Abstract

An ad hoc network is a collection of mobile nodes that do not have any fixed topology. In such a network, nodes are likely to join or leave the network in an arbitrary manner. Joining of any nodes is announced by itself to other neighboring nodes and nodes already present in the network learns about joining of the new node by this announcement. In such a scenario, discovery of path from one node to another node is an important task for the routing protocols used for the purpose. Adhoc on demand vector (AODV) is one routing protocol used in MANET environment. Being a reactive protocol, path discovery process in AODV is initiated by sender node when there is no routing information for an intended destination.

In this paper, we present a formal model for path discovery process of the AODV protocol using Event-B. The model have been developed and checked using the RODIN tool which provides an integrated framework for development of Event-B models. Event-B technique uses a notion of refinement to specify the mathematical models of distributed systems in an incremental manner. The specifications of the system have been checked for consistency and satisfy the
Formal Development of Path Discovery in AODV Routing Protocol using Event-B

behavioural properties of the system expressed as invariants. All the proof obligations were discharged automatically by the RODIN tool.

References

10. Mario Gerla, Xiaoyan Hong, Li Ma, Guangya Pei, Landmark routing protocol (LANM4R), Internet Draft, draft-ietf-manet-lanmar-01.txt, work in progress, June 2001.
16. *Joa-Ng and I.-T. Lu, A Peer-to-Peer zone-based two-level link state routing for mobile Ad hoc Networks, In IEEE Journal on Selected Areas in Communications, Special Issue on

**Index Terms**

Computer Science

Wireless
Keywords

MANET, AODV, Formal Method, Event-B.