Network Security: Basic Concepts, Challenges and Preventive Measures

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Abstract

The increasing use of computer networks and Internet-based services has created significant opportunities for communication and information sharing, but it has also increased exposure to cyber threats. Network security focuses on protecting computer networks, systems, and data from unauthorized access, misuse, disruption, and attacks. This paper provides an overview of fundamental network security concepts, including confidentiality, integrity, availability, authentication, authorization, firewalls, encryption, and access control. It examines common security threats such as malware, phishing, denial-of-service attacks, password attacks, and unauthorized access. The paper also discusses preventive measures that can help organizations and individual users improve network security, including strong authentication, regular software updates, secure configurations, encryption, firewalls, and user awareness. The study emphasizes that effective network security requires both appropriate technical controls and responsible user behavior. It concludes that continuous security awareness and systematic preventive measures are essential for maintaining safe and reliable computer networks.

Keywords: Network Security, Cyber Security, Encryption, Firewall, Authentication, Malware, Data Protection, Network Threats