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CONTENT CENTRIC ROUTING IN ENERGY EFFICIENT MULTI GROUP NETWORK

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Abstract: Device to device communication is enabled the content discovery mechanism,that provide the users to steer their request to the adjacent nodes or group. This method proposes the content centric routing in device-to-device architecture based on WiFi direct.This also implements the intra- and inter-group bidirectional communication.This proposed method involved the content advertising and requesting among members of the multi-group network.Lastly evaluate theperformance of the architecture on real test bed involving portable devices in different group configurations.

Keywords: content discovery, content-centric, energy efficient.

I. INTRODUCTION

It can be argued that the vast majority of wireless communicating devices in use today relies on an Access Point. Here the user must register the base station. In another way it is facilitates a uniform provision. At the same time the communication is possible in direct device to device communication. This paper proposed a WiFi direct technology for communication. The cellular interface would jump-start the D2D link between suitable devices by handling the discovery and authentication phases, thus serving as broker party. Many of the compromises in store for Device to device communication lay bare what is arguably its biggest flaw: lacking a "static" infrastructure, here the availability of content is, spotty and unreliable, and best. Even if requested content is cached by a nearby node, then reachable through a multi-hop D2D path, a robust content discovery and retrieval mechanism is needed for D2D communication.

The proposed mechanism should be aware, and, if possible, should leverage the peculiarities of the D2D environment: high node churn, volatile topologies and resource-constrained devices. This proposed method is used in medium and large scale scenarios using open source portable devices.This paper proposes the limitation of current mode of communication. This work in the following stage 1)here implement the multi device topology 2) designing the multi group and provide multi-group communication this avoid the limitations of the physical one by exploitingtransport-layer tunneling. Then the logical topology allows usto enable, inter-group and bidirectional data transfers, that is not be impossible in today's Wi-Fi Directbasednetworks.3) Lastly implement a novel content registration oradvertisement protocol that is designed to populateone Content Routing Tables (CRT) consistently with the datathat which provide each user is willing to share.

II. EXISTING SYSTEM

The Existing system contain the energy efficient discovery in WiFi. Which provide the neighboring nodes to discover and advertise the small chunks of information. Here developed a unicast communication that is a one directional communication. Here used a radio signal for communication. The beacon frames that used to the presence of LAN is send in a broadcasting model based paradigm.

The existing work is manage the WiFi module and save large amount of energy and the second thing is it use a unicast communication. The two modes of technique are used in the developed method they are scanning phase and synchronous phase. The scanning phase scan the devices which they are come to the WiFi coverage then the synchronous phase synchronous the nodes. At last find the performance level of communication even the WiFi module is active and deactivatephase.

III. PROPOSED SYSTEM

In the proposed method contains the multi-group communication that is means the content centric model of communication this deals with group broadcast model.Firstly create a node and then scan which are the available nodes. After that scan the available nodes and form a cluster the give a name to the cluster. This cluster is otherwise called group. Group with nodes can create another group. After that send a message into group broadcast with symmetric and asymmetric and then search peers and broadcast dissemination is occurring and the receiver decrypt the message. A well encryption

standard is used in this security phase. AES algorithm is used for security.Below figure describes the architecture of content centric routing.

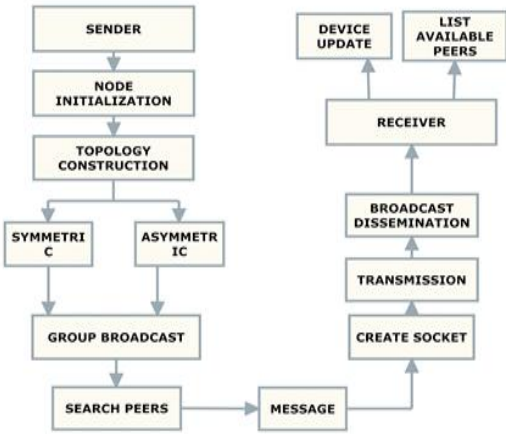

Figure1. Architecture

A. Algorithm

Broadcast Dissemination Algorithm

- We first let Client1 send the UDP message as an IP broadcast within its subnet, which includes peers p1 and p2.
- At the MAC layer, the message is sent as a broadcast
- Acting as an AP, p1 further broadcasts the MAC frame. It should be noted that this procedure amounts to a MAC-layer relaying
- The packet is therefore received by the legacy client in Group 1, i.e., including p2.
- Since it is a broadcast packet at both the MAC and the IP layer, p2 will process it and send it to its own application layer.
- p2 checks the Sequence Number and the Source Name fields in the control information at application layer.
- Since this packet has not been seen before, p2 saves the pair (Sequence Number, Source Name) into its list, and compares its own name against the Destination Name.
- Since it is an application broadcast packet and working in Relay-Enabled mode, p2 initiates an application-layer relay process.
- Thus, a new IP broadcast packet is created, with the Wi-Fi Direct interface IP address of p2 as Source Address, and transmitted.
- The message is received by p3 (and discarded because of the invalid source IP) and by Client2, which is Relay-Enabled.
- After checking the destination addresses and that the message was not seen before, Client2 relays the packet at the application layer.
- Again, at the IP layer, the source address will be set to the Wi-Fi Direct interface IP address of the device, i.e., Client2. p3 receives the packet after it is rebroadcast at the MAC layer by p2.
- Upon receiving the packet, p3 repeats the same procedure as done by p2. Then, p3 resends the packet.
- Finally, Client3 receives the data.
- After examining the data, Client3 submits the packet for application-level data processing and relays the packet again.
- However, p3 checks the (Sequence Number, Source Name) pair and detects that the packet has been seen before, thus it discards it.

AES algorithm

- The algorithm begins with an Add round key stage followed by 9 rounds of four stages and a tenth round of three stages.
- This applies for both encryption and decryption with the exception that each stage of a round the decryption algorithm is the inverse of it's counterpart in the encryption algorithm.
- The four stages are as follows:
- 1. Substitute bytes
- 2. Shift rows
- 3. Mix Columns
- 4. Add Round Key
- The tenth round simply leaves out the Mix Columns stage.
- The first nine rounds of the decryption algorithm consist of the following:
- 1. Inverse Shift rows
- 2. Inverse Substitute bytes
- 3. Inverse Add Round Key
- 4. Inverse Mix Columns
- Again, the tenth round simply leaves out the Inverse Mix Columns stage.
- Each of these stages will now be considered in more detail in below figure.2.

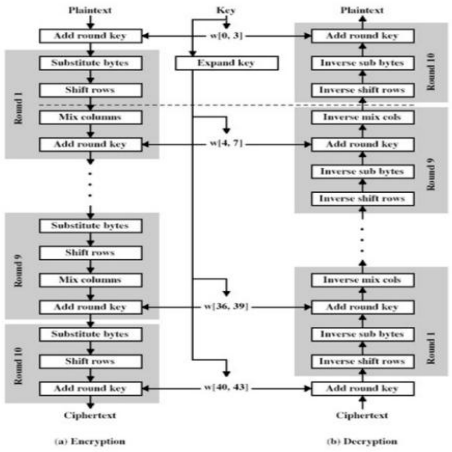

Figure2. Broadcast Dissemination Algorithm

IV. RESULT ANALYSIS

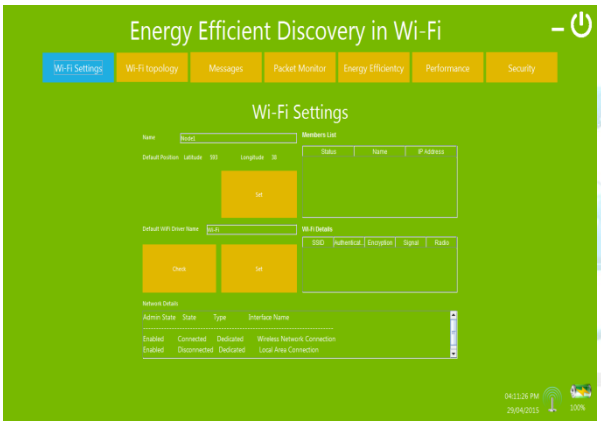

Figure3. WI-FI Settings

This shows that the node creation and the properties of Wi-Fi, it also shows that whether the Wi-Fi is connected or disconnected.

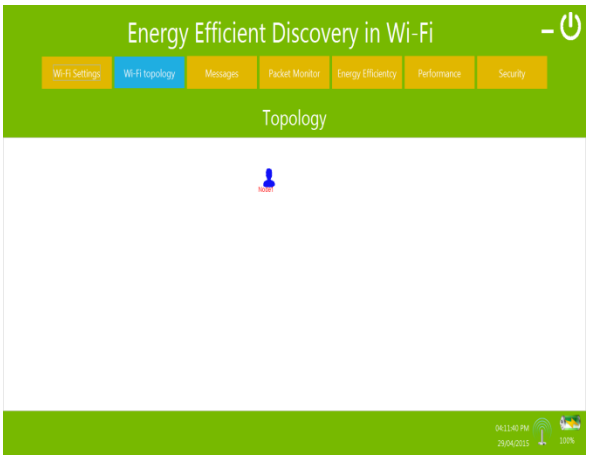

Figure4. WI-FI Topology

Here set an area for the nodes.This is the total circumference of Wi-Fi coverage.

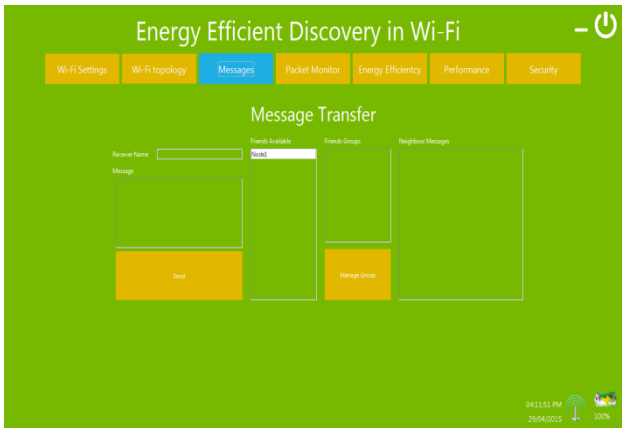

Figure5. List of friends available

This section is the communication phase. Here seen that how many friends are available in the Wi-Fi coverage as well as the groups of nodes.

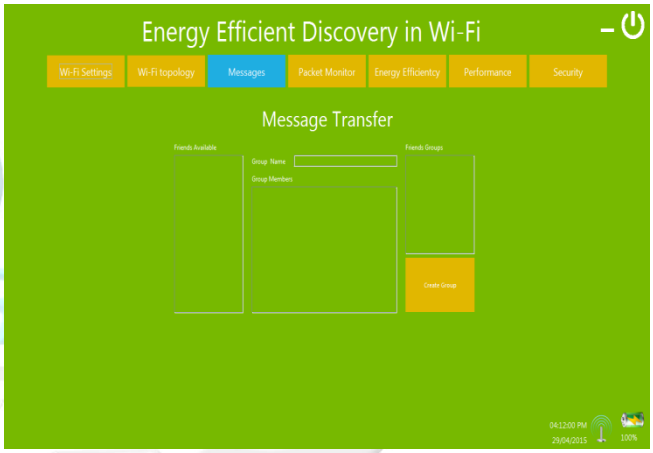

Figure6. WI-FI Message transfer

This section shows that creation of groups' response to the friends available. Same nodes in a group can't create to another group.

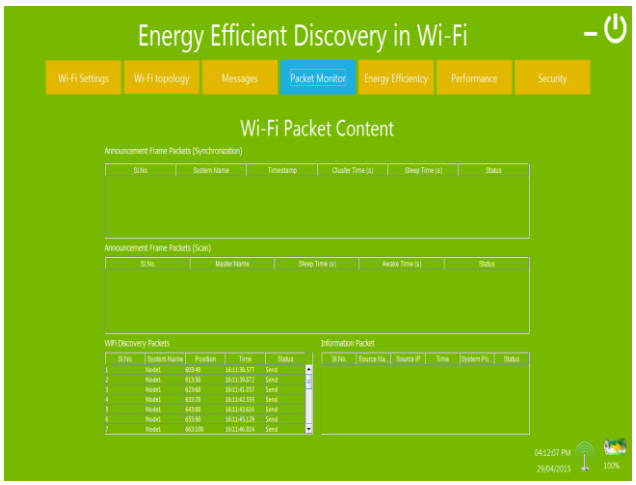

Figure7.WI-FI Packet Monitor

This contains the announcement packet frame properties and the properties of Wi-Fi packet content monitoring.

Figure8.WI-FI Energy Efficiency

Above figure shows the two modes of content centric routing, herethe content centric modes start.

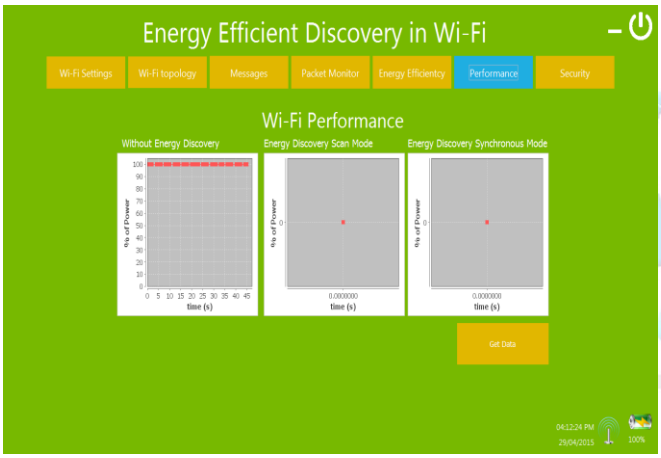

Figure9.WI-FI Performance Analysis

Here shows the efficiency in energy efficient way and the content centric mode. This shows the power usage and decreasing of battery power

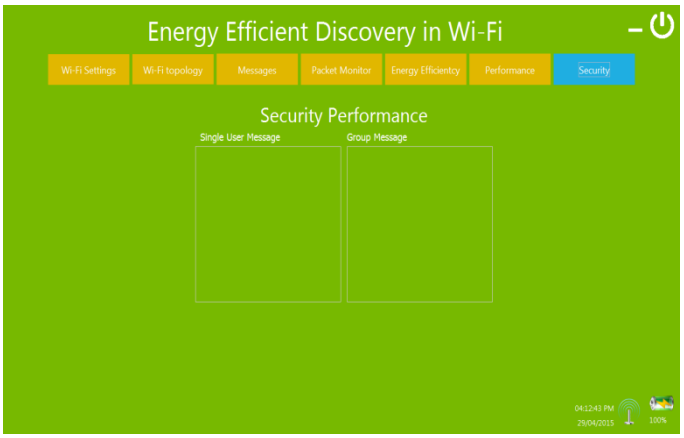

Figure10.WI-FI Security Performance

This is the security section of the content centric routing in multi group network.Here set the encryption standards.

V. CONCLUSION

This work implemented bidirectional, multi-group communication in portable devices supporting the recent Wi-Fi Direct protocol. This design extend the achievable communication range for a protocol after that the current implementation in off-the-shelf, thenunrooted portable devices has been tailored for single group D2D communication.

This proposed a solution to overcome the limitations of the physical Wi-Fi Direct network topology and of its own addressing plan, andhere built a logical design topology that enables bidirectional inter-group data transfers. Here implement cooperative traffic relaying scheme among adjacent groups and, through transport-layer tunnels,this leads to the full network connectivity. This work contains system also devised a content centric routing scheme, which properly exploits the above backbone and allows content discovery,advertisement and retrieval in arbitrary D2D network topologies.

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