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CYBER SKILLS LEVEL-UP! 2023

CYBERSECURITY :

MEMORY ANALYSIS

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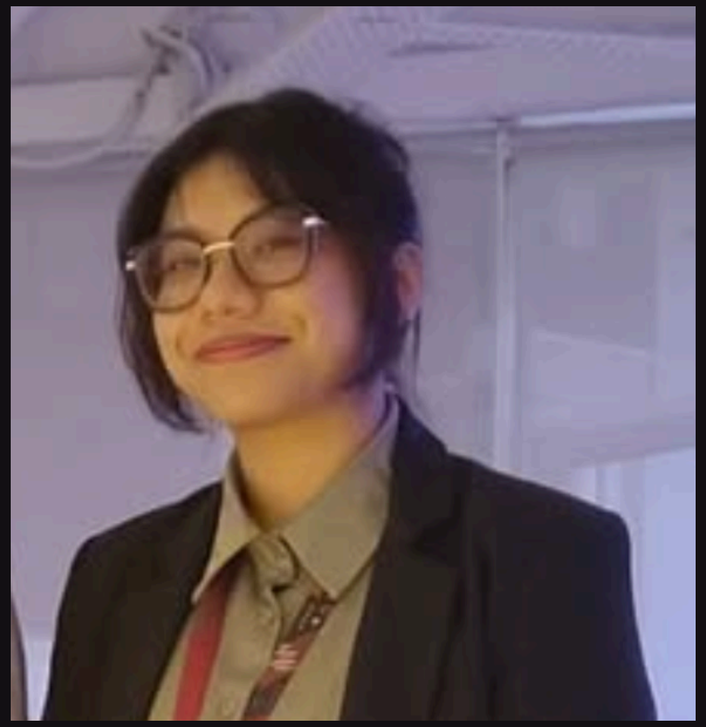
INTRODUCTION



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  - Alumni MCC 2024
  - One of the winner for best writeup during MCC 2024
  - Project Manager for BlackBerry CTF 2025 (RE:UN1ON)
  - Seasonal ctf player

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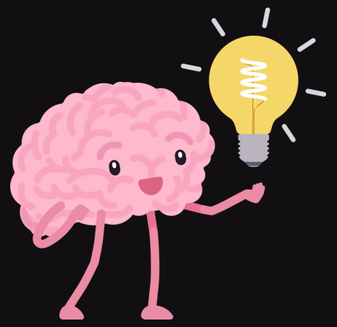

OVERVIEW

Volatile Memory

Memory Dumps

Demo & challenges

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OVERVIEW

Volatile Memory

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HOW DO WE DISCOVER THE ATTACKER? BY?

- Disk artifacts
- Logs
- Memory

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HOW DO WE DISCOVER THE ATTACKER? BY?

Memory

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WHY MEMORY?

Memory

- Volatile memory referring to stored data that holds system & user-level data while computers runs.
- System powered off/restarted = data lost
- RAM → temporarily stores everything from open files & running process & encrypted data
- That’s why it is important to investigate as early as possible when investigating RAM.

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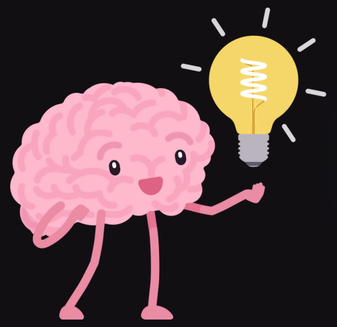

MEMORY HIERARCHY

FASTEST

CPU REGISTERS → CPU CACHE → RAM → DISK STORAGE

SLOWEST

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WHAT DOES IT MEAN?

→ CPU registers & cache are extremely fast BUT there's a size limitation

→ RAM is the main working memory for the OS

→ Disk storage is much slower but is very useful for long-term data rentention

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IN SHORT:

Disk forensics shows what attackers left behind, memory shows what they're DOING.

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OVERVIEW

Memory Dump

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MEMORY DUMP?

Memory dump is a snapshot of a system's RAM at a specific point in time.

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HOW IS IT CREATED?

It depends on the operating system in use

kernel mode dumps located at %SystemRoot% \ MEMORY.DMP and hibernation files stored as %SystemDrive% \ hiberfil.sys

Tools like built-in crash dumps, Sysinternals' RAMMap, or third-party utilities such as WinPmem and FTK Imager

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TYPES OF MEMORY DUMP

Full Memory Dump

Process Dump

Pagefile and Swap Analysis

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DEMO & CHALLENGE

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Q&A SESSION

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WRITEUP CHALLENGE:

https://www.notion.so/3ch0/CSLU-GMI-Memory-Analysis-244d05a447d580f9a3bfd93be143e233?source=copy_link

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THANK YOU