

Providing trust based communication in cloudlets using third party

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Abstract: *A cloudlet is a datacenter which is small in size and having mobility. It is located at edge of the internet. The cloudlet helps a mobile device to have low latency while using applications with powerful computing. In this paper we are implementing a trusted communication with the help of third party, this makes the cloudlet nodes to trust the mobile nodes from where a service is requested. The third party is placed in between the cloudlet host and mobile client. The cloudlet will trust the mobile node when it is registered with the third party and same with the mobile node and cloudlet. The process and data offloading request from mobile node is to be accepted by the cloudlet. While the Cloudlet client is installed in a mobile device then it is authenticated and registered through a third party in service registry. Requester or a certificate repository credentials are validated by a third-party online trusted authority. Cloudlets are referred as individual elements of a offload infrastructure. The mobile cloud computing model helps us to deploy this scenario. Load balancing can be implemented to reduce latency, more active, alive by using virtual machines.*

Keywords: *cloudlets, offloading, cloudlet host, mobile cloud computing, virtual machines.*

INTRODUCTION

Nowadays cloud computing is emerging in many of applications in our daily life. Keeping apart that the availability of cloud is also a problem because of emerging usage of mobile devices. To make cloud services available to every mobile device is not possible, so the local cloud services called as cloudlet are introduced to serve the applications in a particular local area. Virtual machines are used to satisfy the requirements of cloud data center.

Mobile devices may face handoff among available cloudlets when it is moving from one place to another which happens only in wide area network.

Cloudlet architecture has a three tier which are mobile device, cloudlet and cloud, cloudlet brings cloud very much nearer to the requested mobile device. Important attribute of a cloudlet is that it can have cached data from a cloud to ensure fast access of the data and maintains a buffer for the data originating from mobile device. Cloudlets are localized, discoverable and stateless servers which runs one or more virtual machines in order to service the mobile devices from various users in a cloudlet range. Cloudlets decreases the battery power usage by relying nearer to the mobile device in the architecture and the virtual machines supports this cloudlet environment by providing flexibility in communication setup and administration time. As we know that cloudlet are discoverable, the cloudlet client is installed on a cloudlet enabled mobile devices which uses multicast Domain Name System to query for cloudlets though it is insecure. When the number of mobile nodes increasing the validating is not possible for servicing a request so the registry is maintained for the storage of mobile device information and authenticating it, as soon as a mobile device is requesting cloudlet it is undergone through a third party which is having the authenticated information. By having such scenario only authenticated mobile devices are going to get the service from a cloudlet. cloudSim is a framework for simulation and modeling the infrastructures and services for cloud computing.

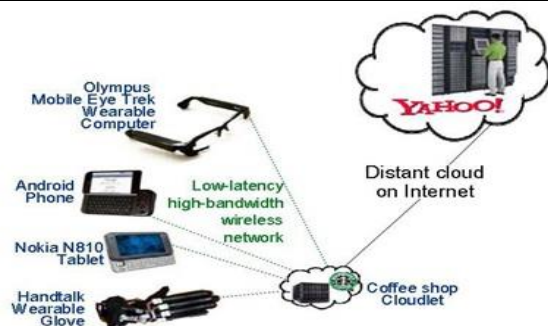


Fig 1: Basic Cloudlet scenario

EXISTING SYSTEM

The Cloud Computing provides a easy way to communicate with the mobile devices irrespective of the location with the basic requirement of internet connection. The cloud will serve many mobile devices with variety of services like infrastructure, software and platform while providing such services the load of cloud to be balanced to get uninterrupted services, this can be possible by placing the cloudlet wherever a group of mobile systems are available. The virtual machine plays a major role in providing services as infrastructure and it is a abstraction of cloudlet. Offloading of infrastructure is maintained for achieving low response time. Many applications are using the cloudlet concept like augmented reality applications etc. in some areas where the mobile devices are high we cannot know the authenticated mobile device is using the cloudlet or not this makes some problem while allocating the resources to any mobile device. When a mobile devices are moving from one place to another the handoff to be taken place among cloudlet in order to achieve such handoffs the device is to be registered at some place where it is authenticated. Cloudlet resources are wasted when the mobile devices are more and not registered as shown in figure 1, the mobile

1. Optimize Resource Consumption by Cloudlet-Based Cyber-Foraging

The resources should be optimized in order to serve more requests and the computation capability to be improved which can be possible by cloudlets and offloading of code. The cyber foraging refers to the searching of resources from available devices in a environment. The virtual machine helps to provide flexibility, mobility, scalability and elasticity in communication. Here the applications are divided into very thin client which runs in a mobile device. The service Virtual Machine has computation-intensive

device is directly connected to cloudlet which is available nearer and the cloudlet will be connected to the cloud server.

Why cloudlet?

Cloudlet brings cloud services to nearer to mobile devices, rather than depending on the distant cloud services a nearby resource-rich infrastructure can be encouraged for easy accessing and load balancing. The cloudlet can be assumed to be as widely spreaded computing infrastructure which is connected to the internet and it is available to the nearby mobile devices. Cloudlet is also known as local cloud which brings the cloud services closer to mobile devices.

Benefits of cloudlet:

Cloudlet servers are stateless which makes management simple, the replacing of cloudlet is also easy with simple effort and configuration setup.

The availability of cloudlet to mobile devices can make the architecture more tough for Denial of Service of attacks.

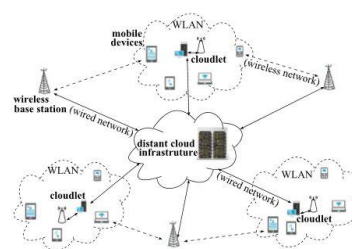


Fig 2: A cloudlet based cloud computing environment with mobile devices.

server. Fig 3 shows architecture for cyber foraging in which the main elements are mobile client and the cloudlet host. To discover the cloudlet client a discovery service is running inside the cloudlet host, which publishes metadata of cloudlet for determining appropriate cloudlet for offloading of application and code and to be connect. The cloudlet metadata contains IP address and port to connect to cloud server and describing cloudlet capabilities. In every application a cloudlet ready client application is presented at client portion. The negotiation between the cloudlet client and server for offloading is handled with the information contained in the client App Metadata. As soon as the

negotiation is completed a cloudlet is identified for offloading process then cloudlet client sends the Client App Metadata and provisioning Data to the cloud server. The provisioning refers to the configuring and deploying the service virtual machine that contains the server code on the cloudlet for making ready to be used by client running on the mobile device. The provisioning data varies depending on the cloudlet provisioning process like optimized virtual machine synthesis, cached virtual machine, application virtualization, cloudlet push and on-demand virtual machine provisioning and can range from parameters to start service virtual machine that already resides on the cloudlet host. The cloudlet server configures and starts the corresponding service virtual machine inside the virtual machine manager according to the cloudlet defines provisioning process and data. When the service virtual machine is started then the client app is notified that is ready for execution.

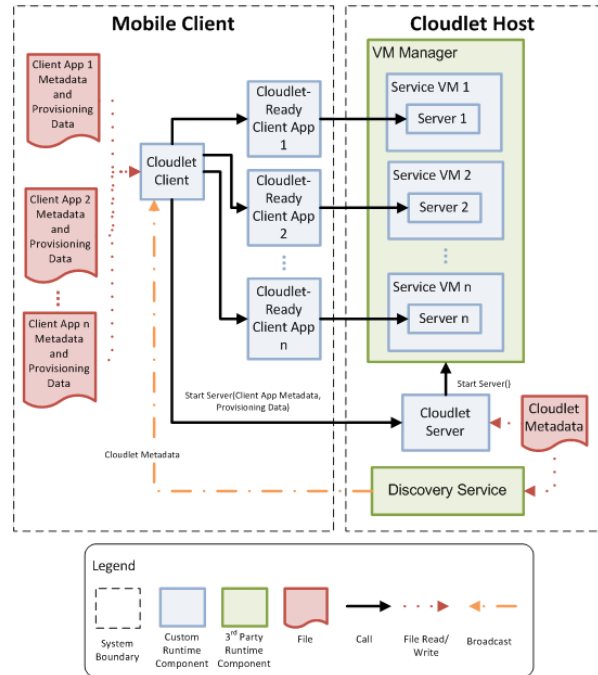


Fig 3: Architecture for cyber foraging

2. PROPOSED SYSTEM

In existing system we had seen that there are group of cloudlets which share load of cloud server to provide service to mobile system. The cloudlet architecture which is

3. CONCLUSION AND FUTURE WORK

three tier with mobile device, cloudlet and cloud. This scenario is suited when there is less number of mobile devices in a cloudlet range, but in nowadays we come across many mobile devices if such a case then service quality for all mobile devices are not encourageable. So, to avoid requests from un authenticated devices are not accepted by maintaining the registry for all mobile devices which is under a cloudlet.

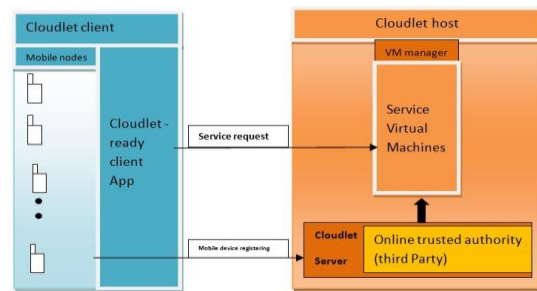


Fig 4: cloudlet client and server communication with online trusted authority.

As shown in the figure 4. The cloudlet server ensures the communication between the computing nodes are authenticated. The online trusted authority included in the cloudlet server will validates the credentials of the requester or a certificate repository. When a mobile node is ready to request the cloud services then the credentials are stored in a service repository so that it can be authenticated whenever it requests a cloudlet. The handoff will takes place when a mobile device is moving from one place to another, in such cases the discovery service looks for available mobile nodes in a cloudlet.

If a mobile device user moves away from the cloudlet he is currently using, interactive response will degrade as the logical network distance increases. To address this effect of user mobility, the offloaded services on the first cloudlet need to be transferred to the second cloudlet maintaining end-to-end network quality. This makes possibility of live migration in cloud computing.

In this paper we have included a online trusted authority which contains the credentials of mobile devices which

validates every mobile device that connects to cloudlet. By implementing this architecture only authorized devices are allowed to use the cloudlet services. The cloudlet performs load balancing and used to improve performance of communication between nodes. Virtual machine supports for this communication.

The future work may also involves integrating the tactical cloudlet concept for easy deployment and redeployment capabilities so that the execution time is improved and to sustain its computation before cloudlets become out of range. To identify failed communication between mobile devices and cloudlets to lower the computation.

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