IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 4 Issue 4, April 2017
ISSN (Online) 2348 – 7968 | Impact Factor (2016) – 5.264
www.ijiset.com

Comparative Study on Dynamic Bandwidth Allocation of Adhoc networks for three zones over a network via non homogeneous conditions.

Rajesh Yadhav K [1], Srinivasa Rao T[1] and Prasad Vadamodula[2]

[1] Department of CSE, Gitam Institute of Technology, Gitam University,
Visakhapatnam, Andhra Pradesh, INDIA

[2] Department of CSE, GMR Institute of Technology(Autonomous), Affiliated to JNTU-KUniversity,
Rajam, Andhra Pradesh, INDIA

Abstract:

Non Homogeneous wireless sensor network (NHWSN) routing protocols have drawn more and more attention. Various NHWSN routing protocols have been proposed to improve the performance of adhoc networks. Among these protocols, NHWSN routing protocols can improve the performance of the network significantly using three zones. In this paper, evaluation of three node NHWSN protocols proposed based on its conditions. Main focus on the three node transmitter data and the number of packets sent over network, which is an important aspect to evaluate the monitoring ability of the protocol. A conduct of experiments analyze the performance of the 3 zones under non homogeneous conditions had opted better results compared with traditional methods and 2 zones homogeneous and non homogeneous networks.

Keywords: *3 Node, Adhoc Networ , Buffer, Delay, Performance & Non Homogeneous.*

1.INTRODUCTION

The demand for voice transmission wireless adhoc networks growing rapidly in many different fields. To satisfy this growing demand by many users, various kinds of effective wireless adhoc networks have been developed. Sophisticated Technological Innovations in recent years, a wide variety of wireless adhoc networks are designed and analyzed with effective bandwidth allocation techniques. In general a realistic and high speed transmission of data over wireless transmission lines is a major issue of the wireless systems. It is generally known that the wireless adhoc networks gives better performance over traditions networking and yields relatively short network delay.

1.1 Traditional Approaches & Algorithms Review:

1.1.1 Pro-Active Routing:

- Direction Forward Routing Protocol (DFR)
- Cluster head Gateway Switch Routing Protocol (CGSR)
- Distributed Bellman-Ford Routing Protocol (DBF)
- Highly Dynamic Destination-Sequenced
- Distance Vector routing protocol (DSDV)
- Hierarchical State Routing protocol (HSR)
- Wireless Routing Protocol (WRP)

1.1.2 Reactive Routing

- Ad-Hoc On demand Distance Vector Routing Protocol (AODV)
- Ad-Hoc On demand Multipath Distance Vector Routing Protocol (AOMDV)
- Backup Source Routing Protocol (BSR)
- Dynamic Source Routing Protocol (DSR)
- Signal Stability Routing Protocol (SSR)
- Preferred link based routing (PLBR)
- Temporally-Ordered Routing Algorithm routing protocol (TORA)

1.1.3 Hybrid Routing

- Hybrid Routing Protocol for Large Scale Mobile Ad Hoc Networks with Mobile Backbones (HPRLS)
- Temporally-Ordered Routing Algorithm routing protocol (TORA) and many others etc.
- Core Extraction Distributed Ad hoc Routing Protocol (CEDAR)
- Distributed Dynamic Routing Algorithm Protocol (DDR)
- Global State Routing protocol (GSR)
- Hybrid Ad Hoc Routing Protocol (HARP)
- Augmented Tree-based Routing protocol (ATR)

1.2 Multi-HOP using nodes in Homogeneous and Non Homogeneous Conditions :

The statistical multiplexing in wireless system has a tremendous influence in utilizing channel capacities efficiently. Many of the wireless adhoc networks which support the voice, data and teleprocessing applications are often mixed with statistical techniques and dynamic engineering skills.

Due to the unpredicted nature of demands at wireless transmission lines, congestion occurs in wireless systems. Generally the analysis in a Wireless system is mainly concerned with the problems of allocation and distribution of data packetization, statistical multiplexing, flow control, bit-dropping, link capacity assignment, delays and routing for efficient utilization of the resources.

For efficient utilization of resources, it is needed to analyze the statistically multiplexing of data transmission through congestion control strategies. Usually bit dropping method is employed for congestion control. The idea of bit dropping is to discard certain portion of the traffic, such as least significant bits in order to reduce the transmission time, while maintaining satisfactory quality of service as perceived by the end user, whenever there is congestion in buffers.

Bit dropping method can be classified as input bit dropping (IBD) and output bit dropping (OBD) respectively. In IBD bits may be dropped when the packets are placed in the queue waiting for transmission. In contrast bits are possibly discarding in OBD only from a packet being transmitted over the channel. This implies fluctuations in voice quality due to dynamically varying bit rate during a cell transmission. To maintain the voice quality another approach is to consider dynamical bandwidth allocation in the transmitter through utilizing the vacant bandwidth available in the router for the cells which are dropped from the packet under transmission.

For evaluating the performance of transmitter under following conditions:

(a) at a fixed load when instantaneous fluctuations occur and

(b) under variable load when variations occur due to bit dropping

2.PROPOSED METHODOLOGY

To design and develop various methods under two and three zones wireless adhoc network with dynamic bandwidth allocation under homogeneous and non-homogeneous conditions.

2.1 Case Study 1: To design and develop load dependent dynamic allocation of bandwidth for wireless adhoc networks for two & three zones under homogeneous conditions.

2.2 Case Study 2: To design and develop load dependent dynamic allocation of bandwidth for wireless adhoc networks for two & three zones under non-homogeneous conditions.

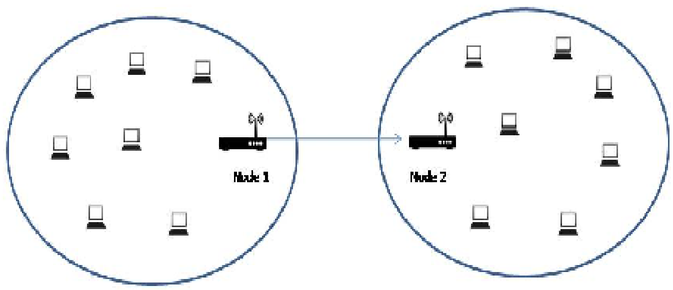

Fig 2.1: Dynamic bandwidth management for wireless adhoc networks for two zones under homogeneous & non homogeneous conditions

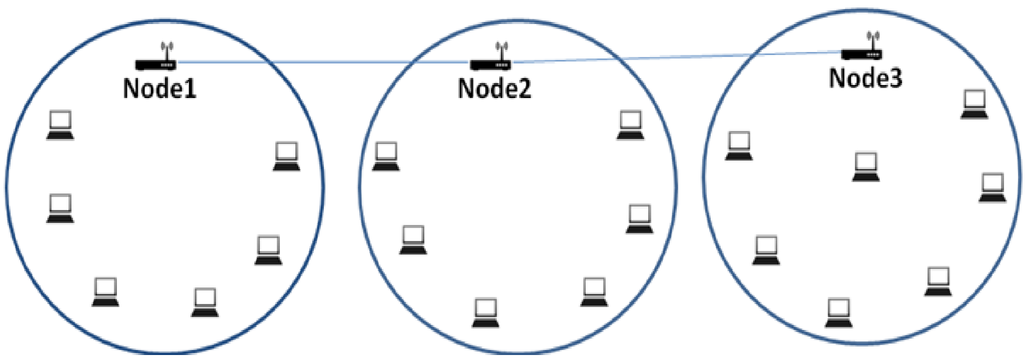

Fig 2.2: Dynamic bandwidth management for wireless adhoc networks for three zone under homogeneous & non homogeneous conditions

2.3 Module Developed for all nodes considering Homogeneous & Non Homogeneous Conditions:

2.3.1 PROPOSED ALGORITHM FOR THREE NODE ZONE

 # Begin

Step 1:

The occurrences of the events in non-overlapping intervals are **statistically independent**.

Step 2:

The probability of **one packet** during a small interval of time h is

$$[\lambda(t)\ h + o(h)].$$

Step 3:

The probability that there is **one packet** transmission through **first transmitter** when there are $\mathbf{n_1}$ **packets** in the first buffer during a small interval of time h is

$$[n_1\ \mu_1\ h + o(h)]$$

Step 4:

The probability that there is **one packet** transmission through **second transmitter** when there are $\mathbf{n_2}$ **packets** in the **second buffer** during a small interval of time h is

$$[n_2\ \mu_2\ h + o(h)]$$

Step 5:

The probability that there is **one packet** transmission through **third transmitter** when there are $\mathbf{n_3}$ **packets** in the third buffer during a small interval of time h is

$$[n_3\ \mu_3\ h + o(h)]$$

Step 6:

The probability that other than the above events during a small interval of time h is **[o(h)]**

Step 7:

The probability that there is **no arrival** to the **first buffer** and no transmission in first, **second and third nodes** during a small interval of time h when there are $\mathbf{n_1}$ **packets** in the **first buffer** and $\mathbf{n_2}$ **packets** in the **second buffer**, $\mathbf{n_3}$ **packets** in the **third buffer** is

$$[1 - \lambda(t)\ h - n_1\ \mu_1\ h - n_2\ \mu_2\ h - n_3\ \mu_3 h + o(h)]$$

End

3. COMPARATIVE STUDY BASED ON ROUTING PROTOCOLS FOR TRADITIONAL METHODS

Attributes	**Proactive Protocols**	**Reactive Protocols**	**Hybrid Protocols**
Update Routing Information	Very Frequently	Based on the demand	Combination of PP & RP., On demand Approaach
Routing Algorithm Includes	DSDV, OLSR & WRP	AODV, DSR & TORA	ZRP, ZHLS, DST & DDR
Distance Vector Robustness in Manets	Very Less	Widely Used	Needed Frequently
Updation of Table	Periodicaly	Very Frequently	Frequently
Computation Cost	Based on its Frequency	New Purchase of Nodes	Based on its Frequency
Recompute Cost	Considered	No , New Information is furnished with freshness	No
Multi Point Relaying	No, It doesn’t supports.	Yes, It supports	Yes, It supports
Optimization	Required	Required	Not required
Reduction of Packets	Based on Reduction Links	Highly adaptive	Getting rid of duplicate Nodes

Shortest Path	Best Solutions	Actual Solutions	Actual solutions
Ability of looping	Free	Free	No
Applicable for Mobile Networks	No	Yes	Used in Sub networks and Sub Zonesz
Casting Opted	Unicasting	Unicasting & Multicasting	Inter Zone Communication & Casting
Intermediate Node Generations	Not required	Generated	Increase and decrease of Bandwidhts
Performance Target	Optimized Performance	Optimized Performance	Best Performance

4. COMPARATIVE STUDY FOR DIFFERENT ZONES UNDER HOMOGENEOUS AND NON HOMOGENEOUS CONDITIONS

	2 Zones Under Homogeneous Conditions	**3 Zones Under Homogeneous Conditions**	**3 Zones Under Non-Homogeneous Conditions (PROPOSED)***
Allocation of Bandwidth	Done dynamically	Done dynamically & could be fixed based on transmitter stability	Idle bandwidth is considered
Access Points	2 Zones consist 2 Access Point	3 Zones consist 3 Access Point	3 Zones consist 3 Access Point
Mean	Minimum	Varies	Fixed
Delay	Low	Very Low	Varies as per accuracy
Service Time	Low	Accurate	Accurate
Ability of reducing the parametric values	Less Packets	More Packets	Fixed Packets
Rate of Packets Flow	Faster	Rapid	Rapid in Nano Seconds
Throughput	Faster in all nodes	Faster in third node & unchanged in the remaining two nodes	Increases in all the nodes, when all the other parameters are fixed.
Utilization	Faster	Stable & Faster	Efficient & Feasible
Mean Delay	Unstable	Faster	Rapid
Futured Name	Single HOP	Two HOP	Two NHOP
Time Increase	Emptiness , Bufferness Decreases in First Buffer & Emptiness , Bufferness	Emptiness , Bufferness Decreases in First Buffer & Emptiness , Bufferness	Probability of Increase or decrease in Emptiness & Bufferness is noticed as fuzzy.

	Increases in Second Buffer	Increases in Second Buffer	
Mean Number of Packets	Increases in First Buffer & Decreases in Second Buffer	Increases w.r.t Buffer and there after gets stabilized & Unchanged Status is Observed in Buffer 1 & 2	Fixed in third Buffer & Increases in First & Second Buffer
Mean Arrival Time	Increases in First Buffer & Decreases in Second Buffer	Increases in third Buffer & No Change in First & Second Buffers	Increases in all the nodes
Utilization of Transmitters	Increases in First Buffer & Decreases in Second Buffer	Stabilized & No change in First & Second Buffers	Increases in all the three nodes transmitters , when all the other parameters are to be fixed for sure.
Buffer Parametric values	Fixed Always	Third Transmitter Increases. & Unchange in First & Second Buffer	Varies in First and Second Node but fixed in Third Node
First Buffer Parametric Values	Dynamically Change	Unchange	First Node generates constant Packets of 17489
Second Buffer Parametric Values	Fixed and Increases the Variance	Unchange	Second Node generates 18831 constant packets
Third Buffer Parametric Values	Not Applicable	Fixed Variance Obtained	Very High Number of Constant Packets are generates based on the bandwidth scope
Transimitter Rates	First Buffer Increases, Second Buffer Increases, Third Buffer Not Apllicable	All the Three Buffers Increases	Third Node Transmission rates are high compared with other nodes
Result Obtained at	Traditional Levels	Accurate Levels	Probabilistic & Optimal Levels
Performance Level	Less Sensitive ad varies	Sensitive and Dependent at all levels	Highly Sensitive at performance level

5. CONCLUSION

Results show that the characteristics of NHWSN on 3 nodes with non homogeneous conditions are better than the homogeneous in terms of all the parametric values of the first node and the number of packets sent over network. As mentioned above, these non homogeneous conditions based protocols have the ability to manage the network and their member nodes and can better balance the consumption of the nodes in the whole network. Moreover, the multi-hop path proposed among the nodes over the network is very important concern to save the delay time during the data transmission.

6. FUTURE SCOPE

- The future scope is used in discovering the route maintenance w.r.t manet protocols under non homogeneous conditions.
- The parametric values of dynamic bandwidth could be extended on non homogeneous

conditions using generated hybrid routing protocols.

- An enhanced routing protocol on non homogeneous conditions to determine the Manet localization performances based on the access points among tandem and adhoc communication networks.
- An enhanced system to develop routing in multicast link using non homogeneous conditions

REFERENCES

[1] Rajesh Yadhav., Srinivasa Rao.(2015), A Survey of various routing protocols in MANETs,International Journal of Computer Science & Information Technology, Vol.6(5),pp 4587 - 4592.

[2] Rajesh Yadhav., Srinivasa Rao.(2017), Dynamic Bandwidh Management for Wireless Adhoc networks for Two zones under Homogeneous conditions, Vol.159(4),pp 0975 - 8887.

[3] Kin K.Leung., L K Kraun et al (1997),Load-dependent service queues with application to congestion control in broadband networks, IEEE Global Telecommunications Conference, Vol.3,pp 1674 - 1679.

[4] Karanam,V.R., Sriram, K., and Bowker, D.O. (1988), Performance evaluation of variable bit rate voice in packet-switched networks. AT&T Technical Journal, Volume: 67, Issue: 5, pp. 57 – 71.

[5] Samarth H Shah, Kai Chen and Klara Nahrstedt (2003), Dyanamic Bandwidth Management for Single hop ad hoc wireless Networks, Proceeding of First IEEE International conference on Pervasive computing and communication, (PerCom'03), pp.1-9

[6] Ying Qiu and peter Marbach (2003), Bandwidth allocation in ah hoc networks: a price based approach, INFOCOM 2003, proceeding of the Twenty second annual joint conference of the IEEE computers and communications,pp797-807.

[7] Iftekhar Hussain, Zaved Iqubal Ahmed, Dilip kumar Saikia and Nityananda Sarme (2015) A QoS aware dynamic bandwidth allocation scheme for multi hop WiFi based long distance networks, EURASIP Journal on Wireless Wireless ad hoc networkand Networking.

[8] Amulya Sakhamuru, Varun Manchikalapudi (2015), Enhancement of fair distribution of Bandwidth over mobile ad hoc networks, International journal of Scienctific & Engineering Research, Vol.6, NO.5, pp. 1445-1449.

[9] Vivita Sherin B and Sugadev M, (2016), Optimization of Dynamic Channel allocation techniques in Mobile wireless sensor networks. ARPN Journal of Engineering and Applied Sciences, Vol.11, No.13, pp. 8221-8225.

[10] Seraphin B.Calo (1981), Message delays in repeated-service tandem connections, IEEE Transactions on Communications,Vol.COM-29,No.5. pp 670-678.

[11] Kotikalapudi Sriram, R.Scott McKinney, and Mostafa Hashem Sherif (1991), Voice packetisation and compression on broadband ATM networks, IEEE Journal of Selected Areas Communications, Vol.3, pp 294-304.