IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 5, Issue 1, January 2025

Quantum Key Distribution: Securing Networks Against Post-Quantum Threats

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Abstract: *This Research Focuses on,the advent of quantum computing poses significant risks to classical encryption methods, rendering many existing cryptographic protocols obsolete. Quantum Key Distribution (QKD) emerges as a revolutionary solution, leveraging the principles of quantum mechanics to enable unconditionally secure communication. This research paper explores the implementation and advancements in QKD for securing networks against post-quantum threats. We analyze the challenges, practical implementations, and future prospects of integrating QKD into modern communication infrastructures. The findings highlight the critical role of QKD in ensuring resilient cybersecurity in the quantum era.*
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Keywords: Quantum Key Distribution (QKD), Post-Quantum Cryptography, Secure Communication, Quantum Computing, Cryptographic Protocols, Cybersecurity.