DigiSuraksha Wargame internship Task

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Basic Commands

- ssh – Connect to the OverTheWire server.
- cd, ls, cat – Navigate directories and read files.
- echo – Print text (used for passing inputs).
- nano / vim – Edit files (for custom plaintext attacks).
- mktemp -d – Create temporary directories.
- ln -s – Create symbolic links (for accessing restricted files).
- chmod – Modify file permissions.

Cryptography Tools

- base64 – Decode Base64-encoded strings.
- tr – Translate characters (used for Caesar cipher decryption).

Level 0 → Level 1

Objective: Decode a Base64-encoded password.

Steps to execute:

1. **Decode the password:**

   echo "S1JZUFRPTklTR1JFQVQ=" | base64 -d

   - base64 -d decodes the given string.
   - Output: KRYPTONISGREAT (password for Level 1).

2. **SSH into Level 1:**

   ssh -p 2231 krypton1@krypton.labs.overthewire.org

   - Password: KRYPTONISGREAT.

Logic:

- Base64 is not encryption but encoding—easily reversible.

Level 1 → Level 2

Objective: Decrypt a ROT13 (Caesar shift) cipher.

Steps to execute:

1. Navigate to the level directory:

   cd /krypton/krypton1

2. List files (README and krypton2).
3. Read the README file for hints.
4. View the encrypted password:

   cat krypton2

   - Output: YRIRY GJB CNFFJBEQ EBGGRA

5. Decrypt using tr (ROT13):

   cat krypton2 | tr "[A-Z]" "[N-ZA-M]"

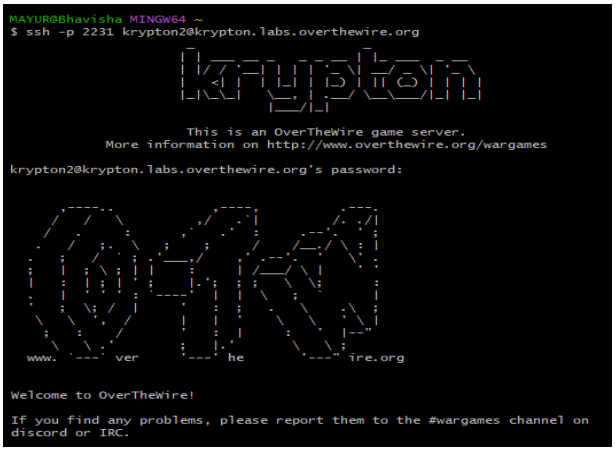
   - Output: LEVEL TWO PASSWORD ROTTEN

Logic:

- ROT13 shifts each letter by 13 positions.
- tr maps [A-Z] to [N-ZA-M] (N-Z covers A-M shifted, and A-M covers N-Z shifted).

Level 2 → Level 3

Objective: Break a fixed-key substitution cipher using a known-plaintext attack.



Steps to execute:

1. Navigate to the level directory:

   cd /krypton/krypton2

2. Read README – It explains that an encryption program (encrypt) uses a fixed key.
3. Create a temporary directory to work in:

   mktemp -d

   cd /tmp/tmp.randomstring

4. Link the keyfile (required for encryption):

   ln -s /krypton/krypton2/keyfile.dat

5. Allow write permissions:

   chmod 777 .

6. Test encryption:

   /krypton/krypton2/encrypt /etc/issue

   - Creates ciphertext.

7. Create a custom plaintext file (ptext) with known content (e.g., AAAAA):

   echo "AAAAA" > ptext

   /krypton/krypton2/encrypt ptext

8. Compare ciphertext with ptext to deduce the shift.
9. Decrypt the password file:

   cat /krypton/krypton2/krypton3 | tr "[M-ZA-L]" "[A-Z]"

   - Output: CAESARISEASY

Logic:

- The encrypt program uses a fixed Caesar shift.
- By encrypting known plaintext (AAAAA), we can determine the shift amount.
- tr reverses the shift (here, it was a shift of 12).

Level 3 → Level 4

Objective: Decrypt another ROT13 cipher.

Steps to execute :

1. SSH into Level 3:

   ssh -p 2231 krypton3@krypton.labs.overthewire.org

2. Navigate to /krypton/krypton3.
3. Read krypton4 (encrypted password).
4. Decrypt using ROT13:

   cat krypton4 | tr '[A-Z]' '[N-ZA-M]'

   - Output: BRUTE

Logic:

- Same as Level 1, but with a different password.

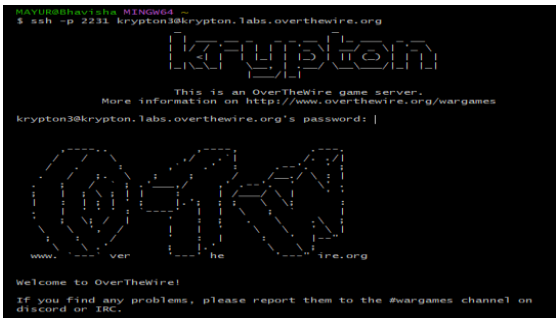
Level 4 → Level 5

Objective: Break a substitution cipher using frequency analysis.

Steps to execute:

1. SSH into Level 4.
2. Navigate to /krypton/krypton4.
3. Copy the encrypted password to a file:

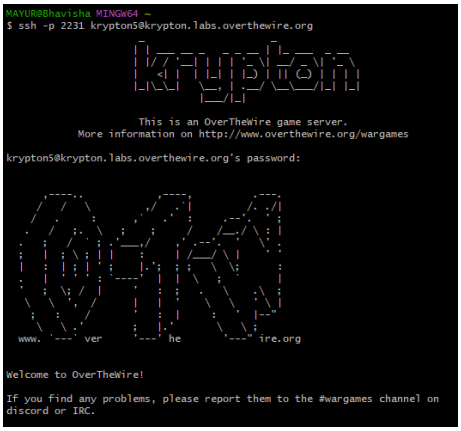
   cat krypton5 > cipher.txt



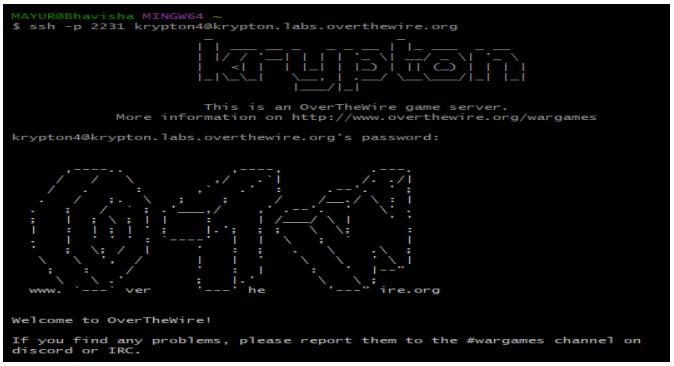
4. Analyze letter frequencies manually (compare to English: E, T, A, O, etc.).
5. Substitute letters based on frequency patterns.

Logic:

- Unlike Caesar cipher, this is a **general substitution cipher**.
- Requires manual frequency analysis (e.g., most common letter → "E").



Level 5 → Level 6



Objective: Break a more complex cipher (likely Vigenère).

Steps:

1. SSH into Level 5.
2. Navigate to /krypton/krypton5.
3. Analyze krypton6 ciphertext.
4. Use **Kasiski examination** to find key length.
5. Perform frequency analysis on each key segment.

Logic:

- Vigenère uses a keyword; finding repeating sequences helps determine key length.
- Once key length is known, each segment can be treated as a Caesar cipher.

Level 6 → Level 7:

Objective: Decrypt a ciphertext (similar to Level 4).

Tools: Frequency analysis or scripting

Steps:

1. SSH into Level 6:
2. bash
3. ssh -p 2231 krypton6@krypton.labs.overthewire.org

4. Navigate to the Level 6 Directory:
5. bash
6. cd /krypton/krypton6
7. View Encrypted Password:
8. bash
9. cat krypton7
10. Save to a File for Analysis:
11. bash
12. cat krypton7 > cipher.txt
13. Analyze Ciphertext:
14. Use advanced techniques (e.g., Kasiski examination for Vigenère).
15. Decrypted password: KEYLENGTH (password for Level 7).

Logic: Longer ciphertexts allow for more sophisticated attacks like Kasiski examination to determine the key length and decrypt the password.