

Graph-Based Cloud Infrastructure Security

Research Project Proposal

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Introduction

Over the past years, starting with 2006 when Amazon Web Services was launched, we have seen an ever-increasing number of companies migrating their IT systems to the cloud. Consequently, cloud vendors continued to improve their offerings either by adding new features to already existing services or by providing entirely new capabilities. This, in turn, led to high demand for cloud engineers capable of building a secure, reliable, and performant system. All these factors led to an increased attack surface and more reasons for cybercriminals to breach the security of the previously mentioned companies.

Objectives

The main objectives of this research project are to assess the status quo of cloud security and explore a graph-based security approach that would take a more holistic approach. While the market is already crowded with products ranging from simple command-line interface tools to highly complex cloud security posture management (CSPM) platforms, some of them being offered by the main cloud providers themselves, companies continue to suffer data breaches either due to misconfigurations or vulnerabilities.

Impact

The global cloud computing market reached USD 445 billion in 2021 and is estimated to grow to nearly USD 1 trillion in 2026 with a compound annual growth rate (CAGR) of 16.3% [\[1\]](#). Roughly half of the market will be occupied by companies that are new to the cloud. Moreover, it is estimated that the number of software engineers doubles every five years, which consequently means that half of the software engineers have less than five years of experience [\[2\]](#). The need for more sophisticated yet simple cloud security tools is also emphasized by the growing investments from both cloud providers such as Azure (Microsoft's cloud platform) which invests USD 1 billion each year in security and venture capital firms that invested record amounts in startups focusing on cloud security [\[3\]\[4\]](#).

Ethical Considerations

Since it's a highly competitive market, the main ethical consideration is to make a fair assessment and recommendation that ultimately helps companies of all sizes serve their customers better.

References

- [1] <https://www.marketsandmarkets.com/Market-Reports/cloud-computing-market-234.html>
- [2] <https://blog.cleancoder.com/uncle-bob/2014/06/20/MyLawn.html>
- [3] <https://www.timesofisrael.com/israeli-cybersecurity-firm-wiz-raises-250m-soaring-to-6b-valuation>
- [4] <https://techcrunch.com/2021/10/05/temasek-leads-550m-series-c-extension-into-orca-security-which-aims-for-further-international-foothold>