Investigating Ransomware Attack Vectors and Developing Countermeasures

Introduction

Ransomware has become a critical cybersecurity threat, disrupting organizations by encrypting their files and demanding payment for decryption. Understanding the attack vectors and developing effective countermeasures is essential to mitigating these risks.

Research Objectives

- To investigate the most common attack vectors used in ransomware attacks.
- To analyze the impact of ransomware on system vulnerabilities.
- To develop and propose effective countermeasures against ransomware threats.

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Attack Vectors

Common Vectors Identified:

- Phishing emails (60% of respondents identified as greatest threat)
- Exploitation of RDP (Remote Desktop Protocol)
- Drive-by downloads
- Software vulnerabilities

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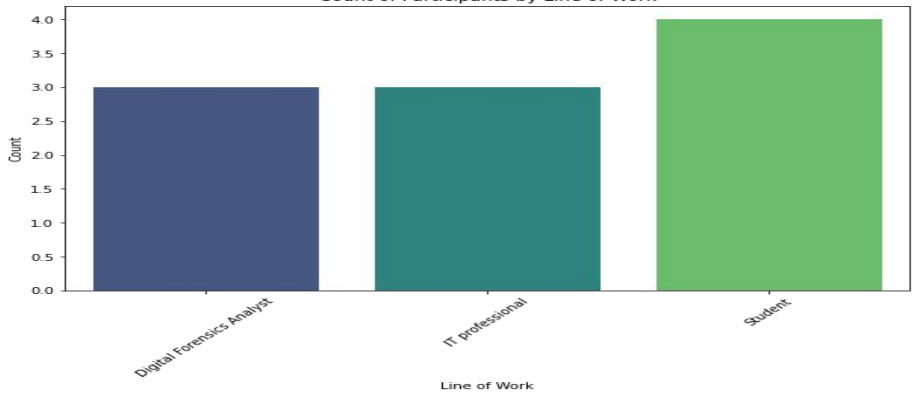
Variable	Count	Mean	Standard	Min	0.25	50% (Me	0.75	Max
Years_of_experience	10	4	3.74	1	1.25	2.5	5.25	11
Phishing_encounter_frequency	10	3.5	0.53	3	3	3.5	4	4
RDP_cases_investigated	10	0.9	1.1	0	0	0.5	1.75	3
Impact_on_enterprise_networks	10	3.6	1.07	2	3	4	4	5
Critical_infrastructure_cases	10	38	33.6	0	12.5	30	57.5	90
Investigation_time_average	10	34.2	49.58	2	2.25	10.5	57.75	150
Countermeasures_effectiveness	10	3.5	0.85	2	3	3.5	4	5
Training_sessions_conducted	10	1	1.25	0	0	0.5	1.75	3



This bar plot above shows the distribution of participants' lines of work. "IT professional" and "Digital Forensics Analyst" are the most common, indicating that the survey primarily involves individuals in technical and cybersecurity roles, with fewer students.

METHODOLOGY

Data Analysis

- Numerical, multiple-choice, and rating scale questions were included to assess the severity and frequency of attack vectors.

Correlation analyis

Correlation analysis between years of experience, training sessions, and phishing encounter frequency.

Data Collection

- Questionnaire designed to gather insights from professionals in digital forensics, focusing on attack vectors, impact, and training.
- Numerical, multiple-choice, and rating scale questions were included to assess the severity and frequency of attack vectors.

Education and awareness

Assessment of system vulnerability and countermeasure effectiveness

Findings

Greatest Threat Vector

Phishing emails were identified as the greatest threat (60% of respondents).

Vulnerable Systems

Don't download content from sites that are not trustworthy. These may contain malware.

Effectiveness of Countermeasures

- Log analysis tools were considered the most effective forensic tools (50%).
- Strong correlation between the number of RDP cases investigated and the training sessions conducted (0.73), highlighting the role of training in preparedness.

Recommendations

1. CONTINUOUS PHISHING AWARENESS CAMPAIGNS.
2. STRENGTHENING WINDOWS SERVER SECURITY.
3. IMPLEMENTING REGULAR PENETRATION TESTING AND VULNERABILITY ASSESSMENTS.

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COUNTERMEASURES

MEASURES

- Phishing awareness training: unanimously agreed as crucial.
- Enhanced security for RDP: stricter controls, usage monitoring.
- Regular software updates and patch management.

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Conclusion

- In conclusion,ransomware continues to pose a significant threat to enterprise systems, primarily through phishing and RDP vulnerabilities.
- Effective countermeasures, including continuous training and system monitoring, are critical to mitigating these risks.

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