



STEGANOGRAPHY

The science of hidden communication

About the speaker



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Expertise

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In the vast webs of cyberspace, effective layers of cybersecurity are essential. Organizations must evolve tactics to outsmart threats. Innovative defenses enable networks to thrive. Integrating technology yields security, harnessing intelligence effectively. Leveraging data, companies optimize networks, fostering enhanced resilience, ensuring network continuity, empowering stability.

What is Stegano Graphy ?

Covered

Writing

Technique used to hide or **conceal** a secret message/ file within an ordinary file to avoid detection, ensuring that no one, apart from the sender and the intended recipient, suspects the existence of the secret.





Types of steganography

01

Image

Hides data within digital image pixels.

02

Audio

Conceals info in audio file frequencies

03

Video

Secretly embeds data within video files.

04

Network

Conceals data in network protocols, evading detection.

05

Whitespace

Embeds info in text spaces subtly.

06

Payload

Concealing data covertly within digital content for secret missions.

Evolution of Steganography



Ancient Era

Middle Ages

World War Era

Digital Age

Modern Times



Writing messages on the shaved head of a messenger and allowing the hair to grow back, Use of invisible inks made from natural substances.



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Use of invisible inks that required specific chemicals to reveal the message, and coded manuscripts hiding compressed information seamlessly.

Evolution of Steganography



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Utilizing concealed microdots, encoded book ciphers, and intricate pattern codes, requiring specific methods for revelation.

Evolution of Steganography



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Concealing data in images, audio, and video using LSB insertion, where information is hidden in the least significant bits of the digital media's data

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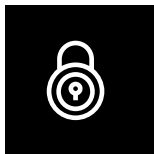
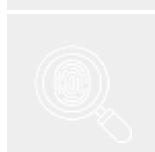
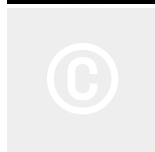
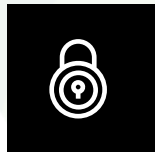
Modern Times



Employing advanced techniques, such as digital watermarking, payload and use of cryptography to encrypt the hidden message before embedding it into multimedia files or network protocols



Applications



Covert Communication

- Conceals private messages within seemingly innocent data
- Facilitates discreet communication for sensitive and confidential exchanges
- Shields sensitive information from unauthorized access or tampering.



Applications



Copyright Protection

- Safeguards digital media ownership by embedding invisible marks.
- Embeds data for integrity verification and authentication purposes.





Applications



Network Security

- Enhances communication security through concealed information in networks.
- Establishing covert channels for confidential communication in a network environment.





Applications



Digital Forensics

- Uncovers hidden information during forensic analysis of digital media.
- Steganography helps verify the authenticity of digital media in forensic investigations.
- Investigators analyze steganographic techniques to uncover malicious activities.





Applications



Military and Defense

- Aids secure communication in military operations through steganography.
- Supporting secret missions by hiding critical details within images, audio, or other digital files.



FBI

FBI employs steganography as part of covert operations.

Flame Malware (2012)

Hiding malicious payload in audio and image files

Al - Qaeda (2000 's)

It used to hide messages in digital images.

Steganography in Actual Incidents

Cozy Bear (2015)

Hide malware within images and documents

IoT Botnet (2018)

Malware hid its control server address within images.

Stegomalware (2019)

Hid payload within image files and operate discreetly on infected systems



Hand-on-Activity



Image
Steganography



Video
Steganography



Payload
Steganography

www.tinyurl.com/m0steganography



Key Notes

- Introduction to steganography and its evolution.
- Types and applications of steganography (image, audio, video, etc.).
- Real life examples where steganography is used .
- Steganography workshop.



Thank You!

Feel free to ask any questions



Appreciate your Feedback