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Abstract

When networks are too large, the overhead introduced by dynamic routing consumes too much of network resources(processing, transmission capacity–bandwidth, and memory storage). To overcome this, some highly developed dynamic routing protocols such as link–state protocol adapt techniques to hierarchically organize networks and thereby reduce overhead.

This paper introduces a new technique in link–state routing protocol such as OSPF(Open Shortest Path First) and IS-IS(Intermediate System to Intermediate System) to organize routing information in large networks. Systematic method composed of two stages provides logical and hierarchical configuration of link-state routing domain.

In the first stage, the domain is splitted into one backbone area and many local areas under the consideration of balancing the amount of required routing information among areas. To complete this objective, mathematical network design techniques including decomposition and heuristics are employed. In the second stage, in order to meet certain connectivity requirements, the determined backbone from the first stage is augmented by additional configuration of virtual links. As a result of the second stage, reliability of the entire internetwork is expected to be highly enhanced.

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