Abstract Details

Title: Implementation of OSPF Protocol for Directed and Undirected Graph

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Abstract: The OSPF is an open standard protocol that is most popularly used in modern networks. It is a link state protocol. Various protocols are used for shortest path. But in real life mostly problems are undirected graph like nature. OSPF using Dijkstra's algorithm solved shortest path problem in both type of problems i.e. directed and undirected graph. Along with problems becomes more crucial when no. of undirected branches are more than no. of nodes (eg. in road map, electrical circuits, protein structure, Genetic Engineering etc.).This research wills find how OSPF routing protocols works for directed and undirected graph problem. Following are the reasons of using OSPF: 1) OSPF is not a CISCO proprietary protocol like EIGRP.2) OSPF always determines the loop free routes.3) If any changes occur in the network it updates fast.4) Low bandwidth utilization.5) Support multiple routes for a single destination network.6) OSPF is based on cost of the interface. Finally, use of Dijkstra's algorithm with sparse matrix will produce a running time of $O((|E|+|V|) \log |V|)$ instead of $O(|V|^2 + |E|)$. Where V is the no. of nodes and E are the branches in graph.

Keywords: OSPF, Dijkstra's algorithm, Directed and Undirected graph, Sparse Matrix, MATLAB.