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Enlarge Storing Concept in an Efficient Handoff Allocation during Travel by Time Based Algorithm

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Abstract

Objectives: During travelling mobile hosts move from one cell to another cell, to deliver continuous service, the new cell would have sufficient channels to support the ongoing communication of the mobile hosts that moved into the cell. If channels are statically allocated, a cell may run out of channels when large number of mobile hosts moves to a cell, thus degrading the quality of service. Because allocation of cells statically without knowing the proper information hold most cells so it will decrease the quality of service of cellular network. Methods/Statistical Analysis: To overwhelm this problem, dynamic channel allocation methods have been proposed which allocate channels to cells on request, thus cumulative channel consumption and hence improving the quality of service. This scheme aimed at minimizing the effect of assigned channels on the availability of them in order to use in the interfering cells and reduce their overall reuse distance. Findings: The system shows better performance when the channels are distributed uniformly/non-uniformly with queues using the frequency reuse scheme. In order to support QoS in cellular networks it is a significant issue to allocate the communication channels efficiently because the bandwidth allocated for the cellular communication. The existing system used channel allocation system, based on traffic and priority, but it is not enough. Applications/Improvements: The proposed system is designed based on the time of entering of the cellular node in a new allocated cell and the time period for the particular cell stayed in the previous cell. So it is better for the travelling cellular networks. This research work focus only on a class of applications needing hard QoS guarantee. A more interesting work will address how to allocate.

Keywords: Dynamic Channel, Mobile Hosts, Network, Prioritization Schemes, Resource Allocation, QOS

1. Introduction

Mobility is the most important feature of a wireless cellular communication system. Usually, continuous service is achieved by supporting handoff (or handover) from one cell to another. Handoff[1–3] is the process of changing the channel (frequency, time slot, spreading code, or combination of them) associated with the current connection while a call is in progress. It is often initiated either by crossing a cell boundary or by deterioration of the signal in the current channel[4–7]. The reason why handoffs are critical in cellular communication systems is that neighbouring cells are always using a disjoint subset of frequency bands, so negotiations must take place between the Mobile Station (MS), the current serving Base Station (BS), and the next potential BS[8–10]. Other related issues, such as decision making and priority strategies during overloading, might influence the overall performance.

2. Communication Disruption

Cognitive Radio technology improves spectrum utilization by enabling secondary users to access primary user's unutilized spectrum in an opportunistic man-

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ner. However, it causes disruptions to both primary and secondary communication and leads to high switching overhead[11–13]. In this paper, we propose a novel proactive spectrum handoff approach based on time estimation (TPSH) to reduce the communication disruptions to primary users and increase the channel utilization efficiency. Secondary users utilize past channel histories to maintain an estimation vector of the channel remaining idle period and make predictions on future spectrum availability, and then schedule the channel usage in advance[14–16]. We propose a smart channel selection and switching algorithm to implement above approach. In addition, a threshold is introduced when handoff happens to maintain a trade-off between the disruption effects on primary users and channel efficiency. Simulation results show that our approach can significantly reduce the communication disruption to primary user by up to 32%, and improve the overall channel efficiency by about 7%–18%.

A dynamic channel allocation scheme is proposed in this paper, which is applied to integrated voice/data services in TD-SCDMA mobile communication system[17–19]. The scheme provides the reserved channel for handoff calls to increase the rate of successful accession. Meanwhile, the new call queuing strategy is adopted to limit the deterioration of the new call blocking probability caused by the reservation scheme. When a serving call goes away, the new call in the queue can obtain the free channel in the FIFO manner. It reveals that the scheme can not only reduce the blocking probability of handoff call, the blocking probability of data call and the delay of data transmission, but also improve the new call blocking probability obviously.

A new network-based Dynamic Channel Assignment (DCA) scheme with the flexible use of Reuse partitioning technique is proposed, namely flexible dynamic reuse partitioning with interference information (FDRP-WI). Many dynamic channel assignment schemes have been proposed and studied to increase the capacity of cellular systems[20,21]. Reuse partitioning is another technique to achieve higher capacity by reducing the overall reuse distance. In convention, when RP is exploited in DCA, a portion of channels will be assigned permanently to each partitioned region. However, the number of channels assigned to each region may not be optimum due to the uneven and time-varying traffic. In this scheme, channels are open to all incoming calls and no channel allocation for each region is required. As long as the assignment satisfies the co-channel interference constraints, any user from different regions can use any channel. This scheme aimed to minimize the effect of assigned channels on the availability of channels for use in the interfering cells and to reduce their overall reuse distances. Under both uniform and non-uniform traffic distributions, FDRP-WI exhibits outstanding performance in improving the system capacity by reducing the blocking probability.

The Quality of Service based dynamic channel allocation protocol for wireless and mobile networks. In recent years, with the study of many channel allocation and handoff strategies for wireless networks to ensure continuous services a guaranteed quality of service to mobile users is essential[22]. Most of the proposed channel allocation schemes do not take the quality of service provisioning into account. A distributed algorithm[23] for dynamic channel allocation with an efficient adaptive channel reservation schema providing continuous quality of service support. To acquire the low dropping rate, a proper number of channels in the congested cells are reserved for the handoff calls. This number of reserved channels is related to the traffic involved in the network. This proposed algorithm is based upon the mutual exclusion paradigm where all the channels are grouped into three equal groups and any cell in a cluster can hold a channel group as long as no one of its adjacent cells is holding this group. All the base stations in the mobile cellular network are able to acquire a group at the same time considering the mutual exclusion concept. In terms of expected quality of service guarantees, this scheme dynamically adjusts the amount of reserved channels according to the instant traffic situation. Each base station periodically calculates its recent average call dropping rate. Once the average call dropping rate is larger than the target value, the number of reserved channels is decreased[24]. This target value is independently selected by each base station. Base station has the capability of locating a mobile host and predicting a mobile host's movement. If a new connection request from a mobile host which goes ahead to a congested cell (hot cell), it will possibly be blocked by the base station. If mobile host will enter a cold neighbouring cell, the new call request is accepted by the base station[25,26]. Experimental results indicated clearly that, this scheme exhibited a better performance when compared to channel allocation scheme that doesn't support any quality of service. The future for this is as it does not take into account the possibility that the base station or the link failures, designing a quality of service and fault tolerant based dynamic channel allocation scheme can be done.

The bandwidth constraint models that have been proposed by IETF; these are the Maximum Allocation Model (MAM), the Maximum Allocation with Reservation (MAR) and the Russian Doll Model (RDM). Each of these models enables network operators to enforce different bandwidth constraints for different CTs with some variants in the degree of bandwidth isolation and sharing and in the need for pre-emption[27,28]. Key parameters in these models are those on which the maximum allowable bandwidth depends. This paper describes the bandwidth management problem and its importance towards QoS user needs fulfilment and presents an algorithmic solution. He describes the DS-TE technology as the reference architecture for the current NGNs and illustrates the issues the operators have to address when mapping the services into DS-TE class types. DS-TE network architecture implements Diffserv classification in a Multi-Protocol Label Switching with Traffic Engineering (MPLS-TE) environment. In this paper the author proposed that the bandwidth management in network taking on the DS-TE architecture, which is an advanced solution for multi service QoS aware IP networks. A methodology aimed at guiding the operator towards the classification of the provided services traffic flows into class type and setting of the bandwidth constraints has been presented.

3. Conclusion

The objective of the work proposed in this research paper is to explore the time-based resource allocation (storage) problem to increase the utilization of a cellular network. Our work in this regard resulted in the following main contributions: (1) an algorithm for finding the optimal bandwidth allocation in time. (2) a measurement scheme to construct arrival/residence time distribution based on just monitoring the handoff events and (3) a time-based resource reservation In this point of view, this research paper proposes optimized channel allocation algorithm which uses cross layer architecture to efficiently utilize the bandwidth and time and priority based reservation scheme. With the enormous growth of mobile users, effective utilization of bandwidth is very much essential. These procedures are used to reduce the call blocking probability, call dropping probability, end-to-end delay and thereby increasing the performance of the system by increasing the throughput of the complete system. Main objective of this research is to maximize the quality of service by the efficient utilization of bandwidth reservation. To have a channel allocation scheme which reduces the blocking of new calls and also efficiently handles handoff calls without dropping them. The paper aims to provide better performance in bandwidth reservation and channel allocation procedures. in packet delivery and to increase the throughput of the system.

Our further extension of our work will involve taking more realistic scenarios as mentioned in and use different spatial resource allocation schemes along with our scheme to find how they work together under varied mobility patterns.

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