International Journal of Scientific Research Engineering & Technology (IJSRET)
Volume 1 Issue5 pp 190-193 August 2012 www.ijsret.org ISSN 2278 – 0882

Mobile Cloud Computing: A New Approach, Case Study, Result & Analysis

[1]Payal Rani, [2]Nalini Tyagi
[1]Information Technology Department, [2]Electrical & Electronics Department,
[1]NIMS Universit[1], [2]GBT University
[1]p.prani07@gmail.com
[2]nalinityagi2010@gmail.com

ABSTRACT

In this paper we aim Cloud Computing as a new computing technology which provide efficient reliable, customized and isolated hardware network. Although cloud computing industry promises tremendous prospects of market growth, for users of cloud services, cloud computing has a wide range of potential risks and safety issues in every field of era .This paper has a challenging cloud security issues for the better prospects of life in mobile cloud computing. It covers the key technologies of cloud computing, security challenge and problem in cloud computing, recent advances in cloud security. Most we explore the "middle ground", where users can still share physical hardware resource, but user networks are isolated and accesses are controlled in the way similar to that in enterprise networks. We propose an architecture that takes advantage of network virtualization and centralized controller for next rapid development.

Keywords: *Distributed computing, Mobile cloud computing; parallel computing; Virtualization, Cloud security, Architecture*

I. INTRODUCTION

The advantages of cloud computing as an IT infrastructure are becoming more apparent as Internet services develop. Cloud computing services follow a scalable delivery and usage model, which means services, can be requested on demand and can be customized. Networks that provide resources are called clouds. Clouds form a kind of virtual data storage and resource pool on a web-based platform and these resources can be accessed by users. There are three key cloud service models. Software is a Service, platform as a Service and Infrastructure as a Service. The core concept of cloud computing is to provide on-demand services and to make terminals into mere input/output devices by improving cloud processing capacity and reducing terminal processing load as an extension of Internet search technology, mobile search is a generic term for mobile-based search technology. It refers to the acquisition often-demand information and services (Wireless Application Protocol (WAP) sites, Internet information, mobile value-added service, or local information) on a mobile terminal via short message service, WAP, Interactive Voice Response and other access modes. Despite these benefits, there are challenges — specifically, security challenges. Conventional infrastructure security controls designed for dedicated hardware do not map well to virtualized environments. To address these challenges, virtual infrastructure architectures must have well-defined security policies and procedures in place. Additionally, although they probably will never be fully interoperable with existing dedicated security controls, there has to be some degree of compatibility between the newer security protections specifically designed for virtualized environments and traditional controls. This paper first discusses the most common unaddressed security issues in virtualized infrastructures. It then explains how Cloud Compute family of products delivers security services that address these issues. Finally, it presents a cloud security services architecture virtualization strategy that enterprises can deploy to get the most favorable Cloud Compute offer.

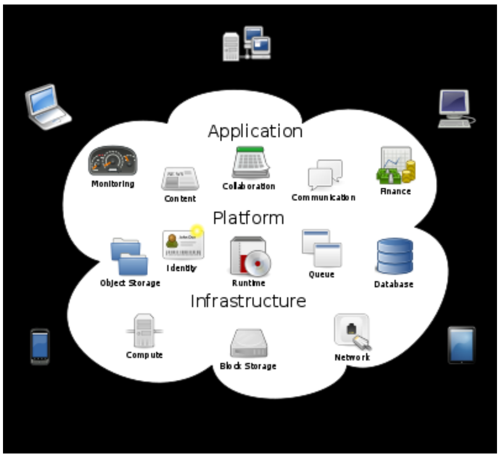

Fig1: Introduction of cloud computing

II. MOBILE SEARCH SERVICES OVERVIEW

Mobile search involves providing services via mobile search engines. These acquire information from user input and integrate information from different providers to build relationships between the two. Processing information on an engine means that information it can be made suitable for a mobile terminal compared with traditional Internet search, mobile search has the following advantages: More Flexibility: Users are no longer restricted by a fixed terminal and can search anywhere and anytime accurate results. Mobile search is focused on simplicity and effectiveness. These features require the search engine to have stronger capacity for natural language analysis and to provide accurate results. Diverse applications mobile search should be more like a basic capacity than a service. It has been widely used for entertainment data filing, travel and managing personal information. Combining diverse features boosts the development of popular applications. Since the multiservice development model emerged, isolation of the mobile search services, and flexibility of search traffic have become clear requirements.

Many technical problems are encountered in the development of mobile search. These include data expansion for personalized search, more data from user access logs and other user-associated information needs to be recorded. These demand greater storage and processing capability in mobile phones. Limited processing power providing accurate results means increasing the processing work load of search technology. Enhancing user experience, processing search data, and correlation analysis all require quick and powerful computing. Information security for mobile search is the basic requirement of multiservice application is security. This is essentially different from Internet search technology. Service flexibility service scale differs considerably during different stages of development. Fluctuations require powerful service processing capacity for a mobile search engine. As well as cost and energy saving, service flexibility must be taken into account.

III. CLOUD COMPUTING IN MOBILE SEARCH

Key areas of mobile search development are mobile network, search technology and user end. The emergence of cloud computing infuses a powerful driving force for the development of mobile search. Massive Data Storage Cloud computing provides a secure and reliable data storage centre for both storage and management. A cloud-based distributed network with scalable architecture not only provides mass data storage capacity but also takes advantage of storage capacity in the server itself. So computing and storage size are upgraded together, and this can significantly improve system reliability, availability, efficiency, and scalability, parallel computing provides powerful computing for mobile search applications. Map Reduce is a data processing solution based on mass data storage. Computing tasks can be decomposed by the Map Reduce programming mode. Real world computing tasks can be abstracted and then implemented by a partition statute using this programming model. Parallel computing is the solution to mass data storage in mobile search. New solutions for mobile security cloud computing is combined with parallel computing, grid computing, and other emerging technologies and concepts. In applying cloud computing, security must be guaranteed for multiservice applications in the basic cloud structure. Distributed storage and distributed database are key technologies for which service security is a key requirement. Virtualization can be used to build a hardware and software wall for securing services.

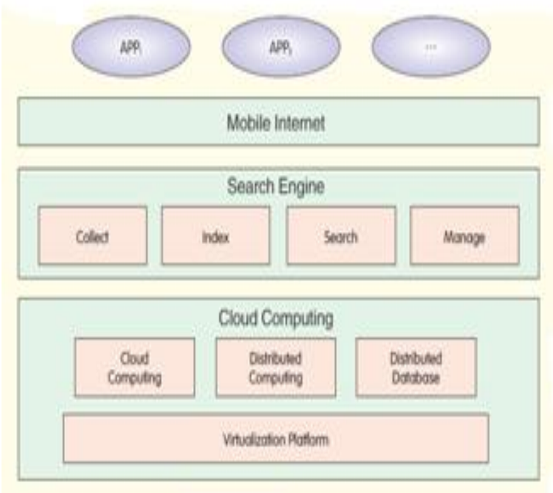

Figure2: System architecture of mobile search based on cloud computing.

IV. PARALLEL COMPUTING

In Smart phones have exploded popularity in recent years, becoming ever more sophisticated and capable. As a result, developers worldwide are building increasingly complex applications that require ever increasing amounts of computational power and energy. In this paper we propose Think Air, a framework that makes it simple for developers to migrate their smart phone applications to the cloud. Think Air exploits the concept of smart phone virtualization in the cloud and provides method-level computation offloading. Advancing on previous work, it focuses on the elasticity and scalability of the cloud and enhances the power of mobile cloud computing by parallelizing method execution using multiple virtual machine (VM) images. We implement Think Air and evaluate it with a range of benchmarks starting from simple micro-benchmarks to more complex applications. First, we show that the execution time and energy consumption decrease two orders of magnitude for a N-queens puzzle application and one order of magnitude for a face detection and a virus scan application. We then show that a parallelizable application can invoke multiple VMs to execute in the cloud in a seamless and on-demand manner such as to achieve greater reduction on execution time and energy consumption. We finally use a memory hungry image combiner tool to demonstrate that applications can dynamically request VMs with more computational power in order to meet their computational requirements.

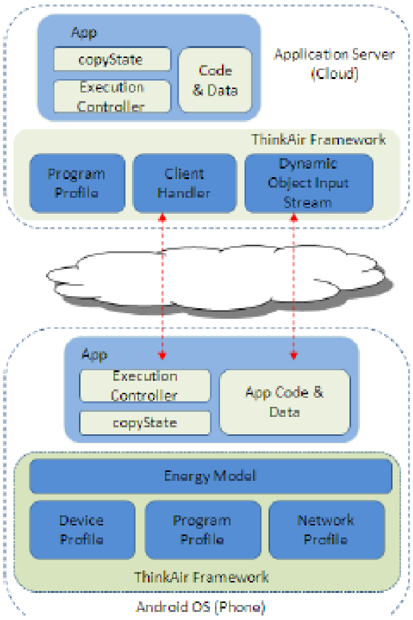

Fig3: Overview of the Thin Air framework.

V. DESIGN GOALS AND ARCHITECTURE

The design of Thin Air is based on some assumptions which we believe are already or soon will become true:

(1) Mobile broadband connectivity and speeds continue to increase, enabling access to cloud resources with relatively low Round Trip Times (RTTs) and high bandwidths;

(2) As mobile device capabilities increase, so do the demands placed upon by developers, making the cloud an attractive means to provide the necessary resources; and

(3) Cloud computing continues to develop, supplying resources to users at low cost and on-demand. We reflect these assumptions in Thin Air through four key design objectives.

(i) Dynamic adaptation to changing environment. As one of the main characteristics of mobile computing environment is rapid change, Thin Air framework should adapt quickly and efficiently as conditions change to achieve high performance as well as to avoid interfering with the correct execution of original software when connectivity is lost.

(ii) Ease of use for developers. By providing a simple interface for developers, Thin Air eliminates the risk of misusing the framework and accidentally hurting performance instead of improving it, and allows less skilled and novice developers to use it and increase competition, which is one of the main driving forces in today's mobile application market.

(iii) Performance improvement through cloud computing. As the main focus of Thin Air, we aim to improve both computational performance and power efficiency of mobile devices by bridging smart phones to the cloud. If this bridge becomes ubiquitous, it serves as a stepping stone towards more sophisticated software.

(iv) Dynamic scaling of computational power. To satisfy the customer's performance requirements for commercial grade service, Thin Air explores the possibility of dynamically scaling the computational power at the server side as well as parallelizing execution where possible for optimal performance. The Thin Air framework consists of three major components: the execution environment, the application server and the profilers.

VI. APPLICATION CASE

The following illustrates the benefit of using cloud-based mobile search. An enterprise has a set of news search systems for mobile users. The system servers provide the main search function and are combined with minicomputers with largest available 200 caps access traffic. There are still many redundant caps for traffic (average: 10 caps, max: 50 caps). A major incident happens, and people want to find out what is going on. So they use the most convenient tool, a mobile terminal, to search for

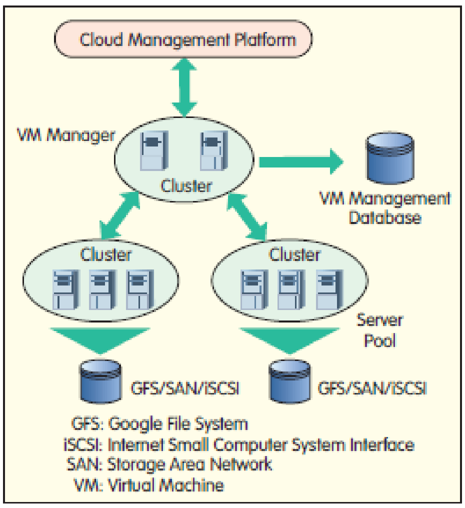

Fig4: Virtualization platform deployment.

Information. This brings about a sharp rise in service access traffic to 200 caps. Such a spike in access traffic would challenge a mobile search system with a traditional structure. When the system is unable to complete user requests, a large number of requests accumulate in the system tray buffer, or are rejected, and this leads to delayed response times or denial of access. So user satisfaction with mobile search is greatly affected. To solve this problem, the enterprise reconstructs the system based on cloud technology. Existing minicomputers are kept and are given the main computing processing capacity. When traffic rises sharply, the new search system with distributed structure and virtualization technology allows the new PC server to join into the service system (20-50 caps) processing capability for one node) in one minute with the added advantages of cloud computing the system assigns user requests to N access points, and the data of each access point is assigned M processing nodes for processing according to the computing capability of every node. In this way, large-scale service requests can be handled by multinode load sharing and multinode parallel processing. After the peak, the corresponding nodes can be released. In practice, one minicomputer and 6-8 PC servers doubles system capability to 400 caps a minute. Similarly, this can be used for support in emergency situations to ensure service availability.

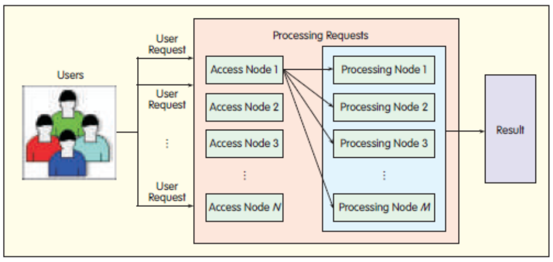

Fig5: Application overview

VII. ON-DEMAND SECURITY CONCEPTUAL MODEL

A conceptual security model (Fig. 6) is given to illustrate how on-demand security can be achieved in a cloud-based telecommunications service environment. Assume that vector A is the security unit set. Let A_1 be the security unit set of the transmission security domain, A_2 the security unit set of the processing security domain and A_3 the security unit set of the storage security domain. A_1, A_2 , and A_3 are the subsets of A; that is,A_1 A, $A_2 \subset A$, and $A_3 \subset A$. Let f_1, f_2, and f_3 be the security parameter vectors of the security unit sets of the above three domains. The expression of these security parameter vectors is fi (x_1, x_2, x_3), where x_1 is service type, x_2 is site where the data is located, and x3 is the level of security. On-demand security for cloud-based telecommunications service is computed as $A_1 \times f_1 \oplus A_2 \times f_2 \oplus A_3 \times f_3$; that is, the integration of the security solutions of three domains, where $\oplus$ is the connector. The security units in A_i are security functions such as encryption, authentication, and integration that were already realized by the cloud platform during the R&D stage. fi is the security assessment model that should be implemented by Security Operation Center (SOC). It is a mathematics model plus necessary security policies. In this model, a security administrator needs to configure parameters for x_1 and x_2 and the user configures the parameter for x_3. These parameters are only relevant to the service platform.

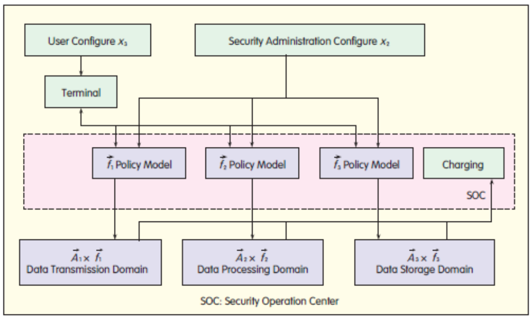

Fig6: Processing flow for the user request

VIII. RESULT & CONCLUSION

As the basis of mobile Internet architecture, cloud computing will be vigorously developed. Technologies between mobile search and cloud computing will fuse together, and more services will be introduced with this converged technology that will bring about greater convenience for work and life.

REFERENCES

[1] Y. Liu, "Summary of cloud computing and mobile cloud computing application, "Information and Communications Technologies, No.2, pp.14-20, Feb. 2010.
[2] Q. Yuan, "Mobile Search Technologies and Service Development, "Telecom Network Technology, no. 4, pp. 38-42, Apr. 2007.
[3] T. Guo, "Competition Promoting Development: Mobile Search Trends,"Globrand. [online]. Available: http://www.globrand.com/2010/344424. shtml
[4] Devi Li,"Analysis of Hot Topics in Cloud Computing,"ZTE Communications, vol. 8, no. 4, pp. 1-5, Dec. 2010.
[5] P. Zhao, "Cloud Computing Technology and Its Applications,"ZTE Communications, vol. 8, no. 4, pp. 34-38, Dec. 2010.