Compatibility Issues and Challenges in 802.11g Implementation: A Review

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***Abstract*-In this paper emphasis is laid on the understanding of 802.11g systems by studying the compatibility and design challenges of the system. Practically these systems pose some configurational security implementation problems, which are to be understood to the fullest. The energy drain topological issues in are studied and some solutions are proposed to eradicate the problems to an extent where intelligent devices can be manufactured. The technology still needs some break through when it comes to security and energy drain issues in multiple networks.**

***Index Terms*-MANET, Multinet, PSM, Security,Wireless**

I. INTRODUCTION

The WLAN technologies we are using currently are association based i.e. once a network card is associated with a network it works for that network in particular entirelyit cannot be used by other networks where different frequency channels are used.The WLAN supports mobile computing in small regions as for example office,airports,railway stations, park etc.The WLAN classified in two main modes, first is named as infrastructure mode or permanent mode and second one is the infrastructure less(adhoc) mode also called temporary mode. In first, an AP is placed in the centre in a wired network and in second one all the stations communicate with each other directly without needing any centralized AP.Along with the advantage of flexibility some other merits of WLAN are mobility, coverage range, ease of use, installation speed,scability and installation and maintenance cost etc.The multinet approach is a software based approach that connects multiple networks simultaneously with the help of a single wireless card multiple networks are studied and some solutions are proposed to eradicate the problems to an extent where intelligent devices can be manufactured. The technology still needs some break through when it comes to security and energy drain issues in multiple networks. In this paper we explore the energy drain issues,power consumption,mutinet and two radios based approach proposed scenarios and results section wise respectively are defined.

1. Energy Drain Issue

The energy drain issue is major responsible for network grid disturbance or its architecture splits. It is one of the main possible attacks against wireless networks .Since we know that in a existing network it is very complicated to replace the existing nodes or batteries since there is a fixed amount of

energy available for the different function so as the foreign nodes or attacker nodes transmits large amount of data to the network so that much energy is required to serve the foreign nodes and in this fashion much energy is consumed and as a result of this some effects are observed on the networks performance.

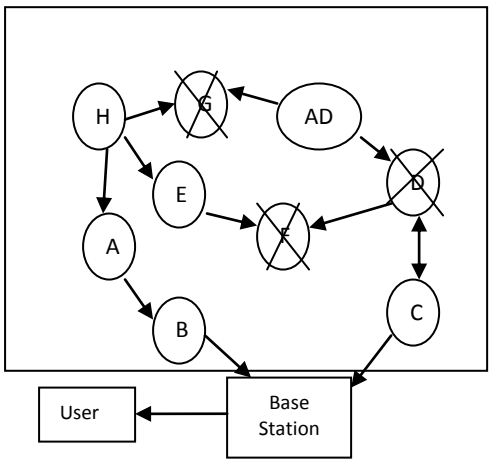

Fig (a): Communication between nodes in a network

The above figure (a)shows AD node which is actually not a part of the network but it try to send packets to the neighbouring nodes(C,D and F) so that the nodes responds and replies to its request and some part of the energy is wasted is done making these false conversations. In Mobile Ad hoc Networks (MANETs) [1,2] nodes are driven by batteries.So limited energy used criteria is always there. The nodes also are of mobile nature throughout the network, if a node goes

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out of the network the link between other nodes and it is broken. There are two major reasons of a link failure:

a) Due to energy drain finally the node stops working or dies and the network performance get affected.b) Node going out of range of its neighboring node. So, to achieve the route stability in MANETs, both stability oflink and node isrequired.

1.1 Power Consumption

One or more APs consists a WLAN.These APs are connected to a wired network.Lastly the wireless linkbetween the remote devices and APs. These remote devices are generally Personal computers,Laptops and notebooks with inbuilt WLAN card.The remote devices like laptops uses battery power and it has mobile nature,on other side AP operates on AC power and generally it is affixed device on a roof of a builing,so our investigation is mainly focused on the energy efficiency of a WLAN remote device.
Adding a WLAN card to a PC or laptop the level of power consumption increases mainly because of two reasons: Due to additional power consumption by the card itself and, rest of the platform who are supporting the card and the WLAN connection. The result analysis of the two modes that is multinet and two radios is to be discussed in the next section.

1.2 Multinet versus Two radios

Multinet is a virtualization architecture for wireless LAN (WLAN) cards. It abstracts a single WLAN card to appear as multiple virtual WLAN cards to the user. The user can then configure each virtual card to connect to a different wireless network. Therefore, MultiNet allows a user to simultaneously connect his machine to multiple wireless networks using just one WLAN card. This new functionality introduced by MultiNet enables many new applications, which were not possible earlier using a single WLAN card. For example,
1. With MultiNet, you can connect to a guest's machine or play games over an ad hoc network, while surfing the web via an infrastructure network.
2. You can use MultiNet to connect your ad hoc network, which may contain many nodes, to the Internet using only one node.
3. MultiNet can help make your home infrastructure network elastic by extending its access to nodes that are out of range of your home WiFi Access Point.
4. Gateway Node: A node that is part of a wireless ad hoc network and close to an AP, connected to the Internet, can become a gateway node for the ad hoc network [3].
5.Concurrent Connectivity: A use can connect her device to a temporary (or Adhoc) network.
6. VirtualMachines: Users can connect different virtual machines [6] to physically different wireless networks communicate by switching on orthogonal channels [5].

II. Security

The Most important challengein wireless networking is security.It is the bone of network administrator and owner of the network.It is a problem with evolving challenges all the time.WLAN has much security iterations throughout its lifetime [3]. The 802.11 standard, its initial ratification, has faced security challenges,and several new standards are being proposed such that they have more secured algorithms and it can provide more secured communication.

III. Proposed scenarios

A wireless device can be connected to multiple networks, which is possible to be connected with the help of wireless cards. A software based approach named as Multinet,which is a virtualization[4]architecture for wireless cards.Another important approach includes fabricated reports should be dropped enroute as early as possible. This MultiNet virtualization architecture gave birth to various applications earlier that were not possible before using alone a single wireless card. Some of them are listed here:

3.1 Capacity enhancement:

The capacity of ad hoc networks could be enhanced when network nodes within range of interference can transfer data by continuouslyswitching on channels which are orthogonal to each other [6].

3.2 Network Elasticity:

For a permanent network its range can be further enhanced by allowing outskirt nodes to act as relays for authorized nodes that are outside the AP (Access Point) range.

When a WLAN card is added to the laptop, platform power consumption increases for two reasons:
1. The additional power consumed by the WLAN card itself.
2. The additional power consumed by the rest of the platform in supporting the WLAN card and the WLAN connection.

IV.Energy Aware protocol

Mobile devices are most useful if they are to be used at “any place and at any time”, Power supply is the most important limitation to achieve this. The management of

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power is very much challenging factor in wireless communication. Many energy aware routing protocols has been proposed and developed some of the important protocols are listed here:

Minimum-MaximumBatteryCostrouting[MMBCR],Minimum Battery Cost Routing[MBCR][7],Request Delay Routing Protocol (RDRP), Max-Min Routing Protocol (MMRP) [8], Minimum Drain Rate (MDR)[9], Energy-Dependent DSR (ED-DSR)[10].In these routing protocols the main objective is to decrease the energy consumed per packet transferred to the receiver from sender.

4.1 Concept of Multipath routing

In the previous section 4.1 the protocols defined are single path based protocols connecting the source and destination. Also in a well-connected network there may have many paths between source and destination pair. In case of multipath routing, more hosts are to be required. In case of wired networks for multipath routing, multiple merits are presented [11,12]the merits of multipathrouting is not obvious in MANETs because the data trafficalong different routes may suffer from congestiondue to broadcasting feature of radio transmission.
In MANET the multipath is used to enhance the network's performance to some extent. For example decreasing the time of end-to-end delay [13], network security enhancement [14], and data delivery robustness [15, 16] .between nodes power consumption balancing. The multipath routing consists of three components:
1) Route discovery,**2)** Route maintenance and **3)**Traffic distribution between multi routes.
Route discovery component includes searching multi routes between source and destination nodes. Second component which is route maintenance includes searching and repairing the faulty and broken paths. Finally the traffic allocation method gives information about how packet data is distributed among the network routes or paths.

V. RESULTS

This section includes the results of above mentioned sections.
After the result section the conclusion section is there which is going to tell us about the whole paper's conclusion in brief.

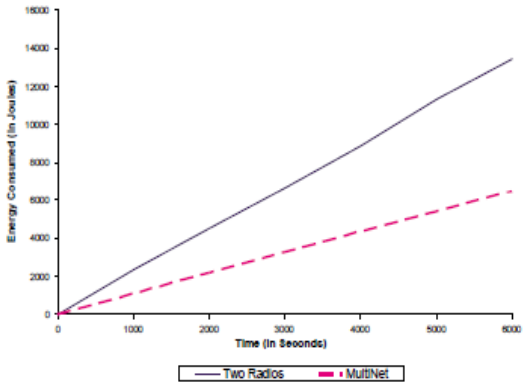

Figure (b): Comparing energy usage for mutinet & two radios

Above Figure (b) shows the aggregate energy consumed by the Multi net scheme and the two radio scheme.

With Power saving mode, the multiple radio approach can be modified to consume less power by allowing the network card in infrastructure mode to use PSM.
Figure shows the energy usage when the infrastructure radio uses PSM for our application

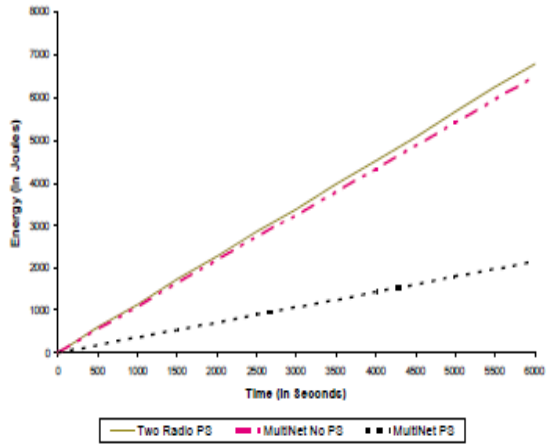

Figure (c): Energy usage for PSM based infrastructure radio

Network	Two radios	Multinet
Adhoc	4.4 Mbps	1.1 Mbps
Infrastructure	5.8 Mbps	4.35 Mbps

Table (a).Throughput comparision between Adhoc and infrastructure network

The above table indicates using two or more radios consumes more power.The radios keep transmitting and

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receiving at all the times as the radios be always be in the ON mode.Even when it is not,the radio is in idle mode,and drains a significant amount of power.
In our simulations we assume that wireless networks operate at their maximum TCP throughput of 4.4 Mbps and 5.8 Mbps for an Adhoc and infrastructure network respectively.

VI. Conclusion

This paper shows the comparision of two radios and multinet approach example for different parameters such as energy consumption by the two approaches and throughput comparison in adhoc and infrastructure network mode. The Multinet approach consumes low energy than two radio system.But still some issues like energy drain and security are a major issues in the implementation of 802.11g.Also the several energy aware routing protocols are presented for management of power consumed.

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