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A Survey On Creating Adhoc Cloud Over Manet

Sadhana Tripathi
Research Scholar, (M.Tech.)
Gyan Ganga Institute of Technology and Science
Jabalpur (M.P.), [INDIA]
Email: sadhnatripathi378@gmail.com

Dr. Mukta Bhatele
Professor
Department of Computer Science & Engineering
Gyan Ganga Institute of Technology and Science
Jabalpur (M.P.), [INDIA]
Email:mukta_bhatele@rediffmail.com

ABSTRACT

A Spontaneous adhoc network can be defined as special case of MANET that is formed by a set of mobile nodes in closed location and during certain periods. There would be no centralized controller or coordinator and without user intervention, all nodes are free to join or leave the group. This scenario has multiple advantages such as ubiquity, availability, affordability, and spontaneity. A protocol for deployment and management of adhoc mobile cloud set up have also been discussed. A group of nodes with sufficient resources (providers) collaborate to set up IAAS like cloud. In this paper we have reviewed different papers on mobile cloud computing and mobile adhoc networks. An architecture for adhoc cloud set up has also been discussed.

Keywords:— *Mobile cloud computing, Adhoc network, Deployment protocol, Dynamic management.*

I. INTRODUCTION

A mobile adhoc network is a self configuring network of mobile devices connected by wireless links. Each device in a MANET is free to move independently in any direction. The approach is to consider and use interconnected mobile devices in the local vicinity as resource provider aiming to provide resource or sensed data to neighbouring nodes in needs. Such needs may arise in battlefield, natural disaster, mountaineous region etc where adhoc community can be gathered and more generally in any hostile environment where connectivity with cloud server does not exist. When Wi-Fi terminals do not work properly or get damaged, there can only be mobile terminals communicating peer to peer and evolving as a virtual cloud to provide collected information and locally processed. Various approaches for mobile cloud computing have been discussed by different researchers. The first and the most common approach of mobile cloud is to run applications on a remote resourceful server, so the mobile device acts only like a thin client connected to the remote server through 3G. Cloudlet is the second concept of mobile cloud computing, where the mobile devices offloads its workload to a local cloudlet comprised of a more powerful computer with connectivity to the remote cloud servers. Another approach is to consider and use interconnected mobile devices in the local vicinity as resource providers to provider resources to neighboring nodes as the need arises. Bluetooth is often used as an underlying communication technology thanks to its advantages, mainly low radiation and low energy cost. An architecture and a protocol for the adhoc mobile cloud, aims to exploits the resources of mobile terminals up in a MANETS network to create a virtual cloud to meet the needs in terms of mobile community resources have

been potrayed. This architecture includes c-protocol between cloud framework and communication technology layer. This protocol has been designed to provide a set of services that allows both better MCC management and to abstract and simplify a part of MANETS networks operation. Its main services are :

- On demand cloud deployment.
- Dynamic management of cloud service providers.
- Dynamic management of cloud customers.

Design of C-protocol: This protocol uses a set of UDP messages exchanged between nodes.

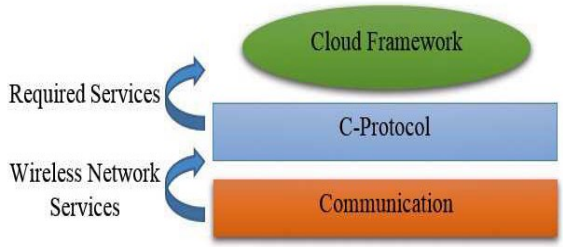

Figure 1 : Layered Architecture

1.1 MCC set up

This phase aims at setting up an ad hoc MCC over a spontaneous MANET. Any node can initiates the cloud setup by announcing a request on the network. This initiator generates an identifier for the CPS (cloud-ID field) and starts the cloud deployment process by broadcast a cloud advertisement message. Interested nodes send an unicast message to the initiator. After the collection of cloud proposal messages, the initiator generates unique identifier for the selected providers PI (provider identifier). Initiator creates primary provider and customer lists. Provider list as a table containing information relative to provider nodes, including direct neighbours of each supplier and their type.

1.2 Dynamic management of MCC nodes

When receiving a request to increase the resources, the various provider nodes are launching a process of adding new provider nodes in their neighborhood (locally).At the end of this process provider nodes perform a local updates to their provider list to add new members. Noting that the newly added members are not actually put into service until the reception of cloud parameters.

1.3 Add new provider process

Each provider nodes identifies its neighbour nodes which are not member of cloud and send them a message new-p-request. When receiving this message, the interested nodes responds by sending a messages new-p-response containing characteristics of new mobile terminal.

1.4 Provider list recovery process

The process of recovering non received provider list (PL) in the phase of exchanging lists between providers maintains the coherence of the system. If any of these providers detects that one or more colleagues provider have not sent their list, it identifies them and sends to each one of them a messages PL-back-request to retrieve PLs that have not been received previously. The provider responds with a message PL-backup-response containing the PL-backup. This protocol provides to the upper cloud framework a set of services like an on demand deployment and a dynamic management of cloud members. This protocol is generic with regards to the cloud framework.

II. Literature Review

Zaghdoudi et al[1]explored the deployment of peer to peer mobile cloud over mobile adhoc networks.MCC architecture and c-protocol has been described. Mobility and dynamicity aspects of mobile adhoc network has been taken into consideration. The protocol is generic with regard to cloud framework.

Kumar Karthik et al [2]suggested that cloud computing can potentially save energy for mobile users. cloud computing can save energy for mobile users through "computation offloading*"* Mobile cloud computing services would be significantly different from cloud services for desktops because they must offer energy savings. The services should consider the energy overhead for privacy, security, reliability, and data communication before offloading.

Satyanarayanan Mahadev et al [2] put forth a vision of mobile computing that breaks free of fundamental constraint. Resource poverty is a fundamental constraint that severely limits the class of applications that can be run on mobile devices. Rather than relying on a distant "cloud," a mobile user instantiates a "cloudlet" on nearby infrastructure and uses it via a wireless LAN.

Marinelli Eugene et al [3] suggested that Hyrax provides a convenient, sufficiently abstract interface for developing applications that use mobile data. Hyrax provides an infrastructure for mobile cloud computing, providing an abstract interface for using data and executing computing jobs on a mobile device cloud. Hyrax easily scales to all of the nodes in his test bed, and would likely scale to many more nodes. It also works reasonably well for local peer-to-peer data sharing and is generally successful in tolerating node-departure.

Tandel Milindkumar H. et al[4] presented a comparative analysis of Energy consumption in a smartphone when executing a computation intensive task versus End-to-end energy consumption when the same task is offloaded to a remote server. Also presented an evaluation between two popular communication technologies i.e. Wi-Fi and 3G.

Cuervo Eduardo et al [5] presented MAUI, a system that enables fine-grained energy-aware offload of mobile code to the infrastructure. Previous approaches to these problems either relied heavily on programmer support to partition an application, or they were coarse-grained requiring full process (or full VM) migration.

Rewardker D.N. et al [6] studied work related to spontaneous wireless ad hoc network along with technologies required to build and secure the network. As it is a social kind of network work as peer to peer network nodes are themselves responsible for all network activities like creating network, joining new node, providing services and so on. They have provided a unique IP address to each node of the network for its identity.

Feeney L.M. et al [7] define a spontaneous network as a small scale ad hoc network intended to support a collaborative application and explored some of the unique challenges that need to be faced in building such environments.

Lacuesta Raquel et al [8] have developed and tested some algorithms that allow managing the nodes that join and leave the spontaneous ad hoc network. In order to guarantee the network security and the reliability of the communications and transmitted data, we have also developed a trusted algorithm. This algorithm is based on the advanced encryption standard (AES) algorithm and it has implemented a symmetric encryption scheme with simple key management features.

Fernando Niroshinie et al [9] explored the feasibility of a mobile cloud computing framework to use local resources to solve these problems. The framework aims to determine a priori the usefulness of sharing workload at runtime. The results of experiments conducted in Bluetooth transmission and an initial prototype are also presented.

Paridhi Vijay et al [10] used concept of cloud computing and job sharing over cloud provides a brand new opportunity for the development of mobile applications that can get heavy tasks done over cloud by offloading computation tasks on cloud, since it allows the mobile devices to maintain a very thin layer for user applications and shift the computation and processing overhead to the virtual environment. Explosive usage of limited resources in smart phones leads to problems such as battery life, memory, feasibility and CPU. To solve this problem, we propose a dynamic mobile cloud computing architecture framework to use global resources instead of local resources.

Niroshinie Fernando **et al** [11] provided an extensive survey of mobile cloud computing research, while highlighting the specific concerns in mobile cloud computing. We present a taxonomy based on the key issues in this area, and discuss the different approaches taken to tackle these issues.

Dinh Hoang T. et al [12] gives a survey of MCC, which helps general readers have an overview of the MCC including the definition, architecture, and applications. The issues, existing solutions, and approaches are presented. The applications supported by MCC including m-commerce, m learning, and mobile healthcare have been discussed which clearly show the applicability of the MCC to a wide range of mobile services.

Gonzalo Huerta et al[13] through a light on the complementary solution is to take advantage of nearby mobile devices but this requires to incorporate context and task awareness. Mobile devices are still resource constraint and battery dependent.

III. CONCLUSION

This survey paper on adhoc cloud as a service and a protocol for deployment and management of nodes over MANETs. Layered architecture for such network have been portrayed. C-protocol for exchange between nodes has been discussed. Our future work is to include quality of service for mobile cloud computing in this kind of architecture.

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