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RESEARCH ARTICLE

DESIGN OF OPEN SHORTEST PATH FIRST PROTOCOL –A LINK STATE PROTOCOL USING OPNET MODULAR

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Abstract— Open Shortest Path First (OSPF) is an Interior Gateway Routing Protocol, based on Shortest Path First (SPF) or link-state technology. Open Shortest Path First (OSPF) is a link state routing protocol which was first defined as version 2 in RFC 2328. This is used to allow routers to dynamically learn routes from other routers and to advertise routes to other routers. OSPF router keeps track of the state of all the various network connections (links) between itself and a network it is trying to send data to. This makes it a link-state routing protocol.

Optimized network engineering tool (OPNET) modeler is an interactive graphical user interface (GUI) that provides hierarchical structure of problem solving. Moreover, it includes lot of documentation on learning and application of software in networking domain. In this thesis work it has been attempted to find out the best route in OSPF through simulation. The work was started with the basic idea of Wired and Wireless LANs and how these networks perform under various types of circumstances. In particular, the effect of various parameters and configurations on the network performance was analyzed using the network simulator- OPNET. The work further extends to design a virtual model of OSPF, link state protocol in OPNET. The comparison of traffic sent (bits/sec), traffic received (bits/sec), bit error rate, bit error rate per packet, throughput (packets/sec) and throughput (bits/sec) have been investigated in simulation medium. The results show the proper route making in OSPF. Some delays in Received packets have been observed due to network congestion parameters. The amount of packet received is more than the packet sent due to addition of IP addresses. The work can be extended to inculcate other network traffic parameters and to design another protocols using simulation and to compare them.

Keywords: - OSPF, OPNET, GPS, GUI, TCP/IP

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