COMPARATIVE PERFORMANCE ANALYSIS OF PROTOCOL ALLOHA AND CSMA/CA IN MOBILE AD HOC NETWORK (MANET) ESTABLISHMENT FOR BATTLESHIP TACTICAL COMMUNICATION

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ABSTRACT

Tactical communications system is a communication system which is used directly to support military operations. Tactical communications should have self-organizing, self-healing, and self-forming ability. One of tactical communication system problem is its military operation area has no fixed infrastructure, so it requires a reliable network connection. Another problem is high mobility of the unit which caused the network topology changes. This problem can be solved by using a Mobile Ad Hoc Network (MANET). Mobile Ad hoc Network (MANET) is a network that consists of mobile nodes that communicate over wireless networks, without a fixed support infrastructure. This research will be carried out a comparative performance evaluation of the Aloha and CSMA/CA MAC protocol in the process of MANET establishment in 3 steps such as scanning, authentication, and association so that the parameters which compared are duration of network establishment, throughput, and scalability. Three battleship formations are used in this research such as random, bird, and star. The simulation results show that the CSMA/CA protocol produces the smallest duration that is 0.14983 seconds, throughput is 239.068 kbps and scalability value is 0.6553. While the Aloha MAC protocol has the fastest time during the establishment is 0.61343 seconds, average throughput 95.55 kbps, and scalability value is 0.4537. From the results, CSMA/CA MAC protocol has better performance than Aloha MAC protocol for MANET establishment.

Keywords : MANET establishment, Aloha, CSMA/CA
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