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Refereed Proceeding Papers

[j-wang-01:2013] Junbo Wang, Kazuhiro Matsumoto, and Zixue Cheng et al. A Location Optimazition Method Based on Communication Requirements to Reconnect Seperated Communication Areas after a Disaster. In *Proc. of the 2013 IEEE International Conference on Internet of Things*, pages 653–657, 2013.

Smartphones and other portable devices are now spreading rapidly and widely, and many different wireless network technologies are available on those devices. Meanwhile, although communication systems such as twitter or e-mail is useful to share information of safety, in a period after happening of a disaster, general communication systems may not available due to the destruction or limited usage of communication infrastructure. The MANET is one such kind of technology to be used for sharing safety information at that time. However, the communication network based MANET is very easily to be separated due to destroy of some building or movement of some relay nodes. In this paper, we tackle the above research problem to find optimal positions to deploy nodes and reconnect the network. To achieve that, we should focus on the following two aspects. One is how to detect the separated areas after disaster. Another is how to find optimal positions of mobile routers to quickly and efficiently reconnect the separated communication area. To this end, we propose a location optimization method based on communication requirement to reconnect separated communication areas after a disaster. It mainly consists of two algorithms to solve the above problems respectively. The simulation result has shown feasibility of the method proposed in the paper.

[j-wang-02:2013] Junbo Wang, Zixue Cheng, and Peng Li et al. Design of a Best Load Balancing Method for Anti-Disaster Mobile Mesh Communication Networks. In *Proc. of 2013IEEE Second International Conference on Mobile Services*, pages 64–69, 2013.

After happening of a disaster, general communication systems, e.g., cell-phone, usually are not available, as Great East Japan Earthquake happened in Japan, due to destroy or limited usage of base stations. To quickly reconstruct a communication system for safety confirmation and transferring important information, e.g., food and medicine information, many researches have been performed. One of hottest topic is mobile mesh communication system, by quickly setting some special

wireless mesh routers in the disaster area and let users communicate each other. However, how to effectively locate and use the mobile mesh routers to construct a communication system is a key research problem, due to the following features after happening of a disaster, (1) unbalanced distribution of crowd, (2) limited communication resources, (3) different users ' demand on communication throughput. In the paper, to solve the above problems, we propose a best load balancing method for anti-disaster mobile mesh communication systems. The basic ideas of the method are that, (1) first quickly putting some special mobile mesh routers in a disaster area to construct a communication system after happening of a disaster, (2) gradually find the best location and work scope of mobile mesh router (MMR) to let all MMRs work effectively. Finally, we have shown the feasibility research of the proposed method in Matlab.

Grants

[j-wang-03:2013] Junbo Wang. An Autonomy IoT/M2M Platform based on Situations of Users and Networks, 2013-2016.

In most of current researches on Internet of Things/M2M, information/message is always transmitted between local sensing part and remote Cloud part without well analysis of user, network and Cloud situations. Due to that, there will be amount of garbage data transmitted through situation-unknown network and bring a lot of possible problems, e.g., important messages may be lost in the transmission, or service response will be bad for user experience, and so on. To solve the above problems, we have proposed a three Tiers autonomous IoT/M2M architecture, by grasping and analyzing user, network and Cloud situations, and then optimize the whole network to ensure a reliable and quick response IoT/M2M system. More specifically, three Ties autonomous IoT/M2M architecture includes (1) a new mechanism to automatically detect and manage user, network situation, and then autonomously optimize networks based on situations; (2) a local Cloud by automatically collecting surrounding mobile computing resources to realize quick response for users' requirements; (3) service providing mechanism in Cloud side, to provide suitable services based on various situations of users.