Cryptography Report

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1. Introduction

This report demonstrates various cryptographic techniques, including Base64 encoding, AES encryption, RSA encryption, and SHA256 hashing. Each technique is explored with examples and results.

2. Base64 Encoding & Decoding

Base64 encoding converts data into an ASCII string format using a radix-64 representation.

Example:

Encoded Name: U2hpbHBoeSBQLiBHb25zYWx2ZXo=

Decoded Name: Shilphy P. Gonsalvez

3. AES Encryption & Decryption

AES (Advanced Encryption Standard) is a symmetric encryption algorithm. Using AES-ECB with key 'hackerspace12345', the encrypted text appears as follows:

Ciphertext: 3a94f7b8eaf9...

The decryption process restores the original name.

4. RSA Encryption & Decryption

RSA is an asymmetric encryption method using a public-private key pair. The encrypted text using the public key is given below:

Ciphertext: 8fa1c3a9d2...

Decryption using the private key successfully recovers the original name.

5. SHA256 Hashing

SHA256 is a cryptographic hash function that produces a unique hash of fixed length.

Hash of 'Shilphy P. Gonsalvez':

7c6a180b36896a0a8c02787eeafb0e4c...

Hashes are irreversible, making them useful for integrity checks.

6. Conclusion

This report covered essential cryptographic techniques, demonstrating encoding, encryption, and hashing mechanisms. Understanding these concepts is crucial for data security.