ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2016

Adaptive Spectrum Reuse for Device-to Device Communications Underlaying Cellular Networks over MANET

K.Esther [1], P.Janani[2], D.Evangeline jessy[3], M.Muthulakshmi[4]

Assistant Professor, Department of Electronic and Communication Engineering, Christ Institute of Technology, Pondicherry, India1

B.Tech, Department of Electronic and Communication Engineering, Christ Institute of Technology, Pondicherry, India[2], [3], [4].

ABSTRACT: Spectrum Reuse management in the Cellular communication is the most important criteria and issue to be Maintained the packet and data while processing Device to Device communication over Manet environment. Queuing is one of the very important mechanisms in system capacity. Mobile Adhoc network (MANETs) presents a good platform for the fast deployment of Device services in many application scenarios. , the main challenge in extreme sensitivity to spectrum reuse and packet loss in cellular communication over Manet. In this paper a new methodology is proposed which enhance the performance of spectrum reuse and enhance system capacity load in device to device communication carrying over MANET environment. Through simulation and mathematical expression we analyze and evaluate QOS parameters. Simulation experiments demonstrate that the proposed method does provide adaptive spectrum reuse in cellular communication network.

KEYWORDS: MANET, QOS

I. INTRODUCTION

Device-to-device (D2D) networking allows direct communication between cellular mobiles, thus bypassing the base stations (BS). D2D opens up new opportunities for proximity based commercial services, particularly social networking applications [2], [3]. Other use cases include public safety, local data transfer and data flooding [3]. Further, D2D may bring benefits such as increased spectral efficiency, extended cellular coverage, improved energy efficiency and reduced backhaul demand [4], [5]. A movable ad hoc network (MANET) is a meeting of wireless mobile hosts which carefully form a scheme. It is repeatedly, self-configuring, infrastructure-less system of mobile devices connected without wires.[1]

II. RELATED WORK

The idea of incorporating D2D communication in cellular networks, or more generally, the concept of hybrid network consisting of both infrastructure-based and ad hoc networks has long been a topic of considerable interest. In earlier studies D2D was mainly proposed for relaying purposes. Since D2D communication is a new trending topic in cellular networks, there is no survey available on the topic. However, from an architectural perspective, D2D communications may look similar to Mobile Ad-hoc NETworks (MANET) and Cognitive Radio Networks (CRN). However, there are some key differences among these architectures that cannot be ignored. Although there is no standard for D2D communications.

III. PROBLEM IDENTIFICATION

Cellular communication application such as reporting calculation, event detection, channel capacity, and site aware routing [1]. In such application, sensors nodes are categorized into fasten nodes (AANs) and unknown nodes

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2016

(AUNs). The major distinction among them is that the AANs know their locations, for instance with the help of spectrum reuse problem is a major, whereas they are unknown for the BS (Base Station) [1]. A Device communication scheme tries to improve the capacity the BS using the in order extracts from the signal between the nodes. The in order can obvious itself in the form of received signal strength indicator (RSSI), time of arrival, angel of arrival, and time differential of arrival [1]. Among them, RSSI-based localization schemes are the most prevalent one due to easier implementation and less complexity [1]. In this method, the distance between the nodes is estimated using a signal propagation model is calculated.

AODV

AODV is a steering protocol for MANETs and additional wireless adhoc networks. In AODV Routing Protocol a way is recognized simply when it is necessary by a basis node for transmitting data packets. AODV build routes using a route ask for and route reply instrument. When a source node needs a route to a purpose it broadcasts a route demand (RREQ) packet crossways the system. Nodes in receipt of this packet inform their in order for the source node. The RREQ contain the most recent series figure, basis node's IP address, and development number and broadcast ID. If the node that receives is either a destination or if it has route to destination with equivalent sequence number it sends a route reply RREP.

IV. PROPOSED ALGORITHM

The procedure of in-between the network into unified substructures is called node movement and the unified substructures are called **ADBPQ (Adaptive Distance Based Priority Queue)**. The Priority Weight head (PH) of every cluster act as a manager within the base. Each PH acts as a provisional base position within its zone or cluster. It also communicates with additional PHs [2].

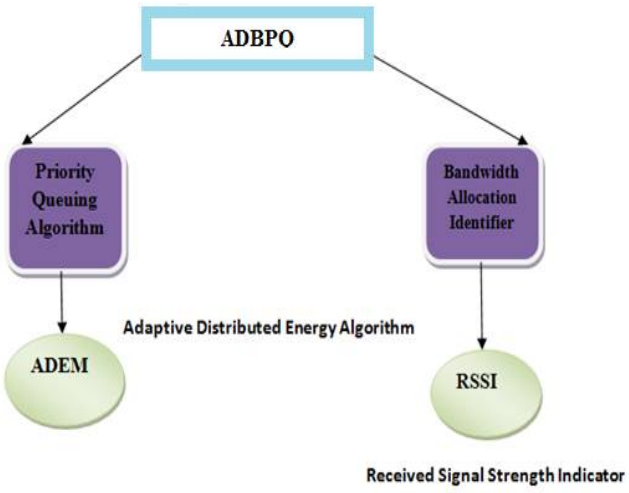


Fig: 1 Proposed Mechanism Diagram

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2016

Table: 1 Frame Format

ST.B (1 Bit)	NID (1 Byte)	H.C (1 Byte)	DIST (1 Byte)	A (1 Byte)	DID (1 Byte)	STOP (1 Bit)

ST.B—Start Bit; NID-Node ID; H.C-Hop Count; DIST: Distance; A-Acknowledgement; DID-Destination ID; STOP-Stop Bit

Functional Diagram

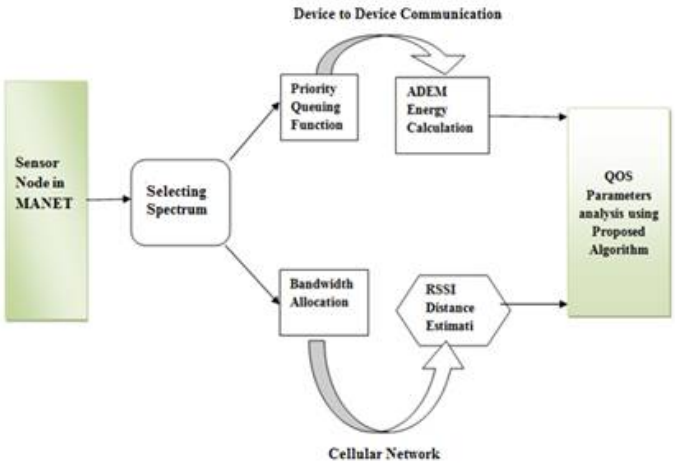


Fig:2 Functional diagram of Adaptive Distance Based Priority Queue

A. ***ADBPQ- Adaptive Distance Based Priority queuing:***

Base Internet Protocol in Manet over cellular communication base direction-finding traffic management to psychoanalysis 128 bit format, the final goal is to give analysis traffic management in cluster based Mobile ad-hoc surroundings. To give better Quality of Services (QoS) in different parameters. [2]

B. ***Priority – Head (PH) Algorithm:***

It uses location information for node configuration. It selects the node head from the uppermost degree node in a neighborhood. To psychoanalysis the node in small package flow in First comes First Out in priority basic influx device in group of nodes in cluster background.

C. ***Bandwidth-Identifier (BI) Algorithm:***

The node with the smallest amount identifier (ID) is selected as a cluster head. This cause bandwidth space portion in resulting a short lifetime span of the system. The distance opinion flanked by nodes for allocates the traffic flow in particular bandwidth Head selection.

D. ***Adaptive Distributed Energy Mechanism (ADEM)***

It is a customized account of the Energy Identifier algorithm. Each cluster selects its cluster skull from its adjacent nodes have the lowly ID. In this algorithm every node can decide its cluster and only one cluster, and transmit only one communication.

The message is notify by different group of cluster mechanism in to allocate the IPv6 direction-finding in over all traffic scenarios.

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2016

E. ***Received Signal Strength Indicator Algorithm (RSSI)***

RSSI-based location algorithm uses the average of all calculated location as position estimation of the unknown nodes, also affected by environmental factors. This makes the algorithm accuracy is not high in energy constrained, environmental change in wireless sensor networks.

F. ***Message Format Proposed Algorithm***

a. ***Adpt_Config_Request:*** The message is used to start an Auto configuration services requesting after receiving a Discovery message.
b. ***Node_ initialized*** in different routing mechanism
c. ***Sele_Priority _Head***: selection of priority Head in Manet route Mechanism…
d. ***Request:*** this message is used to request an On-line joint IP address and key options.
e. ***Spectrum Reuse Alert:*** this message enables new when a malicious node is discovered along the node.

1) Proposed Algorithm E2RPQ New Priority Queue Formation

Step 1: Income Nodes Packet –Ni
Step 2: Check Node Sequence – Ns-#
Step 3: Check Selection head highest priority Seq-Ps #
Step 4: if
Seq # --→ all the nodes
Step 5: then
Check Black List
if
Black List is un-check
Then
Select high, low, medium head
Else
Reject
Step 6: end if.

2) Formation Algorithm RSSI Mechanism

Input: Set of uni cast node
Output: Set of nearest node
Begin High Priority selection =1*/
Repeat
Select a priority node which belongs to Device Cluster traffic which is 1 hop distance apart from other participating nodes with a small length.
Do
N=ni ; d=d1
Compute a cluster the priority based head high selection.
While ni = nj
Node is formed with corresponding lying with in cluster.

3) Algorithm formation for Bandwidth

DBl-----→ Distance Bandwidth for long
DBs----→ Distance Bandwidth for Short
$Time_{arrival}$--→ loop counter for Distance Estimation
Evaluated RSSI distance estimation in Bandwidth separation
While
Time – arrival value at dis T A
/**********Remains….go while as Selection Head**********/
End while

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

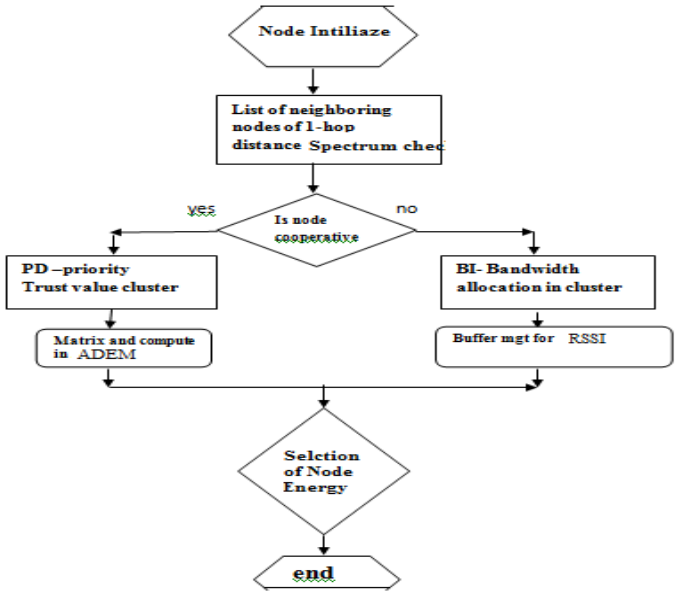
International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2016

If(Time < RSSI D1>D2>D3)
/*********The RSSI formation is true**********/
Else
{
Both D1 & D2
Bandwidth for long in estimation…
End

FLOW CHART FOR E2RPQ



V. SIMULATION RESULTS

The simulation is done in NS2 simulator. To simulate and evaluate the module, it is useful to use the open source network simulator, NS-2. NS-2 is a discrete event simulator written in C++ and Otcl for networking research. It works at packet level and schedules the events such as packet and timer expiration. It provides substantial support for simulation of TCP, routing, and multicast protocols over wired, wireless and satellite networks. NS2 is not a real time simulator. Instead of handling the events at the same time, the centric event scheduler handles events one by one. However it is not a serious problem since the events are often transitory in most network simulations. Nowadays, NS2 is widely used as a standard experiment environment in research community.

NS2 consists of two kinds of classes: C++ classes and OTcl classes. The C++ classes are used for packet handling and event processing. The event scheduler is the main controller of events. The network components are Node, Link, Queue, etc. Both the event scheduler and network components are written in C++. The OTcl classes provide control and configuration functions. With OTcl scripts we can define network topologies, schedule events or applications that we want to simulate. The tclcl is a language that provides a linkage between C++ and OTcl. The compiled objects are available to the OTcl interpreter through the OTcl linkage. Users design and run simulations by using an OTcl scripts. NS2 takes the OTcl script as an input and produces a trace file as output.

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2016

Table 2: Functions used for programming E^{2}RPQ

Function Name	Functionalities
Init_AODV( );	Initial Routing mechanism
Select _Node Priority( );	Selecting Node using WSN module
Power_Down_Mode( );	Analysis Power and Energy module
NH_P( );	Node Head to Priority initialization
BW ENC_Msg_Tx( );	Bandwidth allocation
ADBPQ _Init( );	Initialization of Energy protocol
Read_DIS( );	Reading of Distance in node
Compare ( );	Look for RSSI and Bandwidth
Decision( );	Make a decision on transmission
Reconfig_RSSI( );	Reinitialize / Change the NHS commands

The PH & BA algorithm was developed using the above functions using queuing and cluster logic. The life time of the network can be calculated depending on the energy consumption of the each node at each and every phase.

Device to Device Distance Calculation using RSSI Mechanism

To authenticate the algorithm whether eliminate the effects of path loss and time factor for positioning, system simulation simulates the kinds of environment. In simulated environment 1, assuming Distance attenuation factor of the radio Propagation model n = 2.2. In simulated environment 2, assuming path attenuation factor of the NAM (Network Animation Window)

n = 4.8. Two kinds of the simulated environment in the above, the mobile nodes are taken sequentially as 20 the simulation results is illustrated

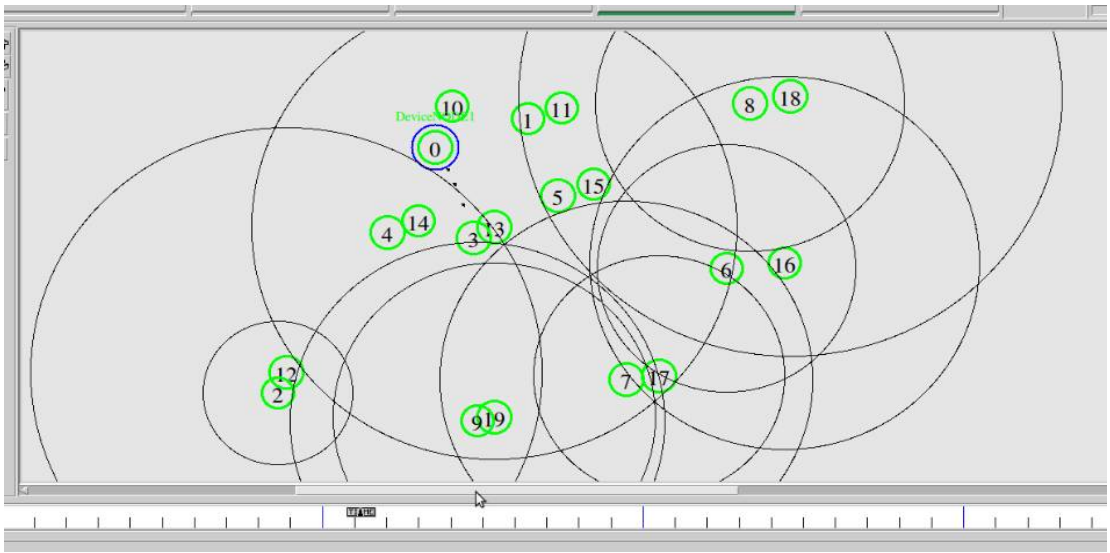


Fig 3: Path Estimation flow in MANET

The spectrum is shared on the priority queuing in the cellular users and the device to device communication and the path of estimation flow is measured in the manet senario

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2016

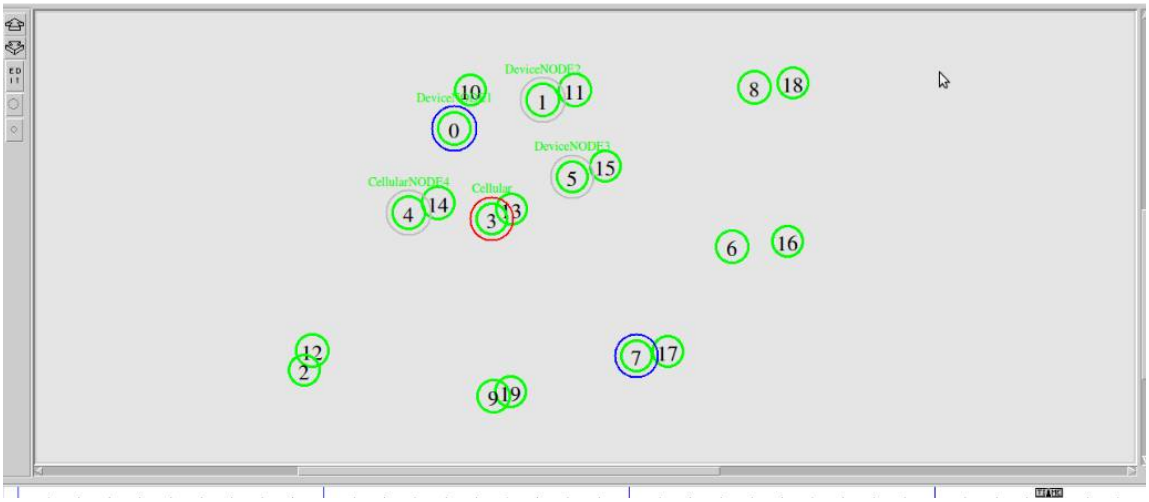


Fig 7 : Spectrum Reuse in Device to Device communication

In this figure the spectrum is shared between the nodes in which the packet has to be transferred. The source node and the destination node between which the spectrum is shared must to selected.

Fig 4:users in cellular range, energy

This shows the number of cellular users to be allocated in a spectrum and the energy of the nodes

VI. CONCLUSION AND FUTURE WORK

This paper presents a new RSSI-based wireless sensor device node antenna gain, etc produce significant changes on the propagation loss, whatever the cellular algorithm is used, located by RSSI measurements are obtain better positioning results. RSSI measurements randomness is corrected by using median method to Suppress RSSI random fluctuations. By the relative relationship of distance between the nodes can calculate the distance between nodes and eliminate the effect of path loss factors. Based on a fundamental understanding of social-aware D2D communication systems in both communication and social domains, we have carried out extensive simulations to evaluate its performance. The results have demonstrated that our solution has a significant advantage over the two state-of-the-art schemes, in terms of reducing D2D data transmission time.

ISSN(Online): 2320-9801
ISSN (Print) : 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2016

VII. ACKNOWLEGMENTS

We thank our HOD **Dr.T.Thirumurugan**, Ph.D. (Department of Electronics and Communication Engineering) to help us for creating this paper with his sincere guidance and Technical Expertise in the field of communication. The help of our guide Mrs.K.Esther, M.Tech, Department of ECE Christ Institute Of Technology (CIT) is really immense and I thank her for her great motivation and encouragement. I would also thank my college Christ institute of technology for giving me the good environment to bring out our talents.

REFERENCES

[1] Yong Li, Member, IEEE, Shuang Su, Sheng Chen, Fellow, IEEE,"Social aware resource allocation for Device-to-Device communications underlaying cellular networks,"June 2015.
[2] H. Ryu and S.-H. Park, "Performance comparison of resource allocation schemes for D2D communications," In Proc. WCNC 2014 (Istanbul,Turkey), April 6-9, 2014, pp. 266–270.
[3] Y. Li, D. Jin, J. Yuan, and Z. Han, "Coalitional games for resourceallocation in the device-to-device uplink underlaying cellular networks,"IEEE Trans. Wirel. Commun., vol. 13, no. 7, pp. 3965–3977, Jul. 2014.
[4] Y. Li, T. Wu, P. Hui, D. Jin, and S. Chen, "Social-aware D2D communications:qualitative insights and quantitative analysis," IEEE Commun. *Mag*., vol. 52, no. 6, pp. 150–158, Jun. 2014.
[5] C. Xu, L. Song, Z. Han, Q. Zhao, X. Wang, X. Cheng, and B. Jiao, "Efficiency resource allocation for device-to-device underlay communicationsystems: A reverse iterative combinatorial auction based approach,"IEEE J. Sel. Areas Commun., vol. 31, no. 9, pp. 348–358, Sep. 2013.

BIOGRAPHY

Mrs. K.Esther is working as an Assistant Professor (Department of ECE) in CHRIST INSTITUTE OF TECHNOLOGY (CIT). She is interested in Electro Magnetic wave theory, wave guides and antennas, Digital signal processing, signals and system, Digital circuits, Electronic circuits.

Ms. P.Janani is a student who is pursuing B.Tech (Electronics and Communication Engineering) in CHRIST INSTITUTE OF TECHNOLOGY (CIT).She is interested in electronic circuits, analog and digital communication.

Ms.D.Evangeline Jessy is a student who is pursuing B.Tech (Electronics and Communication Engineering) in CHRIST INSTITUTE OF TECHNOLOGY (CIT).She is interested in Electro Magnetic wave theory, wave guides and antennas

Ms.M.Muthulakshmi is a student who is pursuing B.Tech (Electronics and Communication Engineering) in CHRIST INSTITUTE OF TECHNOLOGY (CIT).She is interested in control systems and analog communication.