Large user Transmission through Presence Cloud in Mobile Presence Server Architecture

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Abstract: In present days, Mobile phones are very much attracted & maximum numbers of peoples are used very widely. And also usages of social networks are increased day by day, especially in mobile phones. Presence service of mobile is an important element of a social network application. The most significant action of a mobile presence service is to enable mobile user’s presence updates. Here, presence data means, it consists human's current standing, user's position or place (GPS location), Internet Protocol address & also updates of their online friends continuously. Frequent huge number of messages shared by presence servers which may lead to a buddy-list search problem in a large-scale mobile presence service. By this cause, searching operation is slow, communication cost is high and also search latency is high. For, overcome these types of problems, we propose an effective presence server architecture, called "Presence Cloud", that enables mobile presence services even in large-scale social networks. Presence cloud arranges presence servers into a quorum-based server-to-server architecture, in order to provide effective presence searching. For approach of low search latency, one-hop caching strategy and directed buddy search are given a great support. Presence cloud is used to decrease the communication cost without compromising the search satisfaction level.

Key-Words: Mobile Computing, Social Network applications, Presence Cloud, Mobile presence services, Distributed presence servers, grid quorum systems.

1. Introduction

In the last decade, greater member of peoples are holding mobile phones. Mainly smart phones are attracted to the present decade peoples. By this cause, holding of smart phones are increasing day by day. The cause to hold of smart phones by multiple members of humans is since, in smart phones, for communication purpose there are multiple applications are available. These applications are more attracted the present generation peoples for communication. More presence services are provided by these applications to the users. When these presence services are properly worked then users are satisfied. Actually, Mobile is nothing but a person or a thing can be moved from one place to other place easily, freely & quickly. Operations of computer are nothing but a computing. When users they move their portable devices at that time also those devices having network connections that is nothing but mobile computing. Carrying the mobiles is also easy. It is also one of the reasons for increasing the usage of mobiles. And also this is having special feature that is it can have anytime/anywhere activity. The usages of social networks are greater in present days. Especially these social networks are very much popular in mobile phones. Where the individual peoples can communicate one another through their portable devices such as mobiles or tablets etc. Some examples of social networks are Facebook, WhatsApp, Viber, Hike, ChatOn, Tango, Line etc. Social network services operate persons to share presence remain alive encounters occurring currently through great size distances. For example, In Facebook, every month 35 billion of peoples are added and shown their interests to their friends by sharing their views. In Twitter, 60-65 millions of peoples are tweet their opinions in every month. WhatsApp is also one of the most famous social network application in present days. In this, Instant messages are possible for communication between users. Near to
500 million of peoples are used this WhatsApp application through their mobiles. Viber application is also attracted the users in present days. Share pictures, videos are possible in this App and also make free calls between android users. Mobile phones (Smart phones) could become very good extent & also give more impact in the future. A mobile presence service is plays a main role in social networks. This mobile presence service is a fundamental aspect in social network services. The most significant action of a mobile presence service is to enable mobile user's presence updates. Here, presence data means, it consists human’s current standing, user's position or place, Internet Protocol address & also updates of their online friends continuously. Some examples of mobile presence services are such as Instant messaging, HSPDA, GSM, Wi-Fi, Bluetooth, Satellite, Blue ray etc. Actually these mobile presence services are dividing in to two categories. Those are like as, Static & Dynamic presence services. Static presence services are like as, HSPDA (High Speed Packet Data Architecture), GSM (Global System/Standard for Mobile), IM (Instant Messaging) etc. Dynamic presence services are like as, Google print, Internet access storage locations (Drop Box, Google Drive etc.), WTM (Wireless Transfer Money) etc. By using Bluetooth, two mobiles are sharing their data within small distance wirelessly. The class 1 mobiles are providing range up to 100 meters (20-30 meters in most cases), the class 2 mobiles are providing range up to 30 meters (5-10 meters in most cases). Wi-Fi stands for 'Wireless Fidelity'. It gives great speed internet via radio waves. Distributed presence servers are used to share the information across the servers. For example, one person sends the message to any other person, that message is reach to nearest server. And then that is distributed between several servers. This process is continuous up to achieve destination server, which is nearer to the destination person or user. Based on this process only each and every message is distributed between the users. In distributing environments, there are multiple internet services are giving effective actions in latest decade. We made a systematic inquiry on, what is the relationship between server network topologies and distributed presence servers on the internet. The previous existing systems are not serving services at large-scale mobile presence services. For enabling effective mobile presence services, here, we propose an efficient scalable presence server architecture that is named as "Presence Cloud". In existing systems, buddy-list search problem is occurred when huge number of frequent messages are exchanging by online buddies. This buddy-list search problem is also named like scalability problem. Presence cloud is used as backbone for mobile presence services. Presence cloud is used to exchange the information of billions of humans among thousands of presence servers through the internet. It find out & shown the arrivals of their online friends and also share the messages between them. By using presence cloud, decrease the communication cost without compromising the search satisfaction level. The reminder of this paper is systematically arranged as follows. The further section contains related work. And further place the problem definition. Next sections, here, we concentrate on previous existing systems briefly. And then proposed system is explained in further sections. In this we concentrate on architecture. And then next section, we focused on How to reduce communication cost & latency time. Finally mention the conclusion with suitable references.

2. Related Study

In this related work section, we explain about existing systems, its Advantages & disadvantages. In the last researches mainly concentrate on presence services in existing systems. Those existing systems are compelling various types of problems in its usage. In which there are attempting, how to decrease the communication cost, how to reduce the search time & also concentrate how to
remove the centralized server and then how to solve the buddy-list search problem. These are all some previous existing problems and there are many other problems are also occurred day by day.

In P2P system, retrieve or regain the loosed information is some more difficult & in sometimes it’s impossible. Implementation is very much tough cause of the whole system is decentralized in this. In P2P Session Initiation Protocol system i.e., P2P SIP [3], when number user’s increases, at that situation there is need to add more servers & resources to the network.

In the DHT systems, there is no guarantee in data consistency and data integrity. Centralized server is present in this. For example, centralized server is lost at that time the data present in that centralized server is also lost. By this cause, in this DHT system, trying to remove the centralized server for reducing the data lost. But there are not succeeding in those areas.

3. Problem Statement

Here, actually there are several major problems are occurred. In that mainly concentrate on buddy-list search problem. This problem is take place when huge numbers of messages are occurred continuously. By cause of this search problem, time for passing of messages is very slow i.e., time is delayed to reach particular message to the destination. The reason for occurring this type of problem is ‘overloaded messages’. i.e., by cause of overloaded messages this buddy-list search problem is occurred. It is sometimes called as ‘scalability problem’. Search cost is also called as ‘communication cost’. When a user arrives, the total number of messages produced by the presence server is nothing but search cost. Search satisfaction is nothing but, time it takes to search the user’s arriving buddy list. When the buddy-list search problem is occurred, at that situation there is a chance to delay the message passing. By this cause time is delayed. At the same time, there is need to store that message temporarily up to reach to destination. By this cause, here require extra space to store that message in temporary memory. i.e., like cache memory. This is also one of the major problem in already existing systems.

4. Presence Cloud

The latest various existing systems are confronting different problems to give presence services operatively. Mobile presence service is a significant aspect of a social network application because it provides every mobile user’s current data. Current data means, it consists human’s current standing i.e., he/she is present in online/offline, user’s position or place i.e., GPS location, Internet Protocol address & also updates of their online buddies continuously. When huge number of messages are occurred frequently, at that situation, which may lead to buddy-list search problem. This problem is sometimes called as scalability problem. By cause of this, search operation is slow that may lead to delay in time & at the same time the cost for communication is high cost. i.e., maintenance cost is high.

For avoiding these types of problems, here, we propose the presence server architecture that is named as "Presence Cloud". By using this, we overcome the buddy-list search problem. And also reduces the communication cost or maintenance cost. And also reach the
small constant search latency. i.e., by using presence cloud, decrease the communication cost without compromising the search satisfaction level. The Presence Cloud architecture is explained in the Figure: 1. this is a processing architecture that is structured based on three important components or elements.

Figure 1 shows, In mobile network, mobile users made a data connection to the Presence Cloud by a way of Wi-Fi or 3G network services through the internet. Based on the authentication process the user will connect to the network. And then user sends or request the data. That is send to the nearest PS (presence server). And then that message or data is exchanged between the multiple presence servers. This process is continuous up to the specific message is reached to particular person even that person is moving from one place to any other place. For successful completion of this process is done by using the three important components.

a) **Surface of Presence Cloud server**
Surface of presence cloud server is also named as presence cloud server overlay. This overlay algorithm arranges the presence servers into a server-to-server overlay, that enables a good low-diameter overlay property [1]. This low-diameter property make sure that each presence server (PS) only requires two hops to approach any other presence servers. Presence cloud assures that every presence server only enables a presence server list of size or dimension is $O(\sqrt{n})$, where 'n' is the member of presence servers. This supervises presence servers rely on the abstract idea of grid quorum system [4]. In presence cloud system, every PS node consists a group of PS nodes, i.e., known as PS list.

b) **One-Hop Caching Strategy**
Presence cloud needs a caching strategy to replicate the presence data of users. Search operation is performs very effectively by using this one-hop caching strategy. For distributed assurance, this caching strategy doesn’t need any expensive mechanisms or systems. In presence cloud, every PS node enables a buddy list of latest data of the extended buddies, and also it is answerable for caching the buddy list of every node in its PS list, otherwise, PS nodes only shown the buddy list at most one hop towards from itself. When neighbour friends establish connections to it, then the cache is updated. When PS node want to search for any particular user, it can search not only within his/her friend list, but also searches from user’s friend’s friend list. And also it provides best search operation even the specific user is go away from presence cloud or even in case of failures. This caching strategy make sure that the buddy’s latest data should remain mostly up to date & very much consistent all the way of the session of the user. Every PS in presence cloud enables harshly $2([\sqrt{n}]-1)\times v$ replicas (v means, average number of mobile friends in a PS node) of presence data, appropriate to every PS node replicates its buddy list at most one hop towards from itself.

c) **The Directed Buddy Search**
This buddy search component of presence cloud is joined with one-hop caching & two-hop-overlay. By combining these two components, it provides effective response when searching. In this way, first, arranging the PS nodes in a server to server overlay network, then use one-hop search accurately for queries, in order to decrease the network traffic without any extensive effect on the search outcomes. Second, make or become better response time based on the capitalizing the one-hop caching. Improvement in response time by giving extra possibilities of findoutting friends. Therefore, based on this mechanism, by using a broadcasting operation[1], the total strength of mobile users can be retrieved. These operation is done in any presence server in the mobile presence service.

5. Cost Evolutions
The previous existing systems are facing different types of problems. Those are like, buddy-list search problem, which is occurred by cause of overloaded messages. searching actions are very slow. And then there is a chance to occur
the network traffic. And also high constant search latency is appeared. Here, Maintenance cost is also named as search cost. When user arrives, the total number of messages produced by the presence server is nothing but search cost. When user arrives, time it spends to find the user’s online buddy list is nothing but search satisfaction. User is satisfied with mobile presence services when those services are worked properly & at the same time, when the cost for maintenance is less or cheap. i.e., when communication cost is less, then users are attracted to utilize the mobile presence services. Formula for, reducing the communication cost when any data can be exchanged among PS nodes is,

\[ 2([\sqrt{n}]-1) \times v \]

where, ‘n’ is distance between any 2 PS nodes.

In Figure 2, For example, we consider ‘9’ PS nodes are present in Presence Cloud for distributing the messages or data. If node ‘8’ is want to send the data to node ‘3’. i.e., 8→3 (consider node ‘2’ is intermediate node). Here, two possibility paths are there. First, node ‘8’ is directly go to node ‘3’ (Consider the distance between node ‘8’ & node ‘3’ is 3 kms i.e., 8→3 = 3kms). Second, PS ‘8’ is send data to PS ‘2’ first and then PS ‘2’ send that data to PS ‘3’. (Consider distance between 8→2 = 2.5 kms & 2→3 = 0.5 km). Now, calculate the communication cost by using the above formula. The calculations are,

**First, 8→2 ( n=2.5, v=2 ):**

\[ = 2([\sqrt{2.5}]-1) \times 2 = (0.5811388300842) \times 2 = 2.32455 \]

**Second, 2→3 ( n=0.5, v=2):**

\[ = 2([\sqrt{0.5}]-1) \times 2 = (-0.5857864376) \times 2 = -1.1715728752 \]

For, 8→2→3 = cost(8→2) + Cost(2→3) = 2.32455+(-1.1715728752) = 1.15305

Now, according to above evolutions, Communication cost of “8→3” is ‘2.928’ and “8→2→3” is 1.15305. cost of difference between these two is, 1.77495 (i.e., 2.32455 - 1.15305 = 1.77495). In the same way, large amount of communication cost is reduces when data is exchanged between thousands of presence servers(PS). Therefore, By using presence cloud, communication cost for data exchanging is decreases successfully.

### 6. Conclusion

In this paper, we proposed the presence server architecture[1], called as 'Presence Cloud[1]'. That presence cloud is used to overcome the several types of existing problems in presence services of mobility devices. Presence cloud, that supports the mobile presence services even in large-scale social networks. Presence cloud is used to improve the performance in searching operation. Buddy-list search problem is overcome almostly. Removal of centralized server is also done & in order to avoid the data loss. Presence cloud is used to reduce the communication cost & at the same time reduces the search latency. Through the outputs of appearances & truths, Presence cloud is very much efficient system when compare to the previous existing systems.

### References

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