An Approach to Topology Design and Routing of Computer Networks

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Abstract: Despite the large number of papers on network topology modeling and inference, there still exists ambiguity about the real nature of the Internet and router-level topology. Today, topology generators are tightly bound to the observed data used to validate them. Given that the actual properties of the Internet topology are not known, topology generators should strive to reproduce the variability that characterizes the evolution of the Internet topology over time. Future topology generators should be able to express the variations in local connectivity that makes today's Internet - peering relationships, internal AS topology and routing policies, each changing over time due to failures, maintenance, upgrades and business strategies of the network. Topology generators should capture those dimensions by allowing a certain level of randomness in the outcome, rather than enforcing structural assumptions as the truth about Internet's evolving structure, which may never be discovered. This paper proposes a network model that can be implemented in different network environments and also be used to implement MAN, WAN and mobile communication. The proposed algorithm can design each region and then choose a few stations from them to communicate with other regions.

Tags: Graph Model, Topology, Routing, Minimum Spanning Tree (MST), Networking

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