



TECHNOLOGY

A Method for Dynamically Creating and Maintaining Network Structure Based on Client Mobility

OVERVIEW

A local area network (LAN) is a collection of personal terminals, mainframes, and workstations coupled to a communication link within a distance of 300 meters. LANs have commonly taken the form of wired networks which connect directly via cable to each point within the network. Recently, however, wired networks are being replaced with wireless networks for transferring a signal through a radio waves. LANs which are based on these wireless networks are referred to as wireless local area networks (WLANs). WLANs utilize a standard developed by the Institute of Electrical and Electronics Engineers (IEEE) called 802.11, and have seen immense growth in the last few years. It is predicted that the IEEE 802.11-based WLANs will continue to be rapidly developed because of convenient network connectivity and falling prices, among other factors.

The IEEE 802.11 allows for two operating modes--an ad hoc mode and an infrastructure mode--in relation to a media access control (MAC) layer. In the ad hoc mode, two or more wireless stations (STAs) recognize each other and establish a peer-to-peer communication without an existing infrastructure. In the infrastructure mode, there is a fixed entity called an access point (AP) that bridges all data between all STAs associated with the AP. The AP and its associated STAs form a basic service set (BSS) communicating on the unlicensed radio frequency (RF) spectrum.

The conventional handoff procedure refers to the mechanism or sequence of messages exchanged between the APs and the STA. In the conventional handoff procedure, physical layer connectivity and state information must be transferred from one AP to another AP with respect to the STA in consideration. The handoff is a physical layer function carried out by at least three participating entities, i.e., an STA, a prior-AP, and a subsequent-AP. The three types of delay include a probe delay incurred in the discovery phase, an authentication delay incurred in the authentication phase and a reassociation delay incurred in the reassociation phase. Messages during the probe delay form the discovery phase, while the authentication and reassociation delays form the reauthentication phase. Apart from the latencies discussed above, there will potentially be a bridging delay caused by the time taken for the MAC address updates to Ethernet switches which form the distribution system (i.e., the backbone Ethernet). It can be seen that many latencies are incurred while a handoff between an STA and APs is performed in the conventional WLAN. There are problems in that the latencies not only affect the quality of service (QoS) but also disable high-speed roaming.

The present invention relates to methods for minimizing handoff latencies. The technology is a jointly owned invention with Samsung. For additional information please contact the Office of Technology Commercialization, University of Maryland, College Park on 301-405-3947 or otc@umd.edu.

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Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

Patent(s) pending

LICENSE STATUS

Available for non-exclusive license

CATEGORIES

- Microelectronics
- Information Technology

EXTERNAL RESOURCES

- [US Patent 7,263,357](#)
- [US Patent 7,421,268](#)
- [US Patent 8,977,265](#)
- [US Patent 7,929,948](#)
- [US Patent 7,929,948](#)

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