Computer Networking: Fundamentals, Architecture and Applications

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Abstract

Computer networking has become an essential component of modern information technology, enabling communication and resource sharing among computers and digital devices. This paper provides an overview of the fundamental concepts of computer networking, including network types, topologies, transmission media, networking devices, protocols, and network architectures. It discusses commonly used networks such as LAN, MAN, and WAN and explains the basic principles of client-server and peer-to-peer architectures. The paper also examines the role of networking devices such as routers, switches, hubs, and modems in facilitating communication. Furthermore, it highlights the applications of computer networking in education, business, banking, communication, and information sharing. The study concludes that a clear understanding of networking fundamentals is essential for students and professionals to understand modern communication systems and the development of reliable network infrastructure.

Keywords: Computer Networking, Network Architecture, LAN, MAN, WAN, Network Topology, Network Protocols, Communication