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Somma Sakulkij: LOOP DETECTION AND LOOP SOLUTION TECHNIQUE FOR THE INTERNET USED RIP PROTOCOL. THESIS ADVISOR: Assist. Prof. Lunchakorn Wuttisittikulij, Ph.D., 118 pp. ISBN 974-03-1428-7.

This thesis proposes a technique for loop detection in the Internet, which uses RIP protocol for exchanging routing information between routers. Loop is a problem caused by the changing of network resource states, for example link or router failures. This problem affects the performance of transmitting and receiving data over the Internet. Previously, loop detection techniques have not been effectively addressed; no known technique with systematic procedure exists. As a result, the performance study of RIP protocol has been limited to a few sample networks of known property. In order to extend the study of RIP protocol to cover a larger set of problems, a new loop detection technique is proposed to enable extensive investigations. This new technique is systematic and can be applied to various network topologies. The proposed technique maps each node in the given network structure to a set of represented node. These sets of represented node are assigned special property so that the analysis of possible loop events in each area can be carried out in a systematic manner. As a result of this analysis, we can identify the locations of loops and events of broadcasting sequences that lead to loops. This information can use to offer the probability of loop event of a network and to test performance of many the solving loop methods.

The end of this thesis introduces a new alternative technique for solving loops. The proposed technique requires a node to send a special message to test the new route before the router decides to adopt this new route. By doing this, it is possible to prevent any possibility of loop occurrence. Based on our comparative performance study with other solving loop methods, it is found that the proposed technique is capable of solving short-live loop as the other methods. In addition, this new technique can solve long-live loop, which other methods cannot solve it. Moreover, this technique is applicable to practical environment, as it requires no major modifications to the existing routing protocols.