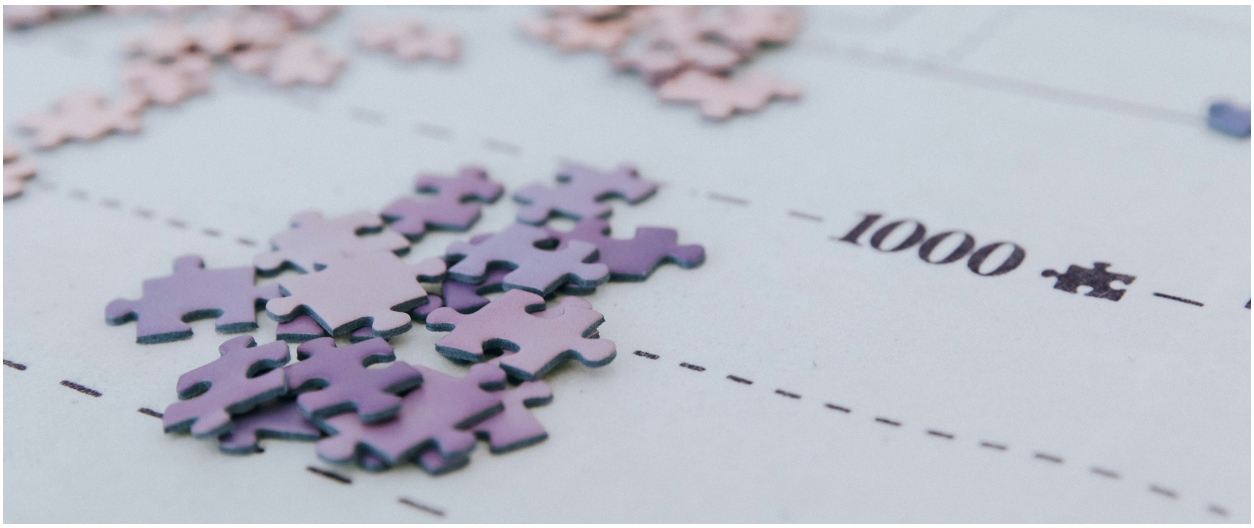


CTF Challenge #4

- Saturday, 12 July, 2025

🕵️ Challenge – Objective Brief

You've stumbled upon a suspicious structure labeled `CTF-Challenge-4` deep within your `~/CTFs/` directory.

🔍 **Your mission (should you choose to accept it):**

1. **Locate and extract at least 4 hidden flags**

   These may be disguised in:

   - Binary-like output (e.g., Base64, ROT13)
   - Fake scripts or "rootkits"
   - Malicious-looking logs or hidden files

2. **Investigate binary impersonation or privilege abuse**
   - Look for **SUID binaries** masquerading as system services
   - Attempt executing and extracting output where safe
3. **Decipher any encoded data**
   - Base64? ROT13? Obfuscated logs?
   - Use your knowledge of encoding/decoding filters
4. **Enumerate and analyze**:
   - World-writable, SUID, or executables with unusual permissions
   - Hidden files or directories (`.` prefixed)
   - Symbolic links pointing to real files
   - Fake cronjobs or scheduled backdoors
5. **Spot distractions, traps, and fakes**

   Some files are **pure bait**. Find at least **one booby trap** — and **document how it misleads**.

6. **Bonus Objective** 🧠 (Optional, but critical for growth):
   - **Reconstruct a plausible attacker operation** from the structure:

- What files might have been exfiltrated?
- What tools or persistence mechanisms were planned?
- Which files were built to mislead or confuse?

CTF Report

Analyst: Jinay Shah [Jynx]

Date: July 12, 2025

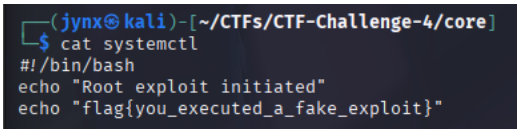
Challenge Directory: ~/CTF-Challenge-4

Objective: Locate hidden files, capture flags, detect traps, analyze anomalies.

🔍 1. Flag Captures

Flag No.	File Path	Flag Content	Extraction Technique	Notes
1.	**~/CTFs/CTF-Challenge-4/core/systemctl**	***flag{you_executed_a_fake_exploit}***	`cat systemctl`	It is an executable file script which in real world would likely execute a root exploit malware or attack, but herein- we just red the file and not execute it for a safer investigative medium.

Output:



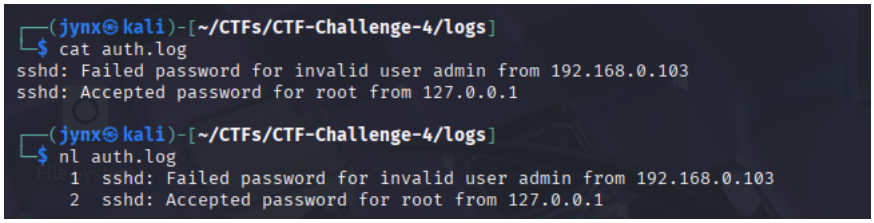
2.	**~/CTFs/CTF-Challenge-4/.hidden_devices/fpga_device.tmp**	**flag{cloaked_network_packet}**	`echo "ZmxhZ3tjbG9ha2VkX25ldHdvcmtfcGFja2V0fQ==" | base64 -d`	Th co er da er W w w 64 co

Output:

🗺️ 2. File Hints [Insights + Reasoning]

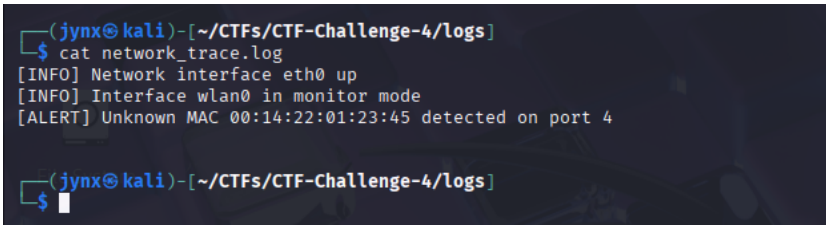
Sr.	File Path	Why?	Contents	Tool/Command Used
1.	~/CTFs/CTF-Challenge-4/logs/auth.log	Interesting because at glance it seems like a system response at least it did to me. But then I tried to read it with numbered lines and I realized its actually the contents of the file.	*sshd: Failed password for invalid user admin from 192.168.0.103* *sshd: Accepted password for root from 127.0.0.1*	`nl auth.log`

Output:



Sr.	File Path	Why?	Contents	Tool/Command Used
2.	~/CTFs/CTF-Challenge-4/logs/network_trace.log	It contains two 'INFO' string about ***eth0,*** it also shows an alert raised for unknow mac address detection.	*cat network_trace.log* *[INFO] Network interface eth0 up* *[INFO] Interface wlan0 in monitor mode* *[ALERT] Unknown MAC 00:14:22:01:23:45 detected on port 4*	`cat network_trace.log`

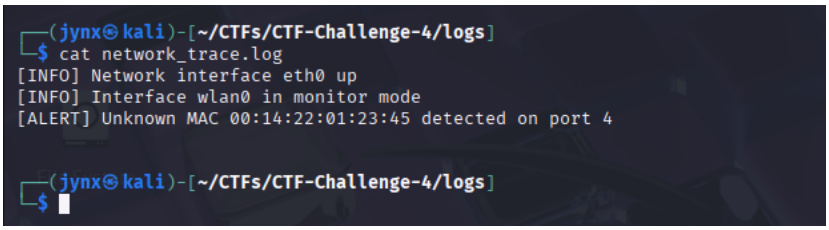
Output:



Sr.	File Path	Why?	Contents	Tool/Command Used
3.	~/CTFs/CTF-Challenge-4/logs/network_trace.log	It contains two 'INFO' string about ***eth0,*** it also shows an alert raised for unknow mac address detection.	*cat network_trace.log* *[INFO] Network interface eth0 up* *[INFO] Interface wlan0 in monitor mode* *[ALERT] Unknown MAC*	`cat network_trace.log`

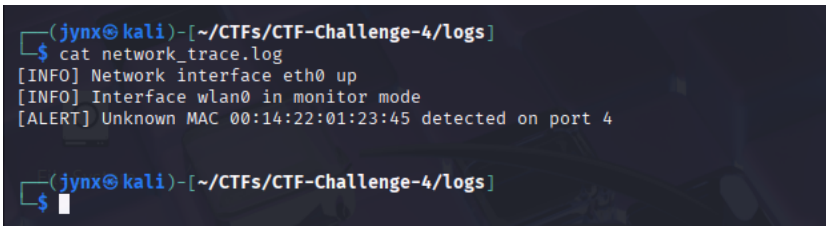
Sr.	File Path	Why?	Contents	Tool/Command Used
			00:14:22:01:23:45 detected on port 4	

Output:



Sr.	File Path	Why?	Contents	Tool/Command Used
4.		It contains two 'INFO' string about ***eth0,*** it also shows an alert raised for unknow mac address detection.	*cat network_trace.log* *[INFO] Network interface eth0 up* *[INFO] Interface wlan0 in monitor mode* *[ALERT] Unknown MAC 00:14:22:01:23:45 detected on port 4*	`cat network_trace.log`

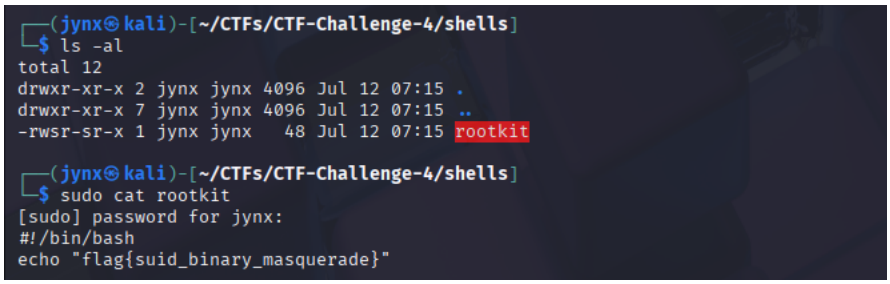
Output:



⚠️ 3. Traps & Distractions

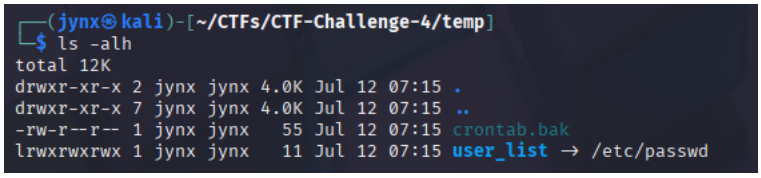
Trap Sr.	Trap Flag	Why It's a Trap	How You Discovered It
1.	**flag{suid_binary_masquerade}**	rootkit file is a SUID permitted file which is executable can be a huge security exploit/ vulnerability that can be a potential security breach	`sudo cat rootkit`

Output:



2.	**~/CTFs/CTF-Challenge-4/temp/user_list**	Its a trap or distraction since its a symbolic link to /etc/passwd (storing critical user information).	cat user_list

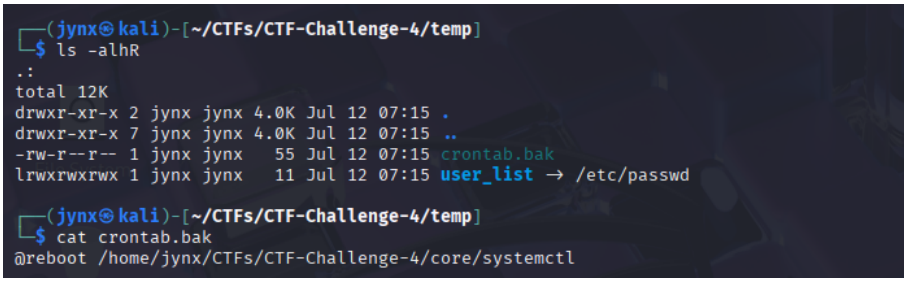
Output:



→ the `/` in in ***lrwxrwxrwx*** represents the symbolic link to /etc/passwd.

3.	**~/CTFs/CTF-Challenge-4/temp/crontab.bak**	Its a distraction since its indicating to reboot a file that essentially leads to nothing.	cat crontab.bak

Output:



🧠 4. Techniques + Commands Used

- `ls -alhR` – full recursive listing in human readable size + long listing format.
- `echo "ZmxhZ3tjbG9ha2VkX25ldHdvcmtfcGFja2V0fQ==" | base64 -d` - used to encode the files contents.
- `nl auth.log` - used to find if the contents of the files are actually streams of string and not a system response (something new I learned or realized).
- `find . -type f -exec cat {} \; | grep -i "flag"` - tried a simple recursive analysis for a flag search in the entire directory but for obvious reason wasn't expected to yield an “answer”.
- `cat` - used to read file contents

🧵 5. Narrative / Final Hypothesis

Analyst: Jinay Shah (a.k.a. `Jynx`)

Case ID: CTF-Challenge-4

Date: July 12, 2025

Classification: Simulated Red Team Intrusion

Incident Type: Local Privilege Escalation + Persistence + Obfuscation

Executive Summary

Based on the digital artifacts and patterns observed in the Challenge 4 environment, it appears that the adversary simulated a post-exploitation persistence strategy, primarily leveraging:

- Misconfigured permissions (SUID, world-readable content),
- Hidden files and folders for concealment,
- Encoded payloads,
- And cron-based persistence mechanisms.

The attacker attempted to maintain stealth while planting misleading data, potential rootkits, and a backdoor-like service (`systemctl` script). Though the environment is simulated, it mimics classic attacker tactics, techniques, and procedures (TTPs) observed in real-world breaches.

Attacker's Likely Objectives

Based on the planted files and structures:

1. **Privilege Escalation**

   The SUID-enabled script (`rootkit`) could be used to escalate privileges from a limited user to root. In real-world contexts, such binaries often invoke system commands or open reverse shells.

2. **Persistence**

   The attacker sets a cronjob using `crontab.bak` to ensure their access is restored every time the system reboots.

3. **Obfuscation**

   By hiding the base64 flag in `.hidden_devices` and wrapping logs with ROT13, the attacker attempts to slow down or mislead forensic analysts.

4. **Distraction & Misdirection**

   Trap files like `debug.log` serve to burn analyst time or provoke premature assumptions. Decoy exploit scripts and misleading logs aim to confuse.

5. **Post-exploitation Enumeration**

   Symbolic linking to `/etc/passwd` may suggest user discovery or preparation for lateral movement in multi-user environments.