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Implementation of Quality of Service for Cloud based Application

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Abstract- The new trends in mobile devices and network technologies are improved so much. One of such improvement or trend is cloud computing and mobile computing. In future, these mobile devices are expected to switch between different network service providers, in order to maintain network connectivity all the time. So mobile devices can all time access Cloud services without any problem. In the current service delivery mechanism, users when move from one physical location to another, s/he continues access from the local Cloud of previous network only. Because of this huge amount of data has to move over the network for very long distance, which creates congestion in the network. This degrades the Quality of Service and Quality of Experience offered by the service. So, a new approach is needed to manage resources properly and provide improved QoS and QoE. This paper provides a novel framework that allows populating services, that run on localized Cloud, to the Cloud present at other geographical location. This will prevent network from high traffic load and will offer service providers an automated resource allocation and management mechanism for their service.

Keyword*: QoS, Cloud computing, service migration*

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I. INTRODUCTION

Cloud computing is a relatively new trend in IT that involves the provision of services over a network such as the Internet. The cloud service offered are divided in three categories: Software as a Service(SaaS), Platform as a Service(PaaS) and Infrastructure as a Service(IaaS).[1] It is an emerging computation paradigm with the goal of freeing up users from the management of hardware, software, and data resources and shifting these burdens to cloud service providers. Software and hardware services are hosted at widely distributed sites. This increases the network traffic and unexpected delays due to network congestions. This problem can be solved by considering service migration.[2]

Different approach is required to manage resources more efficiently, while improving the Quality of Service and Quality of Experience of mobile media services. This introduces a novel concept of Cloud Based Mobile Media Service Delivery in which services run on localized public Clouds and are capable of populating other public Clouds in different geographical locations, depending on service demands and network status. Using an analytical framework, previous concept argues that as the demand for specific services increases in a location, it might be more efficient to move those services closer to that location. This prevents the Internet backbone from experiencing high traffic loads due to multimedia streams and will offer service providers an automated resource allocation and management mechanism for their services. It also investigates how the number of clients can influence the decision making at the Service Delivery layer. It believes that a different approach is required to manage resources more efficiently, while improving the Quality of Service and Quality of Experience. This dissertation introduces a novel concept of Cloud Based Mobile Media Service Delivery in which services run on localized public Clouds and are capable of populating other public Clouds in different geographical locations depending on service demands and network status. Using an analytical framework, this dissertation argues that as the demand for specific services increases in a location, it is more efficient to move those services closer to that location. It will prevent from experiencing high traffic loads due to multimedia streams and will offer service providers an automated resource allocation and management mechanism for their services. So, it proposed public cloud service which is based on Quality of service. It will calculate users geo locations, service provided and apply algorithms to maintain good service delivery at other end.

II. MODULE

In this implementation following modules are used for efficient service allocation and migration.

A. Service Tracking And Resolution

This system includes different clouds and users that access cloud services. Suppose one user comes in specific cloud area and send a request to the cloud for connection. Then the master node of that cloud network sends the request to STAR which contains Cloud IDs. STAR returns specific Cloud ID to the master node. As per that the user's request id registered and connection is established between cloud and user.

B. GSPA

After registration Cloud provides services to the user without any interruption. But user is mobile user. So at the time of accessing service from the Cloud user moves from one location to another or under the area of other cloud, still that user uses the service of previous Cloud instead of nearer one. This creates congestion in network and degrades the QoS. GSPA module regularly checks the QoS of service, when Qos of service degrades it sends migration signal to QoS manager of master node of Cloud.

C. QoS Manager

Then QoS manager finds the target cloud as per the location of user and network status and migrate that service to target cloud. It may happen that target cloud reject the service if it is already under the heavy load at that time again new cloud is selected for migration of service.

III. SYSTEM ARCHITECTURE

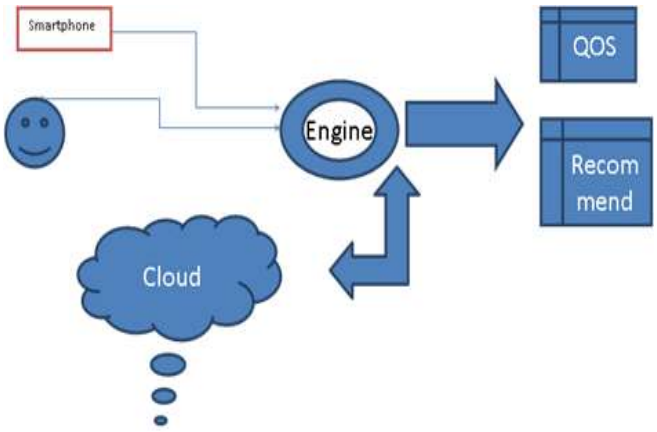

Fig 1. System Architecture

Mobile devices now days come in different shapes and forms. The most popular form of this is laptop, even they are not truly portable in the sense that we cannot operate one while on the move due to the size and form factor. It has created a demand for mobile devices and easier to use for someone on the move and away from a power source. The devices that complete those requirements and created a new trend in mobile computing are smart phones and tablet PCs. Unlike laptops and desktop computers, these mobile devices are made with a long-lasting battery life, a small size and weight, a simple user interface and run basic computing tasks using limited resources such as memory, etc. so at the time of accessing services of one cloud if user changes his location then still he can access the services from previous cloud. The data has to travel long distance to reach to the user. It creates congestion over a network. To solve this problem there is need to populate that service to the new cloud which is closer to the user. It solves the problem of congestion. But if the same service is accessed by second user then it creates the problem of ambiguity. So the proposed system migrates only the object of services instead of migrating the whole service. It also prevents the migration of recently migrated services which causes the congestion over a network. The architectural design of this idea is as shown in fig 1. It shows that the mobile users accesses the services of cloud then if they moves from one geographical region to other region, the QoS of services they accesses are drops below the threshold value means there is time to migrate the service to other cloud. As shown in fig 1 users accesses services from cloud the search engine finds the location of user and then on the basis of QoS he generates the decision whether to populate the service or not and on which cloud to populate the service. So whatever the recommendations that will be send to the cloud. On the basis of this recommendation, service will be populated to other cloud. In this architecture of system search engine means the master node of the cloud which is responsible to manage the cloud. Also master node collects the IDs of the other nodes of cloud, number of subscribers it have, number of services running on cloud. So the engine takes the decision when to migrate the service and on which cloud.

IV. ALGORITHM

1. Start.
2. Start node and QoS manager.
3. User connect to the cloud after successful login.
4. Client sends service request to cloud.
5. Cloud register the request and finds appropriate cloud id.
6. Connection is establish between cloud and client.
7. GSPA checks QoS of service regularly.
8. If QoS drops below threshold value GSPA sends migration signal to QoS manager.
9. QoS manager migrate the service to the target cloud after checking the recommendations of STAR and GSPA.
10. Stop.

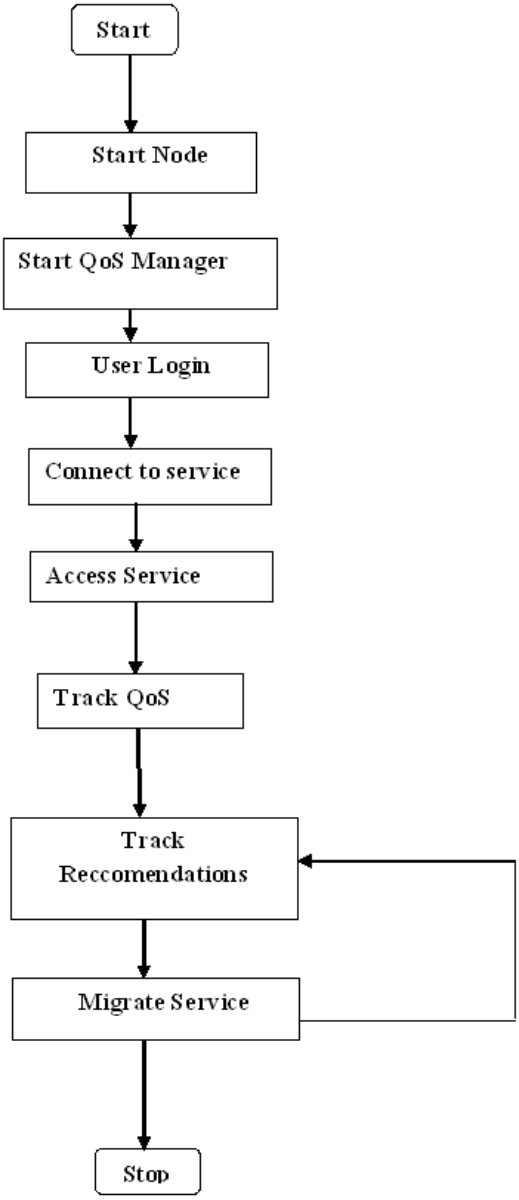

Fig 2. Flowchart

V. CONCLUSION

Cloud Computing along with good processing power gives some issues of Quality of Services. This issue arises especially when the user is mobile user and frequently changes his/her location. This paper has addressed such issue of user mobility. It also discussed the QoS and QoE issue. It provided the framework to deal with such problems. The framework provides the way to populate the service running on localized Cloud to the Cloud of other network. Also when QoS degrades it migrates the object of service to the Cloud nearer to the user instead of moving whole service.

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