

Exploring IP Address Allocation Methods: A Comprehensive Analysis

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Abstract: Over the past 25 years, the current version of the Internet Protocol (IPv4) has remained largely unchanged. Its robustness and ease of implementation have made it a staple in networking. As the groundwork for IPv6 deployment was laid in the early stages, IPv4-based networks began preparations for the transition. This transition progressed through stages: initially, both IPv4 and IPv6 coexisted, then IPv6 gradually took precedence, leading to the eventual withdrawal of IPv4 networks from the market. Throughout this evolution, researchers developed various transition mechanisms tailored to different network infrastructures and stages of evolution. This paper conducts a comprehensive examination of IPv4, including its smart saving techniques, aimed at delaying the shift from IPv4 to IPv6. Additionally, it delves into addressing schemes that are likely to remain unchanged in the future. Moreover, the paper highlights the limitations of IPv4, emphasizing the importance of fortifying the present IPv4 network infrastructure until IPv6 is fully realized.

Keywords: Ipv4, IPv6, Addressing , implication of ipv4

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