Performance Analysis of TCP HYBLA on Wireless Mesh Networks Network (WMN)

Abstract

Wireless Mesh Network (WMN) has become interesting and popular topic for research lately. WMN is communication network consisting of node mesh, router mesh, gateway, and klien mesh. The formation network could be homogeneous or heterogeneous. WMN performance is quite related to TCP. Transport Control Protocol (TCP) is connection-oriented protocol in transport layer. TCP was initially designed for cable network, later on it also worked well in wireless network. Therefore, the presence of TCP Hybla is to work in heterogeneous network. So that, in this research, the performance of TCP Hybla running in WMN was analyzed. The research used experimental research with network simulator NS-3 to know the performance of TCP Hybla in WMN. The result was TCP Hybla in WMN consisting of throughput and cwnd.

**Keywords:** WMN, TCP, TCP Hybla, NS-3

Pendahuluan

Wireless mesh Network (WMN) is enough new alternative network technologies potential to be developed and very rapidly its development due to various advantages and the characteristics it has compared to conventional networks has existed before. WMN is a network communication consisting of mesh nodes, routers mesh, gateway, and client mesh. All arranged become a mesh topology. WMN is the best wireless technology, can support various applications, for example, broadband networks home, community networks and environment, corporate network, building automation, hospitality, education, disaster management, and others

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1. Wireless Mesh Network (WMN)Wireless mesh network (WMN) currently existsbecome a new network architectureable to expand and reachincrease network access capacitywireless. Basically WMN isa wireless network specificallyconsists of a number of mesh clients, gateways andmesh routers. Usually mesh clients consist ofcomputers, cellphones, bluetooth and equipmentother wireless.
2. Transport Control Protocol (TCP) is a protocol that is at the transport layer most widely used because it offers connection-oriented reliability and byte-stream services
3. TCP Congestion Control isend to end control mechanisms that areimplemented to control several parameters that affect TCP
4. TCP HyblaThe basic idea of TCP Hybla is to get the same packet transmission rate from relatively fast TCP variant connections

Research Methods

In this research that will be examined is part of computer networks, especially at the layer transport with the research object to be researched is wireless mesh network performance (WMN) by analyzing parameters throughput and cwnd. This research uses the method qualitatively by analyzing TCP Hybla to get optimal throughput and also the optimal cwnd of a network WMN through network simulation The software uses
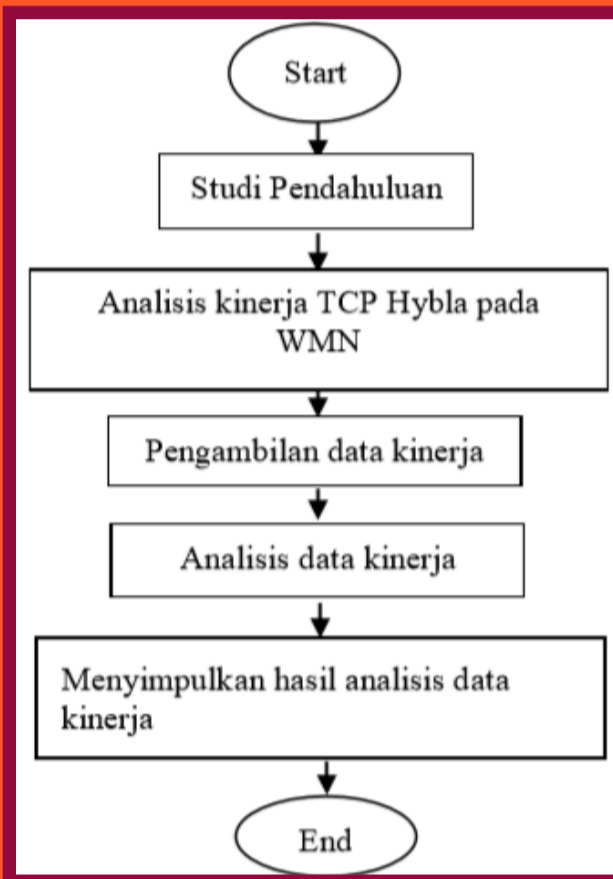
This test was obtained how TCP Hybla works on the effect of distance and number of nodes. The steps involved in :

1. Designing topology In this study, WAN network consists of several nodes that are formed in the lattice topology, which is a 1x5 lattice, 2x5, 3x5, 4x5 and 5x5.

2. Implement TCP Hybla Furthermore, the WMN network topology then Hybla is applied. From the application of this algorithm, it will later throughput and cwnd are obtained to some distance and amount conditions node before testing with respect to all parameters for get optimal results.

3. Evaluation, at this stage the value of throughput and cwnd is value in the initial condition, value expected throughput and cwnd is in optimal condition.

Results and Discussion

Comparison of Throughput and cwnd Against Distance To see a comparison of values throughput and cwnd with increasing distance, need a graph of the relationship between the two. Comparison of Throughput and cwnd Maximum distance to comparison the maximum throughput at each distance tested. From the graph you can see the value the highest throughput generated is at a distance of 10 meters, namely the number of nodes 10. For the maximum cwnd value, the inverse of the throughput value where at a long distance by the amount nodes that are increasing in value cwnd, this is due to the TCP Hybla character ignoring RTT. Although the package not getting another packet ACK shipped.

Conclusion

Based on the results of testing and evaluation with respect to these parameters it is known that TCP Hybla if running on a WMN network when viewed based on working distance more at a distance of 10 meters. If seen based on the number of TCP Hybla performance nodes on WMN works better in almost any number of nodes. For the level of stability based on distance then TCP Hybla pad WMN works stable on a distance of 10, 20 and 30 meters. If seen level its stability is based on the number of nodes then on the number of nodes it works almost stable on all number of nodes. Thus it can be concluded that for the throughput value resulting from TCP Hybla's performance on WMN very influential on increasing distance and node.