DYNAMIC LOAD BALANCING IN LTE NETWORK

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Abstract-*To accommodate high rate together plus capacity in the fifth Generation (5G) communication systems, adapted usage of Time-Frequency resource is essential. So, we tuck on the aggravation of expansion of user association for load balancing in a cellular network along two scales. Initially, we consider joint transmission (JT), which is one of the coordinated multipoint (CoMP) approach, with which a user may be simultaneously served by Heterogeneous base stations. second, we report for, the merging relation between the central station load levels that are subordinate to each other due to inter-cell interference. We formulate two optimization issues, load minimizations (MinSumL) and maximum load minimization (MinMaxL).we propose a mixed integer linear programming(MILP) based schemes by means of linearization. This approach also leads to a spring pattern for fulfillment law. Then, we derive a set of sectional action. Attainment of the conditions assurance fulfills the improvement of both MinSumL MinMaxL. The key result is then developed based on the actions. Simulation results are contributed to revealing the effectiveness of the approaches.*

***Key Words*: joint transmission , cellular networks, base station, interference, linearization.**

1. INTRODUCTION

Following the innovation of smartphones and tablets, the demand for worldwide internet coverage and high-speed internet has aspired rapidly. Global mobile data service grew 74% and Fourth-Generation traffic exceeded 4G Third-Generation 3G traffic for the first time in 2015. The implemented infrastructure cannot change as active to keep up with the fast-growing rate of data application. The high demand for a bad composition means low free capacity and this results in poor service quality and flux congestion.

In a Long Term Evolution (LTE) network which is governed by OFDM, these resources are evaluated as units in the time-frequency region and called as fortune units. This concept has proved to be very reliable for performance characterization.

2. HETEROGENEOUS NETWORK

First, we have to create a heterogeneous network in a Network Simulator(NS2) platform. TheNetwork is a Hexagonal region. In that hexagonal region, there are many cells namely Small cells, Microcells, Macrocells and User Equipment. After creating a Network we have to link the cells and User Equipment using a code. Hetnet is about developing the spectral capability of total range. Employing a merge of macro, pico, femto and relay base stations, heterogeneous networks empower flexible and low-cost distributions and produce constant broadband distributions to users everywhere in the network. This paper discusses the demand for an alternative deployment model and topology using heterogeneous networks. To enhance the execution of these networks, foremost techniques are explained, which are essential to govern and manage interference and convey the entire boon of such networks. Range expansion allows more user stations to benefit exactly from low-power base stations such as picos, femtos, and relays. Adaptive inter-cell interference organization provides bold resource share to the interfering cells and improves inter-cell. We will define two multi objective optimization problem, which is MINSUML and MINMAXL. The Solution to the Minimum of Maximum Load (MinMaxL) problem gives the association which minimizes the maximum load between the cells. The solution to the Minimum Total Load (MinSumL) problem gives the association which minimizes the total load throughout the Network.

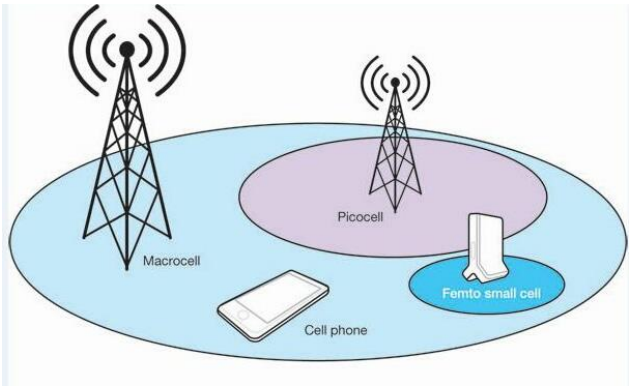

Fig.1.Heterogeneous network

2.1 MACRO CELL

A macrocell is a unit in a mobile phone web that provides radionics broadcasting served by a high power cell site (tower, antenna or mast). originally, macrocells provide coverage larger than microcell. The antennas for macrocells are horsed on ground-based pole, rooftops, and other actual configurations, at a height that accommodates a pleasant representation over circumferential architecture and ground. Macrocell base locations have

effectiveness achievement of frequently tens of watts. Macrocell execution can be elevated by broadening the capability of transreciever. macro-cellular networks, with cell radius 1-30km

2. 2.MICRO CELL

A microcell is a unit in a mobile phone system supplied by a low capability essential base station (tower), covering a constrained area such as a shopping center, a motel, or a transit hub. A microcell is usually larger than a picocell, though the estimation is not always crystal. A microcell uses power control to limit the radius of its description space. Frequently, the range of a microcell is less than two kilometers wide, whereas standard base station may have ranges of up to 35 kilometers (22 mi).

3. JOINT TRANSMISSION

If the Resource unit is not sufficient for users means we have to go for Joint Transmission i.e, to shift one cell to another. Joint Transmission occurs not only from the single network but also from another network. The present aim towards smaller cells, an increasing number of users of mobile networks abide at the peak among two cells; these users mainly accept poor service as a execution of comparatively weak signal and strong interference. Correlative Multi-Point (CoMP) with Joint Transmission (JT) is a mobile networking technic allowing multiple Base Stations (BSs) to intimate transfer to a single user. This boost the users' recipient conditions and prosperity better service to cell-edge users. We scan a CoMP-licensed network, enclosed of multiple BSs mutually dependent by a telecommunication network.

The spectral ability of a single link between a transmitter and a receiver is reserved by the convenient transfer power but the total spectral ability can be boosted by simultaneous transmissions among many devices. This accounts inter-user interference and if not perfectly composed can degrade the execution of the specific link.

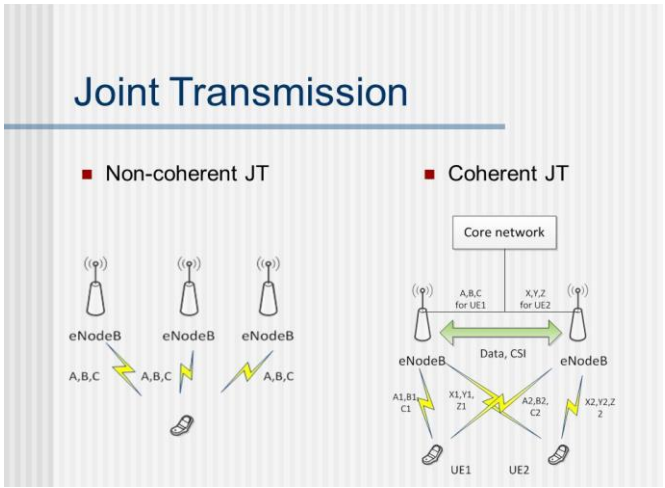

Fig.2.Joint Transmission

3.1 Non-Coherent JT

Non-coherent joint transmission (JT) is unusually appealing due to its minor convolution, shorter overhead, together plus the ability for load balancing. But, a generic analysis of this technique is difficult mostly due to the loss of tractable models. Non-coherent JT by small cells provides spectral ability gains without significantly increasing cell load.

3.2 Coherent Transmission

Coherent optical transmission is a technique that uses modulation of the amplitude and phase of the light, also transmission across two distribution, to approve the transport of considerably more information through a fiber optic cable. Using digital signal processing at both the transmitter and receiver, coherent optics also offers higher bit-rates, greater degrees of flexibility, simpler photonic line systems, and better optical performance.

4. LOAD CELL INTERFERENCE

When we vary User devices to another network means it create a conflict. In our Project, we have to minimize the interference using the Heterogeneous Network. Load cell Interference or Inter-Cell Interference (ICIC) procedure, present a result by applying limitations to the Radio Resource Management (RRM) block, improving supportive carrier conditions across subsets of users that are severely stricken by the interference, and thus come through high Spectral Efficiency. This coordinated resource management can be achieved through located, flexible or real-time coordination with the help of additional inter-cell in which the signaling rate can vary accordingly. In general, inter-cell signaling refers to the communication inter

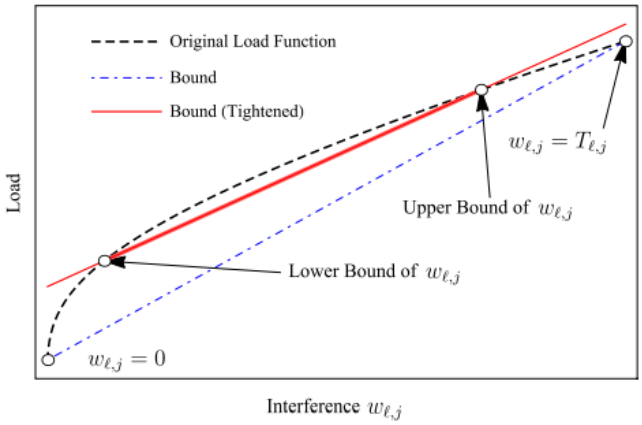

Fig.3.Interference

face among adjoining cells and the received measurement message declaration from the user equipment. The Output is in the form of a graph. If the Interference is higher it gives a non-linear form. In these form we choose two points i.e, Upper Bound and Lower Bound then we joint

those two points using load optimization. Then, the Interference will be minimized.

5. LOAD OPTIMISATION

For Load optimization Network Simulator(NS2) has been used. Network simulation is a procedure whereby an operating system represents the action of a network by designing the interaction between the different network entities (routers, switches, nodes, access points, links etc.). Most simulators use discrete event simulation - the modeling of systems in which state variables change at discrete points in time. The behavior of the network and the various applications and services it supports can then be observed in a test lab; various attributes of the environment can also be modified in a controlled manner to assess how the network/protocols would behave under different conditions.

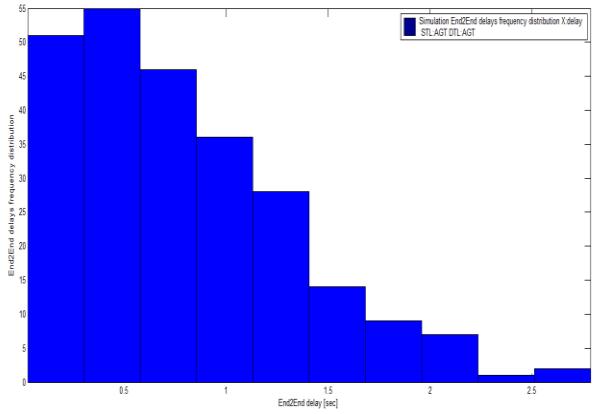

Fig.4.Frequency Distribution

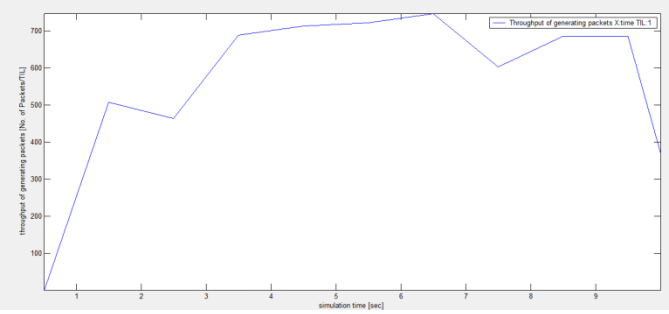

Fig.4.Throughput estimation

6. CONCLUSIONS

The project has inspected how to optimize cell-User Equipment combination with Joint Transmission for load-coupled LTE HetNets. The cell load refers to the volume of time-frequency substance for serving user need, and the unit influences each other's' load levels due to mutual interference. Two optimization problems, MinSumL and MinMaxL, have been formulated and analyzed. It also supports 5G network and Under Water Wireless Communication Networks.

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