

# Research Paper: Cyberattack Case Study

## CIS 3360-Security in Computing

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**Abstract**—The SolarWinds cyber breach, disclosed in December 2020, stands as one of the most significant cyber-espionage incidents of the modern era. Through a sophisticated supply-chain compromise of SolarWinds’ Orion platform, the state sponsored hacker groupd NOBELIUM gained persistent and covert access to U.S. government agencies, corporations, and critical service providers. I examine the historical context, motives, and technical execution of the attack that gave persistent anonymous access to SolarWinds’ build environment, dubbed SUNBURST, demonstrating how the breach not only infiltrated high level networks but also undermined global trust in software ecosystems. By analyzing NOBELIUM’s tactics and the far reaching consequences of the intrusion, I argue that the SolarWinds incident represents a wakeup call moment in cybersecurity. It highlights the vulnerability of supply chains, exposes the limitations of traditional defense mechanisms, and guided us to new industry standards that shape the cybersecurity landscape today.

**Index Terms**—SUNBURST, formatting, style, styling, insert

#### I. INTRODUCTION

On December 13, 2020, Solarwinds, A Texas based technology company that develops network monitoring and IT infrastructure management software, announced what would become the most consequential cyber intrusion in history. The breach focused on exploiting their Orion software, SolarWinds’ main network monitoring platform used by U.S. government agencies, defense contractors, Fortune 500 corporations, and critical national service providers. The attackers, latter dubbed NOBELIUM by microsoft’s Threat Intelligence center (MSTIC) and discovered to be state sponsored attacker group backed by Russia, pursued espionage rather than economic gains. SolarWinds itself was not the ultimate target, thou. Instead, its compromised software supply chain became the conveyor belt for malicious code that infiltrated networks of its customer base undetected for over a year. There where many exploits deployed in this attack, but for the scope of this research I will focus on the ”SUNBURST” exploit.

By the time the intrusion was detected, NOBELIUM had already garanteed their persistent, undetected access to email

servers, sensitive repositories, and classified communications. What followed was not a simple data breach, but a calculated and methodical campaign of cyber-espionage that exploited trust and used it as a mask for malicious intent. The SolarWinds incident was deemed a significant cyberattack not only because of its scale and sophistication, but also because of the national security risk it posed and the trust it shattered in the global technology leaders that are the watchdogs of our networks.

I argue that the SolarWinds breach represents a turning point in cybersecurity. It revealed the vulnerabilities of software supply chains, exposed the weakness of existing detection systems, and forced governments and corporations to rethink the resilience of their networks and how they can restructure themselves for reduced impact. To explore this claim, I will first outline the historical background and motives of NOBELIUM, then examine the technical methods of intrusion, followed by an analysis of the attack’s distinct features, its broader geopolitical implications and if the attack’s patterns are still in use today. Finally, I will evaluate the lessons learned and how this incident reshaped modern approaches to cyber defense.

#### II. BACKGROUND

Background text here

#### III. ANALYSIS

Analysis text here.

#### DISCUSSION

Discussion text here.

#### IV. CONCLUSION

Conclusion text here.

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