Capstone Project: Cybersecurity Architecture & Threat Mitigation

Overview

This project demonstrates the strategic design and implementation of a cybersecurity architecture aligned with internationally recognized standards, focusing on threat detection, risk mitigation, and secure enterprise infrastructure. It reflects a mature, standards-driven approach to solving modern security challenges within simulated enterprise environments.

Key Objectives

- Design an enterprise-grade security architecture using ISO 27001 and NIST Cybersecurity Framework (CSF).
- Conduct comprehensive vulnerability assessments and mitigation using real-world security tools.
- Develop a custom malware detection system with automated threat intelligence.

🔧 Technologies & Tools Used

- **Security Standards**: ISO 27001, NIST CSF
- **Vulnerability Scanning**: Nessus, Wireshark
- **Intrusion Detection**: Snort (open-source IDS)
- **Threat Intelligence**: VirusTotal API
- **Programming**: Python (automation and threat detection scripting)

🔍 Project Highlights

- ✅ **Designed a layered cybersecurity architecture** incorporating access control, network segmentation, data protection, and incident response.
- ✅ **Identified and remediated 30+ vulnerabilities** using Nessus and Wireshark, focusing on insecure protocols, exposed services, and known CVEs.

- ✅ **Developed a Python-based malware detector** integrating Snort for packet-level intrusion detection and the VirusTotal API for cloud-based threat analysis.
- ✅ **Aligned security design with business continuity goals**, emphasizing resilience, proactive defense, and compliance.

📈 Outcome

This project simulated real-world enterprise cybersecurity operations. It strengthened threat visibility, reduced system vulnerabilities, and demonstrated critical cybersecurity capabilities, such as risk assessment, secure software development, and alignment with compliance mandates.

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