Name: Sachin Banjade

Lab Environment & Authorization

This project was conducted in a controlled Linux virtual machine as part of an academic cybersecurity course. All actions were performed on locally authorized systems for educational and defensive security testing purposes only. No external systems or real-world networks were accessed.

Authentication & Access Control Assignment Report

Task 1: Attempt Unauthorized Access

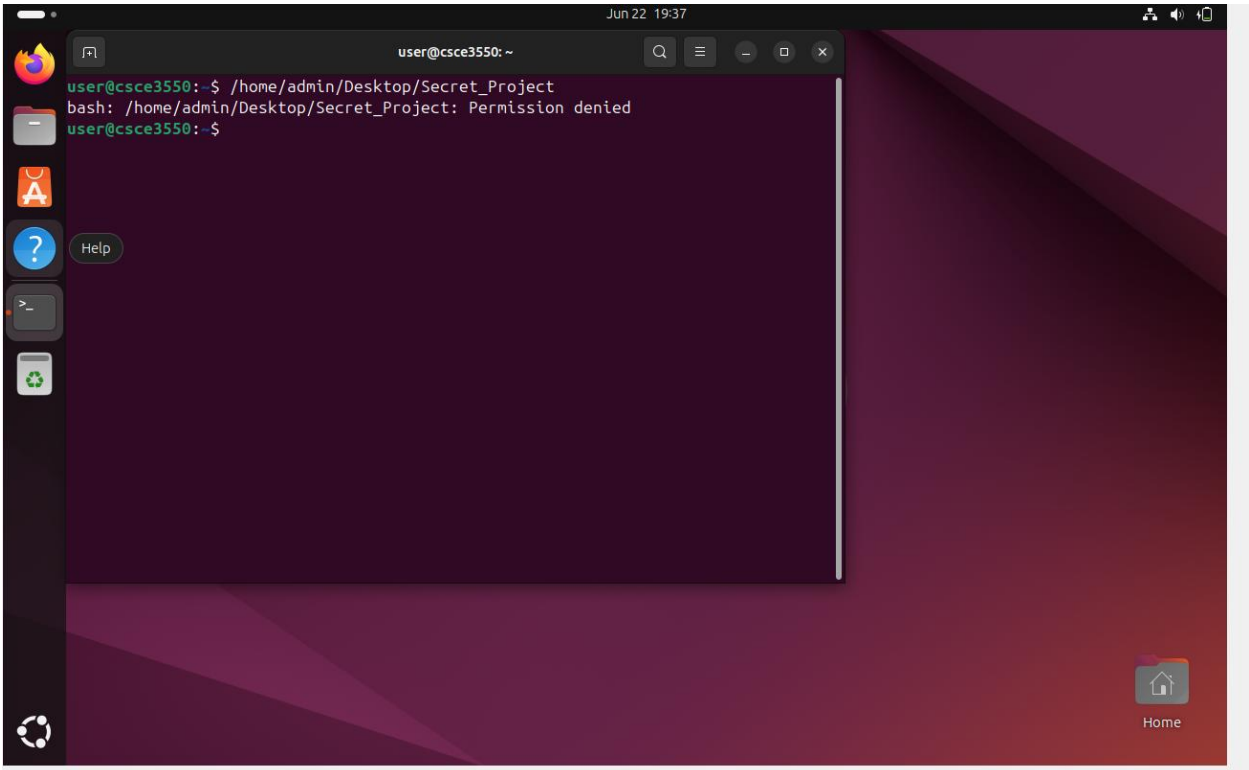
Description:

Using the provided standard user credentials (user / password123), I attempted to access the directory:

/home/admin/Desktop/Secret_Project

Result:

Access was denied due to permission restrictions.



This demonstrates proper authorization enforcement through Linux file permissions

Task 2 Controlled Password-Strength Testing Using Hydra

Description

This test simulates how weak credentials can be exploited in a controlled environment to evaluate password policy effectiveness.

Command Used:

hydra -t 4 -l admin -x 3:3:a ssh://127.0.0.1

Explanation of Parameters:

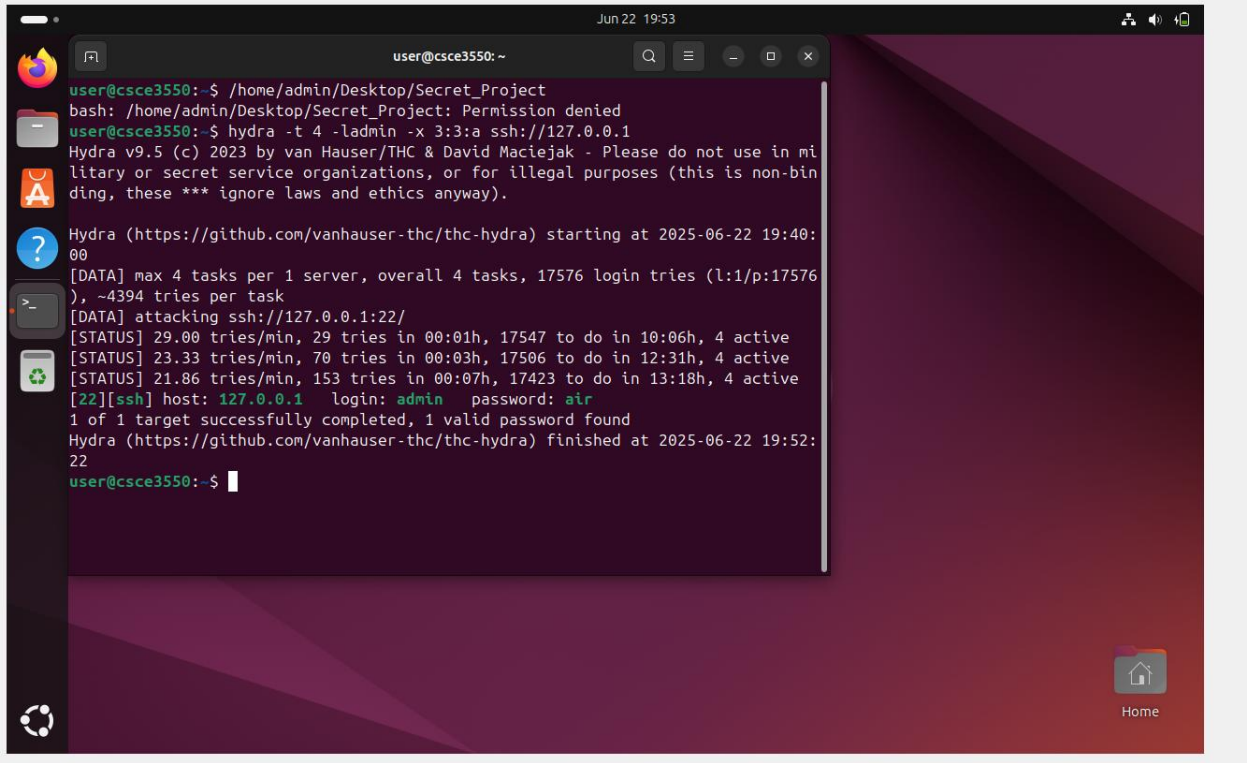
Flag	Description
-t 4	Uses 4 parallel threads for faster execution

Flag	Description
-l admin	Specifies the username to target (admin)
-x 3:3:a	Brute-forces passwords that are exactly 3 lowercase letters
ssh://127.0.0.1	Uses SSH to connect to localhost (the current VM)

Result:

Hydra successfully cracked the password for the admin account.

Cracked Password: air



Task 3: Access the Confidential File as Admin

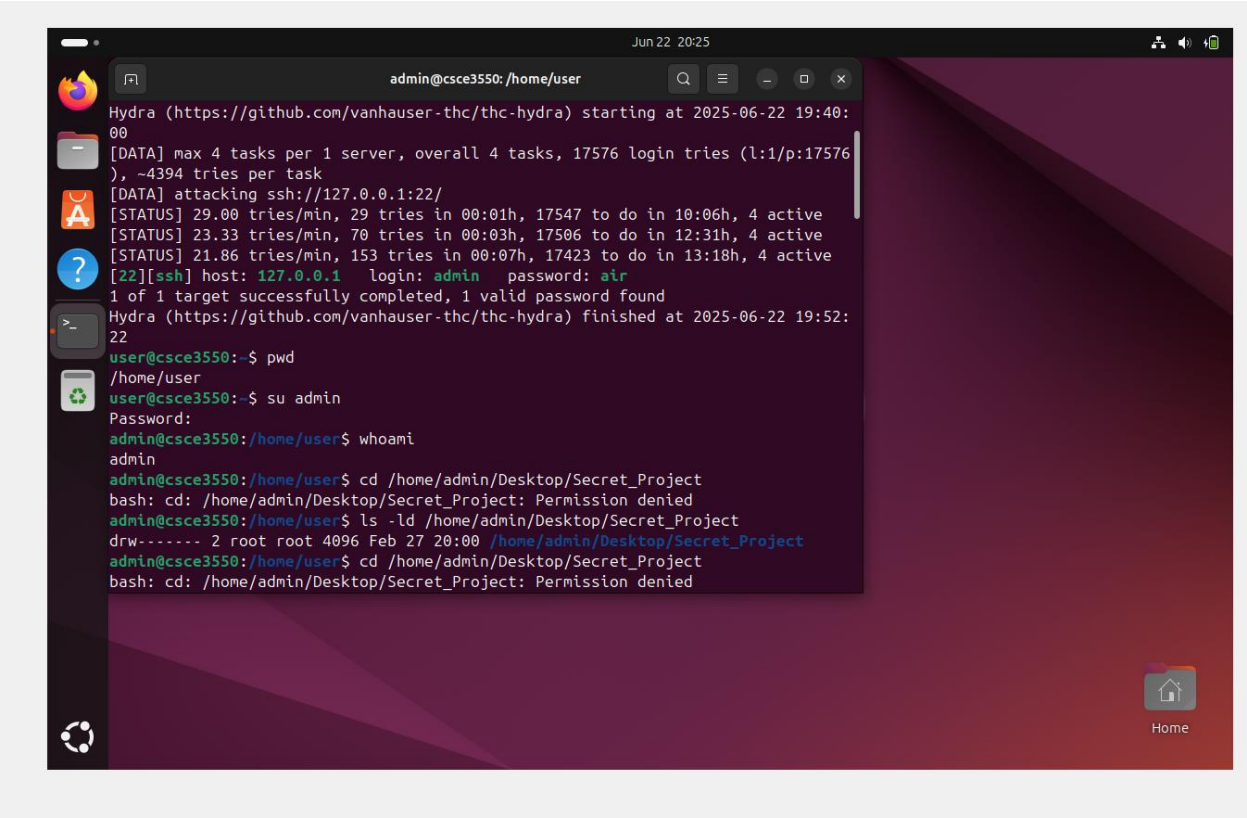
Description:

Using the cracked admin password, I attempted to access the directory:

/home/admin/Desktop/Secret_Project

Result:

Access was still denied even as admin, because the folder was owned by root with restrictive permissions. This highlights the distinction between authentication (verifying identity) and authorization (permission to access resources).



Task 4: Elevate to Root and Change Permissions

Description:

I switched to the root user using:

sudo -i

Once in the root shell, I changed the permissions of the directory and the file using:

chmod o+rx /home/admin

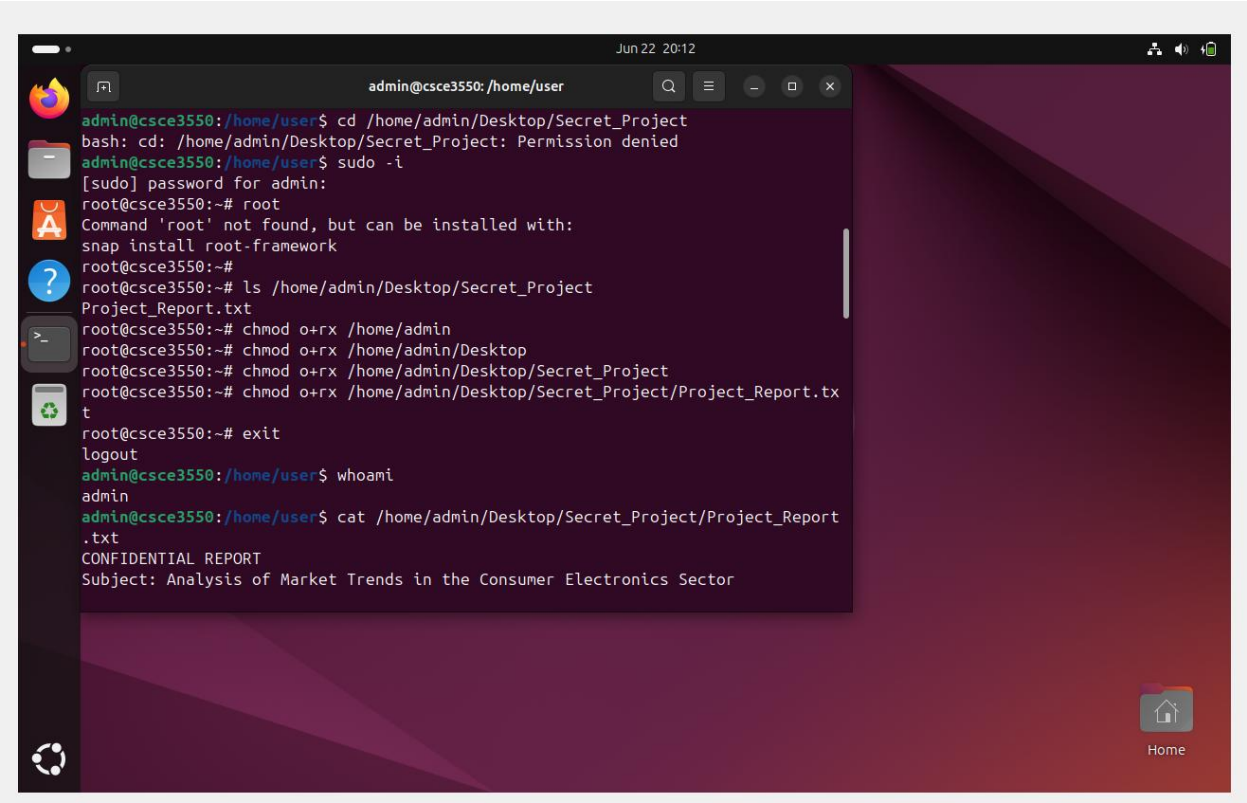
chmod o+rx /home/admin/Desktop

chmod o+rx /home/admin/Desktop/Secret_Project

chmod o+r /home/admin/Desktop/Secret_Project/Project_Report.txt

This allowed the standard user account to access and read the confidential file.

Security Note:
While modifying permissions using chmod o+rx enabled access for demonstration purposes, this approach is not recommended in production systems. A more secure design would involve proper ownership, group-based permissions, or Access Control Lists (ACLs).



Final Step: Access File as Standard User

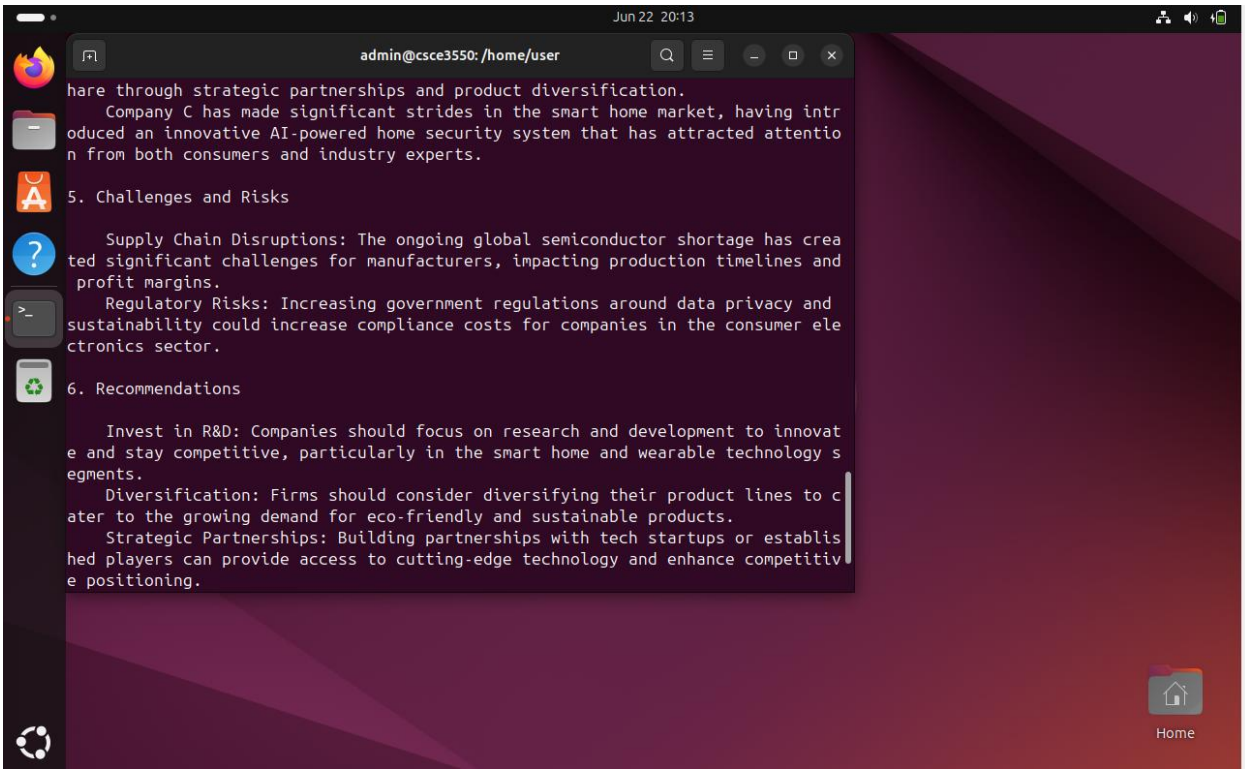
I logged back in as the user and successfully read the contents of Project_Report.txt using:

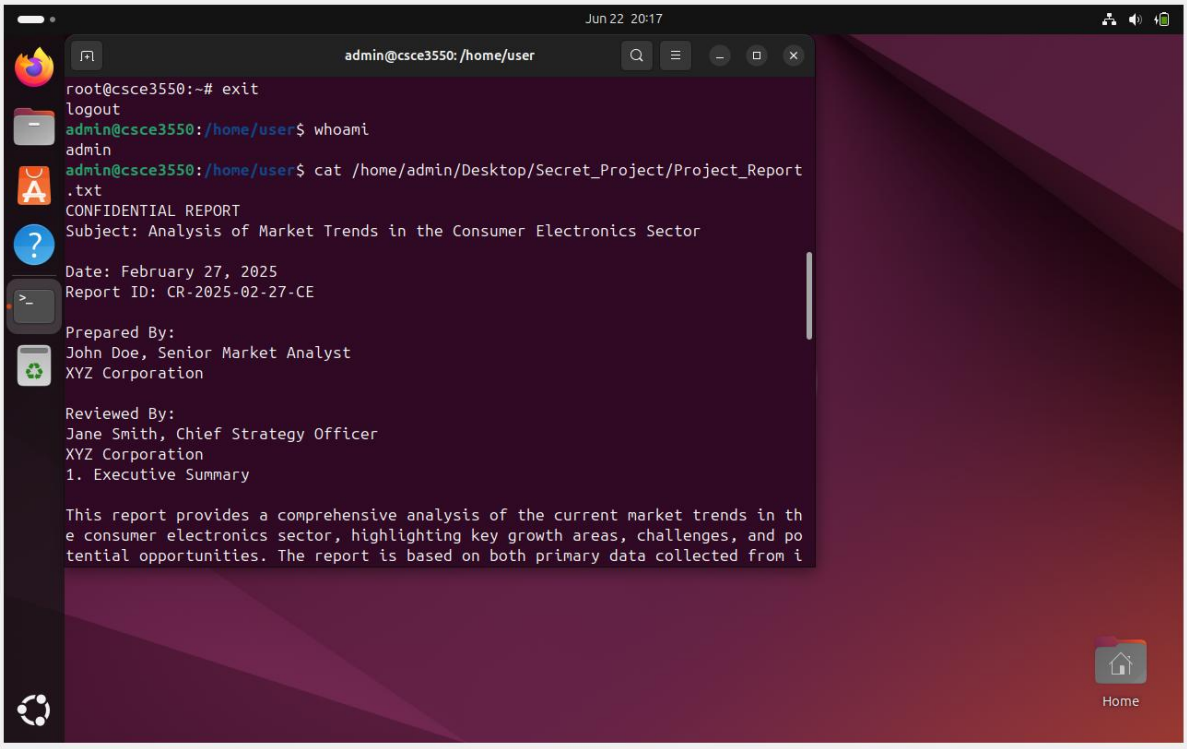
cat /home/admin/Desktop/Secret_Project/Project_Report.txt

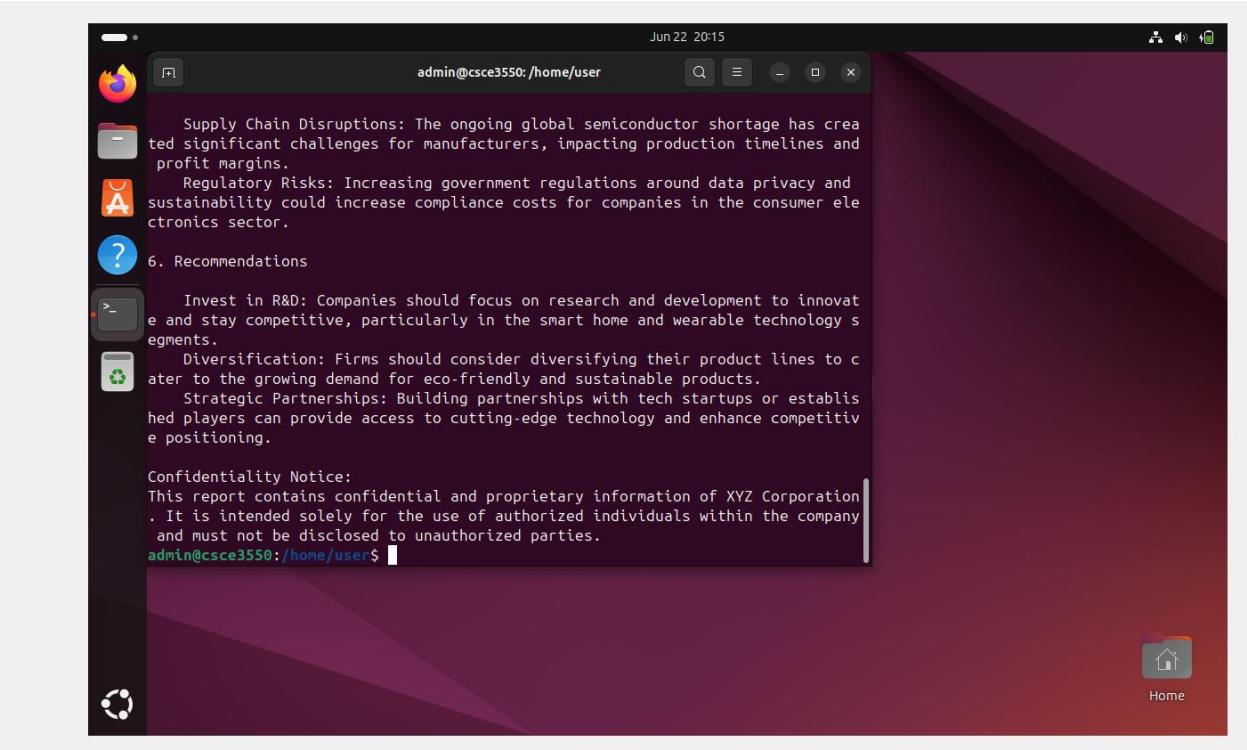
Security Hardening & Best Practices

To prevent similar security risks in real-world systems, the following controls should be implemented:

- Enforce strong password complexity and minimum length policies
- Disable SSH password authentication and use key-based login
- Disable direct root login via SSH
- Apply the principle of least privilege when assigning permissions
- Conduct periodic audits of file permissions and user access


Jun 22 20:13
admin@csce3550: /home/user
hare through strategic partnerships and product diversification.
Company C has made significant strides in the smart home market, having intr
oduced an innovative AI-powered home security system that has attracted attentio
n from both consumers and industry experts.
5. Challenges and Risks
Supply Chain Disruptions: The ongoing global semiconductor shortage has crea
ted significant challenges for manufacturers, impacting production timelines and
profit margins.
Regulatory Risks: Increasing government regulations around data privacy and
sustainability could increase compliance costs for companies in the consumer ele
ctronics sector.
6. Recommendations
Invest in R&D: Companies should focus on research and development to innovat
e and stay competitive, particularly in the smart home and wearable technology s
egments.
Diversification: Firms should consider diversifying their product lines to c
ater to the growing demand for eco-friendly and sustainable products.
Strategic Partnerships: Building partnerships with tech startups or establis
hed players can provide access to cutting-edge technology and enhance competitiv
e positioning.
Home


Jun 22 20:17
admin@csce3550: /home/user
root@csce3550:~# exit
logout
admin@csce3550:/home/user$ whoami
admin
admin@csce3550:/home/user$ cat /home/admin/Desktop/Secret_Project/Project_Report
.txt
CONFIDENTIAL REPORT
Subject: Analysis of Market Trends in the Consumer Electronics Sector
Date: February 27, 2025
Report ID: CR-2025-02-27-CE
Prepared By:
John Doe, Senior Market Analyst
XYZ Corporation
Reviewed By:
Jane Smith, Chief Strategy Officer
XYZ Corporation
1. Executive Summary
This report provides a comprehensive analysis of the current market trends in th
e consumer electronics sector, highlighting key growth areas, challenges, and po
tential opportunities. The report is based on both primary data collected from i
Home



Discussion & Security Implications

This exercise demonstrated how vulnerable a system can be if weak passwords and improper access controls are used. By brute-forcing a simple 3-letter password, I was able to escalate privileges and access sensitive files. In a real-world scenario, this kind of breach could result in data theft, privacy violations, or legal consequences. To mitigate such risks, systems must enforce:

- Strong password policies
- Principle of least privilege
- Regular auditing of user access
- Proper file and directory ownership