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Clustering Smartphones for Disaster Recovery

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Abstract - *This project based on communication between rescue-workers and trapped survivors using their smart-phones. The communication like a messaging system. Messaging system runs on rescue workers as-well-as trapped survivors mobile while self-rescue system runs on trapped survivors mobile. When the rescue fighters enter into the spot for recovery works they will provide a network continuously within certain distance and range. They broadcast message like "hello is anyone there". Simultaneously at the other end the trapped survivors invoke the self-rescue system .In the messaging system they organize a group and a head will be chosen based on the battery level .The head node collects all the necessary information about the nearby trapped survivors in their group .Once when the rescue fighter enters into disaster region the trapped survivors will receive the broadcasted message of rescue fighter and starts communicating their current situation and position .The rescue fighter forwards the information from the trapped survivors to the command center .The command center find the route between rescue fighters in disaster region using AODV routing protocol .After finding the path between each rescue worker nodes they establishes communication with ad-hoc network*

Key Words: **Team Phone, Ad-hoc network, Messaging System, Rescue Operation, Battery Level**

1. INTRODUCTION

Disasters such as flood, cyclones, fire accidents etc. occurs suddenly the people were not aware of such a disaster. After these disasters they cannot communicate each other in the disaster region. This project deals with communication among the survivors in case of disasters. This is done using the Team-phone technology. The trapped survivor having this app into their Smartphone can connect together. The Rescue team can help the trapped survivors using the same app into their phones. Once the trapped survivors connect the network they form the team and communicate each other within the Team. The team head will chose based on the battery level. The head node to gather the needed information about the trapped survivors in the team. The head will initiate to broadcast the emergency message. Once the Rescue fighters entering the disaster area the broadcasted message will received by them. They start communicating response message to trapped survivor group that will received by head node. The head node sent their current location and position. The rescue fighter to forward the messages to command center. The command center to provide the necessary requirements and rescue team for rescue operation. The head node will be getting the low battery level another head node is chosen among the group which node have the battery level high.

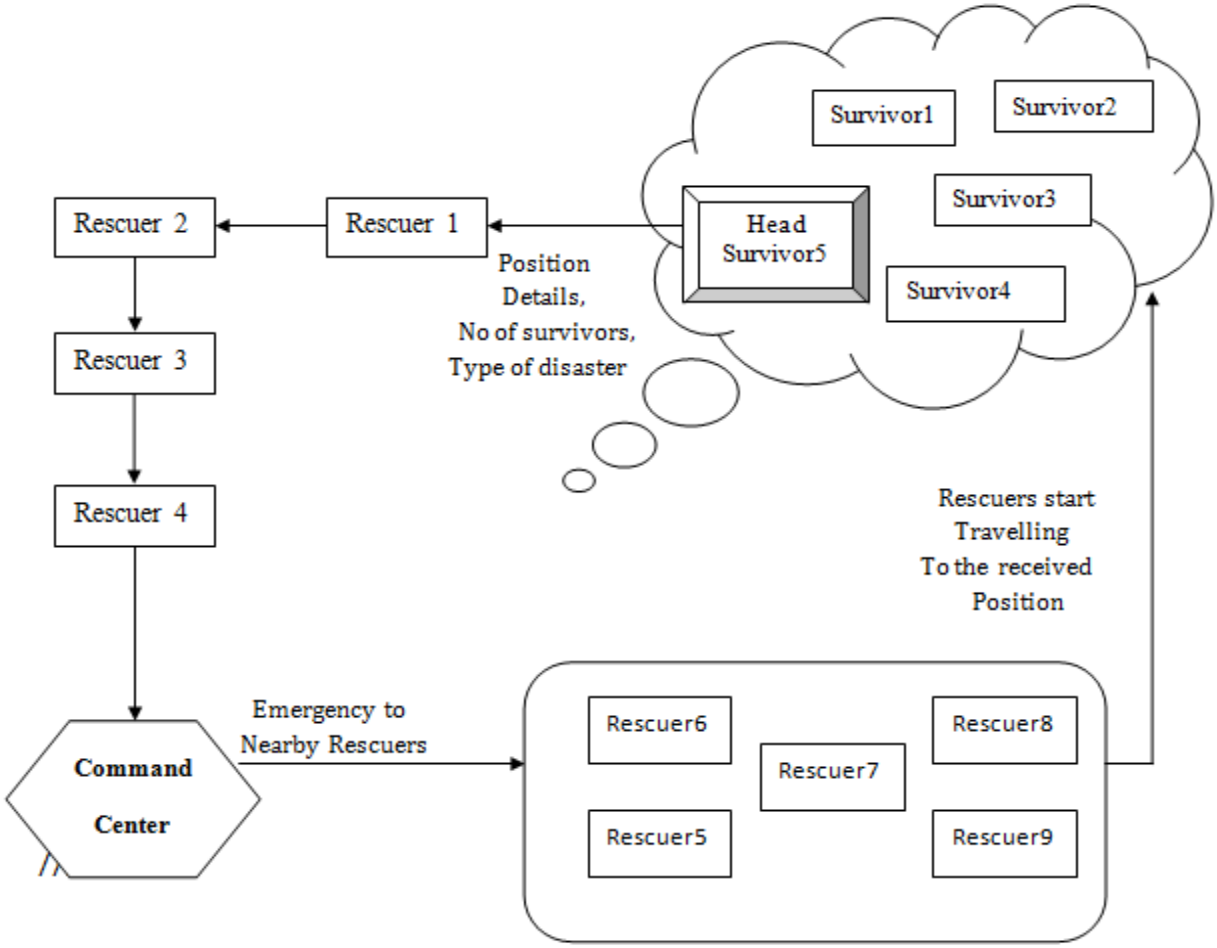
2. EXISTING SYSTEM

In existing system user cannot communicate with others seeking help due to power failures and network failures. These failures impact the rescue operations in-order to find out victims in different area. During the disaster recovery, communication is mandatory for coordinating the rescue operations. However, during earthquakes, the cellular towers will be destroyed and thus cellular communication of smart-phones get blocked. That situation they cannot communicate with the rescue team for help.

3. PROPOSED SYSTEM

In this paper, we propose clustering the smart-phones, a platform for communication in disaster recovery, where smartphones are teamed up and work together to provide data communications. By exploiting Wi-fi and cellular modules of smartphones. Team phone seamlessly integrates cellular networking, in infrastructure-constrained and infrastructure-less scenarios. Team phone also enables energy-efficient methods for trapped survivors to discover rescue fighters and send out emergency messages, by carefully addressing the wake-up scheduling of smartphones. The emergency message includes the coarse-grained location and position information of trapped survivors, which is derived from the last known locations of their smartphones and the network formed by these smartphones. We implement Team phone as an app on the Android platform and deploy it on off-the-shelf smartphones. Experimental results demonstrate that Team phone can properly fulfill the communication requirements and greatly facilitate rescue operations.

4.SYSTEM ARCHITECTURE



5. NETWORK FORMATION

First, we can create a network node assume the communication range of a node is finite. By providing distance and range that is Coverage of a particular node. Node in the network would contain unique name and port number to communicate with another node. Node need to find their nearby neighbor before starting any communication. Neighbor is calculated based on the coverage of each node, when the node comes the coverage range of the other node then the two nodes will consider as the neighbor node.

6. WAKEUP SCHEDULING

Wakeup scheduling is we handle with the battery status of trapped survivors. The battery life of smart-phones must last as long as possible, since rescue operations may last for hours or even days. Therefore, the messaging system must be energy-efficient. Since trapped survivors are most likely difficult to discover, rescue crews may not infer the location of trapped survivors, even if they have received emergency messages from them. On concerning these problems, we use the concept of wakeup scheduling. Here we aggregate the trapped survivors by their disaster type and choose a head among the group based on high battery level. When the emergency button is triggered a group is formed within the trapped survivors and a head node will be selected based on the battery percentage. All the other nodes will be in sleeping state while the head node is in wakeup state will be looking for message transfer. The head node gathers all the necessary information such as position and counts of trapped survivors (nodes) within its group and form an emergency message which is to be sent to the nearby Rescue Fighter.

7. EMERGENCY ALERT:

Here we look at how the messaging system satisfies the data communication within a routing path. The messaging system get invoked once when the emergency is triggered. A broadcast message is generated automatically in this messaging system. After Wakeup Scheduling the head node started broadcasting a message like “help me!”. When any rescuer node enters into the particular range of the head node, they will receive a broadcasted message. When the rescuer receives any broadcasted message, start scanning the trapped survivors by providing a Wi-Fi-hotspot. Thus,

the chosen head will send an emergency message with location information to facilitate rescue operations.

8. INITIATING RECOVERY:

It is once after sending the emergency message with trapped survivors position and location information to rescue fighters, the rescue fighter will forward the message to their nearby command center via opportunistic network using opportunistic routing. The rescuer node search for nearby rescuer node within their range and forwards the info to them. This message transfer runs continuously until it reaches the nearby command center. The command center finds the route between rescue workers in disaster region using AODV routing protocol. After finding the path between rescue fighters the command center commands respective rescue fighters to travel towards the position of trapped survivors. Thus, by using our Team-Phone framework in a mobile ad-hoc network, many trapped survivors will be recovered soon and safely.

9. CONCLUSIONS

In this paper, clustering smartphone for disaster recovery. It mainly consists of communication between the trapped survivor and rescue fighters. In the messaging system using the Wi-Fi interface and the opportunistic network for data communication during the network failure. The group formation of smartphones of trapped survivors provide the energy consumption because the head node only participated in the communication. The remaining survivors in the group need to triggering the emergency message with their location and position information. It can accomplish various message transmission with power consumption and delay.

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