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An Efficient Energy Optimization in Routing Protocol Wireless Adhoc Network

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ABSTRACT

The lack of a fixed infrastructure in ad hoc networks forces ad hoc hosts to rely on each other in order to maintain network stability and functionality therefore an energy efficient model is needed to minimize the cost of communication and to maximize the use of wireless devices which give optimum output. In addition, as ad hoc networks are often designed for specific environments and may have to operate with full availability even in difficult conditions, security solutions applied in more traditional networks may not directly be suitable for protecting them. In ad hoc networks the communicating nodes do not necessarily rely on a fixed infrastructure, which sets new challenges for the necessary security architecture they apply. The main problem involves group members establishing a secure wireless network and at the same time eliminating outside threats. Moreover, in the case where a new node arrives and wishes to become a member of an existing group. Therefore in this paper I try to increase the minimize the security risk in wireless Adhoc networks.

Keywords: Wireless Adhoc Network, Simulation Of Adhoc Network, Energy Management Model, Conclusion.

I. INTRODUCTION

WANET

A **wireless ad hoc network (WANET)** is a method to communicate between two wireless devices with each other Operating in ad-hoc mode allows all wireless devices within range of each other to discover and communicate in peer-to-peer fashion [1][2]

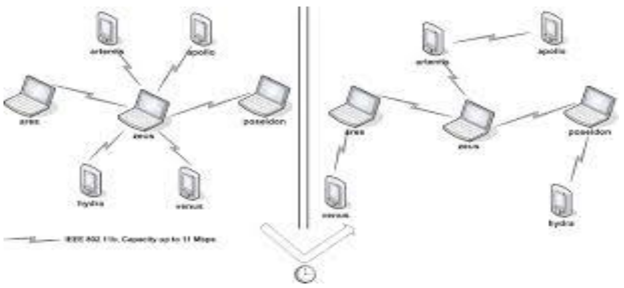

Fig 1: peer to peer network

An ad hoc network typically refers to any set of networks where all devices have to communicate with each other they can be cellular phones or wireless laptops or between cell phone to laptop for the data transfer activities.

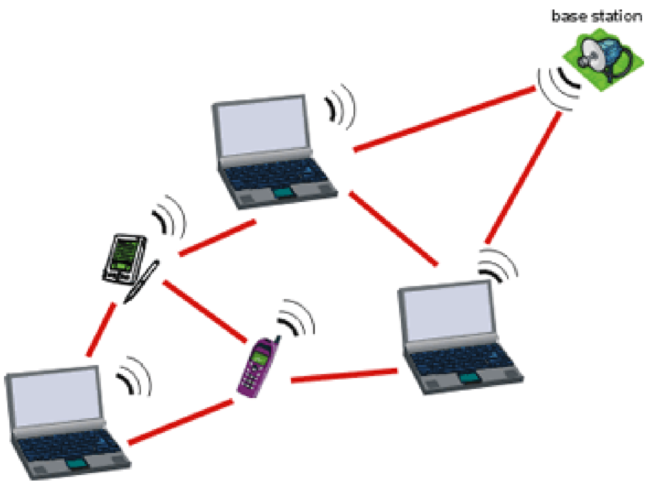

Fig 2: shows the communication between the devices

II. SIMULATION OF ADHOC NETWORK

All the simulations are done through the network simulator-2.35 all in one. As it is the open source and can be expressed in form of graph that is X-graph or the NAM(network animator tool).

```
set val(chan) Channel/WirelessChannel
set val(prop) Propagation/TwoRayGround
set val(netif) Phy/WirelessPhy
set val(mac) Mac/802_11
set val(ifq) Queue/DropTail/PriQueue
set val(ll) LL
set val(ant) Antenna/OmniAntenna
set val(ifqlen) 50
set val(nn) 3
set val(rp) DSDV
set ns [new Simulator]

set tf [open ex2_09hr002.tr w]
$ns trace-all $tf

set tf1 [open ex2_09hr002.nam w]
$ns namtrace-all-wireless $tf1 100 100

set topo [new Topography]
$topo load_flatgrid 100 100

create-god $val(nn)

$ns node-config -adhocRouting $val(rp) \
-llType $val(ll) \
-macType $val(mac) \
-ifqType $val(ifq) \
-ifqLen $val(ifqlen) \
-antType $val(ant) \
-propType $val(prop) \
-phyType $val(netif) \
-channelType $val(chan) \
-topoInstance $topo \
-agentTrace ON \
-routerTrace OFF \
-macTrace OFF \
-movementTrace OFF

set node0 [$ns node]
set node1 [$ns node]
set node2 [$ns node]

$ns initial_node_pos $node0 10
$ns initial_node_pos $node1 10
$ns initial_node_pos $node2 10

$node0 set X_ 25.0
$node0 set Y_ 50.0
$node0 set Z_ 0.0

$node1 set X_ 50.0
$node1 set Y_ 50.0
$node1 set Z_ 0.0

$node2 set X_ 65.0
$node2 set Y_ 50.0
$node2 set Z_ 0.0

set tcp1 [new Agent/TCP]
$ns attach-agent $node0 $tcp1

set ftp [new Application/FTP]
$ftp attach-agent $tcp1

set sink1 [new Agent/TCPSink]
$ns attach-agent $node2 $sink1

$ns connect $tcp1 $sink1
$ns at 10.0 "$node1 setdest 50.0 90.0 0.0"
$ns at 50.0 "$node1 setdest 50.0 10.0 0.0"

$ns at 0.5 "$ftp start"
$ns at 1000 "$ftp stop"
$ns at 1000 "finish"

proc finish {} {
global ns tf tf1
$ns flush-trace
close $tf
exec nam ex2_09hr002.nam &
exit 0
}
$ns run
```

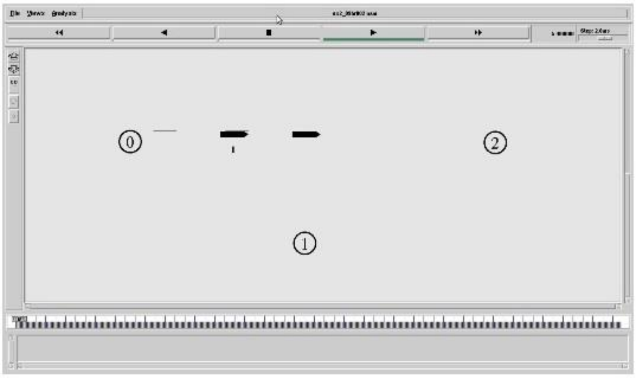

Fig 3 : Network Animator Diagram of Adhoc Network

Simulation Parameters

Application starts at	0.5 sec
stops at	1000 sec
Simulation Time	1000 sec
Topography	1000 x 1000

Table 1: Basic parameters

Node Movement:

Time Node (x, y, z)

10	1	(500, 900, 0)
50	1	(500, 100, 0)

Channel Type :	Wireless Channel
Radio propagation model :	TwoRay Ground
Network Interface type :	Wireless Phy
MAC Type :	802-11
Interface Table 2: Configuration parameters Queue Type :	PriQueue
LinkLayer type :	LL
Antenna model :	Omni Antenna
Max. Pts in ifq :	50
No. of mobile nodes :	3
Routing Protocol :	DSDV

Table 2: Configuration parameters

III. FUTURE RESEARCH

By using the above simulation technique for the energy optimization in Wireless adhoc network we can surely reduce the power consumption that is used while transferring data between two or more devices or when the communication takes places between two or more devices it allows combining partial signals that contains the same information to obtain the complete data. It is clear from our survey of disaster relief networking that multiple technologies need to be combined in order to explain all phases of disaster recovery, while providing differentiated levels of communication services. For example, during the self-organization phase, delay-tolerant and opportunistic networks have the capacity to provide low-bandwidth data services, while wireless mesh networks have the availability and redundancy to provide limited data and voice services. During the next phase, cellular networks bring the capacity and coverage to support choice and data services over large distances. During the transitional phases of disaster response, wireless hybrid networks can be built through the interconnection of small network clusters, thus providing scalable communication support. Due to the heterogeneity these wireless technologies, there are significant interoperability challenges which will continue to be a focus of future research. By an effective use of the partial signals, we present a distributed energy-efficient flow protocol named energy efficient model that supports data transmission in flow paths with less transmission power for each node and design the relevant algorithms and protocols for enabling local decision-making on controlled mobility.

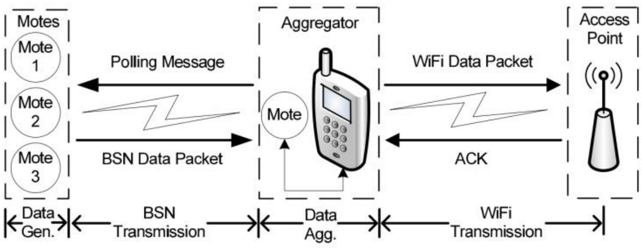

Fig 4: An energy efficient model

IV. PROBLEM MODELLING

We want to determine the power level of each unit such that the minimum of energy is consumed in the MANET when sending a message from a device *s* to a device *d* at an instant *t*. For this purpose, [5]

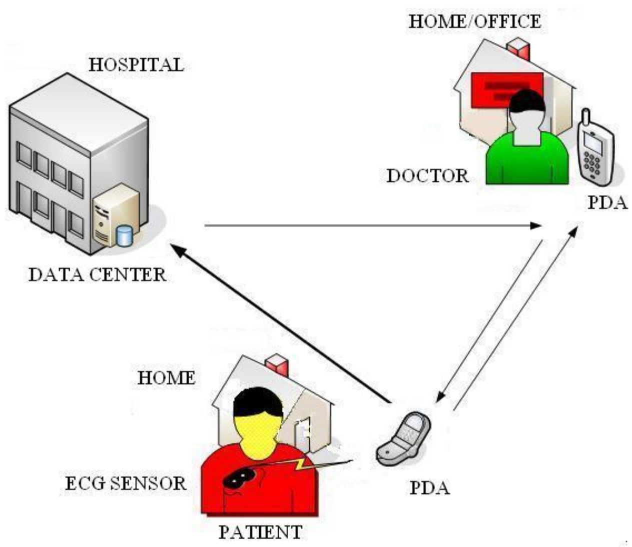

Fig 5: working of model

We model the mobile ad-hoc network in form of a constraint optimization COMANET = (*X* , *D*, *C*) where:

$$\sum_{l=1}^{L} v_{il} = 1 \quad (1)$$

$$x_{ij} d^{\alpha}(i,j) \leq \sum_{l=1}^{L} v_{il} En(l) \quad (2)$$

$$NbP_{sd} > 0 \quad (3)$$

we define the number of paths, existing between devices v_i and v_j, by the following equation:

$$NbP_{ij} = \sum_{S=is_1s_2\ldots s_mj} \prod x_{is_1} x_{s_1s_2} \ldots x_{s_mj} \quad (4)$$

V. CONCLUSION

In this paper, We presented different experimentations illustrating our approach which can assist users to control and regulate batteries capacities in order to minimize the consumption. The experimental results show that our approach gives very promising results. These two issues are essential to achieving our security goals. Besides the standard security mechanisms, we take advantage of the redundancies in ad hoc network topology and use diversity coding on multiple routes to tolerate both benign and Byzantine failures. In this paper, we have presented a wide range of wireless networking solutions for disaster relief. We have investigated disaster relief networking solutions using wireless WiFi-based, cellular, and wireless hybrid network technologies. To build a highly available and highly secure key management service, we propose to use threshold cryptography to distribute trust among a set of servers. Furthermore, our key management service employs share refreshing to achieve proactive security and to adapt to changes in the network in a scalable way. We, as researchers, need to help the humanitarian sector and especially the rescue organizations to avoid missing the next communication revolution that lies under opportunistic networking. This definitely requires advocating for our work but also getting involved, which is primary motivation behind any humanitarian commitment. The paper represents the first step of our research to analyze the security threats, to understand the security requirements for ad hoc networks, and to identify existing techniques, as well as to propose new mechanisms to secure ad hoc networks. Finally, by relaxing the consistency requirement on the servers, our service does not rely on synchrony assumptions. Such assumptions could lead to vulnerability. A prototype of the key management service has been implemented, which shows its feasibility.

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