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Information Sharing System for Human Network

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ABSTRACT: To achieve interoperability between mobile devices, Human networks (HUNETs) a network architecture along with B-SUB is used. B-SUB, an interest-driven information sharing system which exploits the peer-to-peer communication pattern in HUNETs, employs content-based networking that achieves infrastructure-less communication between mobile devices. In B-SUB, content and user interests are described by tags, which are human readable strings. Temporal Counting Bloom Filter (TCBF) is invented to encode tags which achieve efficient content routing. Comprehensive theoretical analyses on the parameter tuning of B-SUB are presented and verify B-SUB's ability to work efficiently under various network conditions. We then extend B-SUB's routing scheme to provide a stronger privacy guarantee. Extensive real-world trace-driven simulations are performed to evaluate the performance of BSUB, and the results demonstrate its efficiency and usefulness.

KEYWORDS: Human network; Temporal Counting Bloom Filter; B-SUB, peer-to-peer communication, tags etc.

I. INTRODUCTION

Recently, a new architecture of networking portable wireless devices has emerged, which is called the delay tolerant networks (DTNs). DTNs adopt a "store-carry and-forward" model, which significantly expands the communication capability of mobile device. Driven by the new application demands and the limitations of the existing architecture, we envision a new type of dynamic networking service called human networks (HUNETs). Physically, a HUNET is composed of human-carried mobile devices, which have the same structure as DTNs. These devices use short-range wireless communication technologies, such as Wi-Fi or Bluetooth, to communicate with each other. Functionally, HUNETs enable information sharing between users in completely decentralized manner without the aid of a wireless communication infrastructure.

We present B-SUB, an interest-driven information sharing system for HUNETs, which stands for the bloom-filter-based publish/SUBscribe. B-SUB is designed for small to medium sized networks composed of dozens of devices restricted in a limited physical area where inter-device communication opportunities are abundant. Typical application scenarios are researchers inside a conference room, students inside a department building, visitors in a recreation centre, and so on. The distinctive features of B-SUB are as follows: First, B-SUB employs content-based networking to achieve infrastructure less communication. B-SUB routes and forward messages based on their content instead of addresses, which enables autonomous access to interested information for users without an end-to-end addressing mechanism. Second, BSUB is much more efficient than traditional content-based publish/subscribe. Mobile devices have weak processors and are powered by batteries. Their computational capability is rather limited. Additionally, the memory capacity and bandwidth of the nodes in a HUNET are also scarce. Traditional content-based networking systems, however, are complex and consume excessive memory and bandwidth.

II. RELATED WORK

New architecture of networking portable wireless devices has emerged, which is called the delay tolerant networks (DTNs) [2]. DTNs adopt a "store-carry-and-forward" model, which significantly expands the communication capability of mobile device.

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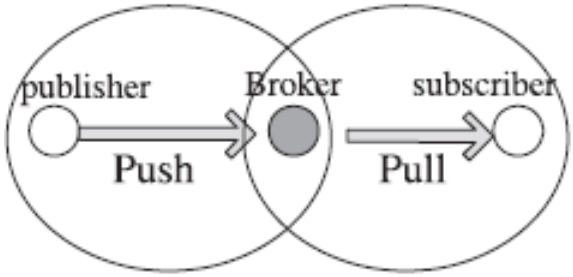

Fig.1 Delay-Tolerant Network Architecture

The distinctive features of B-SUB are as follows: First, B-SUB employs content-based networking [3] to achieve infrastructure-less communication. B-SUB routes and forward messages based on their content instead of addresses, which enables autonomous access to interested information for users without an end-to-end addressing mechanism. Second, B-SUB is much more efficient than traditional content-based publish/subscribe.

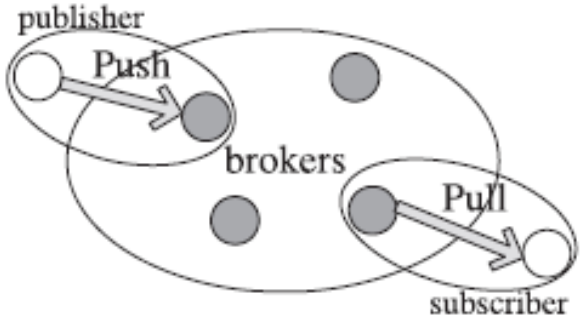

Fig.2 Human Network Architecture

Content-based networking systems [6], however, are complex and consume excessive memory and bandwidth. B-SUB employs a tag-based content description model and uses Bloom filters [5] to compress content and user interests.

III. PROPOSED ALGORITHM

A. *B-SUB (Bloom filter based publish/subscribe):*

B-SUB has two components: content representation and pub/ sub routing. B SUB employs the tag-based content description model. The contents of messages and the interests of users are identified by tags, which are strings that summarize the topics of the message. They are stored in TCBFs, which are then used as probabilistic hints for forwarding messages. The pub/sub routing provisions two functions: interest propagation and message forwarding. Both rely on the TCBF to achieve low storage and computational complexities. B SUB limits the size of messages to a few more than 100 bytes.

B. *TCBF (Temporal Counting Bloom Filter):*

The TCBF is an extension of the counting Bloom filter. Similar to a counting Bloom filter, a TCBF also uses a vector of counters. Insertion of the TCBF increments the associated counters of the inserted key by a fixed value II, called the initial counter value (ICV), instead of 1 in the counting Bloom filter. Each time a key is inserted into a TCBF, the counters associated with the key's hashed bits will be set to the ICV. If the counter has already been set by some other keys, we do not change its value. In other words, the results of insertions are always a TCBF with multiple counters of the same value of II. There are two ways of merging multiple TCBFs: the additive merging or A-merge and the maximum merging or M-merge.

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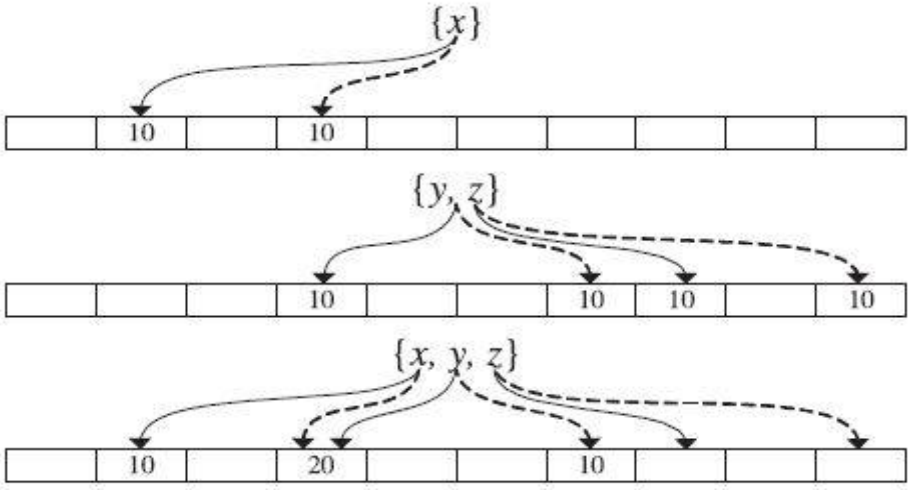

Fig. 3 A-Merge

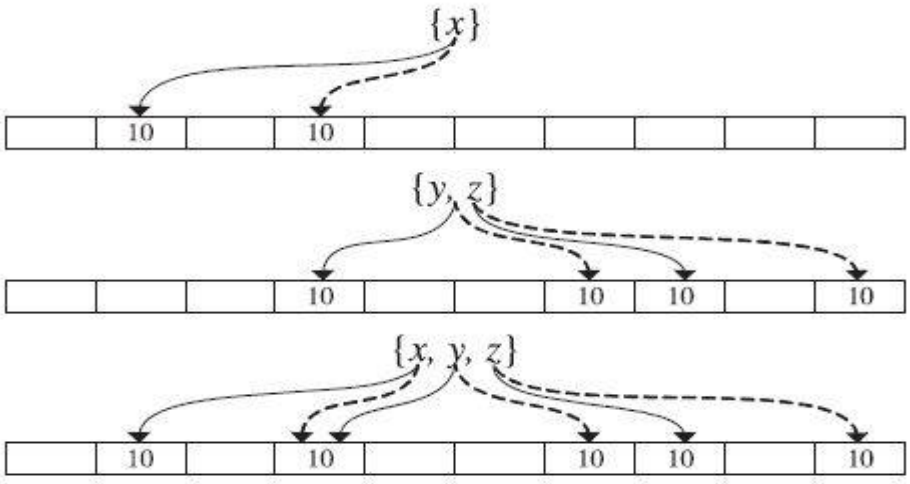

Fig.4 M-Merge

In the A-merge, as shown in Fig. 6.4, the counters are set to the sum of the counters of the original filters. In the M-merge, the values of the new filter's counters are set as the maximum value of the counters of the original filters. The intentions of these two merging operations will be clear after we present the design of B-SUB the interest propagation and, in turn, the performance of the message forwarding of B-SUB.

IV. PSEUDO CODE

Step 1: Java swing application will be used to represent nodes in network.

Step 2: Each user will select its files to share as a service

Step 3: Data transmission simulation will be done using socket programming

Step 4: Customized way for Protocol implementation will be in Counting bloom filter approach.

```
public  class Network {
*/ generate environment for network /*
}
public class NetworkSocketHandler implements Runnable {
```

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/Handles all threads in network/
}
class PeerNodeCreator {
/Creates Node/
}
Interface CountingBloomFilter extends BloomFilter {
/provide Bloom Filter/
}

V. SIMULATION RESULTS

The 'Information sharing system for human network' is a new way for sharing information or files amongst the users of private network. Network here is the peer to peer network responsible for connecting different wireless portable devices such as Laptops, PDA, and Tablets etc. This private network is termed as Human Network (HUNET); it is always considered here that every human being now a day is having one or other mobile devices and connectivity between those mobile devices is indirectly the connectivity between the humans holding those devices.

A class called Network.java is needed to generate the environment which helps different nodes to identify the environment and provide connectivity to other nodes in network. Different nodes will communicate through the router which will be present at the centre of the network as a medium for packet routing.

A Java based application running on every node identifies that device as a part of this system. Once user gets connected with the system he/she can share or fetch the files from network they are connected to. User can make use of a search Engine provided in application window to search the file that he\she wish to view or access. Firstly user need to setup the destination location for files fetched from network. Also user can set the location of folder he\she wishes to share with the other nodes.

If at all user do not want to share any files and only have to fetch files from other nodes, he may not set folder location of sharing folder since it may also be empty. Once users successfully fetch the file, respected messages will be displayed to the respected user's windows.

VI. CONCLUSION AND FUTURE WORK

In this paper, we present B-SUB, an interest-driven information sharing system for HUNETs. B-SUB employs content-based networking to achieve infrastructure-less communication between mobile devices. Specifically, B-SUB employs a tag-based content description model. A novel data structure, the TCBF, is invented to compress user interests and guide content routing. The use of TCBF reduces the memory and bandwidth consumption of B-SUB. We systematically analyze the impact of several parameters of B-SUB on its behaviors and performance. An extension of B-SUB called B-SUB-P is then proposed to better protect user privacy. Extensive real-world trace-based simulations are performed to verify the performance of B-SUB and B-SUB-P. The results have proven that B-SUB and B-SUB-P archive similar delivery ratio and delay as the optimal method (PUSH), but consumes much less resources.

REFERENCES

1. Yaxiong Zhao, and Jie Wu, "The Design and Evaluation of An Information Sharing System for Human Networks" **IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, VOL. 25, NO. 3, MARCH 2014.**
2. K. Fall, "A Delay-Tolerant Network Architecture for Challenged Internets," Proc. Conf. Applications, Technologies, Architectures, and Protocols for Computer Comm., pp. 27-34, 2003.
3. Carzaniga, D.S. Rosenblum, and A.L. Wolf, "Content-Based Addressing and Routing: A General Model and its Application," 2000.
4. P.T. Eugster, P.A. Felber, R. Guerraoui, and A.M. Kermarrec, "The Many Faces of Publish/Subscribe," ACM Computing Surveys, vol. 35, no. 2, pp. 114-131, 2003.
5. B.H. Bloom, "Space/Time Trade-Offs in Hash Coding with Allowable Errors," Comm. ACM, vol. 13, no. 7, pp. 422-426, 1970.
6. Carzaniga, D.S. Rosenblum, and A.L. Wolf, "Design and Evaluation of a Wide-Area Event Notification Service," ACM Trans. Computer Systems, vol. 19, pp. 332-383, Aug. 2001.

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