A Social Networking For Sharing Infrastructure Resources In The Social Cloud Computing

Abstract

The pervasive nature of Online Social Network (OSN) and Cloud computing, clients are beginning to investigate better approaches to connect with, and use these creating standards. OSNs are digital relationship between users that allows them to share and access information on basis of their social associations. In OSN there is pre-established trust formed through ‘friend connections’ within an OSN to form a dynamic ‘Social Cloud’ by empowering users to share resources within a Social Cloud. Users have contributed in making the foundation of social cloud strong via investment in computerized groups. This is further emphasized by the representation, documentation and investigation of social connections. Social Cloud is getting to be more refined. This will facilitate and make it simpler for clients to share their own resources and information via OSN. Thus in a Social Compute Cloud the provisioning of Cloud infrastructure is supported through ‘friend’ connections is modeled in the proposed model. In particular, the proposed model adventures the trust publicized in OSNs as an issue for the good behavior of other ‘workers’in the system.
1. INTRODUCTION
In recent years there has been rapid growth in cloud computing and social networking technologies. Cloud computing shifts the computing resources to a third party, eliminating the need to purchase, configure and maintain those resources. Infrastructure as service providers rid users of the burdens associated with purchasing and maintaining computer equipment; instead compute resources can be out sourced to specialists and consumers can obtain access to an “unlimited” supply of resources. There are two key issues are the notions of trust and accountability between cloud service provider and consumers and providers. In this context, trust and accountability encapsulate several different aspects such as security, privacy, transparency. Goal of proposed system is to provide an infrastructure that allows the execution of workflow on traditional Grid resource which can be on demand with additional Cloud Resources, if necessary. We are focused on provide resource for execution of consumer with proper resource allocation.

Enjoys parts of the merits provided by the conventional cloud and extends features of other distributed computing paradigms namely the grid computing. Imagine the scenario of a computing paradigm where users who collectively construct a pool of resources perform computational tasks on behalf of their social acquaintance. This paradigm and model are similar in many aspects to the conventional distributed computing paradigm. It exhibits such similarities in that users can outsource their computational tasks to peers complementarily to their friends for computing using OSC. Most vital to the connection of Social cloud is the total computational force gave by clients who are willing to share their idle time and available compute cycles. In Online Social Cloud, owners of these computing resources are willing to share their computing resources for their friends, and for a different economic model than in the conventional cloud computing. This behavior makes this work share commonalities with an existing stream of work on creating computing services through volunteers, although by enabling trust driven from social networks. In this paradigm exploits the trust exhibited in social networks as a guarantee for the good behavior of other workers in the system.

2. MOTIVATION
Volunteer computing is a form of internet based distributed computing, which allows users to share their processing cycles, and helps to run computationally costly projects. In existing volunteer computing platforms consist of millions of users, providing large amount of processing cycles and memory. Since the rapid growth in the volunteer computing projects, more researchers have been attracted to study and improve the existing volunteer computing system. In this paper we argue an alternative approach to establish trust and accountability in volunteer computing and Cloud platforms: a Online Social Cloud. It is a dynamic environment through which (new) Cloud like provisioning scenarios can be established based upon the implicit levels of trust that transcend the interpersonal relationships digitally encoded within a social network.
Vision of the OSC is motivated by the need of individuals or groups to access resources they are not in possession of but that could be made available by connected peers which show users are willing to donate personal computer resources to “good” causes. Using this approach, users can download and install a middleware connect their personal social network, and provide resources to, or consume resources from, their friends through an Online Social Network (OSN). We anticipate that resources in a Social Cloud will be shared because they are underutilized, idle, or made available altruistically. Online Social Cloud is “a resource and service sharing model utilizing pre-established trust between members of a social network.

3. Methodology

3.1 User Preferences & Resource allocation
This is an important requirement for an Online Social Cloud, as without it we cannot assume any form of pre-existence trust between outsourcer and worker. Once the social network of a user has been accessed and the social database populated, the question is how to interpret the user’s social ties for the purposes of allocation. There is no single unified methodology for the interpretation of social ties, and which to use is often context dependent.

3.2 User Preferences
In user preferences user can specify the ranks to their friends according to their relationship among them (friend, family, etc.). We provide simple preference matching interface in that both outsourcer and worker can define preference for each other. The higher value gives greater preference to their friend. Assigning same value for different friends is possible. This preference assignment is stored in centralized server for resource allocation. Users also define who they are willing to share with, or “block” users.

3.3 Resource Allocation
Resource Allocations based on the principle of best effort and random allocation. When allocating resources the Resource Allocation Server filters the list of donated resources. The general process of allocation in the Resource Allocation Server is to first determine available donations with which the requesting user has a relationship. To do this the list of all donations in the system is filtered by the list of friends for a particular user. The outsourcer’s preferences for each possible friend are then computed by retrieving preferences stored in the database. Likewise the preferences for each of these friends for the requesting user as an outsourcer are computed. This information is then aggregated and sent to the matching service to determine an appropriate match. The Resource Allocation Server attempts to acquire available nodes from the provider to satisfy the request using resource acquisition mechanisms. If, by the time of reservation, the chosen provider is no longer available the entire process must be re-executed.

3.4 Social Resource Allocation
The general process of allocation in the Resource Allocation Server is to first determine available donations with which the requesting user has relationship. To do this the list of
all workers in the system is filtered by the list of friends for a particular user. The consumer’s preferences for each possible friend are then computed by retrieving preferences stored in the database. Likewise the preferences for each of these friends for the requesting user as a consumer are computed. This information is then aggregated and sent to the matching service to determine an appropriate match. The Resource Allocation Server attempts to acquire available nodes from the provider to satisfy the request using resource acquisition mechanisms.

3. ARCHITECTURE

The architecture composed of the following modules. The working of these modules are also described below:

![Figure 1: Architecture of social cloud networks](image)

4.1 Social Network

We are creating a social network like Facebook that acts as an interface for individuals to create profiles, gets authenticated and share valuable resources over a social network. The new user will register to the social network by providing their valuable information. An existing user will directly login to the social network by providing their id and password. It allows the users to share images, videos to others over the social network. It allows the users to update their status. The Admin Monitors All the Activities Happening inside that of a Social Network. The Users Can Interact with One Another and Share and Reach out...
Their Friends. The Users Set Preference with whom they want their Resources to be shared.

4.2 Social Cloud Platform
Integration between Social Network and Cloud Platform, another component of Social Relationship Management direct links to customer insights, trends, and feedback based on on-going social marketing campaigns, content, and messaging all from a single interface. It’s a complete approach to social that’s built for the way social brand teams work efforts in one place. The technical implementation for the construction and facilitation of the Social Cloud as well as necessary middleware to enable resource sharing between “friends” at the edges of the Internet. Social Cloud platform Acts as The Storage Unit for The Resources Being Shared over the Social Network.

4.3 Social Clearing House
A Social Clearing House is an institutionalized microeconomic system that defines how supply is allocated to demand. Using this module, users can download and install a middleware leverage their personal social network via a Facebook application, and provide resources to, or consume resources from, their friends through a Social Clearing House. However, this definition is orientated primarily for monetary based exchanges, which is not the case here. Therefore, a social clearing house captures the following: the protocols used for distributed resource allocation, the rules of exchange, i.e. who can take part, and with whom may they exchange, and the formalization of one or more allocation mechanisms. For this reason, the social clearing house requires two databases: to capture the social graph of its users, as well as their sharing preferences, and a resource manager to keep track of resource reservations, availability, and allocations.

4.4 Middleware
A middleware is to provide the basic resource fabrics, resource virtualization and sandboxing mechanisms for provisioning and consuming resources. It should also define the protocols needed for users and resources to join and leave the system.

4.5 Socio-Technical Adapters
A socio technical adapter, which in our case is a Facebook application, is needed to provide access to the necessary aspects of users” social networks, and acts a means of authentication, for example, via Facebook connect. Once a user’s social network has been acquired via the socio technical adapter, the social clearing house requires the sharing preferences of the user to facilitate resource allocation. Many aspects of a socio technical adapter require careful consideration, and many methods can be applied to capture preferences.

4.6 Matching mechanisms
Matching Mechanisms are socio economic implementations of the social clearing house microeconomic system. They determine appropriate allocations of resources via users” sharing preferences across their social network. Our approach considers non-monetary allocation mechanisms based on user preferences. Depending on the specific market
objective, several algorithms exist that compute a solution to the matching problem, e.g. computing a particularly fair solution or one with high user welfare.

5. Experimental Results And Analysis

5.1 Matching Algorithm runtime
It can be used to either perform batch allocations for a group of users, or single allocation for an individual user. Whilst it may seem unusual to facilitate both of these settings, the reason is simple: the matching algorithms perform best when batches of users allocated simultaneously. Individual allocations may result in resources being blocked for other users, for example those with a small number of connections. Whereas batch allocation means that users may have to wait until the next round of allocations to receive resources. Both options are inefficient in different ways: individual allocation achieves at best local optima and can block resources for other users, but can be performed in near real time, as the computational effort is significantly lower; batch allocations could achieve the global optimum, but may require either migrations or users to wait for resources. The social network of users is captured via the existence of preferences between users. The matching mechanisms will only consider matching two users if both have a preference for each other. If a preference exists in only one direction, i.e. A has ranked B, but B has not ranked A, we assume that B has not yet considered A, and A”s preference for B will be ignored.

![Figure 2: Algorithm Runtimes with Different Problem Sizes](image)

5.2 Allocation algorithm runtime
The runtime of an allocation algorithm has a large impact on its applicability for a Social Compute Cloud. Given that preference based matching is often NP Hard, algorithm runtime is an important design consideration. Therefore, we investigate how relaxing these assumptions impact algorithm runtime.

6. ISSUES AND CHALLENGES

6.1 Privacy and trust
Privacy has been a subject of great concern with social networks. The protection of a user’s identity varies across the various social network services available across the internet. This website encourages the use of real names and thus makes a connection between their social network and public identities. There are means to deduce identities based upon the social network graph topology, and distorted and removing data could affect the quality of data analysis and mining of the information that is being shared. These issues raise questions as to how these social network services handle their data to balance the needs of third party data consumers and the expectations of their users.

6.2 Ownership of content
The massive amounts of data that exist on social networking services are mostly user generated. Different social media sites have different policies. When dealing with items such as images, the content remains private if set as private by user preferences. While users may be the owners of this data, license agreements based upon the use of the services” network may allow these sites to retain data even after users initiate removal.

7. CONCLUSION
In this paper, we have presented a Social Compute Cloud: a platform that enables the sharing of infrastructure resources between friends via digitally encoded social relationships. Creating a Social Compute Cloud platform will enable the sharing resources between friends via digitally encoded social relationships. Using our implementation, users will be able to execute programs on virtualized resources provided by their friends. Preference based resource matching is (in a general setting) an NP hard are problem, makes often unrealistic assumptions about user preferences and most state of the art algorithms run in batch modes. Cloud accessing user’s social networks, allowing users to elicit sharing preferences, and utilize matching algorithms to enable preference based socially aware resource allocation.
8. REFERENCES


Sixth Annual Hawaii International Conference on System Sciences (HICSS). (Grand Wailea, Maui, USA), 2013.


