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A Performance Evaluation of MOBILITY Management scheme for advance Wireless network

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ABSTRACT — Subjective radio system is an empowering wireless system where keen framework having the ability to sharply utilized the range gaps and modify the far reaching radio range. In this paper, we introduce a adaptability plan; permit subjective radio clients to erratically redirect

Almost the best reachable range band when moving from one to another system. Likewise we display moderates the recurrence and likewise the data transfer capacity required for clients' application. It grants clients to get to the better band with a superior cost. Reproduction results demonstrate that the framework monitor clients' congruity of administration amid their mobility and additionally guarantees high administration for essential too assubjective radio clients. Psychological radio structure has been introduced subsequently to range inadequacy furthermore range inadequacy issues. Notwithstanding, they need to confront a few issues relies on upon the changing elements of the open range, makes it harder to bolster continuous correspondences, only in CR cell networks. In this paper, mobility administration strategyfor a range mindful is

Proposed for CR cell networks. At Search Results starting, novel system design is proposed to appease heterogeneous range scope.

KEYWORDS: Cognitive radio, wireless networks, mobility, quality of services.

I. INTRODUCTION

Cognitive radio main goal is to optimize the radio spectrum assignment by dynamically and efficiently exploiting the spectrum white spaces .Cognitive radio (CR) is a new technology that allows terminals to sense the nearby spectrum and utilize detected spectrum holes opportunistically.CR networks define two types of users: primary and secondary users. Primary users (PU) are licensed users that can access the spectrum thanks to their licenses. However, secondary users (SUs) are unlicensed users (or CR terminals) having CR capabilities to opportunistically access the unused spectrum. User's mobility presents an important challenge in CR wireless network (CRWN) since it can significantly affect its performance by causing services interruption or degrading quality of services (QoS) for example. In this topic, we provide a multi-agent based solution for user's mobility to alleviate service interruption issue. Specially, we adopt a specified trading mechanism that we define between SUs and PUs in order to optimize the spectrum attribution during the handoff. We propose hence a real pricing and sharing system between CR networks' users. For a cognitive-radio system to work suitably, it should track closed loop cycle as shown in Figure 1. The figure shows that cognitive cycle is depend on monitor the channel activity, determining the suitable part of the spectrum for communication, role properly to produce the required mode of communication, and make decision from last channel activity. This cycle permits the cognitive-radio system to self-decision making and also self-recon figure its hardware to physically construct the opted mode of communication.

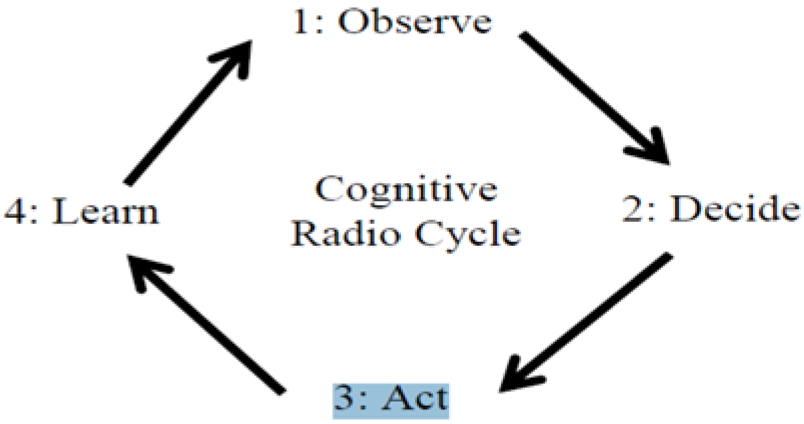

Fig.1 The Cognitive-Radio Closed Cycle

A cognitive-radio device works in the "interweave" or the "underlay" form for good spectrum efficiency. in these both types of forms, the vacant parts of the spectrum also called "white spaces" are always inspected. the primary and secondary users, once discover, are dynamically assign to the different parts of the spectrum. Secondary users are mainly allocated to the white spaces of the channel. in the interweave form of operation, the cognitive-radio device's main function is to find for white spaces, and to determine which white space to assign for secondary users under special rules. The secondary users also convey in this case without any power constraint.

II. MOBILITY SCHEME

A. Cognitive Radio Mobility Scheme

In this section, we briefly describe the scenario we use, and then we present our proposed cognitive radio mobility scheme. We consider a set of mobile CR nodes (MCNs) moving from a zone i towards a zone j through a set of intermediate zones. Zones are considered as ad-hoc or cellular networks and are deployed with a set of primary users (PUs). PUs is operating in different frequency bands. Each zone has its own characteristics such as available frequencies, PUs number and the amount of unused spectrum resources. The challenge, in this scenario, consists in allowing MCNs to move from one Cognitive Radio Cycle 1: Observe 2: Decide 3: Act 4: Learn zone to another one seamlessly without causing service interruption while respecting node requirements and new environment conditions.

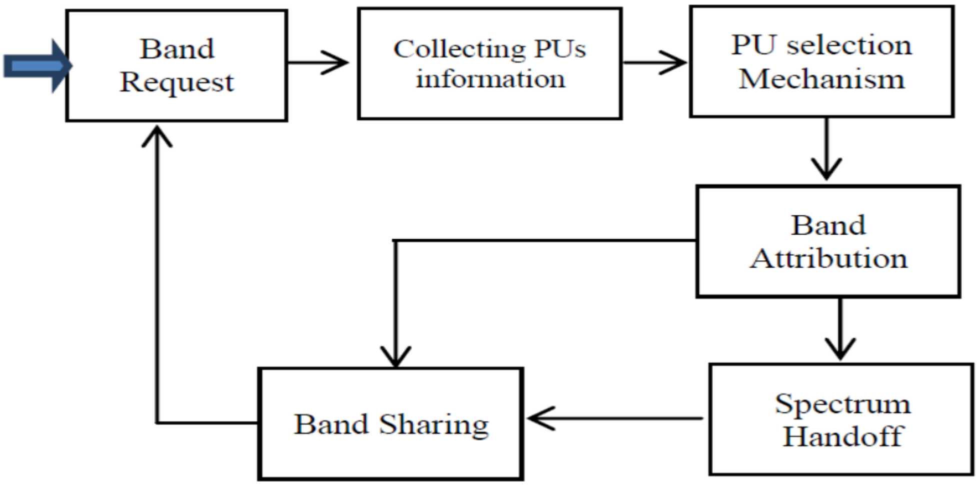

Fig. 2 Handoff steps

As shown in Figure 2, the first step performed by the MCN when it comes close to a new zone is Collecting Pus information. In this step, the MCN broadcasts a band request message to all PUs that is in the new zone in order to collect information about PUs spectrum band conditions. Secondly, the MCN removes from recorded list of detected PUs the ones that have not enough free bands regarding MCN's need. If none of the PUs has sufficient bands, the MCN waits for a given time (Δt) and then retries again to access the spectrum.

Otherwise, the MCN proceeds to the selection of the most appropriate PU's spectrum band. The PU selection Mechanism allows the MCN to select the PU having the most appropriate band according to its requirements. Once the appropriate PU is selected, an agreement between MCN and PU is established and the PU attributes needed bands to the requesting MCN.

The selected PU presents a frequency different from the frequency currently used by the MCN. In this case, the MCN has to perform a Spectrum Handoff. The selected PU gives the same frequency the MCN is using. In such a case, the MCN has no need to perform a spectrum handoff and it starts the Band Sharing process. The Band Sharing process allows the MCN to share the band with the selected PU for the agreed use duration.

B. Spectrum Handoff Modelling

Following to the mobility tasks, each handoff scheme requires different approach as shown below**:**

- **Proactive handoff**

When CR users find handoff task, they implement handoff strategy while controlling communications. After CR user comes on all determination for the handoff, they suspend communication channels and jump to a new spectrum band otherwise a new BS. User mobility and cell overload are the examples of proactive handoff events. Most of systematic handoff schemes are relay on the excited approach.

- **Reactive handoff**

CR users should stop the communication immediately in the sensible handoff task. Then, they compose decisions and permit the handoff. Because of that, this handoff comes with additional handoff delay, dissimilar the proactive approach. In the case that the primary user appears in the spectrum, the CR network should initiate the reactive handoff by immediately vacating the spectrum to restrict interference, and then make decision on a new available band.

III. ALGORITHM

A. PU selection Algorithm

Basically, the MCN finds a PU supplying the frequency it is now using to restrict unwanted spectrum handoffs and to protect session continuity. So on this PU is found, the MCN predefines the PU as per use duration ratio. This ratio is defines as PPS. PPS means Price per Second as we consider that the use duration is in seconds. However, in both events, the MCN cannot base its handoff acceptance decision not only on the frequency but also on the PPS indicators so that it has to pay a very high price that eclipse its payment capacity. Let P_{max} be the maximum acceptable price that the MCN can pay for spectrum use. The MCN starts the Trading process in order to find with the PU a common agreement for its spectrum access.

For algorithm prospect we use following notations:

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- Free_PU_List: The list of PUs having sufficient free bands.
- PU_{sf}: The PU affording the frequency that MCN is using.
- P_{max}: The maximum price accepted by the MCN.
- $P_{initial}$: The price initially proposed by the PU.
- $D_{initial}$: The duration initially proposed by the PU.
- PPS: Price per use duration proposed by the PU.

$$PPS = \frac{P_{initial}}{D_{initial}}$$

BEGIN
The MCN searches for a PUsf in the Free_PU_list.
If (No PU_{sf} is found)
Then
$PU_{preselected} \leftarrow$ PU having the lowest PPS
Else
$PU_{preselected} \leftarrow PU_{sf}$
End If
//The MCN verifies the Price proposed by the $PU_{preselected}$
A: If
$\left(P_{initial}(PU_{preselected}) \leq P_{max}(MCN)\right)$
Then
$PU_{selected} \leftarrow PU_{preselected}$
Else
//The MCN starts a Trading process with the $PU_{preselected}$
Price_Negotiation()
If (Price Negotiation succeeds)
Then
Trading result= successful
Else
Duration_Negotiation()
If (duration Negotiation succeed)
Then
trading result $\leftarrow$ successful
Else
trading result $\leftarrow$ failed
End If
End If
If (trading result== successful)
Then
$PU_{selected} \leftarrow PU_{preselected}$
Else *//choice of another PU*
$PU_{selected} \leftarrow$ Next PU having the lowest PPS
Go to A
End If
End If
END

B. Trading Process

As the trading process is switch on, the MCN tries to cheapen PU's price by trying to pay a P_{new} new price equal to it's P_{new} as for spectrum use. If the PU not allows its offer, the MCN tries to negotiate a use duration extension and proposes a new duration D_{new} as given by equation,

$$D_{new} = D_{initial} \times {P_{initial}}/{P_{max}}$$

Where $P_{initial}$ and $D_{initial}$ represent the price and the duration initially proposed by the preselected PU, respectively. Figure 3 shows PU and MCN function during the trading process in detail.

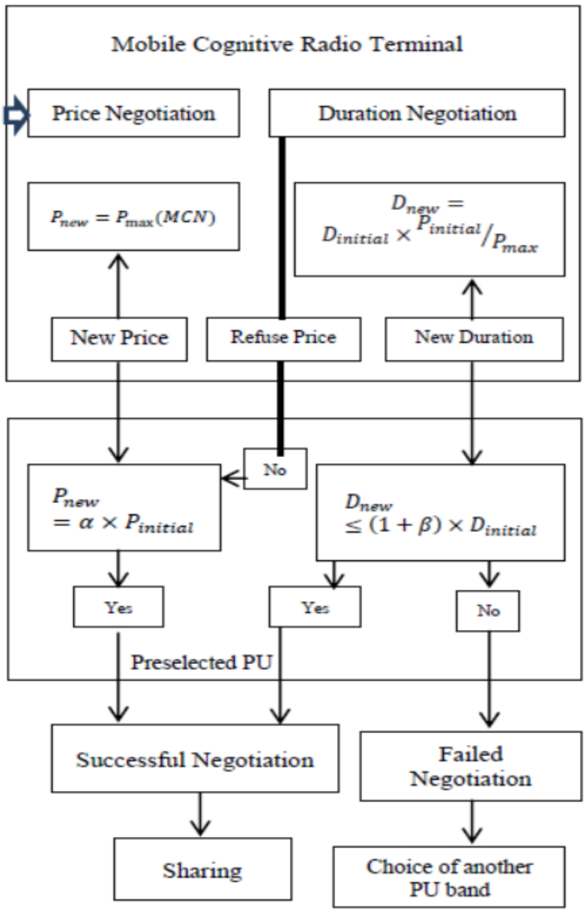

Fig. 3 Trading Process

IV. IMPLEMENTATION RESULTS

The simulations have been implementing on the influence of our trading based approach on user's continuity of service and users' satisfaction. We obtain our tests results under network simulator 3, which is a discrete event simulation tool.

In order to analyse the newly designed mobility scheme for cognitive radio different simulations are performed for cognitive radio network. The most important parameters to analyze the wireless network are throughput, delay, packet delivery ratio, jitter etc. Here the network is simulated for the two parameter throughput and delay respectively against number of iteration. Throughput is nothing but the number of bytes transmitted by a particular node for the iterations. While delay against number of iterations shows the delay occurred during transmitting byte for particular iteration. Iteration is nothing but the number of flow between nodes during specified time duration. Similarly other two parameter that is packet delivery ratio and jitter also can be simulated.

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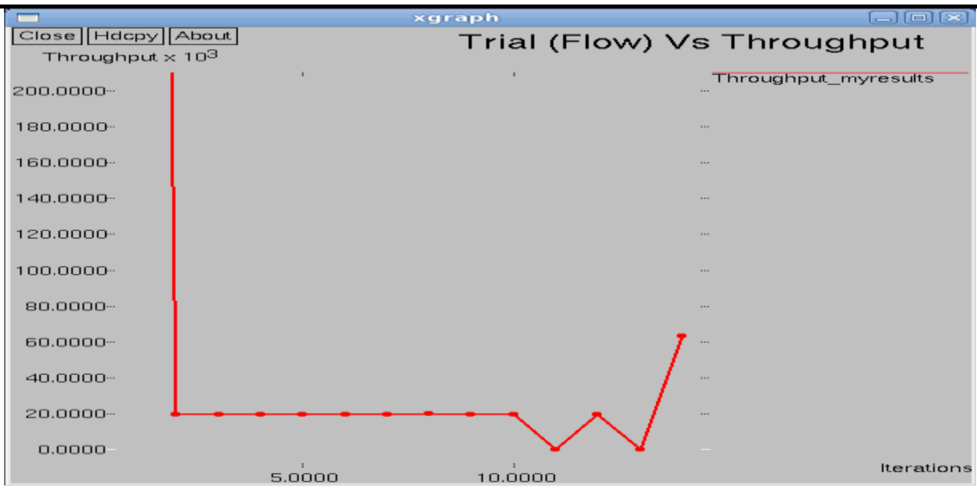

Fig. 4 Throughput generated during data transmission

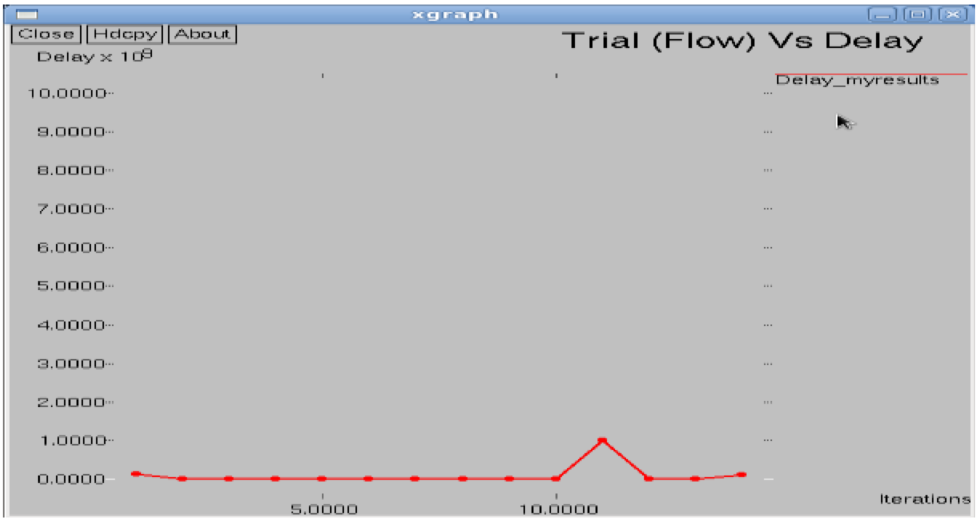

Fig. 5 Delay occurred during data transmission

Packet delivery ratio (PDR) shows number of packet delivered by the node during transmission.

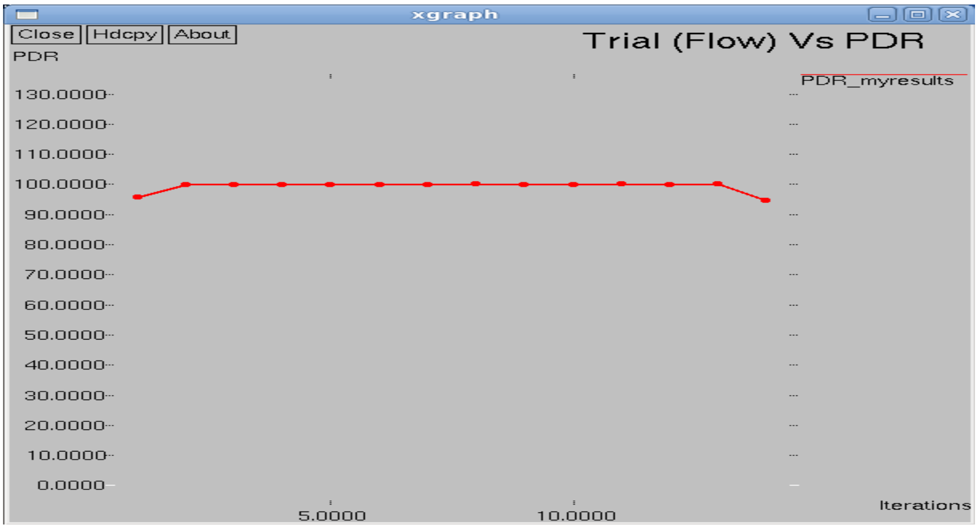

Fig. 6 PDR during data transmission

Jitter shows time between two receiving bytes during transmission.

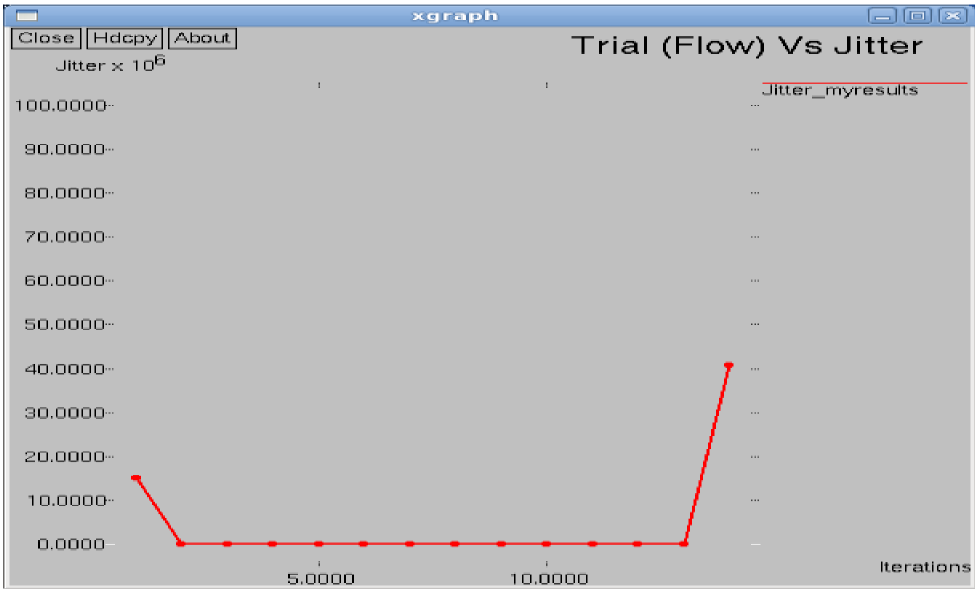

Fig. 7 Jitter during data transmission

V. CONCLUSION

Thus, we discovered a new scheme for mobility management in CR network. Our system takes into account users preferences and spectrum conditions. Simulation results Simulation for cognitive radio network parameter such as throughput, delay, packet delivery ratio, jitter etc had done. For our future work, we will carry out studies conduct the handoff delay and the strike of the speed and the mobility model of cognitive radio users on the system performance.

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