Simulation of Cybersecurity Attacks and Detection Using Machine Learning Techniques with Virtual Local Area Networks Integration

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Abstract : In today's cyber landscape, threats are emerging every single day; they are much more advanced and dynamic than in the past within this cyber landscape. This project focuses on Virtual Local Area Networks or VLANs. VLANs provide the compartmentalization of sensitive information and optimal management of traffic but introduce specific vulnerabilities. Attackers also target VLAN configurations for exploitation of some security holes, such as VLAN hopping. The aim is to deal with such security requirements by developing a machine learning-based IDS for the VLAN environment that identifies in real time the patterns and anomalies signifying possible attacks. Apart from the IDS, it also looks at the generation of cyberattack datasets specific to VLANs with the help of Wireshark that will help train the ML model.

Keywords : cybersecurity, machine learning, VLAN networks, DTP, STP
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