

Hands-on Exercises

Environment

- Book an instance at <https://go.egi.eu/tcsc>
 - Pick up a free line and put your name there (or another identifier)
- SSH access
 - `ssh -p PORT root@tasks.metacentrum.cz`
 - **PORT** is available from the sheet with booked credentials
 - Password: **tcsc-split**
- Common tools will be used (check `man` pages if needed)

Starting investigation

- SOC-raised alert about suspicious communication
 - Communication using *Stratum* protocol was detected
 - The destination was ap.luckpool.net, port 3956/tcp
 - The source was your machine

Check system

- Allocated resources and related information
 - Network interfaces, IP addresses
 - Storage available
- List running processes
 - Detect suspicious names of processes
 - Detect common processes running from non-standard location
- Analyze process resources
 - Open file descriptors
 - Open network connections

Task 1

Check the system and find anything suspicious

Findings

- Suspicious network connection
- Connection originates from a root-owned process
- Trigger incident response procedure now
- Forensics acquisition
 - Snapshot the machine, if possible
 - Get metadata from filesystem before other steps
 - Keep the process running or not? (`kill -STOP PID`)

Checking Process

- **Allocated resources/metadata**
 - `ps ax | grep crond`
 - `lsof -p 2584`
- **Always try to correlate multiple sources/commands**
 - `/proc/PID/exe`
 - `/proc/PID/fd`
 - `/proc/PID/cwd`

Getting process memory

- Memory dump
 - `gcore PID`

Task 2

Check binary `/usr/sbin/crond` and try to estimate its purpose or other details.

Findings

- A compiled binary (C-code), stripped, no obvious obfuscations
 - Likely an HTTP client (CURL-based)
 - Couple of other system/library calls visible
 - Control server URL embedded and visible
 - `http://102.208.0.249/cc/index.html`
- Obvious payload management:
 - Payload dropped to: `%s`
 - Payload executed

Process analysis

- The program is likely a dropper downloading payload from the master and executing it on the machine
- Can we found out more about the payload shipped?

Task 3

Check the memory dump produced by gcore and try to find additional traces about the dropping phase. Can you identify the file that was dropped on the system recently?

Findings

- **Internal log:**
 - Loader dropped to `/usr/sbin/rsyslogd-worker`
 - Loader started

Task 4

Analyse rsyslogd-worker and detect interesting files that the process is using and examine the file.

Findings

- A deleted file in use
 - `/usr/lib/x86_64-linux-gnu/libcron.so.1`
 - `cp /proc/PIN/fd/3 ../3`
- Mining activities confirmed
- Another malicious IP detected

Part two

- Stay on the same machine
- Register account at <https://tasks.metacentrum.cz/> and start
 - 14 tasks in total
 - All tasks contain hints scored 10 points with the solutions, other hints provide leads

Summary

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- Live analysis yields valuable data
 - Analysis must be quick and targeted
- Memory contains data not present on disk
- Encryption is not necessarily problem

Summary

- Metadata are very useful
- Checking timeline provide valuable insight

Summary

- Forensics help reconstruct events and find links between traces
- Forensics is not just technical bits