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Prepared by: DTCS Security Incident Response Team

Executive Summary

Coolbank experienced multiple security incidents within a short time window, affecting on-prem infrastructure, cloud services, and user identities. Detailed forensic analysis determined that these events do not represent a single continuous intrusion, but rather two parallel and independent attack paths conducted by different threat actors using distinct initial access vectors, tooling, and objectives.

The primary incident involved a technically sophisticated infrastructure compromise that began with remote code execution (RCE) against a public-facing Apache Tomcat service on the loan application server. The attacker escalated privileges locally, harvested credentials, pivoted internally using tunneling tools, compromised DMZ and domain assets, deployed remote access tools, and ultimately executed Akira ransomware. In parallel, stolen AWS credentials were abused to provision cloud resources for cryptocurrency mining and to access sensitive S3 data.

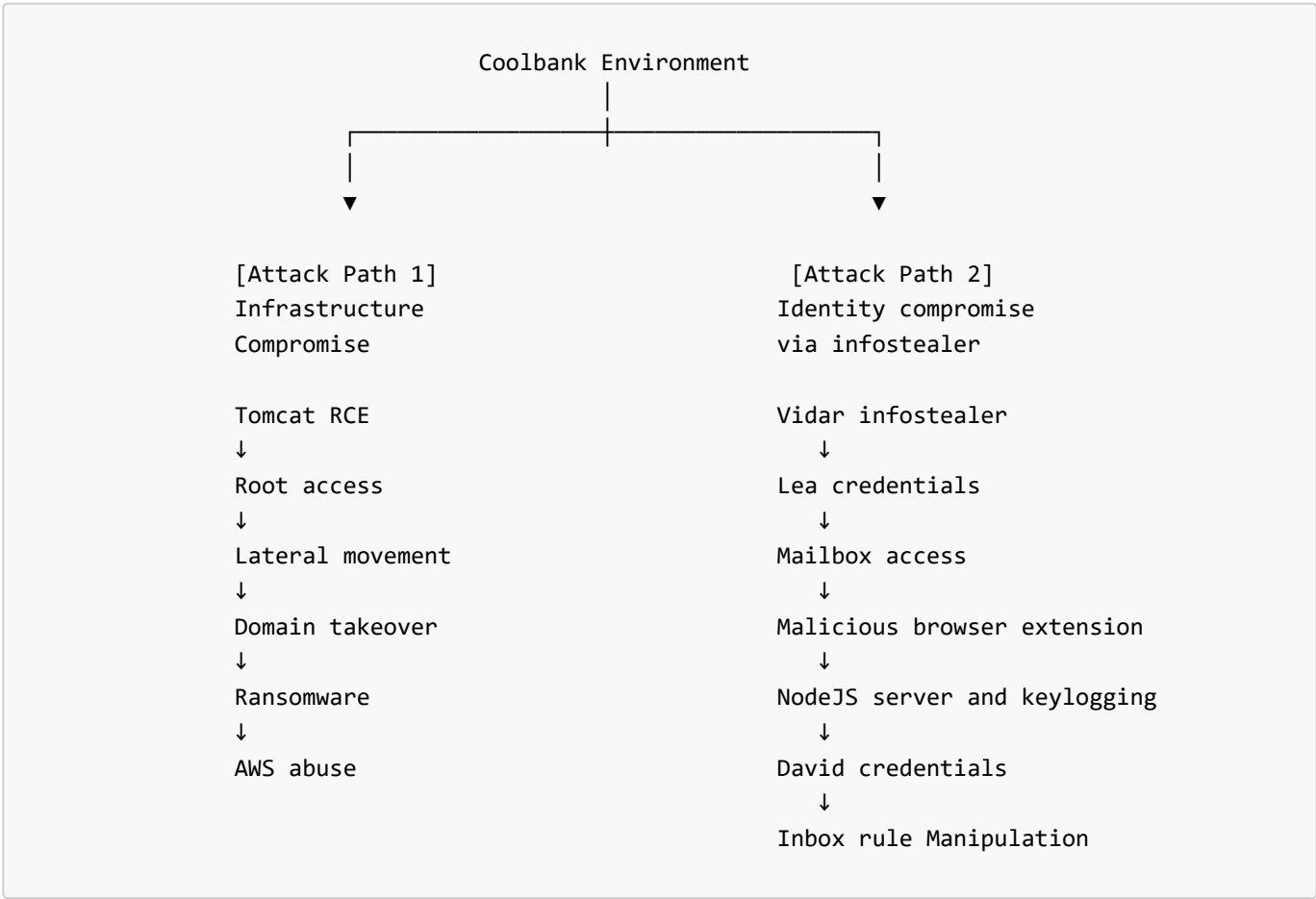
Separately, a secondary but unrelated identity compromise affected the Office 365 account of lea.ciger@coolbank.eu. This incident originated from an infostealer (Vidar) infection on an end-user workstation, which occurred several days before the Tomcat exploitation. The attacker leveraged stolen credentials and authentication cookies to access email, grant application consent, and perform inbox rule manipulation consistent with email account abuse and potential business email compromise (BEC) activity. However, we were not able to explain why miloslav.dubnicka installed NodeJS server on officeWin5 that collected keylogger data, we could not find any evidence of his account compromise so we're not sure if his account was compromised, he was disgruntled employee or this was just a limitation of the game.

While both incidents occurred within the same organizational environment and timeframe, no shared infrastructure, malware, credentials, or operational dependencies were identified. Treating these events as independent attack paths provides a more accurate reconstruction of attacker behavior and supports proportionate remediation and risk assessment.

Incident taxonomy

Incident ID	Classification
CB-2026-01	Infrastructure compromise via RCE (Primary incident)
CB-2026-02	Identity compromise via infostealer (Secondary, unrelated)

Attack Path Model



CB-2026-01 - Infrastructure compromise via RCE timeline

- `2026-01-15T16:40:13.887Z` - [Loan] attacker exploited tomcat11 RCE (CVE-2025-24813/Partial PUT) and downloaded payload `memory_test.sh` what contained remote shell from `192.20.253.137:8080`.
- `2026-01-15T16:40:53.983Z` - [Loan] attacker started reverse shell to `195.20.9.183:8443`.
- `2026-01-15T16:43:13.984Z` - [Loan] attacker escalated privileges by exploiting CVE-2025-32463 Local Privilege Escalation to Root via Sudo chroot in Linux.
- `2026-01-15T16:44:03.983Z` - [Loan] attacker obtained AWS access key and secret key for loan-apiuser from source code in Coolbank java application `/home/developer/projects/loan-app/src/main/java/eu/coolbank/loan/LoanApplicationServlet.java`.
- `2026-01-15T16:48:04.909Z` - [Loan] attacker exfiltrated collected AWS access key to Mega cloud storage provider `g.api.mega.co.nz`.

- 2026-01-15T16:49:11.907Z - [Loan] attacker exfiltrated SSH private key from user spravca on Loan server to Mega cloud storage.
- 2026-01-15T16:51:03.000Z - [AWS] attacker logged to AWS from IP 138.199.21.200 using stolen access key AKIATECIQI6O6Y3CBDOH for loan-apiuser.
- 2026-01-15T16:52:18.000Z - [AWS] attacker created AWS user aws-testing with access key AKIATECIQI6O6U5P3WUZ and attached access policy arn:aws:iam::aws:policy/AdministratorAccess.
- 2026-01-15T16:56:44.000Z - [AWS] attacker listed objects in loan-applicants S3 bucket.
- 2026-01-15T16:58:14.000Z - [AWS] attacker downloaded 7 objects from loan-applicants S3 bucket (see list of exfiltrated documents).
- 2026-01-15T17:00:29.000Z - [AWS] loan-apiuser created ssh key pair (testing_web_key/b4:f4:2a:90:b8:f8:fd:e4:0f:32:66:4a:bd:0c:00:63:ae:31:8b:bb).
- 2026-01-15T17:02:02.000Z - [AWS] loan-apiuser started EC2 instance i-06f9c69d1c1cb1ece with public IP 16.170.218.1.
- 2026-01-15T17:12:55.542Z - [AWS] CryptoCurrency:EC2/BitcoinTool.B - The EC2 instance i-06f9c69d1c1cb1ece is communicating outbound with a known Bitcoin-related IP address 141.95.72.61.
- 2026-01-15T17:15:47.907Z - [Loan] attacker installed pivoting and tunneling tool ligolo-ng on loan server.
- 2026-01-15T17:16:13.984Z - [Loan] attacker started network discovery by running port scan across the DMZ network from the loan server.
- 2026-01-15T17:23:38.000Z - [DMZ] attacker accessed dmzFTP server using stolen ssh private key from spravca.
- 2026-01-15T17:28:40.743Z - [DMZ] attacker installed teamviewer on dmzFTP server.
- 2026-01-15T17:29:48.348Z - [DMZ] attacker created user admfile on dmzFTP server.
- 2026-01-15T17:45:12.020Z - [DMZ] attacker created crontab task on dmzFTP server to establish persistence.
- 2026-01-15T18:54:38.000Z - [DMZ] attacker performed lateral movement and accessed velociraptor server using stolen ssh private key from user spravca.
- 2026-01-15T19:12:57.376Z - [DC] attacker created user administratr on ADC1ofc using Velociraptor and placed it into Domain Admins group.
- 2026-01-15T19:15:42.622Z - [DC] attacker downloads AnyDesk.exe into C:\Users\Public\ on ADC2ofc using Velociraptor.
- 2026-01-15T19:20:38.416Z - [DC] attacker installs AnyDesk.exe on ADC2ofc, configures to start silently with Windows and sets password.
- 2026-01-15T19:26:16.422Z - [DC] attacker created a disk snapshot of ADC2ofc using Volume Shadow Copies, exposed it locally via a filesystem link, and extracted important system files NTDS.ditand SYSTEM into a temporary folder.
- 2026-01-15T19:31:31.956Z - [DC] attacker deleted shadow copies on ADC2ofc to disable system recovery.
- 2026-01-15T19:32:02.932Z - [DC] attacker created user dominik.chrappe in Windows AD and added him to Group Policy Creator Owners group.
- 2026-01-15T20:15:01.543Z - [DMZ] attacker tried to exfiltrate data from dmzFTP server from /etc /home /var/www /root directories, but that appears to fail.
- 2026-01-15T20:52:45.599Z - [DC] attacker started Akira ransomware on ADC2ofc.
- 2026-01-15T21:18:33.000Z - [AWS] An administrator (admin.stanko) while on vacation in Serbia, terminated the suspicious EC2 instance i-06f9c69d1c1cb1ece.

CB-2026-02 - Identity compromise via infostealer timeline

- 2026-01-12T01:03:45.000Z - [HR] Initial infection of Lea's personal computer G2026/Windows 11, from where Vidal Stealer stole 17 unique password and persistent cookie ESTSAUTHPERSISTENT that could be used to attacker to access Lea's O365 account.
- 2026-01-15T20:13:13.971Z - [HR] event with source 36.50.238.15 by lea.ciger@coolbank.eu created high alert Entra ID Protection - Risk Detection - Sign-in Risk. Lea logged in to Outlook Web from IP address located in

`Singapore`, owned by VPN provider while usually she logs in from `37.58.4.198`. Further investigation showed that she logged from Chrome, while she usually used Edge. Her account was using single factor for authentication.

- `2026-01-15T20:23:44.000Z` - [HR] attacker tried to access Azure Portal but it failed due to requirement to enroll for second factor authentication.
- `2026-01-15T20:31:18.204Z` - [HR] attacker granted consent to 3rd party client (eM Client) to access Lea's account.
- `2026-01-15T21:56:26.000Z` - [EXT] miroslav.jakabovic sends email to other users about interesting browser extension. We believe he was tricked by attacker impersonating Lea. Multiple users downloaded extension but only one of them was malicious.
- `2026-01-15T22:12:56.965Z` - [EXT] miloslav.dubnicka installs NodeJS server on officewin5/192.168.12.8 that listens on port `3000` and collects keylogger data. *This is missing link, we can't explain why this happened.*
- `2026-01-15T22:25:58.300Z` - [EXT] user `david.jalovec` downloads malicious browser extension `extension.zip` that is masked keylogger.
- `2026-01-15T22:40:11.346Z` - [EXT] O365 credentials of `david.jalovec` were stolen by keylogger.
- `2026-01-15T23:38:14.578Z` - [EXT] attacker used stolen O365 credentials from `david.jalovec` to login to One Outlook Web using eM Client.
- `2026-01-15T23:52:48.000Z` - [EXT] attacker created inbox rule in Outlook to forward incoming emails to `miloslav.dubnicka@coolbank.eu` and another rule to move email with subject containing `invoice` to Archive folder.
- `2026-01-16T00:40:12.00Z` - [EXT] attacker sent fake email with subject `faktura` to `david.jalovec@coolbank.eu` with intention to trick David paying fake invoice.

Attacker Techniques (Mapped to MITRE ATT&CK)

Tactic	Technique
Initial Access	Exploit Public-Facing Application (T1190)
Execution	Command and Scripting Interpreter
Persistence	Scheduled Task / Cron, Remote Access Tools
Privilege Escalation	Exploitation for Privilege Escalation
Defense Evasion	Living-off-the-Land Tools
Credential Access	Credential Dumping, Input Capture
Lateral Movement	Remote Services (TA0008)
Command & Control	Encrypted Channels, Tunneling
Impact	Ransomware (Akira)

Impact Analysis

Credentials compromised

- AKIATECIQI6O6Y3CBDOH - loan-apiuser AWS access key.
- Lea Ciger (lea.ciger@coolbank.eu) - compromised O365 credentials.
- David Jalovec (david.jalovec@coolbank.eu) - stolen O365 credentials via keylogger.
- spravca - SSH private key `id_ed25519` and passphrase stolen from local user on loan server.

Sensitive documents exfiltrated

- applications/106db801-b157-4e17-a04e-c9b92a54ad04.json [407b]
- applications/6b6ee0a3-5f54-4a65-bef9-2858e7c89a44.json [433b]
- applications/43402e88-148b-4221-92a3-cd9e8c239a9a.json [423b]
- applications/cdc208d6-d601-4b75-8364-b5173b5e8e6a.json [420b]
- applications/6028eeec-d4d2-4002-9c04-63c252137e58.json [427b]
- applications/1ef41cd1-d150-45fc-bf3d-fc41abd0c22b.json [430b]
- applications/2648684d-7288-47bc-96fd-6d1348860cb3.json [435b]
- id_ed25519 (SSH private key)
- NTDS.dit,SYSTEM from ADC2ofc

Affected Assets

- List of hosts compromised:
    - Linux servers
        - loan/192.168.11.49
        - dmzFTP/192.168.11.26
        - velociraptor/192.168.11.7
    - Windows servers:
        - ADC1ofc/192.168.11.98
        - ADC2ofc/192.168.12.99
    - Workstations:
        - officewin1/192.168.12.4/david.jalovec
        - officewin3/192.168.12.6/zdenka.jakubcek
        - officewin5/192.168.12.8/miloslav.dubnicka
    - Cloud:
        - AWS account (loan-apiuser)
        - O365 tenant
- List of hosts impacted by ransomware:
    - ADC2ofc/192.168.12.99
        - C:\Users\Public\
        - C:\Users\Default\
        - C:\Users\administratr\
        - C:\Temp\EXCH\
        - C:\Temp\

Lessons learned

- **What worked well**
    - GuardDuty crypto-mining detection
    - Elastic alerts for unusual process execution
    - O365 risky sign-in detections
    - VSS deletion alerts
- **Recommendations for Improvement**:
    - Enforce MFA everywhere (no exceptions)
    - Timely patching
    - Do not store private key in user home directory - use hardware keys to store ssh private key
    - Use strong password for private key passphrase
    - Training on secure coding practices - do not store keys in the code

- Static code analysis
- Implement application allow-listing
- Deploy EDR with ransomware rollback
- Audit Velociraptor permissions and usage
- Review browser extension allow-lists

Indicators of Compromise (IoCs)

IOC type	IOC value	Comments
Malware	C:\Users\leuska\AppData\Local\Temp\11808150101\bDjqu09.exe	Vidar Sealer
IP	138.199.21.200	attacker loged to AWS using stolen loan-apiuser accesskey
Account	aws-testing	attacker created AWS user
sshkey	b4:f4:2a:90:b8:f8:fd:e4:0f:32:66:4a:bd:0c:00:63:ae:31:8b:bb	key fingerprint of aws-testing user
AWS KEY	AKIATECIQI6O6U5P3WUZ	AWS access key for aws-testing user
AWS KEY	AKIATECIQI6O6Y3CBDOH	compromised AWS access key used by legitimate loan-apiuser
SHA1	0b7fc40a15b5f471261dd76a16c6acd20e055373	sha1 hash of the malicious browser extension
File	extension.zip	name of the file containing malicious browser extension
IP	54.175.155.238	IP address from which malicious browser extension was downloaded
IP	84.252.113.67	attacker logged to O365 using stolen credentials from David Jalovec
UserAgent	eMClient/10.4.4209.0	UserAgent used by attacker during logon
IP	176.9.15.89	IP address from which the tomcat11 RCE (CVE-2025-24813) was exploited
file	memory_test.sh	remote shell
IP	192.30.253.137	IP where attacker connected remote shell from loan
Server	SimpleHTTP/0.6 Python/3.13.11	Server that hosted attackers reverse shell binary

IOC type	IOC value	Comments
file	cpu_test.sh	Local Privilege Escalation to Root via Sudo exploiting CVE-2025-32463
URL	https://github.com/nicocha30/ligolo-ng/releases/download/v0.8.2/ligolo-ng_agent_0.8.2_linux_amd64.tar.gz	Pivoting and tunneling tool used by many pentesters
Malware	teafortwo.exe	ransomware.akira/filecryptor
MD5	ae454079c93a7a1ce276756b9d62d196	teafortwo.exe ransomware.akira/filecryptor
Malware	backupTool.exe	Havoc C2 framework used to establish persistence
SHA256	c9a38fa7b619a1bc814fcf381a940245dfa8d24ae51e7ec22f9461eae288ede3	backupTool.exe Havoc C2 framework used to establish persistence
Account	administratr	User created by attacker to keep persistent access to compromised environment
IP	176.9.13.248	Havoc C2 infrastructure
Account	dominik.chrappe	User created by attacker to keep persistent access to compromised environment
Account	admfile	local user on dmzFTP server created by attacker
IP	200.98.8.82	C2 IP address where the crontab job from dmzFTP was regularly connecting
file	healthcheck	script that exfiltrates data from `/etc /home /var/www /root` and deletes all files under `/home /var/www /root`
string	H4ck3rM4n	Attacker signature left from the privilege escalation script

YARA rules

Disclamer: these were generated by LLM from the list of provided IOCs and were not tested in real environment.

Hash rules

Important: the SHA1 rule will only match the exact object you hashed (ZIP vs extracted file). If you hashed extension.zip, run it on ZIPs. If you hashed extracted JS, run it on extracted files.

```
rule MALWARE_Akira_Filecryptor_Teafortwo_MD5
{
  meta:
    description = "Known Akira/filecryptor sample teafortwo.exe by MD5"
    ioc_type = "md5"
    sample = "teafortwo.exe"
    confidence = "high"

  strings:
    // md5("ae454079c93a7a1ce276756b9d62d196") in little-endian 16 bytes
    $md5 = { 96 D1 62 9D 6B 75 76 E2 1C 7A A7 C9 79 40 45 AE }

  condition:
    filesize > 50KB and filesize < 50MB and hash.md5(0, filesize) ==
"ae454079c93a7a1ce276756b9d62d196"
}

rule MALWARE_HavocC2_BackupTool_SHA256
{
  meta:
    description = "Known Havoc C2 persistence binary backupTool.exe by SHA256"
    ioc_type = "sha256"
    sample = "backupTool.exe"
    confidence = "high"

  condition:
    filesize > 50KB and filesize < 50MB and
    hash.sha256(0, filesize) ==
"c9a38fa7b619a1bc814fcf381a940245dfa8d24ae51e7ec22f9461eae288ede3"
}

rule MALWARE_BrowserExtension_SHA1
{
  meta:
    description = "Malicious browser extension package/content by SHA1"
    ioc_type = "sha1"
    sample = "extension.zip (or extracted payload)"
    confidence = "high_if_hash_matches_correct_object"

  condition:
    filesize > 1KB and filesize < 200MB and
    hash.sha1(0, filesize) == "0b7fc40a15b5f471261dd76a16c6acd20e055373"
}
```

Text/log hunting rules

These are meant for:

- SIEM exports, endpoint triage text, PowerShell history, bash history
- Mail .eml/gateway logs
- Config files, scripts, staged payloads, temp folders, browser caches

```
rule HUNT_AWS_AccessKeys_And_Attacker_Context
{
```

```
  meta:
    description = "Detects presence of specific AWS access keys and related incident
context strings"
    ioc_type = "aws_access_key + account + ip"
    confidence = "medium"
    note = "Best for log/text scanning; do not run alone as malware conviction"

  strings:
    // Specific keys from IOC list
    $k1 = "AKIATECIQI6O6U5P3WUZ"
    $k2 = "AKIATECIQI6O6Y3CBDOH"

    // Accounts / actors
    $acct1 = "aws-testing" nocase
    $acct2 = "loan-apiuser" nocase

    // IP tied to AWS stolen key usage
    $ip1 = "138.199.21.200"

    // SSH key fingerprint format (as seen in IOC)
    $sshfp = "b4:f4:2a:90:b8:f8:fd:e4:0f:32:66:4a:bd:0c:00:63:ae:31:8b:bb" nocase

  condition:
    any of ($k*) or
    (1 of ($acct*) and $ip1) or
    ($acct1 and $sshfp)
}

rule HUNT_O365_Compromise_DavidJalovec_AnonymizedIP
{
  meta:
    description = "O365/Entra compromise pivot: known attacker IP + eMClient UA"
    ioc_type = "ip + useragent"
    confidence = "medium"

  strings:
    $ip = "84.252.113.67"
    $ua = "eMClient/10.4.4209.0" nocase

    // Optional nearby context keywords
    $o365a = "User Risk Detection" nocase
    $o365b = "azure.identity_protection" nocase
    $o365c = "anonymizedIPAddress" nocase

  condition:
    $ip and ($ua or 1 of ($o365*))
}

rule HUNT_Malicious_Extension_Download_Infrastructure
{
  meta:
    description = "Pivot for extension.zip and observed download source IP"
    ioc_type = "filename + ip"
    confidence = "low_to_medium"

  strings:
    $f1 = "extension.zip" nocase
    $ip = "54.175.155.238"
```

```
  condition:
    $f1 and $ip
}

rule HUNT_Tomcat_RCE_CVE_2025_24813_Related_IOCs
{
  meta:
    description = "Pivot for Tomcat RCE exploitation IP and follow-on artifacts"
    ioc_type = "ip + filenames + server banner"
    confidence = "medium"
    note = "Good for web logs, bash history, curl/wget traces, reverse shell staging"

  strings:
    $ip_exploit = "176.9.15.89"

    $f1 = "memory_test.sh" nocase
    $f2 = "cpu_test.sh" nocase

    $ip_shell = "192.30.253.137"
    $srv = "SimpleHTTP/0.6 Python/3.13.11" nocase

    // Ligolo-ng agent URL (as given)
    $ligolo = "github.com/nicocha30/ligolo-ng/releases/download/v0.8.2/ligolo-
ng_agent_0.8.2_linux_amd64.tar.gz" nocase

  condition:
    $ip_exploit and (1 of ($f*) or $srv or $ligolo or $ip_shell)
}
```

Linux rules

```
rule LINUX_Exfil_Wiper_Healthcheck_Signature
{
  meta:
    description = "Detects attacker 'healthcheck' script behavior and signature string
H4ck3rM4n"
    ioc_type = "filename + behavior strings"
    confidence = "high_if_script_matches"
    note = "Run on scripts, crontabs, /etc, /var/www artifacts, triage bundles"

  strings:
    $name = "healthcheck" nocase
    $sig  = "H4ck3rM4n"

    // Targeted directories from IOC
    $d1 = "/etc"
    $d2 = "/home"
    $d3 = "/var/www"
    $d4 = "/root"

    // Deletion/exfil primitives (generic but useful in combination)
    $rm1 = "rm -rf" nocase
    $tar = "tar " nocase
    $curl = "curl " nocase
    $wget = "wget " nocase
```

```
    $scp  = "scp " nocase
    $nc   = "nc " nocase

  condition:
    $sig or
    (
      $name and 2 of ($d*) and
      (1 of ($rm1, $tar) and 1 of ($curl, $wget, $scp, $nc))
    )
}

rule LINUX_Crontab_C2_Connection_200_98_8_82
{
  meta:
    description = "Detects crontab/persistence content connecting to known C2 IP"
    ioc_type = "ip + cron keywords"
    confidence = "medium"

  strings:
    $ip = "200.98.8.82"
    $cron1 = "crontab" nocase
    $cron2 = "/etc/cron" nocase
    $cron3 = "*/"  // common cron interval marker
    $bash  = "/bin/bash" nocase
    $sh    = "/bin/sh" nocase
    $curl  = "curl " nocase
    $wget  = "wget " nocase
    $nc    = "nc " nocase

  condition:
    $ip and (1 of ($cron*, $bash, $sh)) and (1 of ($curl, $wget, $nc) or $cron3)
}
```