

These writeups, authored by Peyton Braun, are designed to guide you through the process of solving all the challenges from the Inaugural University of Wisconsin – Stout Cybersecurity Capture the Flag (CTF) event.

This event was hosted by UW-Stout CyROC x CCDL

I hope these writeups help you gain a deeper understanding of each challenge and how to overcome them.

CTF Challenge Writeups

Each writeup will cover the following aspects of the challenge:

1. **Challenge Overview:** A brief description of the challenge.
2. **Steps to Solve:** Detailed steps, tools used, and reasoning behind each step.
3. **Tools and Methods:** Explanation of why specific tools and methods were chosen.
4. **How It Works:** Insight into the underlying concepts and the thinking process.

Challenge: "The Orbs of Light"

Challenge Overview:

This challenge tests understanding of the Caesar cipher, Morse code, and the ability to observe patterns in a video.

Challenge Description:

- Dr. Elana Markov sat hunched over her desk, the flickering light of a small monitor casting shadows across the cluttered lab. The coordinates had come from a crumbling fragment of an old text—a discovery that many dismissed as mere legend. But Markov knew better.
- She had just returned from the coordinates after finding a ominous video, her breath catching as grainy, footage filled the screen. The camera, sat motionless watched an endless, icy expanse, the snow creating a dense fog in the distance she watched and watched trying to find something, anything to give her a clue of what this was, she knew something was off.
- As she watched the video over and over she realized there must be another part of the video, she must be missing something. She returned to the site and found a note hidden under piles of rubble with the same ancient cipher as before.
- Hours later, she had deciphered the beginning of the hidden message within the light. It was fragmented, incomplete:
- "To find the truth, follow..."
- She pushed on looking everywhere for anymore clues to what this might mean. After searching high and low she discovered a hidden compartment with a cryptic note, the beginning looked familiar, the same as before, but this one was complete "To find the truth, follow... wkh ruev ri oljkw, wkhb iolfnhu lq d

suhglfwdeoh sdwwhuq, wkhb zloo ohdg brx wr Wkh Hwhuqdo Qdyljdwr. Wkh sdvvzrug brx vhn lv rue5riO1jkw"

- With this, she knew what she needed to do.

Steps to Solve:

1. Decode the Ciphered Text:

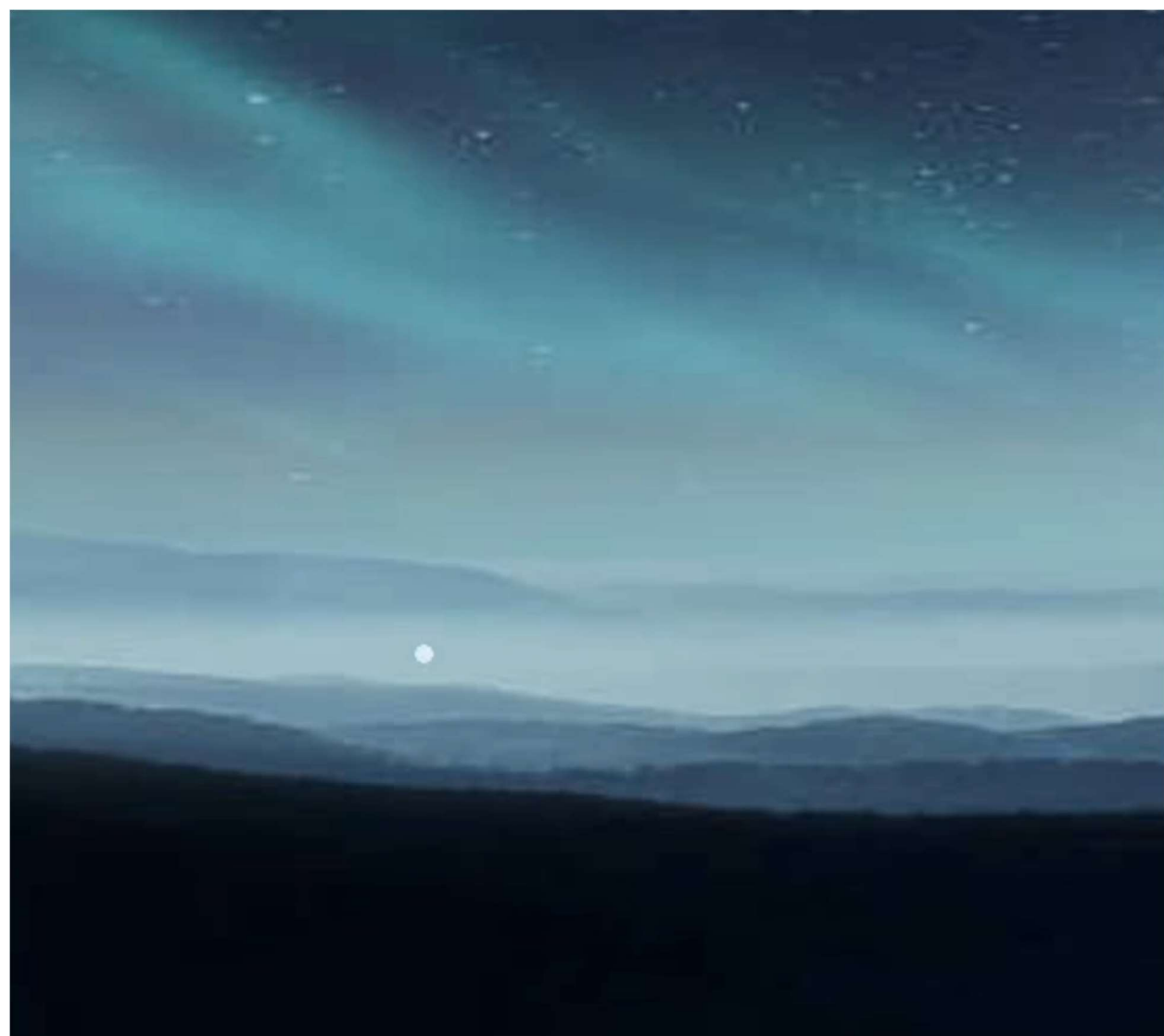
1. Input the encoded text into the Caesar cipher decoder on <https://www.dcode.fr/caesar-cipher>:
2. Encoded text:
 1. wkh ruev ri oljkw, wkhb iolfnhu lq d suhglfwdeoh sdwwhuq, wkhb zloo ohdg brx wr Wkh Hwhuqdo Qdyljdwr. Wkh sdvvzrug brx vhn lv rue5riO1jkw
3. Decoded result:
 1. The orbs of light, they flicker in a predictable pattern, they will lead you to The Eternal Navigator. The password you seek is orb5ofL1ght.

2. Extract the Password:

1. Use the password orb5ofL1ght to unlock the provided zip file.

3. Analyze the Video:

1. Play the video. After 15 seconds, observe the bottom-left corner where flashing lights appear.





4. Decode Morse Code:

1. Note the distinct delays in the flashes. Manually decode the Morse code into plaintext.
 1. Dots appear for 300ms
 2. Dashes appear for 900ms
 3. There is a 300ms delay between parts inside one letter
 4. There is a 1 second delay between each letter

5. Extract the Flag:

The challenge combines ancient and modern ciphers, testing the solver's ability to identify and decode patterns. Manual Morse code decoding demonstrates attention to detail and patience.