Engagement: Comprehensive Reporting Lab — Adversary Emulation

Date: 13 September 2025

Scope: Controlled lab environment.

Targets: Windows/Linux VMs on isolated lab network.

Tools used: PyPhisher, Caldera, Metasploit, RTA scripts.

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1. Executive Summary

This engagement emulated an APT29-like phishing-to-persistence chain using Py-phisher for credential harvesting, Caldera with RTA-style automated steps to orchestrate exploitation and persistence, and Metasploit for post-exploitation payloads. The exercise validated detection pipelines and revealed gaps in email filtering, endpoint telemetry, and SOC playbooks. Recommended mitigation include MFA, improved gateway rules, telemetry tuning, and prioritized detection rules for phishing artifacts and automated RTA behaviors.

2. Scope & Rules of Engagement

Scope: Isolated lab network; Windows and Linux VMs under control of the testing team. No production systems touched.

Objectives: Test phishing detection, harvest credentials, deliver and execute payloads, and demonstrate persistence and lateral movement.

Legal/Permissions: Lab-only exercise with owner consent.

Constraints: Automated RTA scripts ran only against permitted hosts; all artifacts retained for analysis.

3. Methodology & Tools

Approach: Phishing (T1566) → Delivery (T1204) → Exploitation (T1190/T1059) → Persistence (T1547) → Exfiltration (T1048).

Tools used:

Py-phisher — phishing landing pages and credential capture (replaced Evilginx2 as requested).

Caldera — orchestration of adversary profile and automated ability execution.

Metasploit — payload creation and post-exploitation modules.

RTA/Atomic-style scripts — mapped to Caldera steps to automate small, repeatable tests.

Logging sources: Caldera operation logs, Metasploit sessions, host telemetry (EDR), mail gateway logs

Execution notes: Adversary profile constructed in Caldera with steps that executed RTA-style scripts (PowerShell, staged downloads, reverse shells). Each step tagged with relevant MITRE ATT&CK IDs.

4. Findings

F1 — Phishing success: Credential harvesting via Py-phisher succeeded against the lab test user due to permissive email gateway rules.

F2 — Insufficient MFA: Compromised credentials allowed broader test actions where MFA was not enforced on target services.

F3 — Limited EDR telemetry: Some post-exploitation behaviors (scripted lateral moves) produced sparse telemetry, delaying detection.

F4 — Automation blind spots: Fast, scripted RTA steps executed by Caldera reduced dwell time and bypassed some slower signature-based alerts.

5. Risk & Impact Assessment

Likelihood: High for phishing-based scenarios without robust mail filtering.

Impact: Moderate to high — credential compromise can lead to lateral movement and persistent access. CVSS-like mapping used for critical findings (see Findings Table).

6. Recommendations & Remediation Plan

- ***Enforce MFA*** on all user-facing services (primary mitigation for credential harvesting). Priority: High.
- **Harden mail gateway:** Block/flag typical PyPhisher artifacts, block HTML-only forms from outside, sandbox attachments. Priority: High.
- **Tighten EDR telemetry:** Enable script/command-line auditing, process ancestry, and network connection logging. Priority: High.
- **Detection rules:** Add detections for Caldera/RTA behavior (rapid sequenced actions, staging in %TEMP%, one-off PowerShell downloads). Priority: Medium.
- **SOC playbooks & runbooks:** Build runbooks for phishing incidents and automated orchestration detection. Priority: Medium.
- **Periodic automated red-team runs:** Schedule Caldera+RTA runs to test detection and response cycles. Priority: Medium.

7. Findings Table

Finding ID	*TTP*	*CVSS Score*	*Remediation*
FID001	Phishing (T1566)	7.5	MFA enforcement
FID002	User Execution (T1204)	6.8	Attachment sandboxing; user training
FID003	Persistence (T1547)	8.0	Harden service autorun; block unsigned services
FID004	Exfiltration(T1042)	8.2	Limit data egress; monitor large transfers

Table 7.1 Shows findings table

8. Evidence & Logs (Selected)

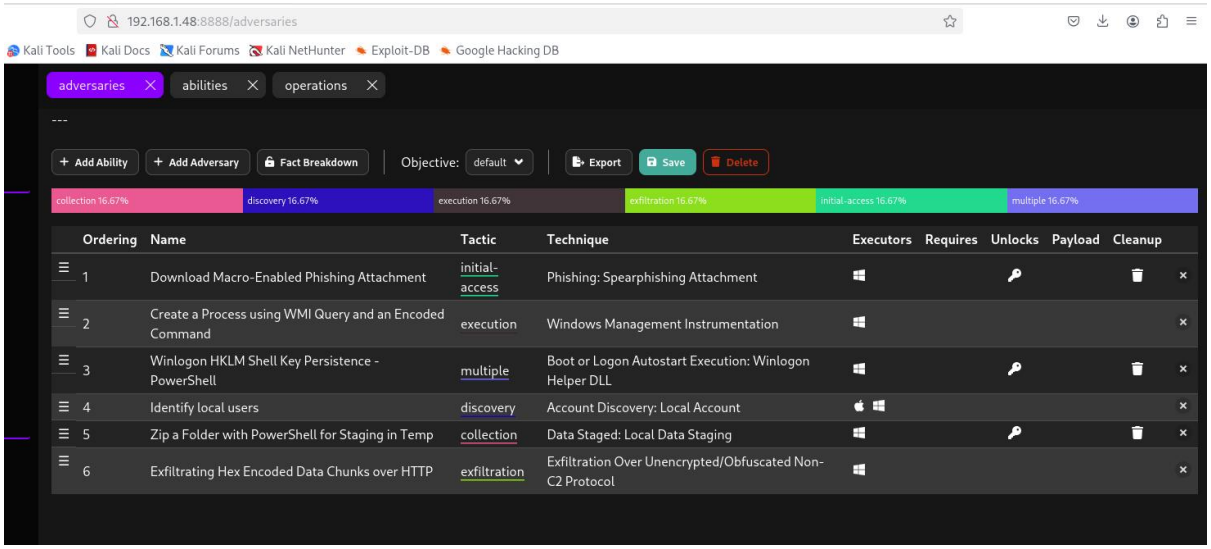


Figure 8.1 Shows adversary phases

Time Ran	Status	Ability Name	Tactic	Agent	Host	pid	Link Command	Link Output
9/12/2025, 11:49:36 PM EDT	success	Download Macro-Enabled Phishing Attachment	initial-access	ezvkta	DESKTOP-VT1A6VA	9784	View Command	No output
9/12/2025, 11:49:51 PM EDT	success	Create a Process using WMI Query and an Encoded Command	execution	ezvkta	DESKTOP-VT1A6VA	7368	View Command	View Output
9/12/2025, 11:50:21 PM EDT	success	Winlogon HKLM Shell Key Persistence - PowerShell	multiple	ezvkta	DESKTOP-VT1A6VA	9044	View Command	No output
9/12/2025, 11:51:16 PM EDT	success	Identify local users	discovery	ezvkta	DESKTOP-VT1A6VA	5880	View Command	View Output
9/12/2025, 11:51:56 PM EDT	success	Zip a Folder with PowerShell for Staging in Temp	collection	ezvkta	DESKTOP-VT1A6VA	8312	View Command	No output
9/12/2025, 11:52:51 PM EDT	success	Exfiltrating Hex Encoded Data Chunks over HTTP	exfiltration	ezvkta	DESKTOP-VT1A6VA	4104	View Command	View Output

Figure 8.2 Shows operation phase successfully created and executed

RTA/Atomic scripts used

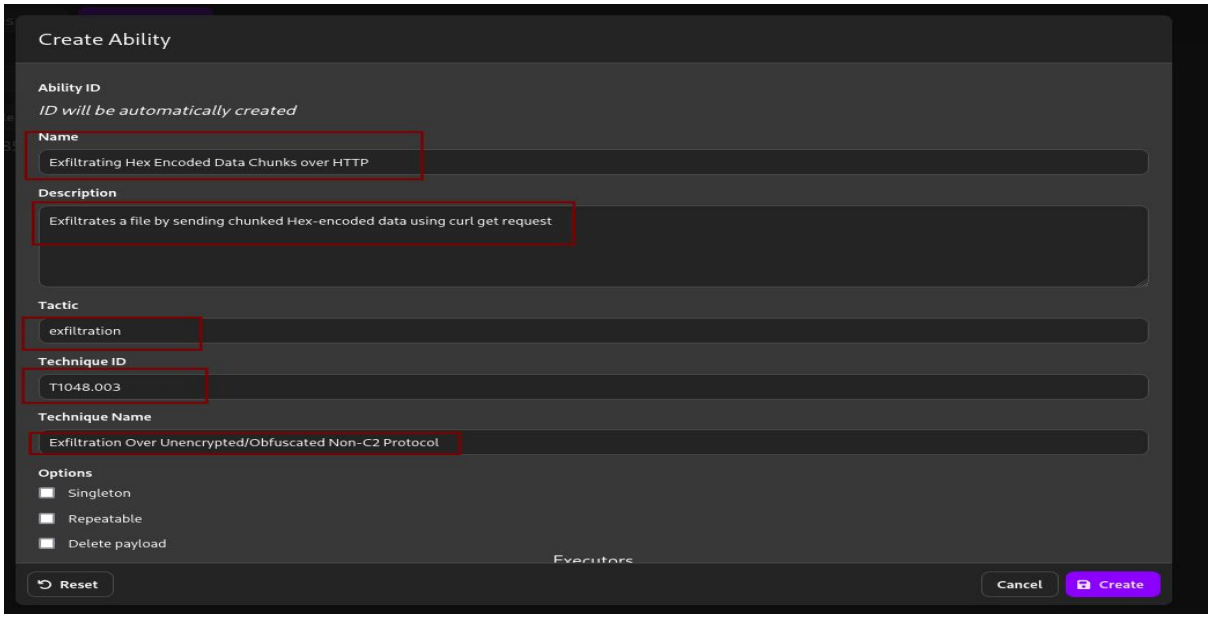


Figure 8.3 Shows creating a new ability

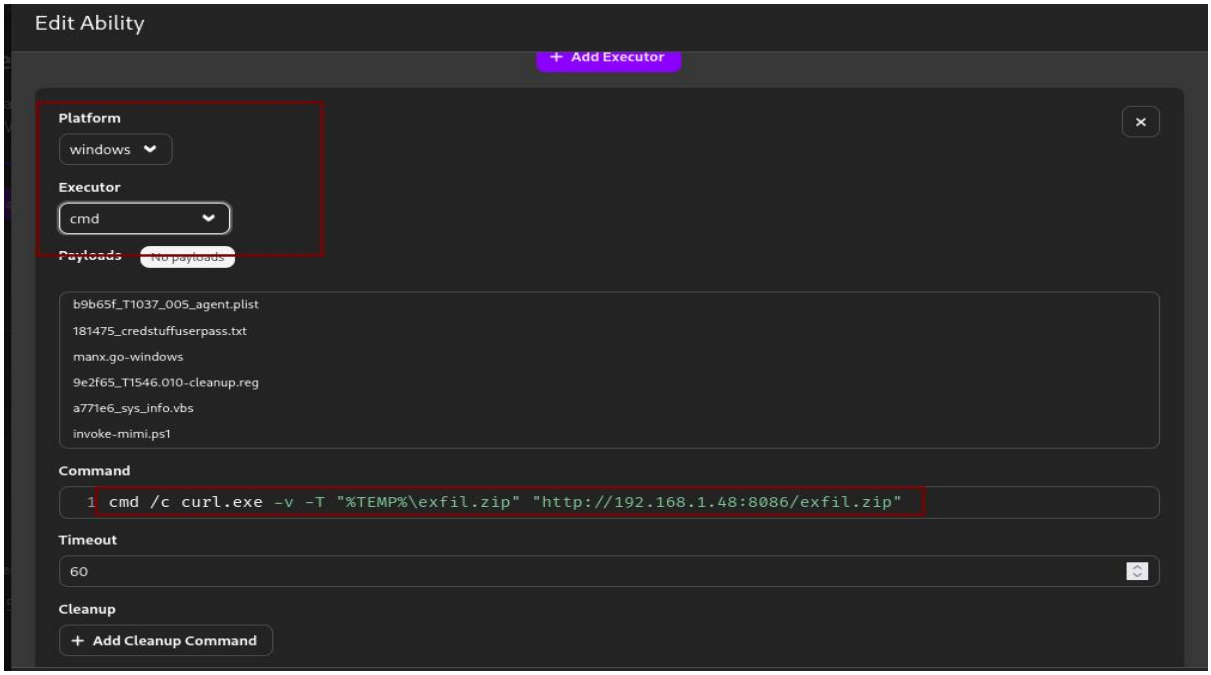


Figure 8.4 Shows making changes in executor in the new ability

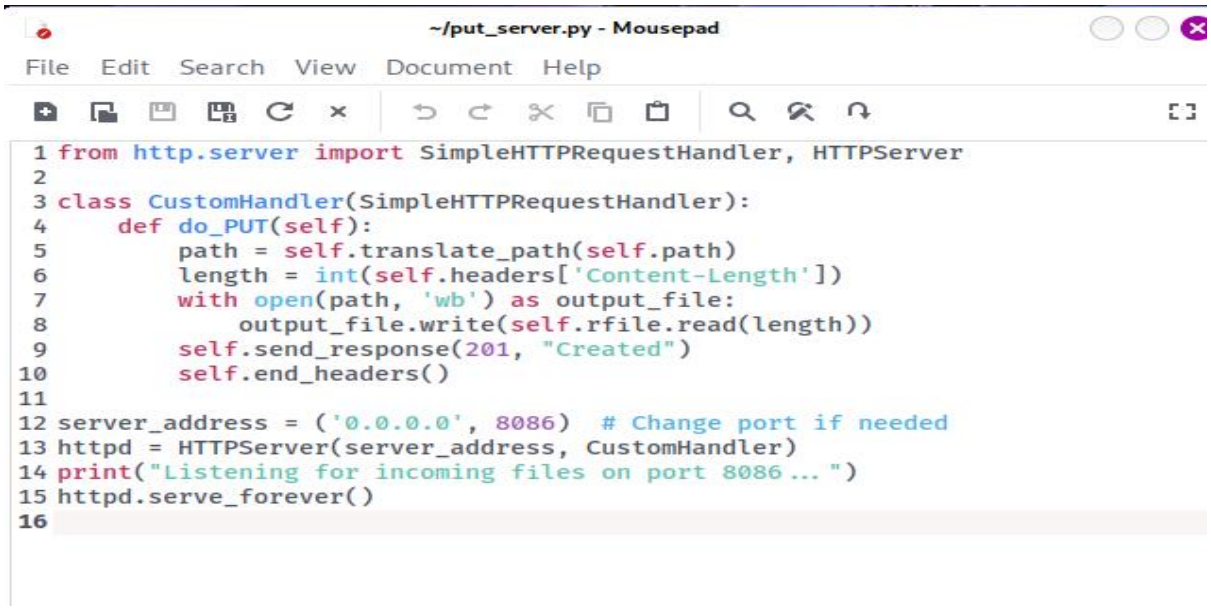


Figure 8.5 Shows python script for catching exfiltratig data

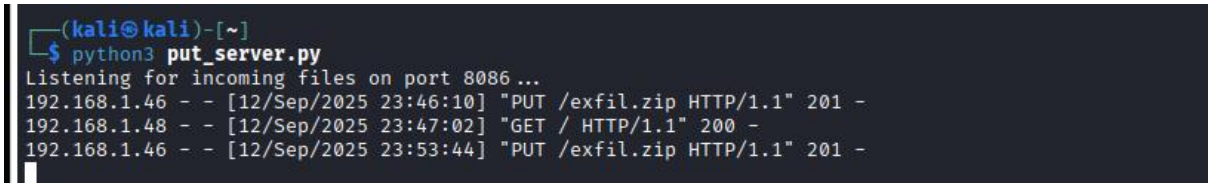


Figure 8.6 Shows python script running

PyPhisher, Metasploit

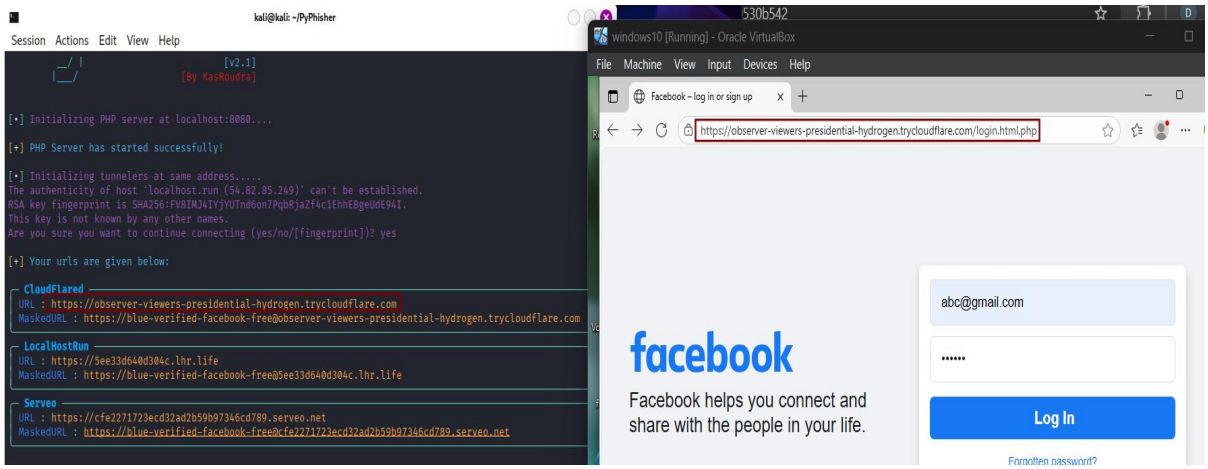


Figure 8.7 Shows phishing link being opened by victim

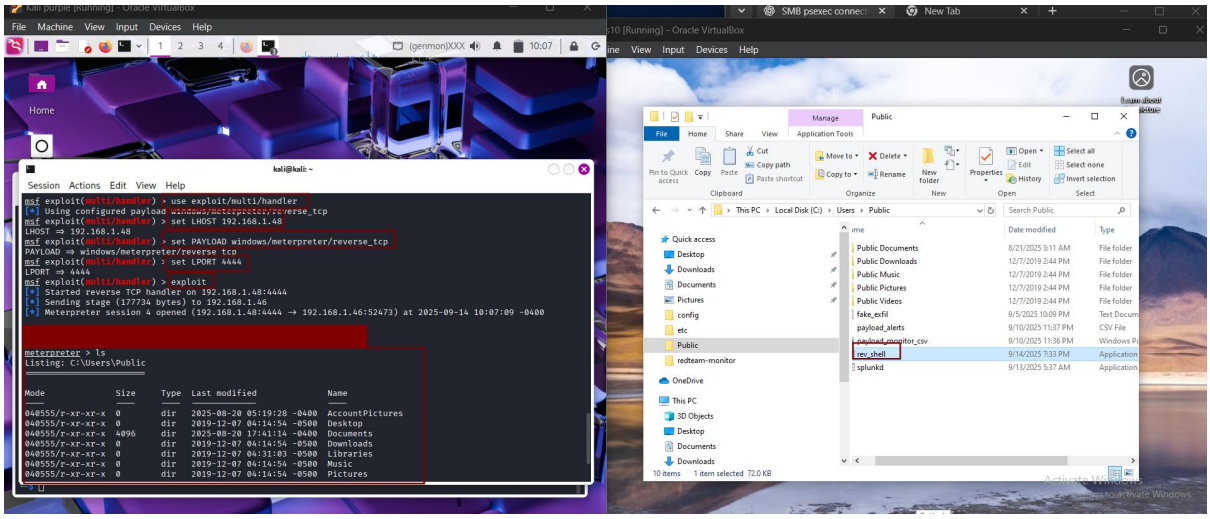
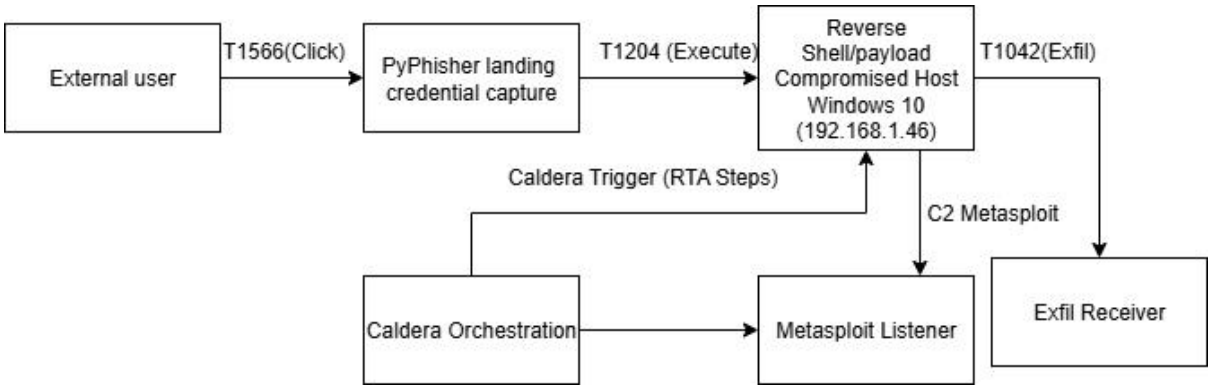


Figure 8.8 Shows Meterpreter session being opened in kali

Figure 8.9 Shows caldera logs

9. Attack Path Diagram



10. Conclusion

This PTES-style report highlights the lab's detection gaps against a phishing-driven, automated attack chain. Implementing MFA, improving mail/attachment handling, and enhancing telemetry will significantly reduce risk. Regular Caldera + RTA runs and tightened SOC playbooks will close identified detection and response gaps.