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Context Quality of Service Adaptor to Provide Mobile Cloud Computing

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Abstract— Quality of cloud service is one essential factors for the achievement of cloud providers in mobile cloud computing. Context-awareness is a accepted scheme for regular knowledge of the mobile situation and choosing the most proper cloud provider. Lack of framework information may destruction the users assurance in the application depiction it useless. To getting the correct answer and crowd sourcing and the group of members are gathering discussing the topic. The discussing advantages are quickly getting the answers reducing the time. The get is easily accessing the data to a cloud and to provide the quality of data.

Index Terms - Mobile cloud computing, Crowd sourcing, Context-awareness, Quality of service, Service detection.

1 INTRODUCTION: Next-generation computing communications, cloud computing, has posed a number of challenges to mobile client users. They do not know how to choose a suitable cloud service on their own. Some method is implemented for the single mobile user to attentive local network environments. However, this context-aware technique can only attentive incomplete location acquaintance and the device need to frequently aware of the environments when they move to a new position. The globe environment attentiveness task is achieved by crowd user. Globe context-aware way has more ability and gathers more knowledge of service providers and system environment.

For new arrivers, so the users do not need to carry on being aware of the surroundings and will hastily determine the proper services when they arrive in a new place. The structure introduced in this paper is based on a good-looking type of outsourcing called crowd sourcing. The term crowd sourcing describe a new distributed business model that resolves the compound problems. Recent studies exhibit the effective acceptance of crowd sourcing techniques for collecting several and reliable decision tasks. Mobile cloud computing is estimated to make mobile devices more powerful by using distributed online computing resources. They are the main curiosity in the saleable applications of cloud computing using the Platform as a Service (PaaS), Infrastructure as a Service (IaaS), and Software as a Service (SaaS) deliverance models. In those platforms, software and resources are hosted on the cloud instead of with the client, who pays for the necessary resources according to their resource usage. In order to improve the efficiency and stability of the cloud service for mobile phone users, the web service composition is introduced. Web service work of art provides a way to combine basic web services (perhaps offered by diverse providers) and value-added services to meet the desires of users. Users only trust mobile cloud computing when the cloud services have the excellence of services. Mobile computing environments are multifarious and impulsive. The presence of lack of knowledge of perceptive environments and incompetent discovering services troubles the users' quality of knowledge in the service thus depiction it useless. The relationship is summarized from. Crowd sourcing improves a user's contentment of using cloud service. When we have more belief of context information, the service adaptor (SA) will be more understandable and efficient. Then, we can supply more excellence cloud services for a user. Crowd sourcing can help SA to understand more mobile phone environments and make the correct decision. While there is no direct relationship between service quality and context

information, we need to build several analysis mechanisms to achieve eligible services for mobile users. In this paper, we advise a crowd sourcing based quality of service structure for mobile cloud service: crowd sourcing based Quality of services adaptor (CQA) for different kinds of mobile applications. CQA is a middleware advance that enables dynamic adapt the cloud service, and safeguards crisis service request, efficient resource use, and savings in economic provision costs. By monitoring the quality of source and quality of device, CQA will respond to cloud service appeal for following Quality of services main concern level. All of the events are under the control of context-reasoning piece in CQA.

• Design a crowd sourcing platform to supply Quality of services for mobile cloud service.

• suggest a crowd sourcing-based server detection schemes for choosing the finest cloud service.

• Implement a trial product platform and evaluate the efficiency of crowd sourcing model with conventional schemes. We briefly bring in mobile cloud computing and Quality of services needs. Then, we present the structural design of the framework CQA and Quality of services modelling method. In the next section, the Quality of services deal with algorithms used in context-reasoning module is described in detail. Finally, conclusions are drawn and future studies are proposed.

2 RELATED WORKS

excellence of Service in mobile cloud computing environment describes the behavior of information as it is exchanged between the mobile client and cloud service. The Quality of Service (Quality of services) in a mobile cloud environment procedures service in accessibility, priority, cost, response time, and all over. For the unusual types of cloud service, an operator is looked-for to be developed to reach different treatment within the environment for them to function correctly.

2.1 Mobile cloud Service Cloud computing is a large-scale distributed network system based on a number of servers in data centres. The models of cloud services are proficient of chiefly be categorized based on a layer concept. In the high layers of this model, Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) are stacked. Due to the restrictions of mobile device, the typical mobile cloud computing services can be functionality grouped into two categories:

2.1.1 Storage Service: This type of service aims to crack the problem of storage precincts on mobile devices. The applications need big data diffusion between mobile client and server. Network availably, react time, and throughout are the main concerns of this variety of service. Mobile trade, mobile healthcare [16], mobile learning, and mobile multimedia are archetypal applications belonging to this kind of service. Mobile retail usually requires low network cost and right through, but high ease of use and response time. Some other services may need high quality of services for high right through.

2.1.2 Computing Service The computing services transport the important computing task from a mobile machine to cloud and accomplish the results. The applications relieve of the task and data to the cloud [19], which is an appropriate solution to address the issues of computational energy and battery life span. Mobile crafty, mobile online gaming, and mobile multimedia are ordinary applications which need large dealing out resources. Some of them also need a high quality of services for short response time and high throughput.

In addition, there are a group of services that do not guarantee return time and priority. This is called as best-effort services, such as email, file backup, and condition updates. As described above, diverse types of cloud services may need different Quality of services requisite. To be aware of fully service request need and present mobile environment, we make use of context-awareness method to accomplish this goal.

2.2 Context-aware Mobile Cloud Service Context-awareness is an outstanding result to mobile environments and intelligently chooses the finest cloud service. Summarizing there are two main context-aware mobile cloud services. One is service adaptor SA running on the mobile site and the other is SA running on cloud. When SA is settled on the cloud side, all the services are grouped together for a

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mobile device. We named this environment centralized architecture. There are three layer into context-aware mobile confuse service structural design: user layer, adaptor layer with cloud service layer. Adaptor layer is in arraign of cloud service matching process. Difference cloud services register their service on a service provider component in the adaptor layer. Context inference mind the user's environment and source context information for determiner. Determiner selects the mainly fitting cloud service from service provider pool based on the present context in sequence.

2.3 Mobile Crowd sourcing Crowd sourcing has been successfully applied in commercial applications: Mechanical Turk, iStockPhoto, and innocently. There are also several reaches on mobile crowd sourcing. Eagle et al. developed a mobile crowd sourcing system, tutelage, which hires users with little benefit to completing simple tasks such as translation, transcription, and filling surveys. Yang et al. designed incentive mechanisms for mobile user sensing. Alt et al. well-thought-out location context as one constraint for distributing tasks for the workforce. For the participatory sensing organism, Kumrai et al. introduce an inducement mechanism to gratify both the users and the once-over providers. However, none of them can be in a straight line applied to Quality of services control platform.

2.4 Motivation for Crowd sourcing-based Quality of services Platform:

The mobile users might have some problems such as overcrowding due to the restriction of wireless bandwidths, network disconnection, and the signal attenuation caused by mobile users' mobility. To carry on with cloud services, we require to reconfigure the system settings by hand for diverse mobile environments. in addition, the need for the provider's information is also a deficiency to decide suitable cloud service. Context-awareness is an outstanding solution to sense mobile environments and sharply desire the preeminent cloud service. In addition to crowd sourcing knowledge, we can accomplish the goal to prefer brightly the best cloud service to present Quality of services for a mobile device. There is some background we need to understand first. With the cloud, so Quality of services is reduced significantly.

3 QUALITY OF SERVICE MANAGEMENT

In this segment, a service excellence model for mobile cloud computing environment is introduced. The cloud service provider and network service carriers are the major factors affect the appeal of cloud services for mobile users**.**

3.1 Service Quality Model the structure of mobile cloud service can be divided into three parts: mobile users, network carriers and cloud service providers. The mobile users can liberally choose unusual networks to use different cloud services. The excellence of service on the mobile device is artificial by both the cloud service providers and network service carriers. We first provide the clarity for the two types of services in mobile cloud computing situation: Definition 1 (Web Service, WS). Web Service is a Tuple: WS, where F denotes the service property supplied by a cloud service provider and Quality of services represents the quality of service at service side. The Web Service is the basic service provided by different cloud service providers. The crucial services offer essential machine service, fundamental desktop service, and storage service and so on. Four Qualities of services properties are used to describe the capabilities of different provider's services, which include computing capacity (CPU), storage (STO), reliability (RL) and price (PR). Web Service (WS) represent the number of computing and storage needs the cloud service provider is able to method per second. The consistency of a cloud service is denoted by RL, which can be considered by the occurrence of usage. PR is the fee that a user pays for a single service request. RTD is the round-trip impediment time among a mobile device and cloud service. BW is the network bandwidth pragmatic from end-user for unusual service. The same cloud service may have special bandwidth through different system carriers. We think that the mobile user can liberally use different types of wireless network. The Web Services cannot be called by mobile users straight . The mobile user requests to use the cloud service during a different network. The network bandwidth is considered in NS. Cloud service provider and network delivery service have different

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service qualities, we need to assess the overall performance and choose the appropriate service providers. In this paper, we suppose that the end-user can select any cloud service and any network service at any time. unlike types of mobile applications have different quality of service requirements. For example: Streaming applications mainly concern about network bandwidth , Real-time applications focus on network response time And Data organization applications are receptive to price and energy utilization. A defined quality of service is desired for assured types of application.

4 CQA DESIGN

The CQA is a third-party platform which continues sensing environment, monitoring resource, and making decisions based on different service requests. The proposal has running an instrument on the client-side to gather both user's context information. In this fragment, we will introduce each constituent in the CQA proposal**.**

4.1 Context Gathering Individually, users will update their cloud service usage report to CQA platform. We set the context update interval to be 12 hours for each user. The latest cloud service will also list on CQA platform. The further information they collect, the more proper the cloud service they resolve select. The mobile site context can be described as:

• CUM: context of user mobility;

• CUL: context of user location;

• CNT: context of network type;

• CPN: context of provider name;

• CPD: context of provider description;

4.2 Service Discovery The service discovery process can be described as a query for the most suitable result from gathering data. After collecting enough context information, we can build a determiner, which can rank the performance of each cloud service in a certain kind of context environment. The workflow of crowdsourcing based service detection.

The update data will be stored in a context database, which describes the relationship between the context environment and cloud service providers. After collecting enough context information, we can build a determiner, which can rank the performance of each cloud service in a certain kind of context environment. The context database stores the relationship between the context environment and available cloud providers.

4.3 Service Selection Engine When the user requests a cloud service, the two parameters [User, Performance] need to be provided to query the available results. Our ranking model calculates the Quality of services performance after the available cloud providers are found. Then, we select the top-rank provider as a result and send back to the requestor. The more data we collect, the more accurate the service we can choose. Those steps are shown in the numbered lengthens; we rank the Quality of services performed using the historical record and select the best one as the result.

4.4 Credit Manager We design a credit manager component which is in charge of evaluating the reliability of each service provider. The credit is the numerical results of the winning service times. Based on the provider uptime and custom regularity, the credit manager calculates the consistency gain RL for each service WS.

RL = regularity of usages frequency of attempts to attach to the service.

5 PROTOTYPE IMPLEMENTATION

The proposed platform is implemented using network simulator NS-3 [35]. The crowdsourcing server, mobile devices, and cloud services are all measured as node class in NS3. The crowdsourcing server joint will gather the context information from different users. When a mobile device requests a cloud server, it will send its context information to crowdsourcing server node. Then, the server will tell the requestor which cloud service provider is the most suitable based on the requestor's context using a ranking scheme. Finally, the requesting node will communicate with the cloud server directly. The complete effective steps of the crowdsourcing stage are as follows:

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An Initial adaptor and generate context: location, network type, network service carrier,

B The application needs cloud check from the adaptor,

C The adaptor send a demand and appliance context to crowdsourcing proposal,

D Ranking the order of the similar records by cloud Quality of services performed,

E If there are records in the knowledge database goes to step g,

F Ask the devices in the location to test the performance of all the cloud service providers in the database, send the benchmark to the platform, and go to step d,

G Send back the result to the requestor,

H The adaptor chooses the cloud service provider for the application.

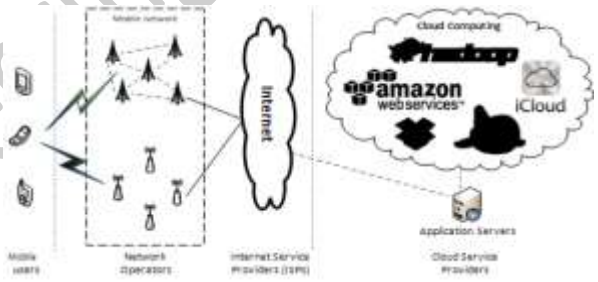
5.1 CQA Adaptor The context theory and service compulsory confirm at mobile user side run in the environment when CQA adaptor is rounded on. As a third-party adaptor, CQA provides a easy interface to receive service needs and return the other services list classify by Quality of services score. An application sends the service queries to the CQA interface and waits for the result. After receiving the result, the requestor will connect to the remote cloud server directly. The CQA adaptor will monitor the provider's status and timely update the service's performance to CQA platform. When the user arrives at a new location, the CQA adaptor will query for all available services at the current location and test performance.

5.2 CQA Server: The CQA platform can also be considered as a cloud service which provides service information. It deliver the quality estimation results of every cloud service. The CQA platform is a user-centric crowdsourcing model [25] that the mobile device has the right to select which task to run. This mechanism is scalable because its running time is linear in the number of users. The user-centric model is computationally efficient and truthful than other models [25].

5.3 Applications

We virtual two applications on top of CQA: an online media request focus on downloading and a photo support application focusing on uplink evaluation.

5.3.1 Online Media to replicate online media application, multiple video files are downloaded from cloud servers. It requires high bandwidth and constant network environment to protect the worth of online video service. individuals video files are stored in different cloud servers and mobile users accidentally choose which file to download. The mobile user is also randomly moving around in different places. After one video file is downloaded, the mobile user will attempt to download another video file. The download instance and download speed are recorded for estimate during the imitation process.



Mobile cloud computing architecture

6 SIMULATION SETUP AND PERFORMANCE EVALUATION To observe and analyze how crowdsourcing can supply the efficient and stable cloud service with Quality of services, we built a simulation environment to evaluate the platform performance using NS-3 [35]

6.1 Case Study The experiment scenario Our experiment focuses on comparing the efficiency and stability of crowdsourcing platform and general context-awareness Quality of services scheme. A mobile device will mechanically select a proper cloud service at unusual locations. As the user will choose different types of network service carrier and service distance problem, the cloud service will result in different Quality of Service for the user. We will fully consider all these situations in our case study.

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Currently, there are three types of cloud services: IaaS (Amazon, VMWare), PaaS (Google App Engine), SaaS (iCloud, Hotmail). hence, we consider three cloud services in our research environment. Each examine has three levels (low, medium, high) of worth service at unusual locations. The location is an area with an Access Point (AP), where a mobile device can connect to networks. The AP connects to cloud services via a wired connection

6.2 Observation and Analysis In order to reduce the experimental results of causal factors, each case was tested 10 times and the average result calculated. the response time, when an application queries for service until the application receives the cloud service's response. As we can see in there is no difference at the beginning of the simulation. However, when the crowdsourcing platform gathers enough context data for a location, the service discovering time is reduced rapidly. After all the locations data be together, the reaction time reached a constant level. The nodes using context-awareness method still need to test the quality performance of each cloud service. hence, the response time can not be reduced.

6.3 Discussion the capability of crowd users is more powerful than a single user. Crowdsourcing stand can solve the difficult cloud services discovering and evaluation problem virtually half times faster than entity. It builds the knowledge database to speed up the Quality of services evaluation works. The user does not require to run the complex estimation tasks locally. Although we use a third-party platform to collect users' context information, we do not evidence users' character information. The proposed system just sense the environment situation and cloud providers' performance at a different location. Mobile users do not want to have privacy worry about osur system.

7 CONCLUSION : we briefly introduced crowdsourcing based Quality of services adaptor (CQA), and its key components and Quality of services control structures. It can be applied to mobile cloud computing environments in order to provide Quality of services management for cloud service. We presented the system devise, mutually with its implementation. The context parameters related with the theory are also discussed. We explained how CQA intelligently provides Quality of services control using context-awareness method's results. The simulation results show that the crowdsourcing based awareness method can reduce the cloud service discovery time than the traditional local context-awareness method, especially for frequently moving user. Current work also denotes that the crowdsourcing model is an efficient way to solve the massive parallel task.

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