- Many respondents were not using the ICT because they were not trained for it. Thus at all the levels and al the courses for soft skills development it is necessary to introduce ICT and increase the employability and improved academic performance.

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Power Saving Routing in MANET A modified casting to ensure energy efficiency

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Abstract

In a typical wireless mobile ad-hoc network (MANET) using a shared communication medium, every node receives or overhears every data transmission occurring in its vicinity. However, this technique is not applicable when a power saving mechanism (PSM) such as the one specified in IEEE 802.11 is employed, where a packet advertisement period is separated from the actual data transmission period. When a node receives an advertised packet that is not destined to it, it switches to a low-power state during the data transmission period, and thus, conserves power. However, since some MANET routing protocols such as Dynamic Source Routing (DSR) collect route information via overhearing, they would suffer if they are used with the IEEE 802.11PSM. Allowing no overhearing may critically deteriorate the performance of the underlying routing protocol, while unconditional overhearing may offset the advantage of using PSM. This paper proposes a new communication mechanism, called Modified Casting or M-cast, via which a sender can specify the desired level of overhearing in addition to the intended receiver by using(Ad-hoc On-demand Distance Vector) AODV protocol. Therefore, it is possible that only a random set of nodes overhear and collect route information for future use. M-cast improves not only the energy efficiency, but also the energy balance among the nodes, without significantly affecting the routing efficiency.

Key Words: Energy efficiency, mobile ad-hoc networks, network lifetime, overhearing, power saving mechanism.

Introduction

Ad-hoc networks are infrastructure less wireless networks. Here, mobile nodes communicate directly with each other. If two nodes are not within radio range of each other, they can use the forwarding functionality of another node to establish a connection. Therefore, nodes of ad-hoc networks are much more complex than those of infrastructure based networks. However, ad-hoc networks are easy to manage and establish. Since they do not require an infrastructure network, they are much more flexible and their use is possible in a broader range of scenarios, e.g. for disaster relief. Depending on the frequency of structural changes in the network, ad- hoc networks can be subdivided into mobile ad -hoc networks, or MANETs, and sensor networks. One of the most critical issues in mobile ad-hoc networks (MANETs) is energy conservation. Since mobile nodes usually operate on batteries, a prudent power saving mechanism is required to guarantee a certain amount of device lifetime. If we want to improve the Energy efficiency then it can be either by reducing the energy used for active communication activities or by reducing the energy spent during an inactive period. Each mobile device can be in one of the two power management modes: active mode (AM) or power save (PS) mode. A device in the PS mode periodically wakes up during the packet advertisement period, called Ad-hoc (or Announcement) Traffic Indication Message (ATIM) window to see if it has any data to receive.It puts itself into the low-power state if it is not addressed, but stays awaken to receive any advertised packet otherwise. The main goal of this paper is to make the IEEE 802.11 PSM applicable in multi-hop MANETs when the popular (Adhoc On-demand Distance Vector) AODV is used as the network

Layer protocol. A major concern in integrating the AODV protocol with the IEEE

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802.11 PSM is overhearing. Overhearing improves the routing efficiency in AODV by eaves dropping other communications and gathering route information. It incurs no extra cost if all mobile nodes operate in the Active Mode because they are always awake and idle listening anyway. A naive solution is to disable overhearing and let a node receive packets only if they are destined to it. However, it is observed that this solution reduces network performance significantly because each node gathers less route information due to the lack of overhearing and resulting in more energy consumption. This paper deals with modified Cast or Mcast, via which a sender can specify the desired level of overhearing when it advertises a packet. Upon receiving a packet advertisement during an ATIM window, a node makes its decision whether or not to overhear it based on the specified overhearing level. If no overhearing is specified, every node decides not to overhear except the intended receiver and if unconditional overhearing is specified, every node should decide to overhear. Modified overhearing achieves a balance somewhere in between, where each node makes its decision based on density and network traffic parameters. Mcast helps nodes conserve energy while maintaining a comparable set of route information in each node. Since route information is maintained by sequence number in AODV, Mcast effectively avoids unnecessary effort to gather redundant route information and thus saves energy.

AODV Protocol Overview

The AODV routing protocol is a reactive routing protocol; therefore, routes are determined only when needed. If messages are used, each active node periodically broadcasts that message that all its neighbors receive. Because nodes periodically send messages, if a node fails to receive several messages from a neighbor, a link break is detected. When a source has data to transmit to an unknown destination, it broadcasts a Route Request (RREQ) for that destination. At each intermediate node, when a RREQ is received a route to the source is created. If the receiving node has not received this RREQ before, is not the destination and does not have a current route to the destination, it re-broadcasts the RREQ. If the receiving node is the destination or has a current route to the destination, it generates a Route Reply (RREP). The RREP is uni-cast in a hop-by-hop fashion to the source. As the RREP propagates, each intermediate node creates a route to the destination. When the source receives the RREP, it records the route to the destination and can begin sending data. If multiple RREPs are received by the source, the route with the shortest hop count is chosen. As data flows from the source to the destination, each node along the route updates the timers associated with the routes to the source and destination, maintaining the routes in the routing table. If a route is not used for some period of time, a node cannot be sure whether the route is still valid; consequently, the node removes the route from its routing table.

If data is flowing and a link break is detected, a Route Error (RERR) is sent to the source of the data in a hop-by-hop fashion. As the RERR propagates towards the source, each intermediate node invalidates routes to any unreachable destinations. When the source of the data receives the RERR, it invalidates the route and reinitiates route discovery if necessary.

IEEE 802.11 PSM

In the IEEE 802.11 PSM, a node can be in one of two different power modes, i.e., active mode when a node can receive frames at any time and power-save mode (PS) when a node is mainly in low-power state and transits to full powered state subject to the rules described next. The low-power state usually consumes at least an order of magnitude less power than in the active state. In the power-save mode, all nodes in the network are synchronized to wake up periodically to listen to signal messages. Broadcast/multicast messages or uni-cast messages to a power-saving node are first buffered at the transmitter and announced during the period when all nodes are awake. The announcement is made via an ad -hoc traffic indication message (ATIM) inside a small interval at the beginning of the signal interval called the ATIM window. If a node receives a directed ATIM frame in the ATIM window (i.e. it is the designated receiver), it sends an acknowledgment and stays awake for the entire signal interval waiting for data packets to be transmitted. Immediately after the ATIM window, a node can transmit buffered broadcast/multicast frames, data packets and management frames addressed to nodes that are known to be active (by reception of acknowledgment to ATIM frames). Otherwise, the node can switch to the low-power state to conserve energy. In IEEE 802.11, a node's power management mode is indicated in the frame control field of the MAC header for each packet. In the IEEE 802.11 PSM, the length of a signal interval and the size of an ATIM window are configured by the first node that initiates the network. A mobile station can choose to wake up every multiples of the signal intervals for further energy saving.

802.11 PSM IN multi-hop networks

Recently, a number of research groups have studied how to utilize the PSM in multi-hop networks. AM nodes offer the routing backbone so that any neighboring node can transmit a packet to one of them without waiting for the next signal interval. A drawback of this scheme is that it usually results in more AM nodes than necessary and degenerates to all AM-node situation when the network is light. More importantly, it does not take the routing overhead into account because it uses geographic routing and assumes that location information is available for free.

Problem statement

The PS mode of IEEE 802.11 is designed for a single-hop (or fully connected) ad-hoc network. When applied to a multi-hop ad-hoc network, three problems may arise. They are *Clock Synchronization, Network Partitioning and Neighbor Discovery.*All these will pose a demand of redesigning the PS mode for multi-hop MANET.

Clock Synchronization

Since IEEE 802.11 assumes that mobile hosts are fully connected, the transmission of a beacon frame can be used to synchronize all hosts' beacon intervals .So the ATIM windows of all hosts can appear at around the same time without much difficulty. In a multi-hop MANET, clock synchronization is a difficult job because communication delays and mobility are all unpredictable, especially when the network scale is large. Even if perfect clock synchronization is available, two temporarily partitioned sub-networks may independently enter PS mode and thus have different ATIM timing. With the clock-drifting problem, the ATIM windows of different hosts are not guaranteed to be synchronous. Thus, the ATIM window has to be re-designed.

Neighbor Discovery

In a wireless and mobile environment, a host can only be aware by other hosts if it transmits a signal that is heard by the others. For a host in the PS mode, not only is its chance to transmit reduced, but also its chance to hear others' signals. As reviewed above, a PS host must compete with other hosts to transmit its beacon. A host will cancel its beacon frame once it hears other's beacon frame. This may run into a dilemma that hosts are likely to have inaccurate neighborhood information when there are PS hosts. Thus, many existing routing protocols that depend on neighbor information may be impeded.

Network Partitioning

The above inaccurate neighbor information may lead to long packet delays or even network partitioning problem. PS hosts with unsynchronized ATIM windows may wake up at different times and may be partitioned into several groups. These conceptually partitioned groups are actually connected. Thus, many existing routing protocols may fail to work in their route discovery process unless all hosts are awakening at the time of the searching process.

Modified Cast Implementation with Aodv - No, Unconditional, And Randomized Overhearing

The uni-cast packet is delivered only to an intended receiver if the IEEE 802.11 PSM is employed. Consider that a node S transmits packets to a node D via a pre-computed routing path with three intermediate nodes. Only five nodes are involved in the communication and the rest would not overhear it (*no overhearing*). However, if each neighbor is required to overhear as in AODV, each sender should be able to ―broadcast a uni-cast message. i.e., it specifies a particular receiver but at the same time asks others to overhear it (*unconditional overhearing*).*Modified overhearing* adds one more possibility in between unconditional and no overhearing. Some of the neighbors overhear, but others do not and these nodes switch to the low-power state during the data transmission period. Modified overhearing saves substantial amount of energy compared to unconditional overhearing. With respect to route information, it does not deteriorate the quality of route information by exploiting the spatial and temporal locality of route information dissemination as explained in the introduction. Consider an example in which nodes X and Y are the two neighbors of the communicating nodes A and B. When node receives a RREP from node B, it obtains a new route (S→ D) and stores it in its **route cache**. Nodes X and Y do not overhear the RREP but, since there will be a number of data packets transferred from node A to B, they will obtain the route information (S → D). If node X overhears the second data packet and node Y overhears the second from the last packet when the route becomes stale and gets eliminated from the route cache.

Modified cast implementation with aodv-modified cast probability

A key design issue in the Modified Cast implementation is randomization. It is determined using the factors listed below.

Sender ID: The main objective of Modified Cast is to minimize redundant overhearing. Since a node would typically propagate the same route information in consecutive packets, a neighbor can easily identify the potential redundancy based on the sender ID.

Number of neighbors: When a node has a large number of neighbors, there potentially exists a high redundancy.

Mobility: When node mobility is high, link errors occur frequently and route information stored in route caches becomes stale easily. Therefore, it is recommended to overhear more conservatively but to rebroadcast more aggressively in this case. Each node can estimate its mobility based on connectivity changes with its neighbors.

Remaining battery energy: This is one of the most obvious criteria that helps extend the network lifetime: less overhearing and less rebroadcast if remaining battery energy is low. However, it is necessary to take other nodes' remaining battery energy into consideration in order to achieve balanced energy consumption. Overhearing decision can be made based on the criteria mentioned above. We adopt a simple scheme using only the number of neighbors (PR ¼ 1= number of neighbors) to show the potential benefit of Modified Cast.

Conclusion

In power-controlled wireless ad-hoc networks, battery energy at conventional routing objectives was to minimize the total consumed energy in reaching the destination. However, the conventional approach may drain out the batteries of certain paths which may disable further information delivery even though there are many nodes with plenty of energy. In Modified Cast, when a packet is transmitted, nodes in the proximity should decide whether or not to overhear it considering the trade-offs between energy efficiency and routing efficiency. Modified Cast also improves energy by as much as 50% (approx). In particular, applications without stringent timing constraints can benefit from the Modified Cast scheme in terms of power conservation.

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Analytical Study of Attrition across Indian Industrial Sectors

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Abstract

"Attrition" a horrible word for Indian industries now days. Most of the Indian industries are facing the challenges of attrition like industries in automobile sector, pharmaceutical sector, IT sector, ITes sector, manufacturing sector, agriculture industry and the BPO industry sector. It becomes very difficult for the industries to retain the key employees of the organization. The main objective of this research paper is to find out the recent trends of attrition, reasons of attrition and to provide suitable retention practices for the Indian industries, those will be valuable to retain key employees of the organizations.

Keywords: Attrition, employee, employer, productivity.

Introduction

Attrition in human resource management means gradual wearing down of employees from the organization by the own will of the employees in organization is known as attrition. Attrition denotes that employees into the present organization are not satisfied (may be due to less pay, ineffective career planning of employees in organization, present employees) Employee turnover and employee attrition both occur when an employee leaves the company. Turnover, however, may result from a number of employment actions, such as discharge, termination, resignation or job abandonment. Attrition occurs when an employee retires or when the company eliminates his job. The major difference between the two is that when turnover occurs, the company seeks someone to replace the employee. In cases of attrition, the employer leaves the vacancy unfilled or eliminates that job role.

Conceptual framework

Attrition can be defined in simple words as the reduction of number of workforce from organization, through retirement, resignation, death etc. employee leaves the organization because of many reasons like higher salary expectations elsewhere, due to personal reasons like marriage, health problem, organizational conflict etc. Attrition is highest in India as compare to the rest of the world. "Attrition in India is at 14%, marginally higher than global and Asia Pacific countries