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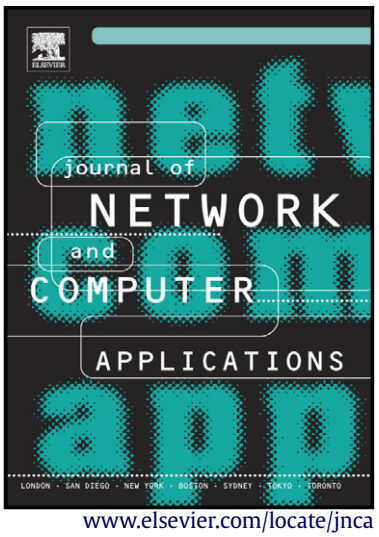

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Network Attacks: Taxonomy, Tools and Systems

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Abstract

To prevent and defend networks from the occurrence of attacks, it is highly essential that we have a broad knowledge of existing tools and systems available in the public domain. Based on the behavior and possible impact or severity of damages, attacks are categorized into a number of distinct classes. In this survey, we provide a taxonomy of attack tools in a consistent way for the benefit of network security researchers. This paper also presents a comprehensive and structured survey of existing tools and systems that can support both attackers and network defenders. We discuss pros and cons of such tools and systems for better understanding of their capabilities. Finally, we include a list of observations and some research challenges that may help new researchers in this field based on our hands-on experience.

Keywords: Network attacks, tools, systems, protocol, DoS

1. Introduction

Due to the Internet's explosive growth and its all pervasive nature, users these days rely on computer networks for most day to day activities. Network attacks attempt to bypass security mechanisms of a network by exploiting the vulnerabilities of the target network. Network attacks disrupt legitimate network operations and include malfunctioning of network devices, overloading a network and denying services of a network to legitimate users, highly reducing network throughput, scanning maliciously and other similar activities. An attacker may also exploit loopholes, bugs, and misconfigurations in software services to disrupt normal network activities. Network security tools facilitate network attackers as well as network defenders in identification of network vulnerabilities and collection of network statistics. Network attackers intentionally try to identify

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