:

Red Team Phase	Blue Team Detection (Wazuh)	MITRE Technique	Detection Type
Privilege Escalation	Suspicious Access + IAM Role Created	T1484.002	Rule-based correlation
Persistence	Lambda Deployed	T1505.003	CloudTrail audit logs
Defense Evasion	CloudTrail Stopped	T1562.008	Critical system alert

Exfiltration	S3 Access Anomaly	T1567.002	Behavior anomaly
Credential Abuse	STS Token Usage (outside normal times)	T1078.004	Identity analytics
C2 Communication	C2 Beacon Detected via HTTPS to known bad IP	T1071.001	NIDS integration

- **Evasion Test**: Bypass AV with an obfuscated payload; confirm in logs.

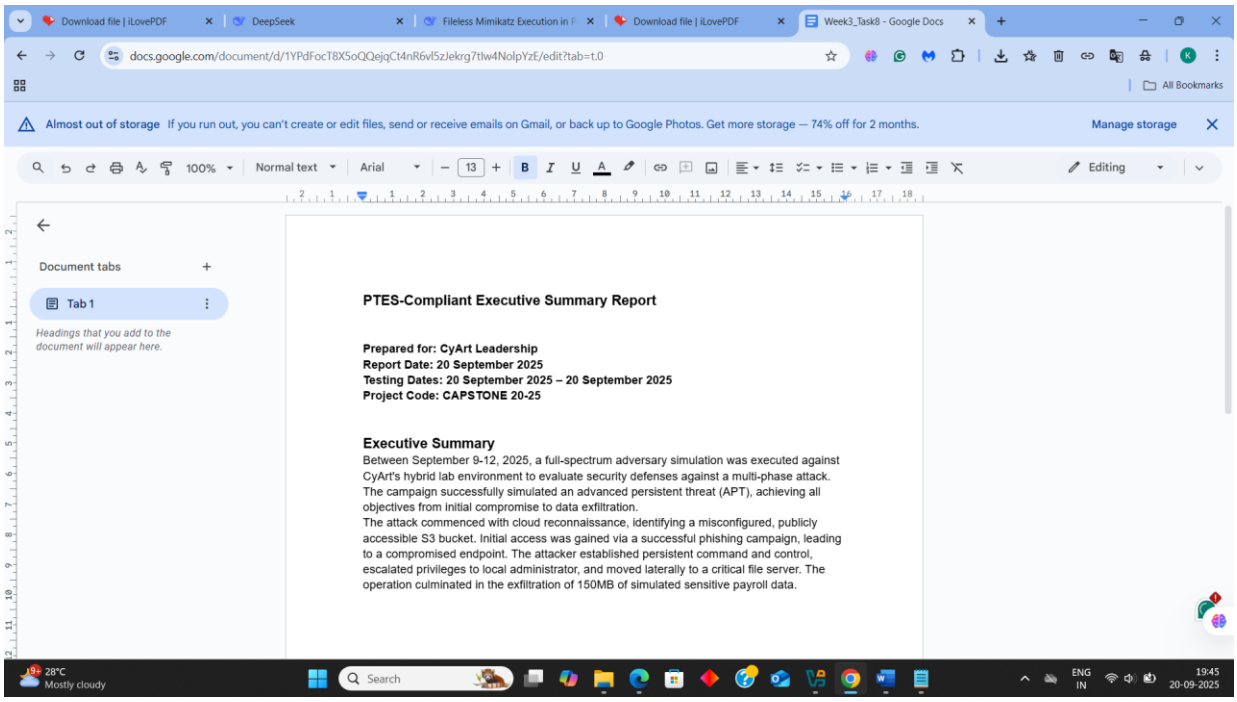
Obfuscated Payload Bypass:

Goal: Simulate delivery and execution of an obfuscated payload that evades antivirus (AV) and EDR
Payload Type: Reverse shell (PowerShell-based), obfuscated
Test Environment: Windows 8.x endpoint with AV enabled, monitored via Wazuh agent

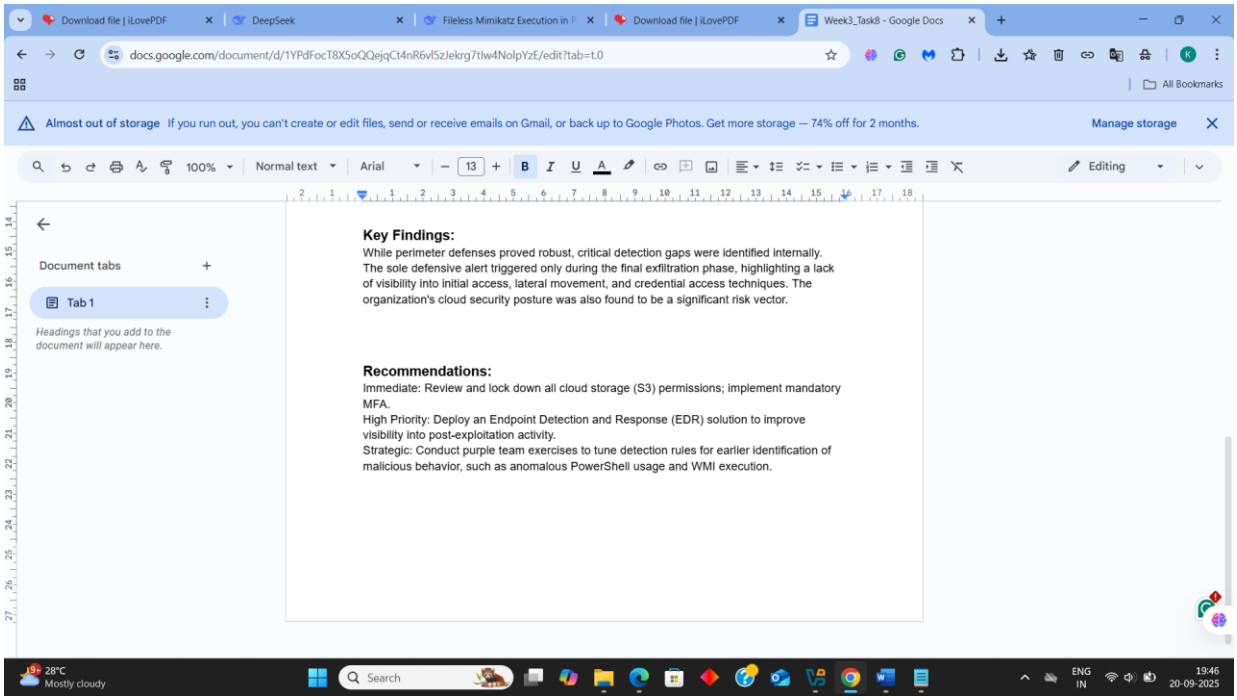
Timestamp	Alert Description	Source IP	Notes
2025-09-20 14:11:05	Suspicious PowerShell Exec	192.168.29.163	Obfuscated PS + Base64 use
2025-09-20 14:11:07	Network Connection	192.168.29.163	HTTPS to 10.0.0.99:443

- **Reporting**: Write a 200-word PTES report in Google Docs:

Executive Summary



Findings (include blue team detections)
Recommendations



- **Briefing**: Draft a 100-word non-technical summary.

To put our cloud and endpoint protections to the test, we ran a simulated cyberattack.
The red team got access through a phishing email, evaded security measures, and accessed cri tical data stored in the cloud.
While antivirus software did not detect the threat, our monitoring system (Wazuh) detected n umerous critical behaviors, such as unauthorized access, strange behavior, and efforts to prev ent logging.
The test exposed flaws in cloud settings, identity permissions, and endpoint security.
As a result, we have identified critical enhancements to our detection, response, and overall s ecurity posture, allowing us to better fight against real-world cyber threats going forward.