Enhance Quality Of Services In Common Radio Resource Management In Heterogenious Network

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Abstract

Radio Resource Management refers to a group of mechanisms that are collectively responsible for efficiently utilizing a Radio Access Technology to provide services with an acceptable level of QoS. RRM mechanisms contains Power Control ,Handover Control , Packet Scheduling or Congestion Control , and Admission Control .Radio Resource Management new strategies are implemented independently in each RAT. RRM strategies is suitable for the heterogeneous network, because each RRM strategy only considers that situation of one particular RAT. CRRM strategy is also known as Multi-access RRM(MRRM) has been proposed. In this paper focus on JCAC algorithm has been presented. Considering four different simulation results are obtained and compared. Result show joint management of radio resources and bandwidth adaptation reduce call blocking or dropping probability in heterogeneous cellular networks.

Keywords AC,CRRRM,RAT,RRM,HC,QOSetc.

I. INTRODUCTION

Next Generation cellular networks from one generation to another has deployment of multiple radio access technologies such as 2G/2.5G/3G/4G in the same or different geographical area. This scenario is heterogeneous cellular networks.

When the radio resources are jointly managed through a joint call admission control algorithms are needed for making radio access technology selection decisions. This paper gives an study of joint call admission control in heterogeneous cellular networks. It then presents a new model of load-based joint call admission control algorithm. Four different scenarios of call admission control in heterogeneous various cellular networks are analyzed and compared with the help

of simulations and results are given to show that the effectiveness of call admission control in the different scenarios.The concept of common radio resource is to efficiently manage the common pooling of radio resources that are available in each of the existing radio access technologies In heterogeneous cellular networks, the radio resource consists of resources that are available in a set of cells under the control of a radio network controller .

II. RELATED WORK

OBJECTIVE

Guarantee the QOS requirements (data rate, delay, and packet loss) of accepted calls.
• Minimize number vertical handoffs, uniformly distribute network load as much as possible,
• Minimize call blocking/dropping probability,
• Maximize operators' revenue,
• Maximize radio resource utilization

MOTIVATION

These motivations are (1) limitation of a single radio access technology (2) users' demand for advanced services and complementary features of different Radio Access Technology, and (3)

Evolution of a new wireless technology. Every RAT is limited in one or more of the following: data rate, coverage, security levels, types of services and quality of service it can provide.

PROBLEM STATEMENT

The coexistence of different cellular networks in the same and different geographical area necessary Common radio resource management for enhanced quality of service provisioning and efficient radio resource utilization. The concept of CRRM arises in order to efficiently manage the common pool services radio resources that are available in each of the existing radio access technologies RAT . In heterogeneous cellular networks, the radio resource consists of resources that are available in a set of cells under the control of a radio network controller and a base station controller.

EXISTING SYSTEM

•A new wireless networks are used radio resource management algorithms are responsible for efficient and effective utilization of the air interface resources in order to integrated guarantee of quality services maintain the planned coverage area, and offer high capacitive. In distributed cellular networks, radio resource can be independently managed as shown in Figure 1

Fig. 1. Independent RRM in heterogeneous wireless networks.

Jointly managed as shown in Figure 2.Joint management of radio resources enhances quality

of service and improves overall radio resource utilization in heterogeneous cellular networks. With joint radio resource management in heterogeneous cellular networks, mobile users will be able to communicate through any of the available radio access technologies (RATs) and roam from one RAT to another, using multi-mode terminals.
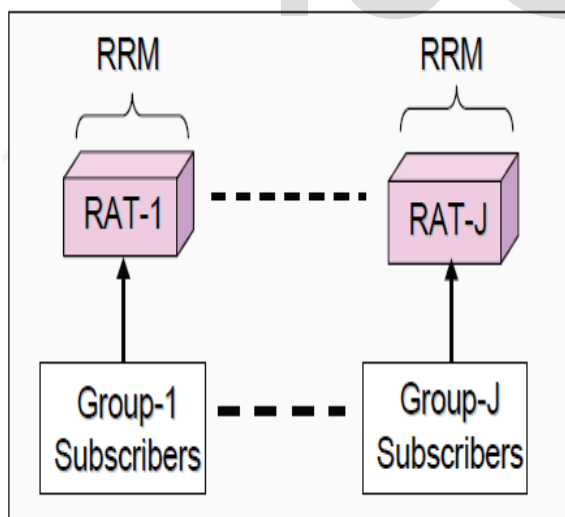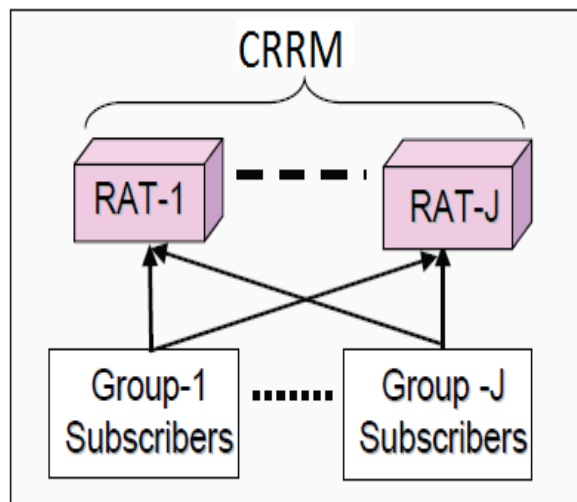

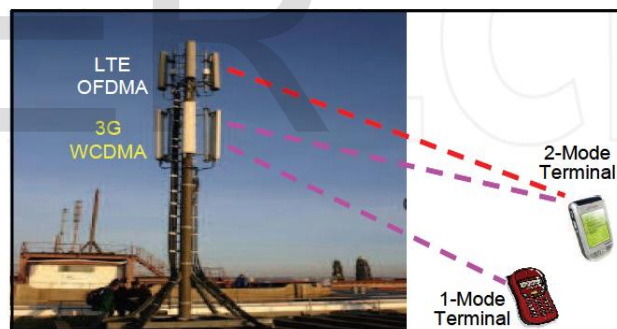Fig. 2. Common RRM in heterogeneous wireless networks

Fig. 3. A typical two-RAT heterogeneous cellular network with co-located cells.

Availability of multi-mode terminals is very crucial for efficient radio resource management in heterogeneous wireless networks. A mobile terminal can be single-mode or multi-mode. A single-mode terminal has just a single RAT interface, and therefore can be connected to only one RAT in the heterogeneous wireless network. A multi-mode terminal has more than one RAT interface, and therefore can be connected to any of

two or more RATs in the heterogeneous wireless network. As show in Figure 3, a subscriber using a two-mode terminal will be able to access network services through either of the two RATs. However, a subscriber using a single-mode terminal will be confined to a single RAT, and cannot benefit from joint radio resource management in the heterogeneous wireless network.In heterogeneous cellular networks, radio resources are managed by using algorithms such as joint call admission control algorithms, joint scheduling algorithms, joint power control algorithms, load balancing algorithms, etc. This paper focuses on joint call admission control (JCAC) algorithms in heterogeneous cellular networks.

PROPOSED ALGORITHM

Joint Call Admission Control in heterogeneous cellular networks

JCAC algorithm is one of the JRRM algorithms, which decides whether an incoming call can be accepted or not. It also decides which of the available radio access networks is most suitable to accommodate the incoming call. Figure 4 shows call admission control procedure in heterogeneous cellular networks.
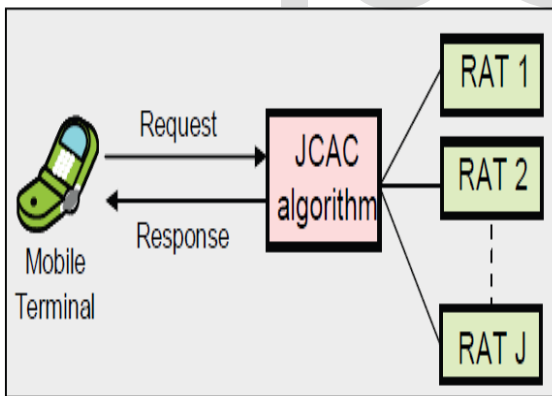

Fig. 4. Call admission control procedure in heterogeneous cellular networks.

A multi-mode mobile terminal wanting to make a call will send a service request to the JCAC algorithm. The JCAC scheme, which executes the JCAC algorithm, will then select the most suitable RAT for the incoming call.

PROPOSED METHODOLOGY

RAT selection approaches used in JCAC algorithms

RAT selection approaches have been proposed in this paper JCAC algorithms in heterogeneous cellular networks. Broadly classified as single or multiple criteria. Single-criterion for JCAC algorithms make call admission decisions considering one criterion, such as network load services cost and services class, random selection, path loss measurement, RAT layer and terminal. On the other hand side multiple criteria of JCAC algorithms used for RAT selection decisions based on combination of single or multiple criteria. The multiple criteria are combined using computational intelligent technique (such as fuzzy logic, Fuzzy-neural, Fuzzy MADM or non-computational intelligent technique (such as cost function). Figure 5 the different approaches for different RAT selection decisions by JCAC algorithms..
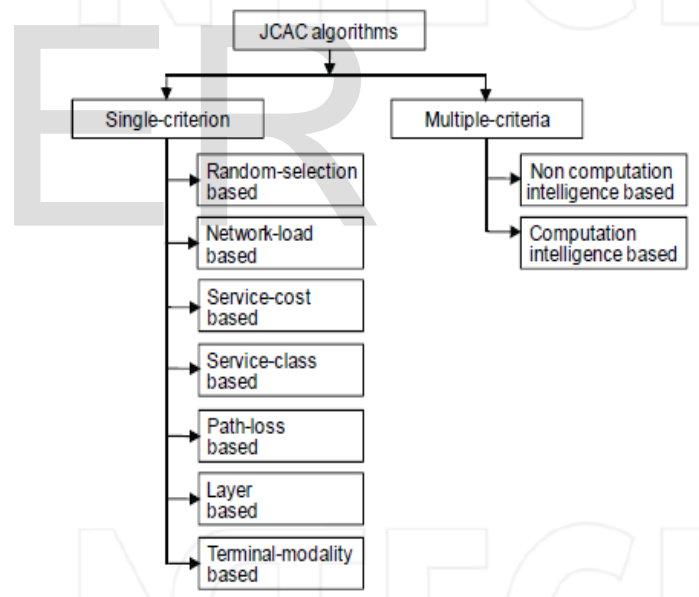
RAT selection decisions by JCAC algorithms

CRRM METHODOLOGY

Basically CRRM concept is based on a two-tier Architecture RRM model consisting of CRRM and RRM entities as shown in Fig.The RRM entity is located at the lower tier and manages RRU within a

RAT. The CRRM entity is at the upper tier of the twotier RRM model. It controls a number of RRM entities and can communicate with other CRRM entities. Based on the information gathered from different   controlling RRM entities, the CRRM entity is able to know the

 RRU availability of multiple RATs technology and allocate a user to the most suitable RAT. The interactions between RRM and CRRM entities used two basic functions. The first function is referred to as the information reporting function, which allows RRM entities to access relevant information to their controlling CRRM entity. The information reporting can be performed either periodically triggered by an event. The reported information contains static cell information cell relations, capabilities and capacities provide efficient quality of sevices, maximum bit rate for a given services and dynamic cell information cell load or received power level, transmit power level, and interference measurements, etc.
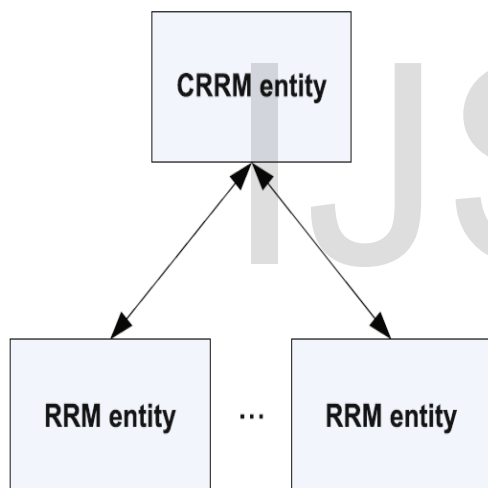

Fig. 2.1 Two-tier RRM model

The second function is used for RRM decision support function, which is in such a way that RRM and CRRM entities interact with each other to make the decisions as shown in Fig. 2.2. There are two RRM decision-making methods. One is CRRM centered decision making in CRRM entity makes the decisions and informs RRM entities to execute them. The second is local RRM decision making in CRRM entity only advises for RRM entities and final decision is made by the RRM entities rather
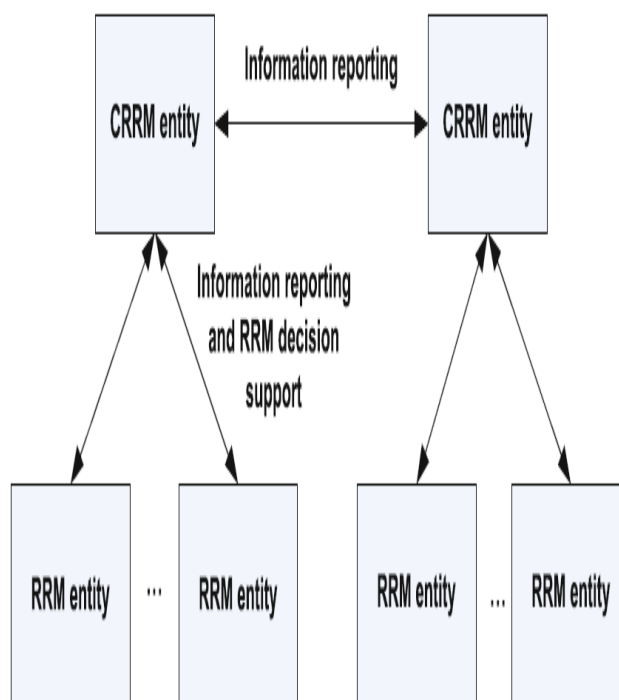
than the CRRM entity
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Fig. 2.2 CRRM interaction model

CONCLUSION

Now a days coexistence of multiple cellular networks in the same geographical area has enabled more efficient utilization of radio resources and enhanced quality services and provide through joint radio resource management. Joint call admission control in heterogeneous and distributed cellular networks has been given in this paper. Different approaches for selecting RATs in heterogeneous cellular networks name as : random selection, network load, service-class, path loss, layer, terminal modality, computational intelligence or non computational intelligence techniques have been proposed to solve this problem .Considering new four different simulation results are obtained and compared. Proposed results show that joint management of radio resources and bandwidth reduce   call   blocking/dropping   probability   in heterogeneous cellular networks.

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